PISA 2015 Results

EXCELLENCE AND EQUITY IN EDUCATION

VOLUME I

Programme for International Student Assessment

OECD

PISA

PISA 2015 Results (Volume I)

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OECD

BETTER POLICIES FOR BETTER LIVES

Please cite this publication as:
OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education,* PISA, OECD Publishing, Paris.
http://dx.doi.org/10.1787/9789264266490-en

ISBN (print) 978-92-64-26732-9
ISBN (PDF) 978-92-64-26649-0

Series: PISA
ISSN (print): 1990-8539
ISSN (on line): 1996-3777

Corrigenda to OECD publications may be found on line at: www.oecd.org/publishing/corrigenda.

Foreword

Equipping citizens with the knowledge and skills necessary to achieve their full potential, contribute to an increasingly interconnected world, and ultimately convert better skills into better lives is a central preoccupation of policy makers around the world. Results from the OECD's Survey of Adult Skills show that highly skilled adults are not only twice as likely to be employed and almost three times more likely to earn an above-median salary than poorly skilled adults, they are also more likely to volunteer, to report that they are in good to excellent health, to see themselves as actors rather than as objects of political processes, and to trust others. Fairness, integrity and inclusiveness in public policy thus all hinge on the skills of citizens.

In working to achieve these goals, more and more countries are looking beyond their own borders for evidence of the most successful and efficient education policies and practices. Over the past decade, the OECD Programme for International Student Assessment, PISA, has become the world's premier yardstick for evaluating the quality, equity and efficiency of school systems. But the evidence base that PISA has produced goes well beyond statistical benchmarking. By identifying the characteristics of high-performing education systems, PISA allows governments and educators to identify effective policies that they can then adapt to their local contexts.

The latest PISA assessment in 2015 focused on science, a discipline that plays an increasing role in our economic and social lives. From taking a painkiller to determining what is a "balanced" meal, from drinking pasteurised milk to deciding whether or not to buy a hybrid car, science is pervasive. And science is not just test tubes and the periodic table; it is the basis of nearly every tool we use – from a simple can opener to the most advanced space explorer. More important, science is not only the domain of scientists. In the context of massive information flows and rapid change, everyone now needs to be able to "think like a scientist": to be able to weigh evidence and come to a conclusion; to understand that scientific "truth" may change over time, as new discoveries are made, and as humans develop a greater understanding of natural forces and of technology's capacities and limitations.

The last time science was the focus of PISA was in 2006. Since then, science and technology have advanced tremendously. The smartphone was invented and became ubiquitous. Social media, cloud-based services, robotics and machine learning have transformed our economic and social life. New possibilities of gene sequencing and genome editing, synthetic biology, bio-printing or regenerative medicine and brain interfaces are changing life itself. Against this backdrop, and the fact that expenditure per primary and secondary student rose by almost 20% across OECD countries over this period, it is disappointing that, for the majority of countries with comparable data, science performance in PISA remained virtually unchanged since 2006. In fact, only a dozen countries showed measurable improvement in the science performance of their 15-year-olds, including high-performing education systems, such as Singapore and Macao (China), and low-performing ones, such as Peru and Colombia.

It is also worrying to see how many young people fail to reach even the most essential learning outcomes. In September 2015, world leaders gathered in New York to set ambitious goals for the future of the global community. Goal 4 of the Sustainable Development Goals seeks to ensure "inclusive and equitable quality education and promote lifelong learning opportunities for all". This includes that "all learners acquire the knowledge and skills needed to promote sustainable development" (Target 4.7). Only in Canada, Estonia, Finland, Hong Kong (China), Japan, Macao (China) and Singapore do at least four out of five 15-year-old students master the baseline level of proficiency in science, reading and mathematics. These countries show that there are countries on nearly every continent that could achieve the goal of universal basic skills by 2030. At the same time, the small group of countries that has moved close to securing at least basic skills for all shows how much remains to be done in most countries – including some of the wealthiest OECD countries – to attain the Sustainable Development Goals.

The data also show that the world is no longer divided between rich and well-educated nations and poor and badly educated ones: the 10% most disadvantaged students in Viet Nam compare favourably to the average student in the OECD area. Clearly, all countries and economies have excellent students, but few have enabled all students to excel. Achieving greater equity in education is not only a social justice imperative, it is also a way to use resources more effectively, increase the supply of skills that fuel economic growth, and promote social cohesion.

PISA also finds varying levels of engagement with science and expectations of science-related careers across students who are similarly capable and interested in science. In a majority of countries and economies, students from advantaged backgrounds are more likely to expect a career in science – even among students who perform similarly in science and who reported similar enjoyment of learning science.

Similarly, while it is encouraging that boys and girls now show similar levels of science performance in PISA, large gender differences remain in students' dispositions towards science-related careers, even among students who score similarly in science and who report similar levels of enjoyment in learning science. In Germany, Hungary and Sweden, for instance, top-performing boys are significantly more likely than top-performing girls to expect a career requiring further training in science. These findings have serious implications not only for higher education, where young women are already under-represented in the science, technology, engineering and mathematics fields of study, but also later on, when these young women enter the labour market.

Gender stereotypes about scientists and about work in science-related occupations can discourage some students from engaging further with science. Schools can counter these stereotypes, and help both boys and girls cultivate a wider perspective on science, including through better career information. Employers and educators in perceived "masculine" or "feminine" fields can also help eliminate existing stereotypes by underscoring the close inter-relationships among the numerous fields of science.

The subject of science itself suffers from a stereotyped image. Too often, school science is seen as the first segment of a (leaky) pipeline that will ultimately select those who will work as scientists and engineers. Not only does the "pipeline" metaphor discount the many pathways successful scientists have travelled to reach their career goals, it also conveys a negative image of those who do not end up as scientists and engineers. Because knowledge and understanding of science is useful well beyond the work of scientists and is, as PISA argues, necessary for full participation in a world shaped by science-based technology, school science should be promoted more positively – perhaps as a "springboard" to new sources of interest and enjoyment. Expanding students' awareness about the utility of science beyond teaching and research occupations can help build a more inclusive view of science, from which fewer students feel excluded.

PISA is not only an accurate indicator of students' abilities to participate fully in society after compulsory school, but also a powerful tool that countries and economies can use to fine-tune their education policies. There is no single combination of policies and practices that will work for everyone, everywhere. Every country has room for improvement, even the top performers. That's why the OECD produces this triennial report on the state of education across the globe: to share evidence of the best policies and practices and to offer our timely and targeted support to help countries provide the best education possible for all of their students. With high levels of youth unemployment, rising inequality, a significant gender gap, and an urgent need to boost inclusive growth in many countries, we have no time to lose. The OECD stands ready to support policy makers in this challenging and crucial endeavour.

Angel Gurría
OECD Secretary-General

Acknowledgements

This report is the product of a collaborative effort between the countries participating in PISA, the national and international experts and institutions working within the framework of the PISA Consortium, and the OECD Secretariat.

The development of this volume was guided by Andreas Schleicher and Yuri Belfali and managed by Miyako Ikeda. This volume was drafted by Francesco Avvisati with Carlos González-Sancho and edited by Marilyn Achiron. Statistical and analytical support was co-ordinated by Giannina Rech and provided by Guillaume Bousquet, Hélène Guillou, Bonaventura Francesco Pacileo and Judit Pál. Rose Bolognini co-ordinated production and Fung Kwan Tam designed the publication. Administrative support was provided by Claire Chetcuti, Juliet Evans, Audrey Poupon and Lisa Smadja. Additional members of the OECD PISA and communications teams who provided analytical and communications support include Peter Adams, Esther Carvalhaes, Anna Choi, Cassandra Davis, Alfonso Echazarra, Tue Halgreen, Jeffrey Mo, Chiara Monticone, Mario Piacentini, Shun Shirai, Michael Stevenson, Sophie Vayssettes and Michael Ward. External consultants for analytical and communications support include Przemyslaw Biecek, Simone Bloem, Maciej Jakubowski, Bartosz Kondratek, Christian Monseur, Jonathan Osborne, Elodie Pools, Jean-François Rouet, Matthias Von Davier and Kentaro Yamamoto.

To support the technical implementation of PISA, the OECD contracted an international consortium of institutions and experts, led by Irwin Kirsch of the Educational Testing Service (ETS). Overall co-ordination of the PISA 2015 assessment, the development of instruments, and scaling and analysis were managed by Claudia Tamassia of the ETS; development of the electronic platform was managed by Michael Wagner of the ETS. Development of the science and collaborative problem-solving frameworks, and adaptation of the frameworks for reading and mathematics, were led by John de Jong and managed by Catherine Hayes of Pearson. Survey operations were led by Merl Robinson and managed by Michael Lemay of Westat. Sampling and weighting operations were led by Keith Rust and managed by Sheila Krawchuk of Westat. Design and development of the questionnaires were led by Eckhard Klieme and managed by Nina Jude of the Deutsches Institut für Pädagogische Forschung (DIPF).

Jonathan Osborne chaired the expert group that guided the preparation of the science assessment framework and instruments. This group included Marcus Hammann, Sarah Howie, Jody Clarke-Midura, Robin Millar, Andrée Tiberghien, Russell Tytler and Darren Wong. Charles Alderson and Jean-Francois Rouet assisted in adapting the reading framework, and Zbigniew Marciniak, Berinderjeet Kaur and Oh Nam Kwon assisted in adapting the mathematics framework. David Kaplan chaired the expert group that guided the preparation of the questionnaire framework and instruments. This group included Eckhard Klieme, Gregory Elacqua, Marit Kjærnsli, Leonidas Kyriakides, Henry M. Levin, Naomi Miyake, Jonathan Osborne, Kathleen Scalise, Fons van de Vijver and Ludger Woessmann. Keith Rust chaired the Technical Advisory Group, whose members include Theo Eggen, John de Jong, Jean Dumais, Cees Glas, David Kaplan, Irwin Kirsch, Christian Monseur, Sophia Rabe-Hesketh, Thierry Rocher, Leslie A. Rutkowski, Margaret Wu and Kentaro Yamamoto.

The development of the report was steered by the PISA Governing Board, chaired by Lorna Bertrand (United Kingdom), with Maria Helena Guimarães de Castro (Brazil), Sungsook Kim (Korea) and Dana Kelly (United States) as vice chairs. Annex D of the volume lists the members of the various PISA bodies, including Governing Board members and National Project Managers in participating countries and economies, the PISA Consortium, and the individual experts and consultants who have contributed to PISA in general.

Table of contents

BOXES

A corrigendum has been issued for this page. See: http://www.oecd.org/about/publishing/Corrigenda-PISA2015-VolumeI.pdf

FIGURE

TABLES

Executive summary

An understanding of science, and of science-based technology, is necessary not only for those whose careers depend on it directly, but also for any citizen who wishes to make informed decisions related to the many controversial issues under debate today. From maintaining a healthy diet, to managing waste in big cities, to weighing the costs and benefits of genetically modified crops or mitigating the catastrophic consequences of global warming, science is ubiquitous in our lives.

Science was the major domain assessed in PISA 2015. PISA views science literacy as skills that are required to engage in reasoned discourse about science-related issues. Competency in science is influenced both by knowledge of and about science, and by attitudes towards science.

WHAT THE DATA TELL US

Students' performance in science and attitudes towards science

- Singapore outperforms all other participating countries/economies in science. Japan, Estonia, Finland and Canada are the four highest-performing OECD countries.
- Some 8% of students across OECD countries (and 24% of students in Singapore) are top performers in science, meaning that they are proficient at Level 5 or 6. Students at these levels are sufficiently skilled in and knowledgeable about science to creatively and autonomously apply their knowledge and skills to a wide variety of situations, including unfamiliar ones.
- For the majority of countries with comparable data, science performance remained essentially unchanged since 2006, despite significant developments in science and technology over that period. However, mean performance in science improved between 2006 and 2015 in Colombia, Israel, Macao (China), Portugal, Qatar and Romania. Over this period, Macao (China), Portugal and Qatar grew the share of students performing at or above Level 5 and simultaneously reduced the share of students performing below the baseline level of proficiency (Level 2). At Level 2, students can draw on their knowledge of basic science content and procedures to identify an appropriate explanation, interpret data, and identify the question being addressed in a simple experiment. All students should be expected to attain Level 2 by the time they leave compulsory education.
- Even though gender differences in science performance tend to be small, on average, in 33 countries and economies, the share of top performers in science is larger among boys than among girls. Finland is the only country in which girls are more likely to be top performers than boys.
- On average across OECD countries, 25% of boys and 24% of girls reported that they expect to work in a science-related occupation. But boys and girls tend to think of working in different fields of science: girls envisage themselves as health professionals more than boys do; and in almost all countries, boys see themselves as becoming ICT professionals, scientists or engineers more than girls do.

Students' performance in reading and mathematics

- About 20% of students in OECD countries, on average, do not attain the baseline level of proficiency in reading. This proportion has remained stable since 2009.
- On average across OECD countries, the gender gap in reading in favour of girls narrowed by 12 points between 2009 and 2015: boys' performance improved, particularly among the highest-achieving boys, while girls' performance deteriorated, particularly among the lowest-achieving girls.
- More than one in four students in Beijing-Shanghai-Jiangsu-Guangdong (China), Hong Kong (China), Singapore and Chinese Taipei are top-performing students in mathematics, meaning that they can handle tasks that require the ability to formulate complex situations mathematically, using symbolic representations.

Equity in education

- Canada, Denmark, Estonia, Hong Kong (China) and Macao (China) achieve high levels of performance and equity in education outcomes.
- Socio-economically disadvantaged students across OECD countries are almost three times more likely than advantaged students not to attain the baseline level of proficiency in science. But about 29% of disadvantaged students are considered resilient – meaning that they beat the odds and perform at high levels. And in Macao (China) and Viet Nam, students facing the greatest disadvantage on an international scale outperform the most advantaged students in about 20 other PISA-participating countries and economies.
- While between 2006 and 2015 no country or economy improved its performance in science and equity in education simultaneously, the relationship between socio-economic status and student performance weakened in nine countries where mean science scores remained stable. The United States shows the largest improvements in equity during this period.
- On average across OECD countries, and after taking their socio-economic status into account, immigrant students are more than twice as likely as their non-immigrant peers to perform below the baseline level of proficiency in science. Yet 24% of disadvantaged immigrant students are considered resilient.
- On average across countries with relatively large immigrant student populations, attending a school with a high concentration of immigrant students is not associated with poorer student performance, after accounting for the school's socio-economic intake.

WHAT PISA RESULTS IMPLY FOR POLICY

Most students who sat the PISA 2015 test expressed a broad interest in science topics and recognised the important role that science plays in their world; but only a minority of students reported that they participate in science activities. Boys and girls, and students from advantaged and disadvantaged backgrounds, often differ in the ways they engaged with science and envisaged themselves working in science-related occupations later on. Gender-related differences in science engagement and career expectations appear more related to disparities in what boys and girls think they are good at and is good for them, than to differences in what they actually can do. Parents and teachers can challenge gender stereotypes about science-related activities and occupations to allow girls and boys to achieve their potential. To support every student's engagement with science, they can also help students become more aware of the range of career opportunities that are made available with training in science and technology.

For disadvantaged students and those who struggle with science, additional resources, targeted to students or schools with the greatest needs, can make a difference in helping students acquire a baseline level of science literacy and develop a lifelong interest in the subject. All students, whether immigrant or non-immigrant, advantaged or disadvantaged, would also benefit from a more limited application of policies that sort students into different programme tracks or schools, particularly if these policies are applied in the earliest years of secondary school. Giving students more opportunities to learn science will help them to learn to "think like a scientist" – a skill that has become all but essential in the 21st century, even if students choose not to work in a science-related career later on.

Reader's guide

Data underlying the figures

The data referred to in this volume are presented in Annex B and, in greater detail, including some additional tables, on the PISA website (www.pisa.oecd.org).

Five symbols are used to denote missing data:

a The category does not apply in the country concerned. Data are therefore missing.

c There are too few observations or no observation to provide reliable estimates (i.e. there are fewer than 30 students or fewer than 5 schools with valid data).

m Data are not available. These data were not submitted by the country or were collected but subsequently removed from the publication for technical reasons.

w Data have been withdrawn or have not been collected at the request of the country concerned.

x Data included in another category or column of the table (e.g. x(2) means that data are included in Column 2 of the table).

Country coverage

This publication features data on 72 countries and economies, including all 35 OECD countries and 37 partner countries and economies (see Map of PISA countries and economies in "What is PISA").

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Two notes were added to the statistical data related to Cyprus:

Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

B-S-J-G (China) refers to the four PISA-participating China provinces: Beijing, Shanghai, Jiangsu and Guangdong.

FYROM refers to the Former Yugoslav Republic of Macedonia.

For the countries below, when results are based on students' or school principals' responses:

Argentina: Only data for the adjudicated region of Ciudad Autónoma de Buenos Aires (CABA) are reported in figures and in the text (see Annex A4).

Kazakhstan: Results for Kazakhstan are reported in a selection of figures (see Annex A4).

Malaysia: Results for Malaysia are reported in a selection of figures (see Annex A4).

International averages

The OECD average corresponds to the arithmetic mean of the respective country estimates. It was calculated for most indicators presented in this report.

The OECD total takes the OECD countries as a single entity, to which each country contributes in proportion to the number of 15-year-olds enrolled in its schools. It can be used to assess how a country compares with the OECD area as a whole.

The EU total takes the European Union Member States as a single entity, to which each member contributes in proportion to the number of 15-year-olds enrolled in its schools.

In this publication, the OECD average is generally used when the focus is on comparing performance across education systems. In the case of some countries, data may not be available for specific indicators, or specific categories may not apply. Readers should, therefore, keep in mind that the terms "OECD average" and "OECD total" refer to the OECD countries included in the respective comparisons. In cases where data are not available or do not apply for all sub-categories of a given population or indicator, the "OECD average" may be consistent within each column of a table but not necessarily across all columns of a table.

In analyses involving data from multiple years, the OECD average is reported on consistent sets of OECD countries, and several averages may be reported in the same table.

A number in the label used in figures and tables indicates the number of countries included in the average:

OECD average-35: Arithmetic mean across all OECD countries.

OECD average-34: Arithmetic mean across all OECD countries, excluding Austria.

OECD average-34-R: Arithmetic mean across all OECD countries, excluding the United States.

OECD average-30: Arithmetic mean across all OECD countries, excluding Chile, Estonia, Israel, Slovenia and the United Kingdom.

OECD average-28: Arithmetic mean across all OECD countries, excluding Estonia, Luxembourg, the Netherlands, the Slovak Republic, Slovenia, Turkey and the United Kingdom.

OECD average-24: Arithmetic mean across all OECD countries, excluding Austria, Chile, Estonia, Israel, Luxembourg, the Netherlands, the Slovak Republic, Slovenia, Turkey, the United Kingdom and the United States.

Rounding figures

Because of rounding, some figures in tables may not add up exactly to the totals. Totals, differences and averages are always calculated on the basis of exact numbers and are rounded only after calculation.

All standard errors in this publication have been rounded to one or two decimal places. Where the value 0.0 or 0.00 is shown, this does not imply that the standard error is zero, but that it is smaller than 0.05 or 0.005, respectively.

Reporting student data

The report uses "15-year-olds" as shorthand for the PISA target population. PISA covers students who are aged between 15 years 3 months and 16 years 2 months at the time of assessment and who are enrolled in school and have completed at least 6 years of formal schooling, regardless of the type of institution in which they are enrolled, and whether they are in full-time or part-time education, whether they attend academic or vocational programmes, and whether they attend public or private schools or foreign schools within the country.

Reporting school data

The principals of the schools in which students were assessed provided information on their schools' characteristics by completing a school questionnaire. Where responses from school principals are presented in this publication, they are weighted so that they are proportionate to the number of 15-year-olds enrolled in the school.

Focusing on statistically significant differences

This volume discusses only statistically significant differences or changes. These are denoted in darker colours in figures and in bold font in tables. See Annex A3 for further information.

Changes in the PISA methodology

Several changes were made to the PISA methodology in 2015:

- **Change in assessment mode** from paper-based to computer. Over the past 20 years, digital technologies have fundamentally transformed the ways in which we read and manage information. To better reflect how students and societies access, use and communicate information, starting with the 2015 round, the assessment was delivered mainly on computers, although countries had the option to use a paper-based version. In order to ensure comparability of results between paper-based tasks that were used in previous PISA assessments and the computer-delivered tasks used in 2015, the 2015 assessment was anchored to previous assessments through a set of items that showed, across countries, the same characteristics in paper- and computer-delivered form. The statistical models used to facilitate the mode change are based on an approach that examines measurement invariance for each item in both modes. In effect, this both accounts for and corrects the potential effect of mode differences by assigning the same parameters only for item-response variables that are comparable on paper and computer. It is conceivable, however, that country differences in familiarity with computers, or in student motivation to take the test on computer or on paper could influence differences in country performance. Box I.5.1 examines the country-level correlation between students' exposure to computers and changes in mean mathematics performance between 2012 and 2015. The results show that countries where students have greater familiarity with ICT tools are roughly as likely to show positive and negative performance trends, as are countries where students have less familiarity with ICT. For more information, see Box I.5.1 and Annex A5.

- **Change in the framework and set of PISA science items.** New science items were developed for PISA 2015 to reflect advances in science and other changes that countries had prioritised for the PISA 2015 assessment. Among other goals, the revision of the science framework included the aim to more fully use the capabilities of the new technology-based delivery mode. To verify that the new science assessment allowed for the establishment of reliable trends with previous PISA assessments, an evaluation of dimensionality was conducted. When new and existing science items were treated as related to distinct latent dimensions, the median correlation (across countries/language groups) between these dimensions was 0.92, a very high value (similar to the correlation observed among subscales from the same domain). Model-fit statistics confirmed that a unidimensional model fits the new science assessment, supporting the conclusion that new and existing science items form a coherent unidimensional scale with good reliability. For more information, see Annex A5.

- **Changes in scaling procedures** include:
  - Change from a one-parameter model to a hybrid model that applies both a one- and two-parameter model, as appropriate. The one-parameter (Rasch) model is retained for all items where the model is statistically appropriate; a more general 2-parameter model is used instead if the fit of the one-parameter model could not be established. This approach improves the fit of the model to the observed student responses and reduces model and measurement errors.
  - Change in treatment of non-reached items to ensure that the treatment is consistent between the estimation of item parameters and the estimation of the population model to generate proficiency estimates in the form of plausible values. This avoids introducing systematic errors when generating performance estimates.
  - Change from cycle-specific scaling to multiple-cycle scaling in order to combine data, and retain and aggregate information about trend items used in previous cycles. This change results in consistent item parameters across cycles, which strengthen and support the inferences made about proficiencies on each scale.
  - Change from including only a subsample for item calibration to including the total sample with weights, in order to fully use the available data and reduce the error in item-parameter estimates by increasing the sample size. This reduces the variability of item-parameter estimation due to the random selection of small calibration samples.
  - Change from assigning internationally fixed item parameters and dropping a few dodgy items per country, to assigning a few nationally unique item parameters for those items that show significant deviation from the international parameters. This retains a maximum set of internationally equivalent items without dropping data and, as a result, reduces overall measurement errors.

The overall impact of these changes on trend comparisons is quantified by the link errors. As in previous cycles, a major part of the linking error is due to re-estimated item parameters. While the magnitude of link errors is comparable to those estimated in previous rounds, the changes in scaling procedures will result in reduced link errors in future assessment rounds. For more information on the calculation of this quantity and how to use it in analyses, see Annex A5 and the *PISA 2015 Technical Report* (OECD, forthcoming).

- **Changes in population coverage and response rates.** Even though PISA has consistently used the same standardised methods to collect comparable and representative samples, and population coverage and response rates were carefully reviewed during the adjudication process, slight changes in population coverage and response rates can affect point estimates of proficiency. The uncertainty around the point estimates due to sampling is quantified in sampling errors, which are the major part of standard errors reported for country mean estimates. For more information, see Annexes A2 and A4.

- **Change in test design** from 13 booklets in the paper-based design to 396 booklet instances. Despite the significant increase in the number of booklet types and instances from previous cycles, it is important to bear in mind that all items belonging to the same domain were delivered in consecutive clusters. No student had more than one hour of test questions related to one domain only. This is an improvement over the existing design, which was made possible by computer delivery. It strengthens the overall measurement of each domain and each respondent's proficiency.

- **Changes in test administration.** As in PISA 2000 (but different from other cycles up to 2012), students in 2015 had to take their break before starting to work on test clusters 3 and 4, and could not work for more than one hour on clusters 1 and 2. This reduces cluster position effects. Another change in test administration is that students who took the test on computers had to solve test questions in a fixed, sequential order, and could not go back to previous questions and revise their answers after reaching the end of the test booklets. This change prepares the ground for introducing adaptive testing in future rounds of PISA.

In sum, changes to the assessment design, the mode of delivery, the framework and the set of science items were carefully examined in order to ensure that the 2015 results can be presented as trend measures at the international level. The data show no consistent association between students' familiarity with ICT and with performance shifts between 2012 and 2015 across countries. Changes in scaling procedures are part of the link error, as they were in the past, where the link error quantified the changes introduced by re-estimating item parameters on a subset of countries and students who participated in each cycle. Changes due to sampling variability are quantified in the sampling error. The remaining changes (changes in test design and administration) are not fully reflected in estimates of the uncertainty of trend comparisons. These changes are a common feature of past PISA rounds as well, and are most likely of secondary importance when analysing trends.

The factors below are examples of potential effects that are relevant for the changes seen from one PISA round to the next. While these can be quantified and related to, for example, census data if available, these are outside of the control of the assessment programme:

- **Change in coverage of PISA target population.** PISA's target population is 15-year-old students enrolled in grade 7 or above. Some education systems saw a rapid expansion of 15-year-olds' access to school because of a reduction in dropout rates or in grade repetition. This is explained in detail, and countries' performance adjusted for this change is presented in Chapters 2, 4 and 5 in Volume I.

- **Change in demographic characteristics.** In some countries, there might be changes in the composition of the population of 15-year-old students. For example, there might be more students with an immigrant background. Chapters 2, 4 and 5 in Volume I present performance (country mean and distribution) adjusted for changes in the composition of the student population, including students' immigrant background, gender and age.

- **Change in student competency.** The average proficiency of 15-year-old students in 2015 might be higher or lower than that in 2012 or earlier rounds.

Abbreviations used in this report

ESCS	PISA index of economic, social and cultural status	PPP	Purchasing power parity
GDP	Gross domestic product	S.D.	Standard deviation
ISCED	International Standard Classification of Education	S.E.	Standard error
ISCO	International Standard Classification of Occupations	STEM	Science, Technology, Engineering and Mathematics
% dif.	Percentage-point difference	Score dif.	Score-point difference
ICT	Information and Communications Technology		

Further documentation

For further information on the PISA assessment instruments and the methods used in PISA, see the *PISA 2015 Technical Report* (OECD, forthcoming).

This report uses the OECD StatLinks service. Below each table and chart is a URL leading to a corresponding Excel™ workbook containing the underlying data. These URLs are stable and will remain unchanged over time. In addition, readers of the e-books will be able to click directly on these links and the workbook will open in a separate window, if their Internet browser is open and running.

What is PISA?

"What is important for citizens to know and be able to do?" In response to that question and to the need for internationally comparable evidence on student performance, the Organisation for Economic Co-operation and Development (OECD) launched the triennial survey of 15-year-old students around the world known as the Programme for International Students Assessment, or PISA. PISA assesses the extent to which 15-year-old students, near the end of their compulsory education, have acquired key knowledge and skills that are essential for full participation in modern societies. The assessment focuses on the core school subjects of science, reading and mathematics. Students' proficiency in an innovative domain is also assessed (in 2015, this domain is collaborative problem solving). The assessment does not just ascertain whether students can reproduce knowledge; it also examines how well students can extrapolate from what they have learned and can apply that knowledge in unfamiliar settings, both in and outside of school. This approach reflects the fact that modern economies reward individuals not for what they know, but for what they can do with what they know.

PISA is an ongoing programme that offers insights for education policy and practice, and that helps monitor trends in students' acquisition of knowledge and skills across countries and in different demographic subgroups within each country. PISA results reveal what is possible in education by showing what students in the highest-performing and most rapidly improving education systems can do. The findings allow policy makers around the world to gauge the knowledge and skills of students in their own countries in comparison with those in other countries, set policy targets against measurable goals achieved by other education systems, and learn from policies and practices applied elsewhere. While PISA cannot identify cause-and-effect relationships between policies/practices and student outcomes, it can show educators, policy makers and the interested public how education systems are similar and different – and what that means for students.

WHAT IS UNIQUE ABOUT PISA?

PISA is different from other international assessments in its:

- **policy orientation**, which links data on student learning outcomes with data on students' backgrounds and attitudes towards learning, and on key factors that shape their learning, in and outside of school, in order to highlight differences in performance and identify the characteristics of students, schools and education systems that perform well;
- **innovative concept of "literacy"**, which refers to students' capacity to apply knowledge and skills in key subjects, and to analyse, reason and communicate effectively as they identify, interpret and solve problems in a variety of situations;
- **relevance to lifelong learning**, as PISA asks students to report on their motivation to learn, their beliefs about themselves, and their learning strategies;
- **regularity**, which enables countries to monitor their progress in meeting key learning objectives; and
- **breadth of coverage**, which, in PISA 2015, encompasses the 35 OECD countries and 37 partner countries and economies.

Box A. **PISA's contributions to the Sustainable Development Goals**

The Sustainable Development Goals (SDGs) were adopted by the United Nations in September 2015. Goal 4 of the SDGs seeks to ensure "inclusive and equitable quality education and promote lifelong learning opportunities for all". More specific targets and indicators spell out what countries need to deliver by 2030. Goal 4 differs from the Millennium Development Goals (MDGs) on education, which were in place between 2000 and 2015, in the following two ways:

- Goal 4 is truly global. The SDGs establish a universal agenda; they do not differentiate between rich and poor countries. Every single country is challenged to achieve the SDGs.
- Goal 4 puts the quality of education and learning outcomes front and centre. Access, participation and enrolment, which were the main focus of the MDG agenda, are still important, and the world is still far from providing equitable access to high-quality education for all. But participation in education is not an end in itself; what matters for people and economies are the skills acquired through education. It is the competencies and character qualities that are developed through schooling, rather than the qualifications and credentials gained, that make people successful and resilient in their professional and personal lives. They are also key in determining individual well-being and the prosperity of societies.

In sum, Goal 4 requires education systems to monitor the actual learning outcomes of their young people. PISA, which already provides measurement tools to this end, is committed to improving, expanding and enriching its assessment tools. For example, PISA 2015 assesses the performance in science, reading and mathematics of 15-year-old students in more than 70 high- and middle-income countries. PISA offers a comparable and robust measure of progress so that all countries, regardless of their starting point, can clearly see where they are on the path towards the internationally agreed targets of quality and equity in education.

Through participation in PISA, countries can also build their capacity to develop relevant data. While most countries that have participated in PISA already have adequate systems in place, that isn't true for many low-income countries. To this end, the OECD PISA for Development initiative not only aims to expand the coverage of the international assessment to include more middle- and low-income countries, but it also offers these countries assistance in building their national assessment and data-collection systems. PISA is also expanding its assessment domains to include other skills relevant to Goal 4. In 2015, for example, PISA assesses 15-year-old students' ability to solve problems collaboratively.

Other OECD data, such as those derived from the Survey of Adult Skills (a product of the OECD Programme for the International Assessment of Adult Competencies [PIAAC]) and the OECD Teaching and Learning International Survey (TALIS), provide a solid evidence base for monitoring education systems. OECD analyses promote peer learning as countries can compare their experiences in implementing policies. Together, OECD indicators, statistics and analyses can be seen as a model of how progress towards the SDG education goal can be measured and reported.

Source: OECD (2016), *Education at a Glance 2016: OECD Indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2016-en.

WHICH COUNTRIES AND ECONOMIES PARTICIPATE IN PISA?

PISA is now used as an assessment tool in many regions around the world. It was implemented in 43 countries and economies in the first assessment (32 in 2000 and 11 in 2002), 41 in the second assessment (2003), 57 in the third assessment (2006), 75 in the fourth assessment (65 in 2009 and 10 in 2010), and 65 in the fifth assessment. So far, 72 countries and economies have participated in PISA 2015.

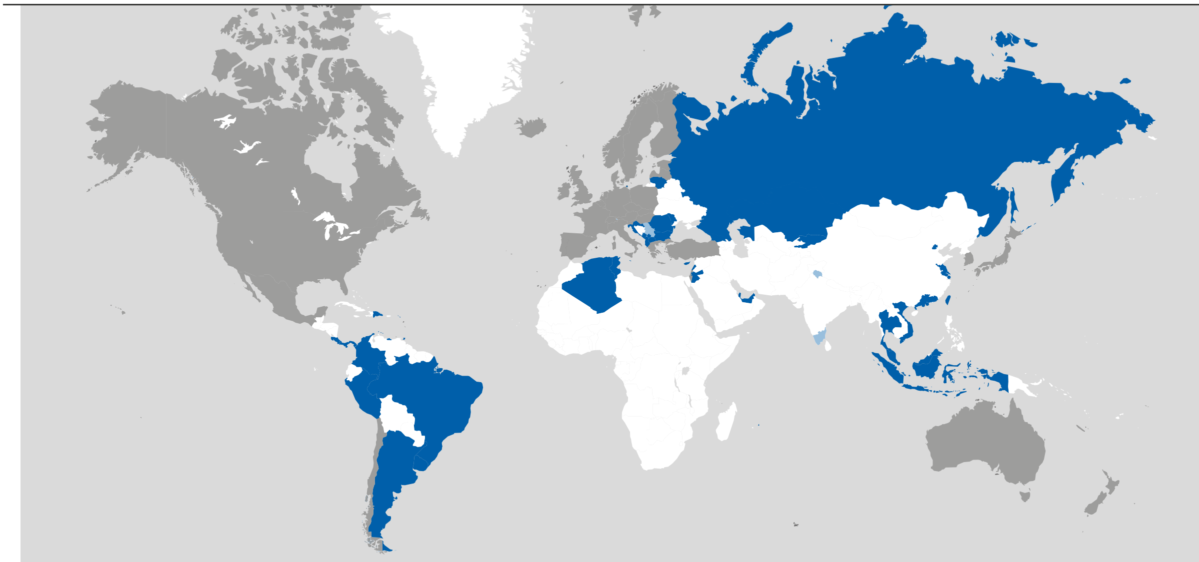
In addition to all OECD countries, the survey has been or is being conducted in:

- **East, South and Southeast Asia**: Beijing, Shanghai, Jiangsu and Guangdong (China), Hong Kong (China), Indonesia, Macao (China), Malaysia, Singapore, Chinese Taipei, Thailand and Viet Nam.
- **Central, Mediterranean and Eastern Europe, and Central Asia**: Albania, Bulgaria, Croatia, Georgia, Kazakhstan, Kosovo, Lebanon, Lithuania, the Former Yugoslav Republic of Macedonia, Malta, Moldova, Montenegro, Romania and the Russian Federation.

A corrigendum has been issued for this page. See: http://www.oecd.org/about/publishing/Corrigenda-PISA2015-VolumeI.pdf

- **The Middle East**: Jordan, Qatar and the United Arab Emirates.
- **Central and South America**: Argentina, Brazil, Colombia, Costa Rica, Dominican Republic, Peru, Trinidad and Tobago, Uruguay.
- **Africa**: Algeria and Tunisia.

Map of PISA countries and economies



OECD countries

Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, The Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States

Partner countries and economies in PISA 2015

Albania, Algeria, Argentina, Brazil, B-S-J-G (China)*, Bulgaria, Colombia, Costa Rica, Croatia, Cyprus[1], Dominican Republic, Former Yugoslav Republic of Macedonia, Georgia, Hong Kong (China), Indonesia, Jordan, Kazakhstan, Kosovo, Lebanon, Lithuania, Macao (China), Malaysia, Malta, Moldova, Montenegro, Peru, Qatar, Romania, Russian Federation, Singapore, Chinese Taipei, Thailand, Trinidad and Tobago, Tunisia, United Arab Emirates, Uruguay, Viet Nam

Partner countries and economies in previous cycles

Azerbaijan, Himachal Pradesh-India, Kyrgyzstan, Liechtenstein, Mauritius, Miranda-Venezuela, Panama, Serbia, Tamil Nadu-India

* B-S-J-G (China) refers to the four PISA participating China provinces: Beijing, Shanghai, Jiangsu, Guangdong.

1. Note by Turkey: The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the “Cyprus issue”.

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

WHAT DOES THE TEST MEASURE?

In each round of PISA, one of the core domains is tested in detail, taking up nearly half of the total testing time. The major domain in 2015 was science, as it was in 2006. Reading was the major domain in 2000 and 2009, and mathematics was the major domain in 2003 and 2012. With this alternating schedule of major domains, a thorough analysis of achievement in each of the three core areas is presented every nine years; an analysis of trends is offered every three years.

The *PISA 2015 Assessment and Analytical Framework* (OECD, 2016b) presents definitions and more detailed descriptions of the domains assessed in PISA 2015:

- **Science literacy** is defined as the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen. A scientifically literate person is willing to engage in reasoned discourse about science and technology, which requires the competencies to explain phenomena scientifically, evaluate and design scientific enquiry, and interpret data and evidence scientifically.
- **Reading literacy** is defined as students' ability to understand, use, reflect on and engage with written texts in order to achieve one's goals, develop one's knowledge and potential, and participate in society.
- **Mathematical literacy** is defined as students' capacity to formulate, employ and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena. It assists individuals in recognising the role that mathematics plays in the world and to make the well-founded judgements and decisions needed by constructive, engaged and reflective citizens.

Box B. **Key features of PISA 2015**

The content

- The PISA 2015 survey focused on science, with reading, mathematics and collaborative problem solving as minor areas of assessment. PISA 2015 also included an assessment of young people's financial literacy, which was optional for countries and economies.

The students

- Approximately 540 000 students completed the assessment in 2015, representing about 29 million 15-year-olds in the schools of the 72 participating countries and economies.

The assessment

- Computer-based tests were used, with assessments lasting a total of two hours for each student.
- Test items were a mixture of multiple-choice questions and questions requiring students to construct their own responses. The items were organised in groups based on a passage setting out a real-life situation. About 810 minutes of test items for science, reading, mathematics and collaborative problem solving were covered, with different students taking different combinations of test items.
- Students also answered a background questionnaire, which took 35 minutes to complete. The questionnaire sought information about the students themselves, their homes, and their school and learning experiences. School principals completed a questionnaire that covered the school system and the learning environment. For additional information, some countries/economies decided to distribute a questionnaire to teachers. It was the first time that this optional teacher questionnaire was offered to PISA-participating countries/economies. In some countries/economies, optional questionnaires were distributed to parents, who were asked to provide information on their perceptions of and involvement in their child's school, their support for learning in the home, and their child's career expectations, particularly in science. Countries could choose two other optional questionnaires for students: one asked students about their familiarity with and use of information and communication technologies (ICT); and the second sought information about students' education to date, including any interruptions in their schooling, and whether and how they are preparing for a future career.

HOW IS THE ASSESSMENT CONDUCTED?

For the first time, PISA 2015 delivered the assessment of all subjects via computer. Paper-based assessments were provided for countries that chose not to test their students by computer, but the paper-based assessment was limited to questions that could measure trends in science, reading and mathematics performance.[1] New questions were developed for the computer-based assessment only. A field trial was used to study the effect of the change in how the assessment was delivered. Data were collected and analysed to establish equivalence between the computer- and paper-based assessments.

The 2015 computer-based assessment was designed as a two-hour test. Each test form allocated to students comprised four 30-minute clusters of test material. This test design included six clusters from each of the domains of science, reading and mathematics to measure trends. For the major subject of science, an additional six clusters of items were developed to reflect the new features of the 2015 framework. In addition, three clusters of collaborative problem-solving items were developed for the countries that decided to participate in that assessment.[2] There were 66 different test forms. Students spent one hour on the science assessment (one cluster each of trends and new science items) plus one hour on one or two other subjects – reading, mathematics or collaborative problem solving. For the countries/economies that chose not to participate in the collaborative problem-solving assessment, 36 test forms were prepared.

Countries that chose paper-based delivery for the main survey measured student performance with 30 pencil-and-paper forms containing trend items from two of the three core PISA domains.

Each test form was completed by a sufficient number of students, allowing for estimations of proficiency on all items by students in each country/economy and in relevant subgroups within a country/economy (such as boys and girls, and students from different social and economic backgrounds).

The assessment of financial literacy was offered as an option in PISA 2015 based on the same framework as the one developed for PISA 2012.[3] The financial literacy assessment lasted one hour and comprised two clusters distributed to a subsample of students in combination with the science, mathematics and reading assessments.

To gather contextual information, PISA 2015 asked students and the principal of their school to respond to questionnaires. The student questionnaire took about 35 minutes to complete; the questionnaire for principals took about 45 minutes to complete. The responses to the questionnaires were analysed with the assessment results to provide both a broader and more nuanced picture of student, school and system performance. The *PISA 2015 Assessment and Analytical Framework* (OECD, 2016a) presents the questionnaire framework in detail. The questionnaires from all assessments since PISA's inception are available on the PISA website: www.pisa.oecd.org.

The questionnaires seek information about:

- Students and their family backgrounds, including their economic, social and cultural capital.
- Aspects of students' lives, such as their attitudes towards learning, their habits and life in and outside of school, and their family environment.
- Aspects of schools, such as the quality of the schools' human and material resources, public and private management and funding, decision-making processes, staffing practices, and the school's curricular emphasis and extracurricular activities offered.
- Context of instruction, including institutional structures and types, class size, classroom and school climate, and science activities in class.
- Aspects of learning, including students' interest, motivation and engagement.

Four additional questionnaires were offered as options:

- **A computer familiarity questionnaire**, focusing on the availability and use of information and communications technology (ICT) and on students' ability to carry out computer tasks and their attitudes towards computer use.
- **An educational career questionnaire**, which collects additional information on interruptions in schooling, on preparation for students' future career, and on support with science learning.
- **A parent questionnaire**, focusing on parents' perceptions of and involvement in their child's school, their support for learning at home, school choice, their child's career expectations, and their background (immigrant/non-immigrant).
- **A teacher questionnaire**, which is new to PISA, will help establish the context for students' test results. In PISA 2015, science teachers were asked to describe their teaching practices through a parallel questionnaire that also focuses on teacher-directed teaching and learning activities in science lessons, and a selected set of enquiry-based activities. The teacher questionnaire asked about the content of the school's science curriculum and how it is communicated to parents too.

The contextual information collected through the student, school and optional questionnaires are complimented by system-level data. Indicators describing the general structure of the education systems, such as expenditure on education, stratification, assessments and examinations, appraisals of teachers and school leaders, instruction time, teachers' salaries, actual teaching time and teacher training are routinely developed and applied by the OECD (e.g. in the annual OECD publication, *Education at a Glance*). These data are extracted from *Education at a Glance 2016* (OECD, 2016b), *Education at a Glance 2015* (OECD, 2015) and *Education at a Glance 2014* (OECD, 2014) for the countries that participate in the annual OECD data collection that is administered through the OECD Indicators of Education Systems (INES) Network. For other countries and economies, a special system-level data collection was conducted in collaboration with PISA Governing Board members and National Project Managers.

WHO ARE THE PISA STUDENTS?

Differences between countries in the nature and extent of pre-primary education and care, in the age at entry into formal schooling, in the structure of the education system, and in the prevalence of grade repetition mean that school grade levels are often not good indicators of where students are in their cognitive development. To better compare student performance internationally, PISA targets students of a specific age. PISA students are aged between 15 years 3 months and 16 years 2 months at the time of the assessment, and have completed at least 6 years of formal schooling. They can be enrolled in any type of institution, participate in full-time or part-time education, in academic or vocational programmes, and attend public or private schools or foreign schools within the country. (For an operational definition of this target population, see Annex A2.) Using this age across countries and over time allows PISA to compare consistently the knowledge and skills of individuals born in the same year who are still in school at age 15, despite the diversity of their education histories in and outside of school.

The population of PISA-participating students is defined by strict technical standards, as are the students who are excluded from participating (see Annex A2). The overall exclusion rate within a country was required to be below 5% to ensure that, under reasonable assumptions, any distortions in national mean scores would remain within plus or minus 5 score points, i.e. typically within the order of magnitude of 2 standard errors of sampling. Exclusion could take place either through the schools that participated or the students who participated within schools (see Annex A2, Tables A2.1 and A2.2).

There are several reasons why a school or a student could be excluded from PISA. Schools might be excluded because they are situated in remote regions and are inaccessible, because they are very small, or because of organisational or operational factors that precluded participation. Students might be excluded because of intellectual disability or limited proficiency in the language of the assessment.

In 30 out of the 72 countries and economies that participated in PISA 2015, the percentage of school-level exclusions amounted to less than 1%; it was 4.1% or less in all countries and economies. When the exclusion of students who met the internationally established exclusion criteria is also taken into account, the exclusion rates increase slightly. However, the overall exclusion rate remains below 2% in 29 participating countries and economies, below 5% in 60 participating countries and economies, and below 7% in all countries except the United Kingdom, Luxembourg (both 8.2%) and Canada (7.5%). In 13 out of the 35 OECD countries, the percentage of school-level exclusions amounted to less than 1% and was less than 3% in 30 OECD countries. When student exclusions within schools are also taken into account, there were 7 OECD countries below 2% and 25 OECD countries below 5%. For more detailed information about school and student exclusion from PISA 2015, see Annex A2.

WHAT KINDS OF RESULTS DOES PISA PROVIDE?

Combined with the information gathered through the tests and the various questionnaires, the PISA assessment provides three main types of outcomes:

- Basic indicators that provide a baseline profile of the knowledge and skills of students.
- Indicators derived from the questionnaires that show how such skills relate to various demographic, social, economic and education variables.
- Indicators on trends that show changes in outcomes and distributions, and in relationships between student-level, school-level, and system-level background variables and outcomes.

WHERE CAN YOU FIND THE RESULTS?

This is the first of five volumes that present the results from PISA 2015. It begins by discussing student performance in science and examines how that performance has changed over previous PISA assessments. Chapter 3 examines students' engagement with science and attitudes towards science, including students' expectations of working in a science-related career later on. Chapters 4 and 5 provide an overview of student performance in reading and mathematics, respectively, and describe the evolution of performance in these subjects over previous PISA assessments. Chapters 6 and 7 define equity in education and examine inclusiveness and fairness in education. Chapter 6 primarily focuses on the socio-economic status of students and schools, while Chapter 7 examines how an immigrant background is related to students' performance in PISA and their attitudes towards science. Chapter 8 discusses what the PISA results imply for policy, and highlights the policy-reform experience of some countries that have improved during their participation in PISA.

The other four volumes cover the following issues:

- *Volume II: Policies and Practices for Successful Schools* examines how student performance is associated with various characteristics of individual schools and concerned school systems. The volume first focuses on science, describing the school resources devoted to science and how science is taught in schools. It discusses how both of these are related to student performance in science, students' epistemic beliefs, and students' expectations of pursuing a career in science. Then, the volume analyses schools and school systems and their relationship with education outcomes more generally, covering the learning environment in school, school governance, selecting and grouping students, and the human, financial, educational and time resources allocated to education. Trends in these indicators between 2006 and 2015 are examined when comparable data are available.
- *Volume III: Students' Well-Being* describes how well adolescent students are learning and living. This volume analyses a broad set of indicators that, collectively, paint a picture of 15-year-old students' home and school environments, the way students communicate with family and friends, how and how often they use the Internet, their physical activities and eating habits, their aspirations for future education, their motivation for school work, and their overall satisfaction with life.
- *Volume IV: Students' Financial Literacy* examines 15-year-old students' understanding about money matters in the 15 countries and economies that participated in this optional assessment. The volume explores how the financial literacy of 15-year-old students is associated with their competencies in science, reading and mathematics, with their socio-economic status, and with their previous experiences with money. The volume also offers an overview of financial education in schools in the participating countries and economies, and provides case studies.
- *Volume V: Collaborative Problem Solving* examines students' ability to work with two or more people to try to solve a problem. The volume provides the rationale for assessing this particular skill and describes performance within and across countries. In addition, the volume highlights the relative strengths and weaknesses of each school system and examines how they are related to individual student characteristics, such as gender, immigrant background and socio-economic status. The volume also explores the role of education in building young people's skills in solving problems collaboratively.

Volume II is published at the same time as Volume I; Volumes III, IV and V will be published in 2017.

The frameworks for assessing science, reading and mathematics in 2015 are described in the *PISA 2015 Assessment and Analytical Framework: Science, Reading, Mathematic and Financial Literacy* (OECD, 2016a). They are also summarised in this volume.

Technical annexes at the end of this volume describe how questionnaire indices were constructed, and discuss sampling issues, quality-assurance procedures, and the process followed for developing the assessment instruments. Many of the issues covered in the technical annexes are elaborated in greater detail in the *PISA 2015 Technical Report* (OECD, forthcoming).

All data tables referred to in the analyses are included at the end of the respective volume in Annex B1, and a set of additional data tables is available on line (www.pisa.oecd.org). A Reader's Guide is also provided in each volume to aid in interpreting the tables and figures that accompany the report. Data from regions within the participating countries are included in Annex B2.

Notes

1. The paper-based form was used in 15 countries/economies including Albania, Algeria, Argentina, Georgia, Indonesia, Jordan, Kazakhstan, Kosovo, Lebanon, the Former Yugoslav Republic of Macedonia, Malta, Moldova, Romania, Trinidad and Tobago, and Viet Nam, as well as in Puerto Rico, an unincorporated territory of the United States.

2. The collaborative problem solving assessment was not conducted in the countries/economies that delivered the PISA 2015 assessment on paper, nor was it conducted in the Dominican Republic, Ireland, Poland, Qatar or Switzerland.

3. The financial literacy assessment was conducted in Australia, Belgium (Flemish community only), Beijing, Shanghai, Jiangsu, and Guangdong (China), Brazil, Canada, Chile, Italy, Lithuania, the Netherlands, Peru, Poland, the Russian Federation, the Slovak Republic, Spain and the United States.

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1

Overview: Excellence and equity in education

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Science is not just test tubes and the periodic table; it is the basis of nearly every tool we use – from a simple can opener to the most advanced space explorer. Nor is science the domain of scientists only. Everyone now needs to be able to "think like a scientist": to be able to weigh evidence and come to a conclusion; to understand that scientific "truth" may change over time, as new discoveries are made, and as humans develop a greater understanding of natural forces and of technology's capacities and limitations. PISA aims not only to assess what students know in science, but also what they can do with what they know, and how they can creatively apply scientific knowledge to real-life situations.

Science was the major domain assessed in PISA 2015. The assessment focused on measuring three competencies: the ability to explain scientific phenomena, to design and evaluate scientific enquiry, and to interpret data and evidence scientifically. Each of these competencies requires a specific type of knowledge about science. Explaining scientific and technological phenomena, for instance, demands knowledge of the content of science. The second and third skills also require an understanding of how scientific knowledge is established and the degree of confidence with which it is held.

PISA views science literacy not as an attribute that a student has or does not have, but as a set of skills that can be acquired to a greater or lesser extent. It is influenced both by knowledge of and about science, and by attitudes towards science. In PISA 2015, students' attitudes, beliefs and values were examined through students' responses to questions in the student questionnaire rather than through their performance on test items.

In 2015, for the first time, the PISA science test was mainly delivered on computer. Doing so greatly expanded the scope of what was assessed. For example, PISA 2015 for the first time assessed students' ability to conduct a scientific enquiry by asking students to design (simulated) experiments and interpret the resulting evidence. Despite this change in the mode of assessment, the results from PISA 2015 are comparable with results from the previous, paper-based assessments.

Singapore outperforms all other participating countries/economies in science.

The easiest way to summarise student performance and compare countries' relative standing in science performance is through the mean performance of students in each country. In PISA 2015, the mean score in science for OECD countries is 493 points. This is the benchmark against which each country's science performance is compared. One country, Singapore, outperforms all others in science, with a mean score of 556 points. Japan (538 points) scores below Singapore, but above all other countries, except Estonia (534 points) and Chinese Taipei (532 points), whose mean scores are not statistically significantly different from each other's. Together with Japan and Estonia, Finland (531 points) and Canada (528 points) are the four highest-performing OECD countries (Figure I.2.13 and Table I.2.3).

On average across OECD countries, 79% of students perform at or above Level 2 in science, the baseline level of proficiency.

PISA also describes student performance by levels of proficiency. PISA 2015 identifies seven levels of proficiency in science, six of which are aligned with the levels defined in PISA 2006, when science was also the major domain assessed. These range from the highest level of proficiency, Level 6, to Level 1a, formerly called Level 1. A new level, Level 1b, was added to the bottom of the scale. Level 1b includes the easiest tasks in the assessment and describes the skills of some of the students performing below Level 1a.

Level 2 is considered the baseline level of science proficiency that is required to engage in science-related issues as a critical and informed citizen. All students should be expected to attain this level by the time they leave compulsory education. More than 90% of students in Viet Nam (94.1%), Macao (China) (91.9%), Estonia (91.2%), Hong Kong (China) (90.6%), Singapore and Japan (both 90.4%) meet this benchmark. (But the PISA sample for Viet Nam covers only about one in two of its 15-year-olds – a reflection of inequities in access to secondary education in that country.) In all OECD countries, more than one in two students perform at Level 2 or higher (Figures I.2.15 and I.2.16).

Some 7.7% of students across OECD countries are top performers in science, meaning that they are proficient at Level 5 or 6. About one in four (24.2%) students in Singapore, and more than one in seven students in Chinese Taipei (15.4%), Japan (15.3%) and Finland (14.3%) perform at this level. By contrast, in 20 countries/economies, including OECD countries Turkey (0.3%) and Mexico (0.1%), less than 1% of all students are top performers (Figure I.2.15).

Performance in science is also related to students' beliefs about the nature and origin of scientific knowledge. Students who score low in science are less likely to agree that scientific knowledge is tentative and to believe that scientific approaches to enquiry, such as the use of repeated experiments, are a good way to acquire new knowledge (Figures I.2.34 and I.2.35).

On average across OECD countries, boys score slightly higher than girls in science.

Boys score four points higher than girls in science, on average across OECD countries – a small, but statistically significant difference. Boys perform significantly better than girls in science in 24 countries and economies. The largest advantage for boys is found in Austria, Costa Rica and Italy, where the difference between boys' and girls' scores is over 15 points. Girls score significantly higher than boys, on average, in 22 countries and economies. In Albania, Bulgaria, Finland, the Former Yugoslav Republic of Macedonia (hereafter "FYROM"), Georgia, Jordan, Qatar, Trinidad and Tobago, and the United Arab Emirates, girls' mean score is more than 15 points higher than boys' (Table I.2.7).

In 33 countries and economies, the share of top-performers in science is larger among boys than among girls (Figure I.2.20). Among the countries where more than 1% of students are top performers in science, in Austria, Chile, Ireland, Italy, Portugal and Uruguay, around two out of three top-performing students are boys. Finland is the only country in which there are more girls than boys among top performers in science. In the remaining countries/economies, the gender difference in the shares of top performers is not statistically significant.

But in most countries, boys' advantage in science performance disappears when examining the shares of students who are able to complete the easiest science tasks in the PISA test. In 28 countries and economies, boys are, in fact, over-represented among low-achieving students in science; in only five countries/economies are girls over-represented among the low achievers in science (Figure I.2.19). In the remaining countries/economies, the gender difference in the shares of low-achieving students is not statistically significant.

Mean performance in science improved significantly between 2006 and 2015 in Colombia, Israel, Macao (China), Portugal, Qatar and Romania.

Every PISA test assesses students' science, reading and mathematics literacy; in each round, one of these subjects is the main domain and the other two are minor domains. Science was the major domain for the first time in 2006 and again in 2015. So the most reliable way to see whether and how student performance in science is improving is to compare results between 2006 and 2015. Trends in science performance are available for 64 countries and economies that participated in PISA 2015. Fifty-one of these have science performance data for 2015 and data from three previous PISA assessments that are comparable (2006, 2009 and 2012); five have data from 2015 and two additional assessments; and eight countries and economies have data from 2015 and one previous assessment.

On average across OECD countries with comparable data in PISA 2006 and PISA 2015, performance in science has not changed significantly. Still, 13 countries show a significant average improvement in science performance – including 6 countries that participated in all assessments since 2006 – and 15 show a significant average deterioration in performance. In Ciudad Autónoma de Buenos Aires (Argentina) (hereafter "CABA [Argentina]"), Georgia and Qatar, student performance in science improved by more than 20 score points every 3 years since these countries/economies began participating in PISA (however, Georgia only participated in PISA 2009 and PISA 2015, and CABA [Argentina] only participated as a separate adjudicated entity since PISA 2012). Albania, Moldova and Peru improved by between 9 and 20 score points every 3 years since 2009, and Colombia improved by 8 points, on average, every 3 years throughout its participation in PISA (since 2006) (Figure I.2.21).

Among OECD countries, Portugal improved by more than seven score points every three years, on average and Israel raised its score by about five points every three years. Partner countries/economies Macao (China), Romania, Singapore, and Trinidad and Tobago also show significant improvements over the period in which they participated in PISA. (Of these, only Macao [China] and Romania participated in all four PISA cycles between 2006 and 2015.) (Figure 1.2.21).

By contrast, in Finland, the Slovak Republic and the United Arab Emirates, student performance in science deteriorated by more than ten points every three years, on average. Performance in Australia, the Czech Republic, Greece, Hong Kong (China), Hungary, Iceland and New Zealand deteriorated between five and ten points every three years; and mean performance in science in Austria, Croatia, Jordan, the Netherlands and Sweden declined by less than five points every three years, on average (Figure 1.2.21).

Across OECD countries on average, the proportion of students scoring below Level 2 in science increased by 1.5 percentage points between 2006 and 2015 (a non-significant increase), while the proportion of students scoring at or above Level 5 decreased by 1.0 percentage point (a non-significant decrease). Between 2006 and 2015, Colombia, Macao (China), Portugal and Qatar reduced the share of students who perform below Level 2. At the same time, Macao (China), Portugal and Qatar were also able to increase the share of students performing at or above Level 5 (Figure I.2.26).

A quarter of students envisions themselves working in a science-related career later on.

Students' current and future engagement with science is primarily shaped by two forces: how students think about themselves – what they think they are good at and what they think is good for them – and their attitudes towards science and towards science-related activities – that is, whether they perceive these activities as important, enjoyable and useful.

On average across OECD countries, almost one in four students expects to work in an occupation that requires further science training beyond compulsory education (Figure I.3.2). Across almost all countries, the expectation of pursuing a career in science is strongly related to proficiency in science. On average across OECD countries, only 13% of students who score below PISA proficiency Level 2 in science hold such expectations, but that percentage increases to 23% for those scoring at Level 2 or 3, to 34% among those scoring at Level 4, and to 42% among top performers in science (those who score at or above Level 5) (Figure I.3.3).

Girls and boys are almost equally likely to expect to work in a science-related career, but they have different interests and different ideas of what those careers might be.

On average across OECD countries, boys and girls are almost equally likely to expect to work in a science-related field. Some 25% of boys, and 24% of girls, expect to be working in a science-related occupation when they are 30 (Table I.3.5).

But boys and girls seem to be interested in different areas of science. Boys are more interested than girls in physics and chemistry, while girls tend to be more interested in health-related topics. And boys and girls tend to think of working in different fields of science. In all 57 countries and economies that included this question in the PISA student questionnaire except the Dominican Republic, more boys than girls reported being interested in the science topics of motion and forces (e.g. velocity, friction, magnetic and gravitational forces). Similarly, in all countries and economies except the Dominican Republic and Thailand, more boys than girls reported being interested in the topics of energy and its transformation (e.g. conservation, chemical reactions). Meanwhile, in all countries and economies, girls were more likely than boys to report being interested in how science can help prevent disease – except in Chinese Taipei, where the gender difference is not significant (Figure I.3.12).

These interests are reflected in gender differences in students' expectations of a career in science. On average across OECD countries, boys are more than twice as likely as girls to expect to work as engineers, scientists or architects (science and engineering professionals); and 4.8% of boys, but only 0.4% of girls, expect to work as ICT professionals. But girls are almost three times as likely as boys to expect to work as doctors, veterinarians or nurses (health professionals) (Tables I.3.11a, I.3.11b and I.3.11c).

In general, boys participate more frequently in science-related activities and have more confidence in their abilities in science than girls.

In general, only a minority of students reported that they watch TV programmes about science, visit websites about science topics, or read science magazines or newspaper articles about science regularly or very often. But on average, nearly twice as many boys as girls so reported. This gender difference in favour of boys is observed across all science-related activities proposed, and in all 57 countries and economies that included this question in the PISA student questionnaire (Figure I.3.7).

When a student is confident in his or her ability to accomplish particular goals in the context of science, he or she is said to have a greater sense of self-efficacy in science. Better performance in science leads to a greater sense of self-efficacy, through positive feedback received from teachers, peers and parents, and the positive emotions associated with that feedback. At the same time, if students do not believe in their ability to accomplish particular tasks, they will not exert the effort needed to complete the task, and a lack of self-efficacy becomes a self-fulfilling prophecy.

In 39 countries and economies, boys show significantly greater self-efficacy than girls. Gender differences in science self-efficacy are particularly large in Denmark, France, Germany, Iceland and Sweden (Figure I.3.20 and Table I.3.4c).

Students who have low self-efficacy in science do not perform as well in science as students who are confident about their ability to use their scientific knowledge and skills in everyday contexts (Figure I.3.22); and the gender gap in science self-efficacy is related to the gender gap in science performance, especially among high-achieving students (Figure I.3.23). Countries and economies where the 10% best-performing boys score significantly above the 10% best-performing girls in science tend to have larger gender gaps in self-efficacy, in favour of boys. By contrast, countries and economies where girls reported greater self-efficacy than boys show no significant gender gap in performance among high-achieving students; and in Jordan, the gender gap in performance is to girls' advantage.

Singapore, Hong Kong (China), Canada and Finland are the highest-performing countries and economies in reading.

In PISA, reading proficiency measures students' ability to use written information in real-life situations. With a mean score of 535 points, Singapore scores around 40 points above the OECD average (493 points). The Canadian provinces of British Columbia and Alberta score close to Singapore's result. Hong Kong (China), Canada and Finland score below Singapore, but at least 30 points above the OECD average, and five countries (Ireland, Estonia, Korea, Japan and Norway) score between 20 and 30 points higher than the OECD average. Forty-one countries and economies score below the OECD average in reading (Figure I.4.1).

Among OECD countries, about 100 points (the equivalent of about three years of schooling) separate the mean scores of the highest-performing OECD countries (Canada and Finland) from the lowest-performing OECD countries (Mexico and Turkey). When partner countries and economies are considered along with OECD countries, this difference amounts to 189 score points (Figure I.4.1).

Nearly one in ten students in OECD countries is a top performer in reading, but two in ten students do not attain the baseline level of proficiency in the subject.

The seven proficiency levels used in the PISA 2015 reading assessment are the same as those established for the 2009 PISA assessment, when reading was the major area of assessment: Level 1b is the lowest described level, then Level 1a, Level 2, Level 3 and so on up to Level 6. Level 2 can be considered the baseline level of proficiency at which students begin to demonstrate the reading skills that will enable them to participate effectively and productively in life. Studies that followed-up on the first students who took the PISA test in 2000 have shown that students who scored below Level 2 in reading faced a disproportionately higher risk of not completing secondary education, of not participating in post-secondary education and of poor labour-market outcomes as young adults.

On average across OECD countries, 80% of students are proficient at Level 2 or higher. In Hong Kong (China), more than 90% of students perform at or above this threshold. But in Algeria and Kosovo, fewer than one in four students scores at or above the baseline level, and in Albania, Brazil, the Dominican Republic, FYROM, Georgia, Indonesia, Lebanon, Peru, Qatar and Tunisia, fewer than one in two students performs at this level (Figure I.4.3).

Across OECD countries, 8.3% of students are top performers in reading, meaning that they are proficient at Level 5 or 6. Singapore has the largest proportion of top performers – 18.4% – among all participating countries and economies. About 14% of students in Canada, Finland and New Zealand, and 13% in Korea and France are top performers in reading. But in 15 countries/economies – including OECD countries Turkey and Mexico – less than 1% of students perform at Level 5 or above (Figure I.4.3).

About 20% of students in OECD countries, on average, do not attain the baseline level of proficiency in reading. In Algeria, Brazil, the Dominican Republic, FYROM, Georgia, Indonesia, Kosovo, Peru, Qatar, Thailand and Tunisia, a greater share of students performs at Level 1a in reading than at any other proficiency level. Across OECD countries, 5.2% of students are only able to solve tasks at Level 1b, and 1.3% of students are not even proficient at this level (Figure I.4.1).

Few countries saw consistent improvements in reading performance since PISA 2000.

Of the 42 countries and economies that have collected comparable data on student performance in at least five PISA assessments, including 2015, only Chile, Germany, Hong Kong (China), Indonesia, Israel, Japan, Latvia, Macao (China), Poland, Portugal, Romania and the Russian Federation (hereafter "Russia") have seen an improving trend in average reading performance. Twenty-four other countries saw no significant improvement or deterioration of performance, on average across successive assessments, between 2000 (or 2003, for countries without data from PISA 2000) and 2015. Among these, Canada has nevertheless been able to maintain its mean performance at least 20 points above the OECD average in all six assessments. Six countries saw a significant negative trend (Figure I.4.6).

Albania, Estonia, Georgia, Ireland, Macao (China), Moldova, Montenegro, Russia, Slovenia and Spain were able to simultaneously increase the share of top performers and reduce the share of low achievers in reading between 2009 and 2015.

Of the 59 countries and economies with comparable data in reading performance between 2009, when reading was the major domain assessed, and 2015, 19 show improvements in mean reading performance, 28 show no significant trend, and the remaining 12 countries and economies show a deterioration in average student performance. CABA (Argentina), Georgia, Moldova and Russia saw an average improvement every 3 years of more than 15 score points in reading (or the equivalent of half a year of schooling) throughout their participation in PISA assessments. Albania, Ireland, Macao (China),

Peru, Qatar and Slovenia saw an average improvement of more than ten score points every three years. These are rapid and significant improvements (Figure I.4.3).

At the same time, several countries also expanded access to education for their 15-year-olds. Among the countries and economies where less than 80% of the population of 15-year-olds were covered by the PISA sample in 2009 (meaning that they were enrolled in school, in grade 7 or above) and that have comparable data for PISA 2009 and PISA 2015, in Brazil, Colombia, Costa Rica, Indonesia and Turkey, the coverage of the PISA sample grew by more than 10 percentage points; in Uruguay, coverage grew by about 8 percentage points (Table I.6.1). In Colombia and Uruguay, whose mean reading scores improved by 12 and 11 score points, respectively, the level at which at least one in two 15-year-olds perform improved even more – by 61 and 38 score points, respectively. While there was no significant trend in mean performance observed in Brazil, the minimum score attained by at least 50% of all 15-year-olds was 26 points higher, respectively, in 2015 than in 2009 (Table I.4.4d).

Between 2009 and 2015, Albania, Estonia, Georgia, Ireland, Macao (China), Moldova, Montenegro, Russia, Slovenia and Spain saw an increase in the share of students who attain the highest proficiency levels in PISA and a simultaneous decrease in the share of students who do not attain the baseline level of proficiency. Fourteen countries and economies (Chile, Croatia, the Czech Republic, Denmark, France, Germany, Latvia, Lithuania, Luxembourg, Malta, Norway, Portugal, Romania, and Singapore) saw growth in the share of top-performing students in reading since PISA 2009 with no concurrent reduction in the share of low-performing students (Figure I.4.9).

The gender gap in reading narrowed somewhat between 2009 and 2015.

PISA has consistently found that, across all countries and economies, girls outperform boys in reading. In PISA 2015, girls outperform boys in reading by 27 score points, on average across OECD countries. But between 2009 and 2015, the gender gap in reading narrowed by 12 points on average across OECD countries. During that period, boys' performance improved somewhat, particularly among the highest-achieving boys, while girls' performance deteriorated, particularly among the lowest-achieving girls. The gender gap in reading performance narrowed significantly in 32 countries and economies, but in the remaining 29 countries and economies there was no change in the gender gap (Figure I.4.11).

Asian countries/economies outperform all other countries in mathematics.

The PISA assessment of mathematics focuses on measuring students' capacity to formulate, use and interpret mathematics in a variety of contexts. To succeed on the PISA test, students must be able to reason mathematically and use mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena.

Singapore scores highest in mathematics of all participating countries and economies: 564 points – more than 70 points above the OECD average of 490 points. Three countries/economies score below Singapore, but higher than any other country/economy in mathematics: Hong Kong (China), Macao (China) and Chinese Taipei. Japan is the highest-performing OECD country, with a mean mathematics score of 532 points. Beijing-Shanghai-Jiangsu-Guangdong (China) (hereafter "B-S-J-G [China]"), with a mean score of 531 points, also scores above all other non-Asian countries participating in PISA, except Switzerland, whose mean score is not statistically significantly different. Thirty-six participating countries and economies score below the OECD average in mathematics (Figure I.5.1).

The gap in mathematics performance between the highest- and the lowest-performing OECD countries is 124 score points. This difference is even wider among partner countries and economies: 236 points separate the highest-performing partner country (Singapore, with 564 points) and the lowest-performing country (the Dominican Republic, with 328 points) (Figure I.5.1).

Around one in ten students in OECD countries is a top performer in mathematics, on average; but in Singapore, more than one in three students are top performers in the subject.

The six proficiency levels used in the PISA 2015 mathematics assessment (ranging from Level 1, the lowest, to Level 6, the highest) are the same as those established for the PISA 2003 and 2012 assessments, when mathematics was the major area of assessment. Level 2 can be considered the baseline level of proficiency that is required to participate fully in modern society. More than 90% of students in Hong Kong (China), Macao (China) and Singapore meet this benchmark. Across OECD countries, an average of 77% of students attains Level 2 or higher. More than one in two students perform at these levels in all OECD countries except Turkey (48.6%) and Mexico (43.4%). But fewer than one in ten students (9.5%) in the Dominican Republic, and fewer than one in five students (19.0%) in Algeria attains the baseline level of proficiency in mathematics (Figure I.5.8).

Across OECD countries, 10.7% of students are top performers, on average, meaning that they are proficient at Level 5 or 6. Across all countries and economies that participated in PISA 2015, the partner country Singapore has the largest proportion of top performers (34.8%), followed by Chinese Taipei (28.1%), Hong Kong (China) (26.5%) and B-S-J-G (China) (25.6%). In 12 countries/economies – including the OECD country, Mexico – less than 1% of students performs at Level 5 or above (Figure I.5.8).

On average across OECD countries, 23.4% of students are proficient only at or below Level 1 in mathematics. In Macao (China) (6.6%), Singapore (7.6%) and Hong Kong (China) (9.0%), less than 10% of students perform at or below Level 1. By contrast, in the Dominican Republic (68.3%) and Algeria (50.6%), more than one in two students score below Level 1 (Figure I.5.8).

Boys tend to score higher than girls in mathematics, but in nine countries and economies, girls outperform boys.

On average across OECD countries, boys outperform girls in mathematics by eight score points. The difference is statistically significant in 28 countries and economies and is largest in Austria, Brazil, CABA (Argentina), Chile, Costa Rica, Germany, Ireland, Italy, Lebanon and Spain, where boys' average score exceeds girls' by more than 15 points. It is noteworthy that none of the high-performing Asian countries and economies is among this group. In fact, in nine countries and economies, including top performers Finland and Macao (China), as well as Albania, FYROM, Georgia, Jordan, Malaysia, Qatar and Trinidad and Tobago, girls score higher than boys in mathematics, on average (Figure I.5.10).

Canada, Denmark, Estonia, Hong Kong (China) and Macao (China) achieve high performance and high equity in education opportunities.

Education systems share the goal of equipping students, irrespective of their socio-economic status, with the skills necessary to achieve their full potential in social and economic life. But PISA shows that in many countries, no matter how well the education system, as a whole, performs, socio-economic status continues to have an impact on students' opportunities to benefit from education and develop their skills. That is why equity in education – ensuring that education outcomes are the result of students' abilities, will and effort, and not the result of their personal circumstances – lies at the heart of advancing social justice and inclusion.

PISA 2015 concentrates on two goals related to equity: inclusion and fairness. PISA defines inclusion in education as ensuring that all students attain essential foundation skills. In this light, education systems where a large proportion of 15-year-olds remains out-of-school and/or has not learned the basic skills needed to fully participate in society are not considered as sufficiently inclusive. Fairness refers to the degree to which background circumstances influence students' education outcomes. PISA defines success in education as a combination of high levels of achievement and high levels of equity, and consistently finds that high performance and greater equity in education are not mutually exclusive.

Access to schooling is nearly universal in most OECD countries

In 22 of the 24 countries/economies that perform above the OECD average in science, PISA samples cover more than 80% of the population of 15-year-olds –which is a proxy measure for their level of enrolment in school in grade 7 or above; the exceptions are Viet Nam (where only 49% are covered by the same) and B-S-J-G (China) (where 64% are covered). In addition, in 21 of these countries and economies, the proportion of students performing below proficiency Level 2 in science is smaller than the OECD average. This means that most high-performing systems also achieve high levels of inclusion: they ensure that the vast majority of 15-year-olds are enrolled in school and reduce the number of students who perform poorly (Table I.6.1).

In 20 countries that participated in PISA 2015, less than 80% of 15-year-olds are enrolled in school and thus represented in the PISA samples. This indicates that these school systems are still far from providing universal access to schooling – a prerequisite for achieving equity in education (Table I.6.1).

Socio-economic status is associated with significant differences in performance in most countries and economies that participate in PISA.

On average across OECD countries, students' socio-economic status explains about 13% of the variation in student performance in science, reading and mathematics. In 10 of the 24 countries and economies that scored above the OECD average in science in PISA 2015, the strength of the relationship between student performance and socio-economic status is below the OECD average (Figure I.6.6).

Advantaged students tend to outscore their disadvantaged peers by large margins. On average across OECD countries, a one-unit increase on the PISA index of economic, social and cultural status is associated with an increase of 38 score points in the science assessment. In the Czech Republic and France, the impact of socio-economic status on performance is largest: a one-unit increase on the index is associated with an improvement of more than 50 score points in science; in Austria, Belgium, Hungary, Korea, Malta, the Netherlands, New Zealand, Singapore and Chinese Taipei, the increase is associated with an improvement of between 45 and 50 score points. By contrast, in 13 countries and economies, the associated change in performance is less than 25 score points (Table I.6.3a).

On average across OECD countries, disadvantaged students are 2.8 times more likely than more advantaged students to not attain the baseline level of proficiency in science.

Countries where it is more likely that disadvantaged students do not reach the baseline level of skills in science, relative to more advantaged students, are remarkably diverse. The increased likelihood of low performance among students with low socio-economic status is observed across school systems performing above, around and below the OECD average. In CABA (Argentina), the Dominican Republic, Peru and Singapore, these students are between 4 and 7 times more likely to be low performers, while in another 13 countries/economies, they are between 3 and 4 times more likely to be low performers (Table I.6.6a).

By contrast, in Algeria, Iceland, Kosovo, Macao (China), Montenegro, Qatar and Thailand, disadvantaged students are no more than twice as likely as more advantaged students to score below proficiency Level 2 in science. Among these countries/economies, Macao (China) is also a high performer in science (Table I.6.6a).

However, many disadvantaged students succeed in attaining high levels of performance, not only within their own countries and economies, but also when considered globally.

PISA consistently shows that poverty is not destiny. On average across OECD countries, in PISA 2015, 29% of disadvantaged students are "resilient" – meaning that they score among the top quarter of students in all participating countries/economies despite the odds against them. In B-S-J-G (China), Estonia, Finland, Hong Kong (China), Japan, Korea, Macao (China), Singapore, Chinese Taipei and Viet Nam, more than four in ten disadvantaged students are considered to be "resilient" (Table I.6.7).

At the same time, the performance of students sharing similar socio-economic circumstances across countries and economies can vary widely. For instance, in Macao (China) and Viet Nam students facing the greatest disadvantage on an international scale have average scores of over 500 points in science, well above the OECD mean score. These disadvantaged students outperform the most advantaged students internationally in about 20 other PISA-participating countries and economies (Table I.6.4a).

Disadvantaged students are less likely to expect a career in science and to embrace scientific approaches to enquiry.

The likelihood of working in a science-related occupation by age 30 is positively associated with student performance in science at age 15. However, even after accounting for performance, disadvantaged students in 46 of the countries/economies that participated in PISA 2015 are significantly less likely than their advantaged peers to expect a career in science. And while PISA 2015 shows that most students understand the value of scientific approaches to enquiry, in virtually all participating countries and economies, advantaged students tend to believe more strongly in these approaches than disadvantaged students (Table I.6.8).

Socio-economic disadvantage tends to manifest itself in less resources for education in schools, and, among students, in less instruction time, and in a greater likelihood of having repeated a grade and being enrolled in a vocational programme.

According to school principals, in more than 30 of the countries/economies that participated in PISA 2015, students in advantaged schools have access to better material and staff resources than their peers in disadvantaged schools. Socio-economic status may also have an impact on opportunities to learn. On average across OECD countries, advantaged students tend to spend about 35 minutes more per week in regular science lessons at school than disadvantaged students (Table I.6.15). Over a full school year, this could amount to more than 20 additional hours of science lessons.

After accounting for differences in performance, disadvantaged students are almost twice as likely as advantaged students to have repeated a grade by the time they sit the PISA test, and almost three times as likely to be enrolled in a vocational rather than academic track (Tables I.6.14 and I.6.16).

In Chile, Denmark, Mexico, Slovenia, Turkey and the United States, between 2006 and 2015, students' socio-economic status became less predictive of performance and weakened in its impact on performance, while these countries' average level of achievement remained stable.

Between 2006 and 2015, the largest reduction in the average impact of socio-economic status on science performance – by 13 score points – was observed in the United States – a country where the percentage of variation in performance explained by students' socio-economic status also decreased by 6 percentage points. In addition, during the same time period, the percentage of resilient students grew from 19% to 32%.

Colombia, Israel, Macao (China), Portugal and Romania maintained equity levels while improving average science performance. However, between 2006 and 2015, no country or economy improved its mean performance in science while simultaneously weakening the influence of students' socio-economic status (Table I.6.17).

On average across OECD countries, the percentage of resilient students increased from 27.7% in 2006 to 29.0% in 2015. A negative trend in student resiliency is observed in five countries and economies, most of which also saw increases in the percentage of low performers, negative or stable trends in the strength and slope of the socio-economic gradient, and a decline in mean science performance. By contrast, some countries with large improvements in student resiliency – Macao (China), Qatar and Romania – also managed to reduce the percentage of students performing below the baseline level of science literacy and to maintain or improve their average performance (Table I.6.17).

More than one in two students in Luxembourg, Macao (China), Qatar and the United Arab Emirates, have an immigrant background, as do close to one in three students in Canada, Hong Kong (China) and Switzerland.

On average across OECD countries, 13% of students in 2015 had an immigrant background – an increase of more than 3 percentage points since 2006. Between 2006 and 2015, the percentage of immigrant students increased by more than ten percentage points in Luxembourg and Qatar, and by between five and ten percentage points in Austria, Canada, Ireland, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the United States (Table I.7.1).

Migration flows also result in an increase in linguistic diversity. In 2015, 67% of first-generation and 45% of second-generation immigrant students did not speak the language of the PISA test at home – in both cases, an increase of four percentage points since 2006. However, a sizeable proportion of immigrant students is not disadvantaged compared with their non-immigrant peers. For example, about 57% of first-generation immigrant students have at least one parent as educated as the average parent in the host country (Table I.7.2).

On average across OECD countries, immigrant students perform lower in science, reading and mathematics than non-immigrant students with the same socio-economic status and mastery of the language of instruction. But in some countries/economies, immigrant students score at high levels both nationally and internationally.

Foreign-born students whose parents were also born outside the host country score 447 points in science – about half a standard deviation below the mean performance of non-immigrant students (500 score points), on average across OECD countries. Second-generation immigrant students perform between the two, with an average science score of 469 points.

Although many immigrant students score lower than their non-immigrant peers in their host country/economy, they can perform at very high levels by international standards. Among countries with relatively large populations of immigrant students, Macao (China) and Singapore are high-performing school systems where the average science scores of both first- and second-generation immigrant students are higher than those of non-immigrant students. Immigrant students in Australia, Canada, Estonia, Hong Kong (China), Ireland and New Zealand also score similarly to or higher than the OECD average in science (Table I.7.4a).

On average across OECD countries, the average difference in science performance between immigrant and non-immigrant students is 31 score points after taking students' socio-economic status into account. Among countries with relatively large immigrant student populations, this gap is largest – between 40 and 55 score points - in Austria, Belgium, Denmark, Germany, Slovenia, Sweden and Switzerland (Table I.7.4a).

Language skills also play a role in explaining the average lower performance of students with an immigrant background. On average across OECD countries, immigrant students who do not regularly speak at home the language in which they sat the PISA test score 54 points lower than non-immigrant students who speak the language of assessment at home,

and more than 20 points lower than their immigrant peers who have greater familiarity with the test language. This "language penalty" in the science assessment is largest – between 90 and 100 score points – in Hong Kong (China) and Luxembourg (Table I.7.8a).

Immigrant students are more than twice as likely as non-immigrant students of similar socio-economic status to perform below proficiency Level 2 in science. Yet 24% of socio-economically disadvantaged immigrant students are considered "resilient".

On average across OECD countries, as many as 39% of first-generation and 30% of second-generation immigrant students perform below proficiency Level 2 in the PISA 2015 science assessment. By contrast, 19% students without an immigrant background are low performers in science (Table I.7.5a).

Differences in the socio-economic status of immigrant and non-immigrant students explain only part of the incidence of low performance among immigrant students. In 19 of the 33 countries with relatively large immigrant student populations, and after taking their socio-economic status into account, immigrant students are still more likely than non-immigrant students to be low performers in science; and in 11 of these countries, they are as likely as non-immigrant students to be low performers.

While the association between socio-economic status and performance is strong, PISA results show that the link is not unbreakable. In Hong Kong (China), Macao (China) and Singapore, more than half of all disadvantaged immigrant students are resilient – as are more than one in three disadvantaged immigrant students in Australia, Canada, Estonia, Ireland and the United Kingdom. These students score among the top quarter of students in all participating countries, after accounting for socio-economic status (Table I.7.6).

On average across countries with relatively large populations of immigrant students, attending a school with a high concentration of immigrant students is not associated with student performance.

Immigrant students tend to be over-represented in certain schools, partly as the result of residential segregation. PISA classifies schools as having a high or low concentration of immigrant students depending on the overall percentage of immigrant students in a country/economy and school size. Before taking into account students' socio-economic status and immigrant background, as well as the socio-economic intake of their school, a higher concentration of immigrant students in a school is associated with lower scores in science (by 18 points), on average across OECD countries. However, once background factors are accounted for, this negative association with performance disappears or is substantially reduced. For example, in Luxembourg, the difference in science performance shrinks from 55 score points to 7 score points; in Belgium, it drops from 41 score points to 12 score points. This indicates that it is the concentration of disadvantage, and not the concentration of immigrant students, per se, that has detrimental effects on learning (Table I.7.10).

Between 2006 and 2015, the average difference in science performance between immigrants and non-immigrant students narrowed by six score points.

In OECD countries Belgium, Italy, Portugal, Spain and Switzerland, the differences in performance between immigrant and non-immigrant students shrank by 20 score points or more over the period, after accounting for socio-economic status and familiarity with the language of assessment; in Canada and Luxembourg, these differences narrowed by between 10 and 20 score points (Table I.7.15a). In many of these countries, the positive trend is mainly a reflection of large improvements in the performance of immigrant students, rather than of poorer performance among their non-immigrant peers. In Italy and Spain, these improvements occurred despite large reductions, between 2006 and 2015, in the percentage of immigrant students with educated parents (Table I.7.2).

What PISA results imply for policy

Most students who sat the PISA 2015 test expressed a broad interest in science topics and recognised the important role that science plays in their world; but only a minority of students reported that they participate in science activities. Boys and girls, and students from advantaged and disadvantaged backgrounds, often differ in the ways they engage with science and envisage themselves working in science-related occupations later on. Gender-related differences in science engagement and career expectations appear more related to disparities in what boys and girls think they are good at and is good for them, than to differences in what they actually can do.

In addition, stereotypes about scientists and about work in science-related occupations (computer science is a "masculine" field and biology a "feminine" field; scientists achieve success due to brilliance rather than hard work; scientists are "mad") can discourage some students from engaging further with science. Parents and teachers can challenge gender stereotypes

about science-related activities and occupations to allow girls and boys to achieve their potential. To support every student's engagement with science, they can also help students become more aware of the range of career opportunities that are made available with training in science and technology.

Promoting a positive and inclusive image of science is also important. Too often, school science is seen as the first segment of a (leaky) pipeline that will ultimately select those who will work as scientists and engineers. Not only does the "pipeline" metaphor discount the many pathways successful scientists have travelled to reach their career goals, it also conveys a negative image of those who do not end up as scientists and engineers. Because knowledge and understanding of science is useful well beyond the work of scientists and is, as PISA argues, necessary for full participation in a world shaped by science-based technology, school science should be promoted more positively – perhaps as a "springboard" to new sources of interest and enjoyment.

PISA 2015 finds that, in more than 40 countries and economies, and after accounting for students' performance in the science assessment, disadvantaged students remain significantly less likely than their advantaged peers to see themselves pursuing a career in science. Specific programmes might be needed to spark interest in science among students who may not receive such stimulation from their family, and to support students' decision to pursue further studies in science. The most immediate way to nurture interest in science among these students may be to increase early exposure to high-quality science instruction in schools.

For disadvantaged students and those who struggle with science, additional resources, targeted to students or schools with the greatest needs, can make a difference in helping students acquire a baseline level of science literacy and develop a lifelong interest in the subject. All students, whether immigrant or non-immigrant, advantaged or disadvantaged, would also benefit from a more limited application of policies that sort students into different programme tracks or schools, particularly if these policies are applied in the earliest years of secondary school. Giving students more opportunities to learn science will help them to learn to "think like a scientist" – a skill that has become all but essential in the 21st century, even if students choose not to work in a science-related career later on.

Figure I.1.1 ■ Snapshot of performance in science, reading and mathematics

- Countries/economies with a mean performance/share of top performers **above** the OECD average; Countries/economies with a share of low achievers **below** the OECD average
- Countries/economies with a mean performance/share of top performers/share of low achievers not significantly different from the OECD average
- Countries/economies with a mean performance/share of top performers **below** the OECD average; Countries/economies with a share of low achievers **above** the OECD average

	Science		Reading		Mathematics		Science, reading and mathematics	
	Mean score in PISA 2015	Average three-year trend	Mean score in PISA 2015	Average three-year trend	Mean score in PISA 2015	Average three-year trend	Share of top performers in at least one subject (Level 5 or 6)	Share of low achievers in all three subjects (below Level 2)
	Mean	Score dif.	Mean	Score dif.	Mean	Score dif.	%	%
OECD average	493	-1	493	-1	490	-1	15.3	13.0
Singapore	556	**7**	535	**5**	564	1	39.1	4.8
Japan	538	3	516	-2	532	1	25.8	5.6
Estonia	534	2	519	**9**	520	2	20.4	4.7
Chinese Taipei	532	0	497	1	542	0	29.9	8.3
Finland	531	**-11**	526	**-5**	511	**-10**	21.4	6.3
Macao (China)	529	**6**	509	**11**	544	**5**	23.9	3.5
Canada	528	-2	527	1	516	**-4**	22.7	5.9
Viet Nam	525	-4	487	**-21**	495	**-17**	12.0	4.5
Hong Kong (China)	523	**-5**	527	-3	548	1	29.3	4.5
B-S-J-G (China)	518	m	494	m	531	m	27.7	10.9
Korea	516	-2	517	**-11**	524	-3	25.6	7.7
New Zealand	513	**-7**	509	**-6**	495	**-8**	20.5	10.6
Slovenia	513	-2	505	**11**	510	2	18.1	8.2
Australia	510	**-6**	503	**-6**	494	**-8**	18.4	11.1
United Kingdom	509	-1	498	2	492	-1	16.9	10.1
Germany	509	-2	509	**6**	506	2	19.2	9.8
Netherlands	509	**-5**	503	-3	512	**-6**	20.0	10.9
Switzerland	506	-2	492	-4	521	-1	22.2	10.1
Ireland	503	0	521	**13**	504	0	15.5	6.8
Belgium	502	-3	499	-4	507	**-5**	19.7	12.7
Denmark	502	2	500	3	511	-2	14.9	7.5
Poland	501	3	506	3	504	**5**	15.8	8.3
Portugal	501	**8**	498	4	492	**7**	15.6	10.7
Norway	498	3	513	**5**	502	1	17.6	8.9
United States	496	2	497	-1	470	-2	13.3	13.6
Austria	495	**-5**	485	-5	497	-2	16.2	13.5
France	495	0	499	2	493	**-4**	18.4	14.8
Sweden	493	**-4**	500	1	494	**-5**	16.7	11.4
Czech Republic	493	**-5**	487	5	492	**-6**	14.0	13.7
Spain	493	2	496	**7**	486	1	10.9	10.3
Latvia	490	1	488	2	482	0	8.3	10.5
Russia	487	3	495	**17**	494	**6**	13.0	7.7
Luxembourg	483	0	481	**5**	486	-2	14.1	17.0
Italy	481	2	485	0	490	**7**	13.5	12.2
Hungary	477	**-9**	470	**-12**	477	**-4**	10.3	18.5
Lithuania	475	-3	472	2	478	-2	9.5	15.3
Croatia	475	**-5**	487	**5**	464	0	9.3	14.5
CABA (Argentina)	475	**51**	475	**46**	456	**38**	7.5	14.5
Iceland	473	**-7**	482	**-9**	488	**-7**	13.2	13.2
Israel	467	**5**	479	2	470	**10**	13.9	20.2
Malta	465	2	447	3	479	**9**	15.3	21.9
Slovak Republic	461	**-10**	453	**-12**	475	**-6**	9.7	20.1
Greece	455	**-6**	467	**-8**	454	1	6.8	20.7
Chile	447	2	459	5	423	4	3.3	23.3
Bulgaria	446	4	432	1	441	**9**	6.9	29.6
United Arab Emirates	437	**-12**	434	-8	427	-7	5.8	31.3
Uruguay	435	1	437	**5**	418	-3	3.6	30.8
Romania	435	**6**	434	4	444	**10**	4.3	24.3
Cyprus[1]	433	-5	443	-6	437	-3	5.6	26.1
Moldova	428	**9**	416	**17**	420	**13**	2.8	30.1
Albania	427	**18**	405	**10**	413	**18**	2.0	31.1
Turkey	425	2	428	**-18**	420	2	1.6	31.2
Trinidad and Tobago	425	**7**	427	**5**	417	2	4.2	32.9
Thailand	421	2	409	**-6**	415	1	1.7	35.8
Costa Rica	420	-7	427	**-9**	400	-6	0.9	33.0
Qatar	418	**21**	402	**15**	402	**26**	3.4	42.0
Colombia	416	**8**	425	6	390	**5**	1.2	38.2
Mexico	416	2	423	-1	408	**5**	0.6	33.8
Montenegro	411	1	427	**10**	418	**6**	2.5	33.0
Georgia	411	**23**	401	**16**	404	**15**	2.6	36.3
Jordan	409	**-5**	408	2	380	-1	0.6	35.7
Indonesia	403	3	397	-2	386	**4**	0.8	42.3
Brazil	401	3	407	-2	377	**6**	2.2	44.1
Peru	397	**14**	398	**14**	387	**10**	0.6	46.7
Lebanon	386	m	347	m	396	m	2.5	50.7
Tunisia	386	0	361	**-21**	367	**4**	0.6	57.3
FYROM	384	m	352	m	371	m	1.0	52.2
Kosovo	378	m	347	m	362	m	0.0	60.4
Algeria	376	m	350	m	360	m	0.1	61.1
Dominican Republic	332	m	358	m	328	m	0.1	70.7

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.
Notes: Values that are statistically significant are marked in bold (see Annex A3).
The average trend is reported for the longest available period since PISA 2006 for science, PISA 2009 for reading, and PISA 2003 for mathematics.
Countries and economies are ranked in descending order of the mean science score in PISA 2015.
Source: OECD, PISA 2015 Database, Tables I.2.4a, I.2.6, I.2.7, I.4.4a and I.5.4a.
StatLink http://dx.doi.org/10.1787/888933431961

Figure I.1.2 ■ Snapshot of students' science beliefs, engagement and motivation

Countries/economies with values **above** the OECD average
Countries/economies with values not significantly different from the OECD average
Countries/economies with values **below** the OECD average

		Beliefs about the nature and origin of scientific knowledge		Share of students with science-related career expectations				Motivation for learning science		
	Mean science score	Index of epistemic beliefs (support for scientific methods of enquiry)	Score-point difference per unit on the index of epistemic beliefs	All students	Boys	Girls	Increased likelihood of boys expecting a career in science	Index of enjoyment of learning science	Score-point difference per unit on the index of enjoyment of learning science	Gender gap in enjoyment of learning science (Boys - Girls)
	Mean	Mean index	Score dif.	%	%	%	Relative risk	Mean index	Score dif.	Dif.
OECD average	493	0.00	**33**	24.5	25.0	23.9	**1.1**	0.02	**25**	**0.13**
Singapore	556	0.22	**34**	28.0	31.8	23.9	**1.3**	0.59	**35**	**0.17**
Japan	538	-0.06	**34**	18.0	18.5	17.5	1.1	-0.33	**27**	**0.52**
Estonia	534	0.01	**36**	24.7	28.9	20.3	**1.4**	0.16	**24**	0.05
Chinese Taipei	532	0.31	**38**	20.9	25.6	16.0	**1.6**	-0.06	**28**	**0.39**
Finland	531	-0.07	**38**	17.0	15.4	18.7	**0.8**	-0.07	**30**	0.04
Macao (China)	529	-0.06	**26**	20.8	22.0	19.6	**1.1**	0.20	**21**	**0.16**
Canada	528	0.30	**29**	33.9	31.2	36.5	**0.9**	0.40	**26**	**0.15**
Viet Nam	525	-0.15	**31**	19.6	21.2	18.1	**1.2**	0.65	**14**	**0.06**
Hong Kong (China)	523	0.04	**23**	23.6	22.9	24.2	0.9	0.28	**20**	**0.26**
B-S-J-G (China)	518	-0.08	**37**	16.8	17.1	16.5	1.0	0.37	**28**	**0.14**
Korea	516	0.02	**38**	19.3	21.7	16.7	**1.3**	-0.14	**31**	**0.32**
New Zealand	513	0.22	**40**	24.8	21.7	27.9	**0.8**	0.20	**32**	0.03
Slovenia	513	0.07	**33**	30.8	34.6	26.8	**1.3**	-0.36	**22**	-0.03
Australia	510	0.26	**39**	29.2	30.3	28.2	**1.1**	0.12	**33**	**0.16**
United Kingdom	509	0.22	**37**	29.1	28.7	29.6	1.0	0.15	**30**	**0.18**
Germany	509	-0.16	**34**	15.3	17.4	13.2	**1.3**	-0.18	**29**	**0.43**
Netherlands	509	-0.19	**46**	16.3	16.9	15.7	1.1	-0.52	**30**	**0.25**
Switzerland	506	-0.07	**34**	19.5	19.8	19.1	1.0	-0.02	**30**	**0.17**
Ireland	503	0.21	**36**	27.3	28.0	26.6	1.1	0.20	**32**	**0.09**
Belgium	502	0.00	**34**	24.5	25.3	23.6	1.1	-0.03	**28**	**0.20**
Denmark	502	0.17	**32**	14.8	11.8	17.7	**0.7**	0.12	**26**	**0.09**
Poland	501	-0.08	**27**	21.0	15.4	26.8	**0.6**	0.02	**18**	**-0.10**
Portugal	501	0.28	**33**	27.5	26.7	28.3	0.9	0.32	**23**	**0.08**
Norway	498	-0.01	**35**	28.6	28.9	28.4	1.0	0.12	**29**	**0.27**
United States	496	0.25	**32**	38.0	33.0	43.0	**0.8**	0.23	**26**	**0.21**
Austria	495	-0.14	**36**	22.3	26.6	18.0	**1.5**	-0.32	**25**	**0.23**
France	495	0.01	**30**	21.2	23.6	18.7	**1.3**	-0.03	**30**	**0.31**
Sweden	493	0.14	**38**	20.2	21.8	18.5	**1.2**	0.08	**27**	**0.22**
Czech Republic	493	-0.23	**41**	16.9	18.6	15.0	**1.2**	-0.34	**27**	-0.06
Spain	493	0.11	**30**	28.6	29.5	27.8	1.1	0.03	**28**	**0.11**
Latvia	490	-0.26	**27**	21.3	21.1	21.5	1.0	0.09	**18**	0.03
Russia	487	-0.26	**27**	23.5	23.2	23.8	1.0	0.00	**16**	0.07
Luxembourg	483	-0.15	**35**	21.1	24.3	18.0	**1.4**	0.10	**26**	**0.14**
Italy	481	-0.10	**34**	22.6	24.7	20.6	**1.2**	0.00	**22**	**0.24**
Hungary	477	-0.36	**35**	18.3	23.9	12.8	**1.9**	-0.23	**20**	-0.02
Lithuania	475	0.11	**22**	23.9	22.5	25.4	**0.9**	0.36	**20**	**-0.14**
Croatia	475	0.03	**32**	24.2	26.8	21.8	**1.2**	-0.11	**22**	0.05
CABA (Argentina)	475	0.09	**28**	27.8	26.2	29.3	0.9	-0.20	**15**	**-0.14**
Iceland	473	0.29	**28**	23.8	20.1	27.3	**0.7**	0.15	**24**	**0.26**
Israel	467	0.18	**38**	27.8	26.1	29.5	**0.9**	0.09	**20**	0.06
Malta	465	0.09	**54**	25.4	30.2	20.4	**1.5**	0.18	**48**	**0.11**
Slovak Republic	461	-0.35	**36**	18.8	18.5	19.0	1.0	-0.24	**25**	-0.02
Greece	455	-0.19	**36**	25.3	25.7	24.9	1.0	0.13	**27**	**0.12**
Chile	447	-0.15	**23**	37.9	36.9	39.0	0.9	0.08	**15**	**-0.09**
Bulgaria	446	-0.18	**34**	27.5	28.8	25.9	1.1	0.28	**17**	**-0.16**
United Arab Emirates	437	0.04	**33**	41.3	39.9	42.6	**0.9**	0.47	**22**	-0.02
Uruguay	435	-0.13	**27**	28.1	23.8	31.9	**0.7**	-0.10	**16**	**-0.07**
Romania	435	-0.38	**27**	23.1	23.3	23.0	1.0	-0.03	**17**	-0.05
Cyprus*	433	-0.15	**33**	29.9	29.3	30.5	1.0	0.15	**29**	0.06
Moldova	428	-0.14	**37**	22.0	22.5	21.3	1.1	0.33	**22**	**-0.17**
Albania	427	-0.03	m	24.8	m	m	m	0.72	m	m
Turkey	425	-0.17	**18**	29.7	34.5	24.9	**1.4**	0.15	**12**	0.01
Trinidad and Tobago	425	-0.02	**28**	27.8	24.6	31.0	**0.8**	0.19	**24**	-0.01
Thailand	421	-0.07	**35**	19.7	12.4	25.2	**0.5**	0.42	**18**	-0.05
Costa Rica	420	-0.15	**16**	44.0	43.8	44.2	1.0	0.35	**4**	-0.03
Qatar	418	-0.10	**33**	38.0	36.3	39.9	**0.9**	0.36	**25**	0.00
Colombia	416	-0.19	**21**	39.7	37.1	42.0	**0.9**	0.32	**7**	-0.02
Mexico	416	-0.17	**17**	40.7	45.4	35.8	**1.3**	0.42	**12**	0.01
Montenegro	411	-0.32	**23**	21.2	20.1	22.4	**0.9**	0.09	**14**	**-0.07**
Georgia	411	0.05	**42**	17.0	16.4	17.7	0.9	0.34	**23**	**-0.13**
Jordan	409	-0.13	**28**	43.7	44.6	42.8	1.0	0.53	**23**	**-0.25**
Indonesia	403	-0.30	**16**	15.3	8.6	22.1	**0.4**	0.65	**6**	**-0.06**
Brazil	401	-0.07	**27**	38.8	34.4	42.8	**0.8**	0.23	**19**	**-0.04**
Peru	397	-0.16	**23**	38.7	42.7	34.6	**1.2**	0.40	**9**	0.01
Lebanon	386	-0.24	**35**	39.7	41.0	38.5	1.1	0.38	**32**	-0.04
Tunisia	386	-0.31	**18**	34.4	28.5	39.5	**0.7**	0.52	**15**	**-0.12**
FYROM	384	-0.18	**30**	24.2	20.0	28.8	**0.7**	0.48	**17**	**-0.29**
Kosovo	378	0.03	**22**	26.4	24.7	28.1	**0.9**	0.92	**14**	**-0.16**
Algeria	376	-0.31	**16**	26.0	23.1	29.2	**0.8**	0.46	**14**	**-0.12**
Dominican Republic	332	-0.10	**13**	45.7	44.7	46.8	1.0	0.54	**6**	-0.05

* See note 1 under Figure I.1.1.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
Countries and economies are ranked in descending order of the mean science score in PISA 2015.
Source: OECD, PISA 2015 Database, Tables I.2.12a-b, I.3.1a-c and I.3.10a-b.
StatLink http://dx.doi.org/10.1787/888933431979

Figure I.1.3 [Part 1/2] ■ Snapshot of equity in education

- Countries/economies with **higher** performance or greater equity than the OECD average
- Countries with values not statistically different from the OECD average
- Countries/economies with **lower** performance or less equity than the OECD average

	Mean science score in PISA 2015	Inclusion and fairness indicators			
		Coverage of the national 15-year-old population (PISA Coverage index 3)	Percentage of variation in science performance explained by students' socio-economic status	Score-point difference in science associated with one-unit increase on the PISA index of economic, social and cultural status[1]	Percentage of resilient students[3]
	Mean	Mean index	%	Score dif.[2]	%
OECD average	493	0.89	12.9	38	29.2
Singapore	556	0.96	17	47	48.8
Japan	538	0.95	10	42	48.8
Estonia	534	0.93	8	32	48.3
Chinese Taipei	532	0.85	14	45	46.3
Finland	531	0.97	10	40	42.8
Macao (China)	529	0.88	2	12	64.6
Canada	528	0.84	9	34	38.7
Viet Nam	525	0.49	11	23	75.5
Hong Kong (China)	523	0.89	5	19	61.8
B-S-J-G (China)	518	0.64	18	40	45.3
Korea	516	0.92	10	44	40.4
New Zealand	513	0.90	14	49	30.4
Slovenia	513	0.93	13	43	34.6
Australia	510	0.91	12	44	32.9
United Kingdom	509	0.84	11	37	35.4
Germany	509	0.96	16	42	33.5
Netherlands	509	0.95	13	47	30.7
Switzerland	506	0.96	16	43	29.1
Ireland	503	0.96	13	38	29.6
Belgium	502	0.93	19	48	27.2
Denmark	502	0.89	10	34	27.5
Poland	501	0.91	13	40	34.6
Portugal	501	0.88	15	31	38.1
Norway	498	0.91	8	37	26.5
United States	496	0.84	11	33	31.6
Austria	495	0.83	16	45	25.9
France	495	0.91	20	57	26.6
Sweden	493	0.94	12	44	24.7
Czech Republic	493	0.94	19	52	24.9
Spain	493	0.91	13	27	39.2
Latvia	490	0.89	9	26	35.2
Russia	487	0.95	7	29	25.5
Luxembourg	483	0.88	21	41	20.7
Italy	481	0.80	10	30	26.6
Hungary	477	0.90	21	47	19.3
Lithuania	475	0.90	12	36	23.1
Croatia	475	0.91	12	38	24.4
CABA (Argentina)	475	1.04	26	37	14.9
Iceland	473	0.93	5	28	17.0
Israel	467	0.94	11	42	15.7
Malta	465	0.98	14	47	21.8
Slovak Republic	461	0.89	16	41	17.5
Greece	455	0.91	13	34	18.1
Chile	447	0.80	17	32	14.6
Bulgaria	446	0.81	16	41	13.6
United Arab Emirates	437	0.91	5	30	7.7
Uruguay	435	0.72	16	32	14.0
Romania	435	0.93	14	34	11.3
Cyprus*	433	0.95	9	31	10.1
Moldova	428	0.93	12	33	13.4
Albania	427	0.84	m	m	m
Turkey	425	0.70	9	20	21.8
Trinidad and Tobago	425	0.76	10	31	12.9
Thailand	421	0.71	9	22	18.4
Costa Rica	420	0.63	16	24	9.4
Qatar	418	0.93	4	27	5.7
Colombia	416	0.75	14	27	11.4
Mexico	416	0.62	11	19	12.8
Montenegro	411	0.90	5	23	9.4
Georgia	411	0.79	11	34	7.5
Jordan	409	0.86	9	25	7.7
Indonesia	403	0.68	13	22	10.9
Brazil	401	0.71	12	27	9.4
Peru	397	0.74	22	30	3.2
Lebanon	386	0.66	10	26	6.1
Tunisia	386	0.93	9	17	4.7
FYROM	384	0.95	7	25	4.1
Kosovo	378	0.71	5	18	2.5
Algeria	376	0.79	1	8	7.4
Dominican Republic	332	0.68	13	25	0.4

* See note 1 under Figure I.1.1.
1. Also referred to as ESCS.
2. All score-point differences in science performance associated with a one-unit increase on the PISA index of economic, social and cultural status are statistically significant.
3. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status in the country/economy of assessment and performs in the top quarter of students among all countries/economies, after accounting for socio-economic status.
4. A positive score indicates a performance difference in favour of non-immigrant students; a negative score indicates a performance difference in favour of immigrant students.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
Countries and economies are ranked in descending order of the mean science score in PISA 2015.
Source: OECD, PISA 2015 Database, Tables I.2.3, I.6.1, I.6.3a, I.6.7, I.6.17, I.7.1 and I.7.15a.
StatLink http://dx.doi.org/10.1787/888933431984

Figure I.1.3 [Part 2/2] ■ Snapshot of equity in education

	Inclusion and fairness indicators		Difference between PISA 2006 and PISA 2015 (PISA2015 - PISA 2006)			
	Percentage of immigrant students in PISA 2015	Difference in science performance between immigrant and non-immigrant students, after accounting for ESCS and language spoken at home[4]	Percentage of variation in science performance explained by students' socio-economic status	Score-point difference in science associated with one-unit increase on the ESCS index	Percentage of resilient students	Difference in science performance between immigrant and non-immigrant students, after accounting for ESCS and language spoken at home
	%	Score dif.	% dif.	Score dif.	% dif.	Score dif.
OECD average	12.5	**19**	**-1.4**	0	**1.5**	**-6**
Singapore	20.9	**-13**	m	m	m	m
Japan	0.5	**53**	1.6	2	**8.2**	m
Estonia	10.0	**28**	-1.0	2	2.0	-2
Chinese Taipei	0.3	m	1.0	2	2.0	m
Finland	4.0	**36**	1.8	**10**	**-10.4**	-11
Macao (China)	62.2	**-19**	-0.1	0	**5.8**	-2
Canada	30.1	-5	0.3	1	0.7	**-11**
Viet Nam	0.1	m	m	m	m	m
Hong Kong (China)	35.1	-1	-1.5	**-8**	-0.7	**10**
B-S-J-G (China)	0.3	**135**	m	m	m	m
Korea	0.1	m	3.1	**13**	-3.2	m
New Zealand	27.1	-3	-2.0	0	-4.7	-9
Slovenia	7.8	14	**-4.0**	**-5**	**4.3**	1
Australia	25.0	**-13**	-0.4	2	-0.2	-8
United Kingdom	16.7	**15**	-2.9	**-8**	**5.0**	9
Germany	16.9	**28**	**-4.0**	-5	**8.7**	7
Netherlands	10.7	**23**	-3.8	3	-1.3	-10
Switzerland	31.1	**16**	-0.7	0	1.2	**-20**
Ireland	14.4	3	-0.5	1	0.4	6
Belgium	17.7	**28**	-0.7	2	1.4	**-32**
Denmark	10.7	**38**	**-3.6**	**-7**	**7.9**	7
Poland	0.3	m	-1.4	0	3.2	m
Portugal	7.3	8	-1.4	3	4.4	**-49**
Norway	12.0	**23**	-0.4	1	**9.3**	8
United States	23.1	-5	**-6.0**	**-13**	**12.3**	-10
Austria	20.3	**18**	0.1	0	-2.2	-17
France	13.2	**20**	-1.9	5	3.0	10
Sweden	17.4	**40**	1.2	**6**	0.6	13
Czech Republic	3.4	2	2.7	1	-3.9	-20
Spain	11.0	**26**	0.9	**3**	**10.7**	**-23**
Latvia	5.0	**14**	-0.5	-4	**6.0**	7
Russia	6.9	5	-0.9	0	-1.0	-4
Luxembourg	52.0	**22**	-1.7	2	1.5	**-16**
Italy	8.0	**11**	-0.6	-1	2.8	**-32**
Hungary	2.7	-11	0.3	2	**-6.7**	-13
Lithuania	1.8	2	-2.6	-2	-2.1	11
Croatia	10.8	**14**	-0.1	3	-0.5	7
CABA (Argentina)	17.0	**15**	m	m	m	m
Iceland	4.1	**53**	**-2.6**	-3	-1.8	24
Israel	17.5	-9	0.9	0	2.3	1
Malta	5.0	-5	m	m	m	m
Slovak Republic	1.2	**40**	-3.6	-4	-2.8	m
Greece	10.8	**14**	-2.1	-2	-2.3	5
Chile	2.1	**21**	**-6.4**	**-6**	-0.4	m
Bulgaria	1.0	**49**	**-6.3**	-7	**4.1**	m
United Arab Emirates	57.6	**-77**	m	m	m	m
Uruguay	0.6	11	-1.6	-2	-1.8	m
Romania	0.4	m	-1.5	-1	**4.8**	m
Cyprus*	11.3	1	m	m	m	m
Moldova	1.4	0	m	m	m	m
Albania	0.6	m	m	m	m	m
Turkey	0.8	22	-6.1	**-7**	-1.4	21
Trinidad and Tobago	3.5	19	m	m	m	m
Thailand	0.8	-8	**-6.5**	-5	**-5.2**	m
Costa Rica	8.0	6	m	m	m	m
Qatar	55.2	**-77**	**2.4**	**15**	**4.9**	**-19**
Colombia	0.6	**60**	3.1	4	0.3	m
Mexico	1.2	**57**	**-5.2**	**-5**	-1.9	-21
Montenegro	5.6	-7	**-2.6**	-1	1.8	12
Georgia	2.2	4	m	m	m	m
Jordan	12.1	-2	-1.6	0	**-6.6**	**13**
Indonesia	0.1	m	3.5	1	-4.1	m
Brazil	0.8	**64**	**-4.5**	-1	-0.9	**30**
Peru	0.5	29	m	m	m	m
Lebanon	3.4	18	m	m	m	m
Tunisia	1.5	**50**	0.1	-2	**-11.7**	-20
FYROM	2.0	**23**	m	m	m	m
Kosovo	1.5	**28**	m	m	m	m
Algeria	1.0	**33**	m	m	m	m
Dominican Republic	1.8	**26**	m	m	m	m

* See note 1 under Figure I.1.1.
1. Also referred to as ESCS.
2. All score-point differences in science performance associated with a one-unit increase on the PISA index of economic, social and cultural status are statistically significant.
3. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status in the country/economy of assessment and performs in the top quarter of students among all countries/economies, after accounting for socio-economic status.
4. A positive score indicates a performance difference in favour of non-immigrant students; a negative score indicates a performance difference in favour of immigrant students.

Note: Values that are statistically significant are indicated in bold (see Annex A3).

Countries and economies are ranked in descending order of the mean science score in PISA 2015.

Source: OECD, PISA 2015 Database, Tables I.2.3, I.6.1, I.6.3a, I.6.7, I.6.17, I.7.1 and I.7.15a.

StatLink http://dx.doi.org/10.1787/888933431984

2

Science performance among 15-year-olds

This chapter defines the notion of science literacy and how it is measured in PISA 2015. It also shows how close countries are to equipping all their students with a baseline level of proficiency in science. This would mean that, when students leave compulsory education, they are at least able to provide possible explanations for scientific phenomena in familiar contexts and to draw appropriate conclusions from data derived from simple investigations. The chapter also discusses the extent to which young adults have acquired a scientific mindset – that is, positive dispositions towards scientific methods of enquiry and towards discussion of science-related topics.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

An understanding of science, and of science-based technology, is necessary not only for those whose careers depend on it directly, but also for any citizen who wishes to make informed decisions related to the many controversial issues under debate today – from more personal issues, such as maintaining a healthy diet, to local issues, such as how to manage waste in big cities, to more global and far-reaching issues, such as the costs and benefits of genetically modified crops or how to prevent and mitigate the catastrophic consequences of global warming.

Science education in primary and secondary school should ensure that by the time students leave school they can understand and engage in discussions about the science and technology-related issues that shape our world. Most current curricula for science education are designed on the premise that an understanding of science is so important that the subject should be a central feature in every young person's education (OECD, 2016b).

What the data tell us

- Singapore outperforms all other participating countries/economies in science. Japan, Estonia, Finland and Canada, in descending order of mean performance, are the four highest-performing OECD countries.
- Some 7.7% of students across OECD countries are top performers in science, meaning that they are proficient at Level 5 or 6. About one in four (24.2%) students in Singapore, and more than one in seven students in Chinese Taipei (15.4%), Japan (15.3%) and Finland (14.3%) perform at this level.
- Mean performance in science improved significantly between 2006 and 2015 in Colombia, Israel, Macao (China), Portugal, Qatar and Romania. Over this period, Macao (China), Portugal and Qatar reduced the share of low-achieving students performing below Level 2, and simultaneously increased the share of students performing at or above Level 5.
- In 33 countries and economies, the share of top performers in science is larger among boys than among girls. Finland is the only country in which girls are more likely to be top performers than boys. At the same time, in most countries, boys and girls are equally able to complete the easiest science tasks in the PISA test.
- Students who score low in science are less likely to agree that scientific knowledge is tentative and to believe that scientific approaches to enquiry, such as repeating experiments, are a good way to acquire new knowledge.

HOW PISA DEFINES SCIENCE LITERACY

PISA 2015 focused on science as the major domain, and defines science literacy as "the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen". A scientifically literate person is willing to engage in reasoned discourse about science and technology. This requires the competencies to explain phenomena scientifically, to evaluate and design scientific enquiry, and to interpret data and evidence scientifically (for a detailed description of science literacy, see the *PISA 2015 Assessment and Analytical Framework: Science, Reading, Mathematics and Financial Literacy*, OECD, 2016b).

Performance in science requires three forms of knowledge: content knowledge, knowledge of the standard methodological procedures used in science, and knowledge of the reasons and ideas used by scientists to justify their claims. Explaining scientific and technological phenomena, for instance, demands knowledge of the content of science. Evaluating scientific enquiry and interpreting evidence scientifically also require an understanding of how scientific knowledge is established and the degree of confidence with which it is held.

The definition of science literacy recognises that there is an affective element to a student's competency: students' attitudes or dispositions towards science can influence their level of interest, sustain their engagement and motivate them to take action (Osborne, Simon and Collins, 2003; Schibeci, 1984).

The use of the term "science literacy" underscores PISA's aim not only to assess what students know in science, but also what they can do with what they know, and how they can creatively apply scientific knowledge to real-life situations. In the remaining parts of this chapter, "science" is also used to refer to the "science literacy" measured in PISA.

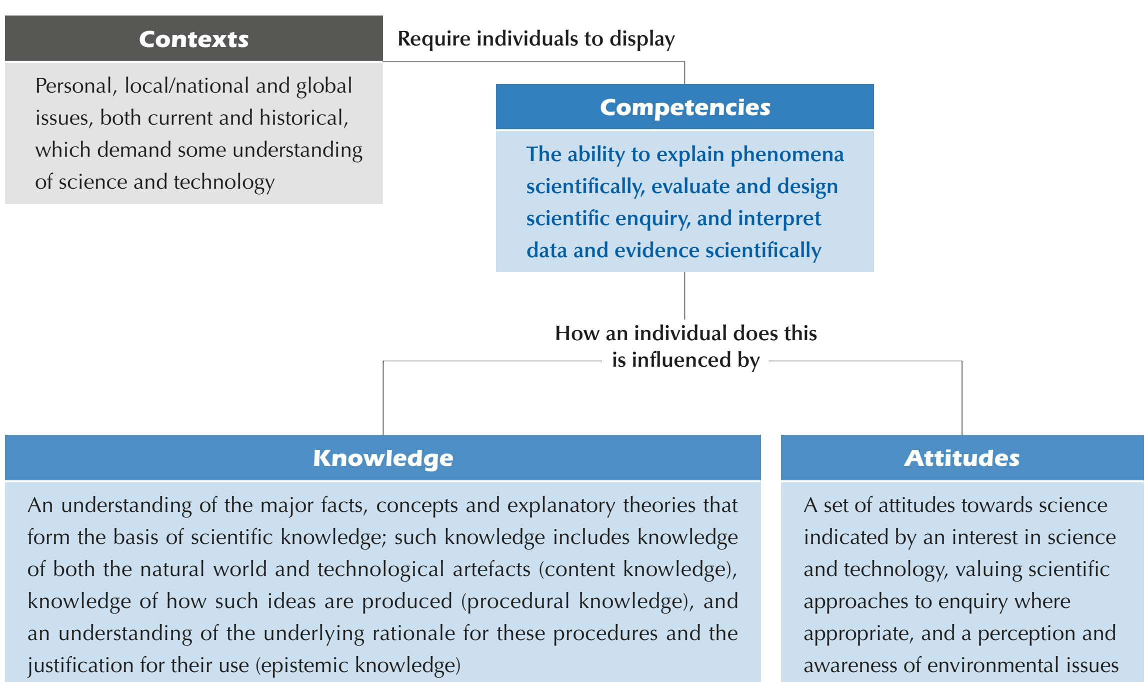
Described in this way, literacy in science is not an attribute that a student has or does not have; rather, it can be acquired to a greater or lesser extent, and is influenced both by knowledge of and about science, and by attitudes towards science.

The concept of science literacy in PISA refers to a knowledge of both *science* and *science-based technology*, even though science and technology do differ in their purposes, processes and products. Technology seeks the optimal solution to a human problem, and there may be more than one optimal solution. In contrast, science seeks the answer to a specific question about the natural, material world. Nevertheless, the two are closely related, and science-literate individuals are expected to be able and willing to engage in reasoned discourse, and make informed decisions, about both science and technology. For instance, individuals make decisions and choices that influence the directions of new technologies (such as the decision to drive a smaller, more fuel-efficient car). Scientifically literate individuals are expected to make more informed choices. They should also be able to recognise that, while science and technology are often a source of solutions, paradoxically, they can also be seen as a source of risk, generating new problems that can only be solved through the use of science and technology.

The PISA 2015 framework for assessing science literacy

Figure I.2.1 presents presents an overview of the main aspects of the PISA 2015 framework for science that was established and agreed by the countries and economies participating in PISA, and how the aspects are related to each other. The central box, highlighted in blue, lists the three competencies that lie at the heart of the PISA definition of science literacy: explaining phenomena scientifically, evaluating and designing scientific enquiry, and interpreting data and evidence scientifically. Students use these competencies in specific contexts that demand some understanding of science and technology; these contexts generally relate to local or global issues. Students' ability to apply their competencies to a specific science context is influenced by both their attitudes towards science, scientific methods and the underlying issue, and by their knowledge of science ideas and how they are produced and justified.

Figure I.2.1 ▪ **Aspects of the science assessment framework for PISA 2015**



The PISA 2015 framework for assessing science in PISA builds on the previous framework, developed for the 2006 assessment. The major difference is that the notion of "knowledge about science", which was referred to in the PISA 2006 definition as an "understanding of the characteristic features of science as a form of human knowledge and enquiry", has been defined more clearly and split into two components – procedural knowledge and epistemic knowledge (i.e. knowledge of the nature and origin of scientific understanding). Several changes in the test design, most notably the move from paper-based to computer-based delivery, also influenced the development of the assessment tasks, as is explained in greater detail below.

Each of the tasks used for the assessment of students' performance in science has been mapped against the different aspects of the framework, as well as against two additional dimensions (response format and cognitive demand), in order to create a balanced assessment that covers the full framework. The distribution of items across framework categories reflects a consensus view among the experts consulted on the relative weight of these components in the definition of science literacy (OECD, 2016b). The six dimensions used to classify items are explained in detail below and are summarised in Figure I.2.2. Three of the six – scientific competencies, knowledge types and content areas – are reporting categories: for each of them, it is possible to contrast student performance in the various subcategories by using subscales.

Figure I.2.2 ▪ **Categories describing the items constructed for the PISA 2015 science assessment**

Reporting categories			Further categories to ensure a balanced assessment		
Scientific competencies	**Knowledge types**	**Content areas**	**Response types**	**Cognitive demand**	**Contexts**
Explain phenomena scientifically	Content	Physical systems	Simple multiple choice	Low	Personal
Evaluate and design scientific enquiry	Procedural[1]	Living systems	Complex multiple choice	Medium	Local/National
Interpret data and evidence scientifically	Epistemic[1]	Earth and space systems	Constructed response	High	Global

1. While distinct from a theoretical point of view, the procedural and epistemic knowledge categories form a single reporting category.

Scientific competencies

According to the PISA definition, a science-literate person is able and willing to engage in reasoned discourse about science and technology. This requires the competencies to:

- **Explain phenomena scientifically** – recognise, offer and evaluate explanations for a range of natural and technological phenomena.
- **Evaluate and design scientific enquiry** – describe and appraise scientific investigations and propose ways of addressing questions scientifically.
- **Interpret data and evidence scientifically** – analyse and evaluate data, claims and arguments in a variety of representations and draw appropriate scientific conclusions.

That the three science competencies are central to the definition of science literacy reflects a view that science is best seen as an ensemble of practices for generating, evaluating and discussing knowledge that is common across all of the natural sciences. Fluency with these practices reflects greater competency, and distinguishes the expert scientist from the novice. While it would be unreasonable to expect a 15-year-old student to have the expertise of a professional scientist, a scientifically literate student can be expected to appreciate the role and significance of these practices and demonstrate a basic proficiency in them.

The competency "explain phenomena scientifically", defined as the ability to recognise, offer and evaluate explanations for a range of natural and technological phenomena, is evident when students recall and apply appropriate scientific knowledge; identify, use and generate explanatory models and representations; make and justify appropriate predictions; offer explanatory hypotheses; and explain the potential implications of scientific knowledge for society.

The competency "evaluate and design scientific enquiry" is required to evaluate reports of scientific findings and investigations critically. It is defined as the ability to describe and appraise scientific investigations and propose ways of addressing questions scientifically. It is reflected in the behaviour of students who identify the question explored in a given scientific study; distinguish questions that can be investigated scientifically from those that cannot; propose a way of exploring a given question scientifically; evaluate ways of exploring a given question scientifically; and describe and evaluate how scientists ensure the reliability of data, and the objectivity and generalisability of explanations.

The competency "interpret data and evidence scientifically" is defined as the ability to analyse and evaluate scientific data, claims and arguments in a variety of representations, and draw appropriate conclusions. Students who can interpret data and evidence scientifically can transform data from one representation to another; analyse and interpret data and draw appropriate conclusions; identify the assumptions, evidence and reasoning behind science-related texts; distinguish between arguments that are based on scientific evidence and theory and those based on other considerations; and contrast and evaluate scientific arguments and evidence from different sources.

The 184 science-related test items – the equivalent of around six hours of test material – from which the PISA 2015 assessment of science was assembled can be classified into categories related to these three competencies according to the main demand of the task. Among all science-related items, 48% (89 items, or the equivalent of almost three hours) mainly draw on students' ability to explain phenomena scientifically, 21% (39 items, or slightly more than one hour) on the ability to evaluate and design scientific enquiry, and 30% (56 items, or almost two hours) on the ability to interpret data and evidence scientifically (see Annex C2).

Knowledge categories

Each of the scientific competencies requires some content knowledge (knowledge of theories, explanatory ideas, information and facts), but also an understanding of how such knowledge has been derived (procedural knowledge) and of the nature of that knowledge (epistemic knowledge).

"Procedural knowledge" refers to knowledge about the concepts and procedures that are essential for scientific enquiry, and that underpin the collection, analysis and interpretation of scientific data. In the quest to explain phenomena in the material world, science proceeds by testing hypotheses through empirical enquiry. Empirical enquiry relies on certain standard procedures to obtain valid and reliable data. Students are expected to know these procedures and related concepts, such as: the notion of dependent and independent variables; the distinction between different types of measurement (qualitative and quantitative, categorical and continuous); ways of assessing and minimising uncertainty (such as repeating measurements); the strategy of controlling variables and its role in experimental design; and common ways of presenting data. It is expected, for instance, that students will know that scientific knowledge is associated with differing degrees of certainty, depending on the nature and quantity of empirical evidence that has accumulated over time.

"Epistemic knowledge" refers to an understanding of the nature and origin of knowledge in science, and reflects students' capacity to think and engage in reasoned discourse as scientists do. Epistemic knowledge is required to understand the distinction between observations, facts, hypotheses, models and theories, but also to understand why certain procedures, such as experiments, are central to establishing knowledge in science.

Slightly over half of all the science-related items in PISA 2015 (98 out of 184) require mainly content knowledge, 60 require procedural knowledge, and 26 require epistemic knowledge.

Content areas

Knowledge can also be classified according to the major scientific fields to which it pertains. Fifteen-year-old students are expected to understand major explanatory ideas and theories from the fields of physics, chemistry, biology, earth and space sciences, and how they apply in contexts where the elements of knowledge are interdependent or interdisciplinary. Items used in the assessment are classified into three content areas: physical systems, living systems, and earth and space systems.[1] Examples of knowledge that 15-year-olds are expected to have acquired include an understanding of the particle model of matter (physical systems), the theory of evolution by natural selection (living systems), and the history and scale of the universe (earth and space systems). About one-third of all the science-related items in PISA 2015 (61 out of 184) relate to physical systems, 74 to living systems, and the remaining 49 to earth and space systems.

Context of assessment items

The real-world issues used as stimuli and items for the assessment of science literacy in 2015 can also be classified by the context in which they are set. Three context categories identify the broad areas of life in which the test problems may arise: "personal", which are contexts related to students' and families' daily lives; "local/national", which are contexts related to the community in which students live; and "global", which are contexts defined by life across the world. An item relating to a fossil fuel issue, for instance, may be classified as personal if it explores energy-saving behaviours, as local/national if it addresses the environmental impact on air quality, and as global, if it examines the link between fossil fuel consumption and the concentration of carbon dioxide in the atmosphere.

The PISA 2015 science assessment is not an assessment of specific contexts; rather, the contexts are used to elicit specific science-related tasks. Therefore, a broad range of personal, local/national and global contexts was included in the assessment.

Attitudes

Peoples' attitudes and beliefs play a significant role in their interest, attention and response to science and technology. The PISA definition of science literacy recognises that a student's response to a science-related issue requires more

than skills and knowledge; it also depends on how able and "willing" the student is "to engage" with the issue. In PISA 2015, students' attitudes, beliefs and values were examined through students' responses to questions in the student questionnaire rather than through their performance on test items. A major distinction among science-related attitudes is between attitudes towards science (e.g. interest in different content areas of science) and scientific attitudes. The former set of attitudes is examined in greater detail in the next chapter. Students' beliefs about science knowledge and knowing (epistemic beliefs), which indicate whether students value scientific approaches to enquiry and are part of the latter set of attitudes, are analysed at the end of this chapter.

Computer-based assessment of science

Computer delivery of the PISA 2015 assessment has made it possible to expand what the PISA science test can assess, compared to previous paper-based versions of PISA tests. For instance, PISA 2015 for the first time assessed students' ability to conduct scientific enquiry by asking them to design (simulated) experiments and interpret the resulting evidence. This was made possible through the use of interactive presentations, where students' actions determined what they saw on the screen. Twenty-four items included in the main study (or about 13%) were interactive, but they were kept confidential so that they can be used in future assessments to measure trends.

The PISA 2015 field-trial unit *RUNNING IN HOT WEATHER*, available online at www.oecd.org/pisa and described in Annex C1, provides an illustration of how interactive science items work. It asks students to collect data on the water loss and body temperature of a runner after a one-hour run under different temperature and humidity conditions. After moving sliders that appear on the screen to the desired temperature and humidity levels, students can run one or more simulations whose results are recorded on the screen and must be used in order to answer the questions in that unit.

Questions based on interactive presentations can focus on the ability to interpret data and evidence scientifically (e.g. Question 1 in *RUNNING IN HOT WEATHER*), on the ability to explain phenomena scientifically (e.g. Question 2), or on the ability to evaluate and design scientific enquiry (e.g. Question 3), and can relate to all content areas and types of knowledge. The relative difficulty or complexity of a particular question was not related to whether the item was presented as interactive or static.

Computer delivery of test items also allowed for a greater variety of contexts to be included in the assessment, and to convey situations of motion and change (e.g. chemical reactions) in a more realistic and motivating way, through the use of animations.

Response types used in the assessment of science

Three broad categories of response formats were used in the PISA 2015 science assessment: simple multiple choice, complex multiple choice, and constructed response. Within each category, new response formats, in addition to those that were also used in paper-based tests, were used in the computer-based science assessment. About one-third of the items can be classified in each category:

- simple multiple choice: items calling for
  - selection of a single response from four options
  - selection of a "hot spot", an answer that is a selectable element within a graphic or text
- complex multiple choice: items calling for
  - responses to a series of related "Yes/No" questions that are scored as a single item (the typical format in 2006)
  - selection of more than one response from a list
  - completion of a sentence by selecting choices from a drop-down menu to fill multiple blanks
  - "drag-and-drop" responses, allowing students to move elements on screen to complete a task of matching, ordering or categorising
- constructed response: items calling for written or drawn responses. Constructed-response items in science typically call for a written response ranging from a phrase to a short paragraph (e.g. two to four sentences of explanation). A small number of constructed-response items call for a drawing (e.g. a graph or diagram). In a computer-based assessment, any such item is supported by simple drawing applications that are specific to the response required. In general, these items cannot be machine scored; they require the professional judgement of trained coders to assign the responses to defined categories. To ensure that the response-coding process yields reliable and cross-nationally comparable results, detailed guidelines and training were provided. All of the procedures to ensure consistency of coding within and between countries are detailed in the *PISA 2015 Technical Report* (OECD, forthcoming).

Cognitive demand of items

A novel feature of the PISA 2015 science assessment was the explicit attempt to cover different levels of cognitive demand across all three types of science competencies and knowledge. Cognitive demand, sometimes referred to as "depth of knowledge", refers to the type of mental processes required to complete an item. In large part, it determines an item's level of difficulty, more than the response format or a student's familiarity with the underlying science content.

The cognitive demand – and thus difficulty – of items is influenced by four factors:

- the number and degree of complexity of the elements of knowledge in the item
- students' level of familiarity with and prior knowledge of the content, procedural and epistemic knowledge involved
- the cognitive operation required by the item, e.g. recall, analysis and/or evaluation
- the extent to which forming a response depends on models or abstract scientific ideas.

To ensure a balanced assessment of science, three levels of cognitive demand are identified:

- **Low depth of knowledge:** Items requiring the student to carry out a one-step procedure, such as recalling a single fact, term, principle or concept, or locating a single point of information from a graph or table.
- **Medium depth of knowledge:** Items requiring the student to use and apply conceptual knowledge to describe or explain phenomena, select appropriate procedures involving two or more steps, organise/display data, or interpret and use simple data sets and graphs.
- **High depth of knowledge:** Items requiring students to analyse complex information or data, synthesise or evaluate evidence, justify claims, reason (given various sources), or develop a plan with which to approach a problem.

Of the 184 items included in the PISA 2015 science assessment, 56 (or about 30%) are classified in the "low depth of knowledge" category, 15 (or about 8%) in the "high depth of knowledge" category, and the majority (113 items, or 61%) in the "medium" category.

Examples of items representing the different categories

Figure I.2.3 summarises how the sample items from the PISA 2015 main study (described in greater detail in Annex C1 and available on line at www.oecd.org/pisa) are categorised.

Figure I.2.3 ▪ **Classification of sample items**

By competency, knowledge and content categories, depth of knowledge, response type and context

Item/Question	Scientific competency	Knowledge type	Content area	Cognitive demand	Response type	Context
SUSTAINABLE FISH FARMING, Question 1	Explain phenomena scientifically	Content	Living	Medium	Complex multiple choice	Local/ National
SUSTAINABLE FISH FARMING, Question 2	Interpret data and evidence scientifically	Content	Living	Low	Simple multiple choice	Local/ National
SUSTAINABLE FISH FARMING, Question 3	Explain phenomena scientifically	Content	Physical	Low	Simple multiple choice	Local/ National
SLOPE-FACE INVESTIGATION, Question 1	Evaluate and design scientific enquiry	Epistemic	Earth and space	Medium	Constructed response	Local/ National
SLOPE-FACE INVESTIGATION, Question 3	Interpret data and evidence scientifically	Epistemic	Earth and space	High	Constructed response	Local/ National
METEOROIDS AND CRATERS, Question 1	Explain phenomena scientifically	Content	Physical	Low	Simple multiple choice	Global
METEOROIDS AND CRATERS, Question 2	Explain phenomena scientifically	Content	Earth and space	Low	Complex multiple choice	Global
METEOROIDS AND CRATERS, Question 3A	Explain phenomena scientifically	Content	Earth and space	Low	Complex multiple choice	Global
METEOROIDS AND CRATERS, Question 3B	Explain phenomena scientifically	Content	Earth and space	Medium	Complex multiple choice	Global
BIRD MIGRATION, Question 1	Explain phenomena scientifically	Content	Living	Medium	Simple multiple choice	Global
BIRD MIGRATION, Question 2	Evaluate and design scientific enquiry	Procedural	Living	High	Constructed response	Global
BIRD MIGRATION, Question 3	Interpret data and evidence scientifically	Procedural	Living	Medium	Complex multiple choice	Global

HOW THE PISA 2015 SCIENCE RESULTS ARE REPORTED

In 57 countries/economies, including all OECD countries, the PISA 2015 test was conducted on computers. The paper-based form was used in 15 countries/economies as well as in Puerto Rico, an unincorporated territory of the United States. The countries/economies that administered the paper-based test in 2015 are: Albania, Algeria, Argentina, the Former Yugoslav Republic of Macedonia (hereafter "FYROM"), Georgia, Indonesia, Jordan, Kazakhstan, Kosovo, Lebanon, Malta, Moldova, Romania, Trinidad and Tobago, and Viet Nam. Only the computer-based test fully covers the new aspects of the science framework for PISA 2015. The paper-based test used only items developed in previous cycles, which represent about half of all the items used in the computer-based assessments. Nevertheless, the procedures used to develop the tests and to analyse and scale student responses were the same for both sets of countries/economies that participated in PISA 2015. And while the science test is not equivalent across the two modes of delivery, results of the paper-based and computer-based tests in 2015 are linked through common items. The results of both are reported on the same scale as the results of previous assessments, so that all countries can be directly compared across modes and across time (see Box I.2.3).[2]

How the PISA 2015 science test was designed, analysed and scaled

This section summarises the test development and scaling procedures used to ensure that results of the PISA 2015 test are comparable across countries and with the results of previous PISA assessments. These procedures are described in greater detail in the *PISA 2015 Technical Report* (OECD, forthcoming). While the development and selection of test questions mostly followed procedures established in previous PISA cycles, several changes were introduced in the administration procedures (including the move from paper- to computer-based delivery and an improved design of test forms) and in the scaling procedures. The impact of these changes on comparing student performance over time is further discussed in Box I.2.3 and Annex A5.

How test questions were developed and selected

The test material had to meet several requirements:

- Test items had to meet the requirements and specifications of the framework for PISA 2015 that was established and agreed upon by the participating countries and economies. The content, cognitive demands and contexts of the items had to be deemed appropriate for a test for 15-year-olds.
- Items had to be of curricular relevance for 15-year-olds in participating countries and economies and appropriate in the respective cultural contexts. It is inevitable that not all tasks in the PISA assessment are equally appropriate in different cultural contexts and equally relevant in different curricular and instructional contexts. But PISA asked experts from every participating country to identify those tasks from the PISA tests that they considered most appropriate for an international test, and these ratings were considered when selecting items for the assessment.
- Items had to meet stringent standards of technical quality and international comparability. In particular, the professional translation and verification of items and an extensive field trial ensured the linguistic equivalence of test questions across the more than 70 languages in which PISA 2015 was conducted. The field trial also served to verify the psychometric equivalence of the instruments, which was further examined before scaling the results of the main study (see Annex A5).
- A sufficient number of items from previous assessments had to be included in order to allow for comparisons with previous rounds of PISA and to continue measuring trends.

Items for the science assessment were selected from a pool of diverse material with a broad range of authors from different cultures and countries.

Just under 50% of the PISA 2015 science items were initially developed for delivery on paper in the PISA 2006 assessment of science and have been kept strictly confidential thereafter. These "trend units" provide the basis for measuring changes in student performance over time, and for linking the PISA 2015 science scale to the existing PISA science scale. All trend items used in PISA 2015 had to be adapted for delivery on computer (also see *PISA 2015 Technical Report* [OECD, forthcoming], Chapter 2). The equivalence between the paper- and computer-based versions of trend items used to measure student proficiency in science, reading and mathematics was assessed on a diverse population of students from all countries that participated in PISA 2015 as part of an extensive field trial. The results of this mode study informed the selection of items and the scaling of student responses for the PISA 2015 main survey (see Box I.2.3).

Slightly more than half of the items used in the assessment were newly developed for computer delivery in PISA 2015. Authors in 14 countries, with contributions from national teams, members of the PISA science expert group, and the PISA International Consortium, created stimulus material and questions that reflect the content, contexts and approaches relevant to students in a large number of PISA-participating countries and economies. Experts reviewed wording and other features of the items, then the items were tested among classes of 15-year-old students in the field trial.

The items were extensively field tested in all countries and economies that participated in the PISA 2015 assessment. Local science experts in each participating country and economy provided detailed feedback on the curricular relevance, appropriateness and potential interest for 15-year-olds. At each stage, material was considered for rejecting, revising or keeping in the pool of potential items. Finally, the international science expert group formulated recommendations as to which items should be included in the main survey instruments. The final set of items selected for the main survey was also subject to reviews by all countries and economies. During those reviews, countries/ economies provided recommendations in relation to: item suitability for assessing the competencies enumerated in the framework; the items' acceptability and appropriateness at the national level; and the overall quality of the assessment instruments, to ensure they were of the highest standard possible. This selection was balanced across the various categories specified in the science framework and spanned a range of levels of difficulty, so that the entire pool of items could measure performance across all science competencies and knowledge types, and across a broad range of content areas and student abilities (for further details, see the *PISA 2015 Technical Report* [OECD, forthcoming]).

Test items were generally developed within "units" that included some stimulus material and one or more questions related to the stimulus.

Altogether, the 184 items that were developed and selected for the PISA 2015 science assessment represent the equivalent of six hours of test questions. Of these items, 85 questions (the equivalent of about three hours) are trend tasks, which were used in previous PISA surveys, and 99 questions (another three hours) are new science tasks. Trend tasks that had originally been developed for paper-based assessments were adapted for computer-based delivery in 57 countries/ economies. They were included in their original paper-based form in the countries/economies that conducted the PISA 2015 test with paper and pencil. New tasks were developed for computer-based delivery and were only included in the tests in the 57 countries that conducted the PISA 2015 test on computer.

How the test forms were designed

In order to ensure that the assessment covered a wide range of content, with the understanding that each student could complete only a limited set of tasks, the full set of tasks was distributed across a range of test forms with overlapping content. Each student thus completed only a fraction of all items, depending on which test form was randomly assigned to him or her. All forms contained an hour-long sequence of science questions, and therefore all students completed about one hour of testing in science – or about 30 items.

Half of the students sat the science test during the first hour of the assessment, and half sat the test during the second hour, after a short break. During the other hour of testing, students worked on sequences of tasks from either one or two of the following domains: reading, mathematics, and in 50 countries and economies, collaborative problem solving, so that all students completed two hours of testing in two or three domains, including science. In 15 countries and economies, a subset of the students in the PISA sample also completed a test of financial literacy after completing the main PISA test and questionnaire. The number and sequence of test domains and of tasks depended on the test form, which was assigned to students by a random draw.

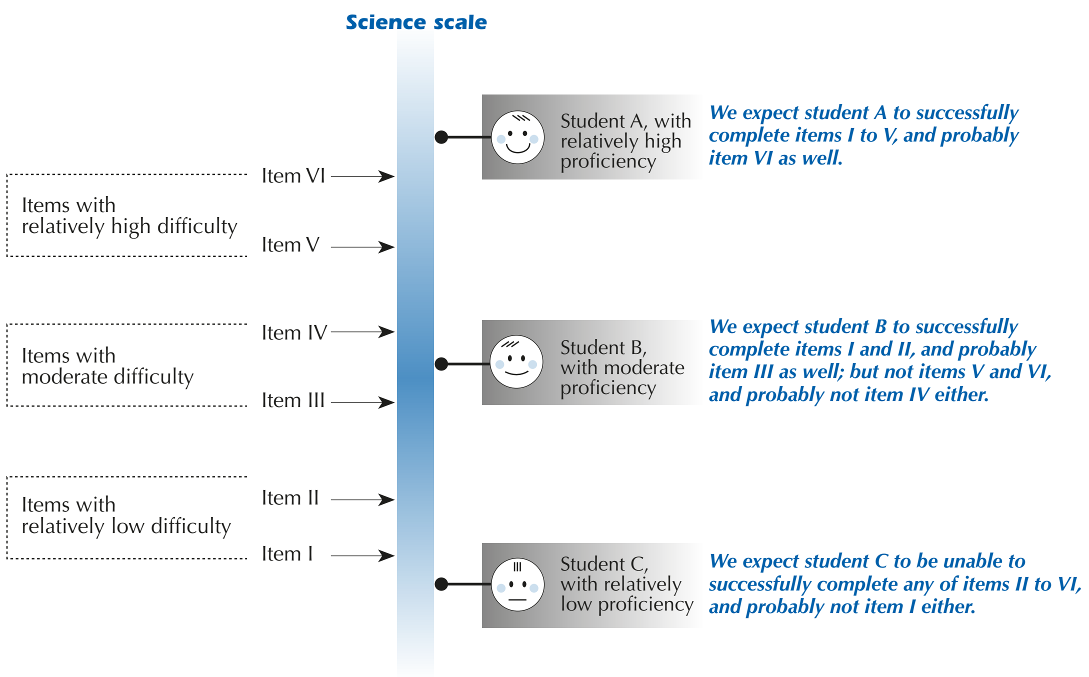
How student responses were analysed and scaled

While different students saw different questions, the test design, which was built on those used in previous PISA assessments, made it possible to construct a continuous scale of proficiency in science, so that each test-taker's performance is associated with a particular point on the scale that indicates his or her estimated science proficiency, and the likelihood that he or she responds correctly to a particular question (higher values on the scale indicate greater proficiency). A description of the modelling technique used to construct this scale can be found in the *PISA 2015 Technical Report* (OECD, forthcoming).

The relative difficulty of tasks was estimated by determining the proportion of test-takers who answer each question correctly. Task difficulty is reported on the same scale as student proficiency (higher values correspond, in this case, to more difficult items). In PISA, the difficulty of a task is defined as the point on the scale where there is at least a 62% probability of a correct response by students who score at or above that point.[3] A single continuous scale shows the relationship between the difficulty of questions and the proficiency of test-takers (Figure I.2.4). By constructing a scale that shows the difficulty of each question, it is possible to locate the level of science literacy that the question demands. By showing the proficiency of each test-taker on the same scale, it is possible to describe each test-taker's level of science literacy.

Just as the sample of students who sat the PISA test in 2015 was drawn to represent all 15-year-old students in the participating countries and economies, so the individual test questions used in the assessment were designed to represent the definition of literacy in science described above. Estimates of student proficiency reflect the kinds of tasks students would be expected to perform successfully. This means that students are likely to be able to successfully answer questions located at or below the difficulty level associated with their own position on the scale. Conversely, they are unlikely to be able to successfully answer questions above the difficulty level associated with their position on the scale.

Figure I.2.4 ▪ **Relationship between questions and student performance on a scale**



The higher a student's proficiency level is located above a given test question, the more likely is he or she to answer the question (and other questions of similar difficulty) successfully. The further the student's proficiency is located below a given question, the less likely is he or she to be able to answer the question (and other questions of similar difficulty) successfully.

Reporting scales for PISA 2015

PISA 2015 provides an overall science scale, which draws on all of the science questions in the assessment, as well as (for countries/economies that used the full set of PISA 2015 science items, i.e. those that administered the PISA 2015 test on computers) scales for the three science competencies, the three content areas and two of the broad knowledge-type categories defined earlier in this chapter. (A single scale for both procedural and epistemic knowledge was constructed because there were too few epistemic knowledge items to support the construction of a continuous scale of epistemic knowledge with desirable properties.)[4] The metric for the overall science scale is based on a mean for OECD countries of 500 points and a standard deviation of 100 points that were set in PISA 2006 when the PISA science scale was first developed.[5] The items that were common to both the 2006 and 2015 test instruments, and were found to measure science competencies comparably in the paper- and computer-based modes, allow for a link to be made with the earlier scale. Annex A5 describes how the PISA 2015 scale was equated to the PISA 2006 scale.

How science proficiency levels are defined in PISA 2015

To help users interpret what student scores mean in substantive terms, PISA scales are divided into proficiency levels. For PISA 2015, the range of difficulty of science tasks is represented by seven levels of science proficiency: six levels that are aligned with the levels used in describing the outcomes of PISA 2006 (ranging from the highest, Level 6, to Level 1a, formerly known as Level 1). At the bottom of the scale, a new Level 1b is described, based on some of the easiest tasks included in the assessment, to indicate the knowledge and skills of some of the students performing below Level 1a (in previous PISA reports, these students were included among those scoring “below Level 1”).

Based on the cognitive demands of tasks that are located within each level, descriptions of each of these levels have been generated to define the kinds of knowledge and skills needed to complete those tasks successfully. Individuals with proficiency within the range of Level 1b are likely to be able to complete Level 1b tasks, but are unlikely to be able to complete tasks at higher levels. Level 6 includes tasks that pose the greatest challenge in terms of the depth of science knowledge and competencies needed to complete them successfully. Students with scores in this range are likely to be able to complete tasks located at this level, as well as all the other PISA science tasks (see the following section for a detailed description of the proficiency levels in science).

Figure I.2.5 shows the location on the science scale of some of the items used in the PISA 2015 assessment of science. These items are only a small sample of all the items used in the assessment, and are presented in greater detail in Annex C1 and on line at www.oecd.org/pisa. While no item at Level 1a and at Level 5 are included among the released main survey items shown in the figure, there were 10 items at Level 1a among the 184 science items used in PISA 2015, and 20 items at Level 5. Since PISA is a recurring assessment, it is useful to retain a sufficient number of questions over successive PISA assessments in order to generate trend data over time.

Figure I.2.5 ▪ **Map of selected science questions illustrating proficiency levels**

Level	Lower score limit	Question	Question difficulty (in PISA score points)
6	708	SUSTAINABLE FISH FARMING – Question 1 (S601Q01)	740
5	633		
4	559	BIRD MIGRATION – Question 2 (S656Q02)	630
		SLOPE–FACE INVESTIGATION – Question 3 (S637Q05)	589
		SUSTAINABLE FISH FARMING – Question 3 (S601Q04)	585
		BIRD MIGRATION – Question 3 (S656Q04)	574
3	484	SLOPE–FACE INVESTIGATION – Question 1 (S637Q01)	517
		BIRD MIGRATION – Question 1 (S656Q01)	501
2	410	METEOROIDS AND CRATERS – Question 1 (S641Q01)	483
		SUSTAINABLE FISH FARMING – Question 2 (S601Q02)	456
		METEOROIDS AND CRATERS – Question 2 (S641Q02)	450
		METEOROIDS AND CRATERS – Question 3B (S641Q04)	438
1a	335		
1b	261	METEOROIDS AND CRATERS – Question 3A (S641Q03)	299

For all levels, the descriptions have been updated to reflect the new categories in the PISA 2015 framework and the large number of new items developed for PISA 2015. Strictly speaking, the updated descriptions only apply to countries that conducted the PISA 2015 test on computer. While the results of the paper-based test conducted in 15 countries/economies can be reported on the same scale as the results of the computer-based test, these countries only used items that were originally developed in PISA 2006.

Figure I.2.6 provides descriptions of the science competencies, knowledge and understanding required at each level of the science literacy scale, and the average proportion of students across OECD countries who perform at each of these proficiency levels.

Figure I.2.6 ▪ **Summary description of the seven levels of proficiency in science in PISA 2015**

Level	Lower score limit	Characteristics of tasks
6	**708**	At Level 6, students can draw on a range of interrelated scientific ideas and concepts from the physical, life and earth and space sciences and use content, procedural and epistemic knowledge in order to offer explanatory hypotheses of novel scientific phenomena, events and processes or to make predictions. In interpreting data and evidence, they are able to discriminate between relevant and irrelevant information and can draw on knowledge external to the normal school curriculum. They can distinguish between arguments that are based on scientific evidence and theory and those based on other considerations. Level 6 students can evaluate competing designs of complex experiments, field studies or simulations and justify their choices.
5	**633**	At Level 5, students can use abstract scientific ideas or concepts to explain unfamiliar and more complex phenomena, events and processes involving multiple causal links. They are able to apply more sophisticated epistemic knowledge to evaluate alternative experimental designs and justify their choices and use theoretical knowledge to interpret information or make predictions. Level 5 students can evaluate ways of exploring a given question scientifically and identify limitations in interpretations of data sets including sources and the effects of uncertainty in scientific data.
4	**559**	At Level 4, students can use more complex or more abstract content knowledge, which is either provided or recalled, to construct explanations of more complex or less familiar events and processes. They can conduct experiments involving two or more independent variables in a constrained context. They are able to justify an experimental design, drawing on elements of procedural and epistemic knowledge. Level 4 students can interpret data drawn from a moderately complex data set or less familiar context, draw appropriate conclusions that go beyond the data and provide justifications for their choices.
3	**484**	At Level 3, students can draw upon moderately complex content knowledge to identify or construct explanations of familiar phenomena. In less familiar or more complex situations, they can construct explanations with relevant cueing or support. They can draw on elements of procedural or epistemic knowledge to carry out a simple experiment in a constrained context. Level 3 students are able to distinguish between scientific and non-scientific issues and identify the evidence supporting a scientific claim.
2	**410**	At Level 2, students are able to draw on everyday content knowledge and basic procedural knowledge to identify an appropriate scientific explanation, interpret data, and identify the question being addressed in a simple experimental design. They can use basic or everyday scientific knowledge to identify a valid conclusion from a simple data set. Level 2 students demonstrate basic epistemic knowledge by being able to identify questions that can be investigated scientifically.
1a	**335**	At Level 1a, students are able to use basic or everyday content and procedural knowledge to recognise or identify explanations of simple scientific phenomenon. With support, they can undertake structured scientific enquiries with no more than two variables. They are able to identify simple causal or correlational relationships and interpret graphical and visual data that require a low level of cognitive demand. Level 1a students can select the best scientific explanation for given data in familiar personal, local and global contexts.
1b	**261**	At Level 1b, students can use basic or everyday scientific knowledge to recognise aspects of familiar or simple phenomenon. They are able to identify simple patterns in data, recognise basic scientific terms and follow explicit instructions to carry out a scientific procedure.

A CONTEXT FOR COMPARING THE SCIENCE PERFORMANCE OF COUNTRIES AND ECONOMIES

Comparing science performance, and performance in school more generally, poses numerous challenges. When teachers give a science test in a classroom, students with varying abilities, attitudes and social backgrounds are required to respond to the same set of tasks. When educators compare the performance of schools, the same test is used across schools that may differ significantly in the structure and sequencing of their curricula, in the pedagogical emphases and instructional methods applied, and in the demographic and social contexts of their student populations. Comparing the performance of education systems across countries adds more layers of complexity, because students are given tests in different languages, and because the social, economic and cultural context of the countries that are being compared are often very different.

However, while students within a country may learn in different contexts according to their home background and the school they attend, their performance is measured against common standards. For example, when they become adults, they will all face common challenges and will often have to compete for the same jobs. Similarly, in a global economy, the benchmark for success in education is no longer improvement by national standards alone, but increasingly, in relation to the best-performing education systems around the world. As difficult as international comparisons are, they are important for educators, and PISA goes to considerable lengths to ensure that such comparisons are valid and fair.

This section discusses countries' science performance in the context of important economic, demographic and social factors that can influence assessment results. It provides a context for interpreting the results that are presented later in the chapter.

PISA's stringent standards for sampling limit the possible exclusion of students and schools and the impact of non-response. These standards are applied to ensure that, for all adjudicated countries, economies and subnational regions, the results support conclusions that are valid for the PISA target population (all students between 15 years and 3 [completed] months and 16 years and 2 [completed] months at the beginning of the testing period, attending educational institutions located within the adjudicated entity, and in grade 7 or higher).

But when interpreting PISA results with regard to the overall population of 15-year-olds, sample coverage must be assessed with respect to this wider population. In most OECD countries and in many partner countries and economies, the target population represents more than 80% of the estimated number of 15-year-olds in the country, so that results can be extended, with some caution but with a high degree of confidence, beyond the PISA target population to all 15-year-olds. By contrast, in a few countries participating in PISA, including OECD countries Mexico and Turkey, the share of out-of-school 15-year-olds, or the number of 15-year-olds who are still in primary education (in grade 6 or lower), represents a significant fraction of the PISA age cohort. "Coverage index 3", discussed in Chapter 6, provides an estimate of the share of the age cohort covered by PISA. It varies from 49% in Viet Nam to more than 95% in Finland, Germany, Ireland, Malta, the Netherlands, the Russian Federation (hereafter "Russia"), Singapore and Switzerland (Table I.6.1).

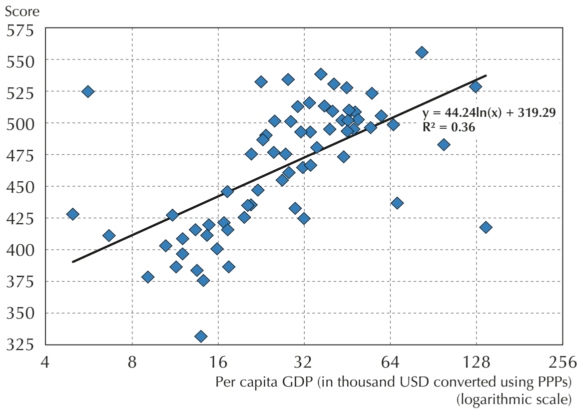
While the PISA results are representative of the target population in all adjudicated countries/economies, including Viet Nam, they cannot be readily generalised to the entire population of 15-year-olds in countries where many young people that age are not enrolled in lower or upper secondary school. Chapter 6 discusses at length the variation in coverage rates across countries and across PISA cycles. This chapter, as well as Chapters 4 and 5 about reading and mathematics performance, presents different ways to account for the share of 15-year-olds who are not covered by the PISA sample when comparing results across countries and across time.

Variations in population coverage are not the only differences that must be borne in mind when comparing results across countries. As discussed in Chapter 6, a family's wealth influences its children's performance in school, but that influence varies markedly across countries. Similarly, the relative prosperity of some countries allows them to spend more on education, while other countries find themselves constrained by a lower national income. It is therefore important to keep the national income of countries in mind when comparing the performance of education systems across countries.

Figure I.2.7 displays the relationship between national income as measured by per capita GDP and students' average science performance.[6] The figure also shows a trend line[7] that summarises the relationship between per capita GDP and mean student performance in science. The relationship suggests that 36% of the variation in countries/economies' mean scores is related to per capita GDP (23% of the variation in OECD countries). Countries with higher national incomes are thus at a relative advantage, even if the chart provides no indications about the causal nature of this relationship. This should be taken into account particularly when interpreting the performance of countries with comparatively low national income, such as Moldova and Viet Nam (Mexico and Turkey among OECD countries). Table I.2.11 shows an "adjusted" score that would be expected if the country had all of its present characteristics except that per capita GDP was equal to the average across OECD countries.

While per capita GDP reflects the potential resources available for education in each country, it does not directly measure the financial resources actually invested in education. Figure I.2.8 compares countries' actual spending per student, on average, from the age of six up to the age of 15, with average student performance in science.[8] The results are expressed in USD using purchasing power parities (PPP).

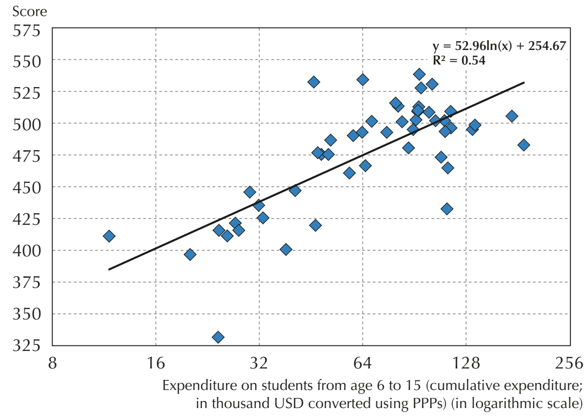
Figure I.2.7 ▪ **Science performance and per capita GDP**



Source: OECD, PISA 2015 Database, Table I.2.11.

StatLink http://dx.doi.org/10.1787/888933431997

Figure I.2.8 ▪ **Science performance and spending on education**



Source: OECD, PISA 2015 Database, Table I.2.11.

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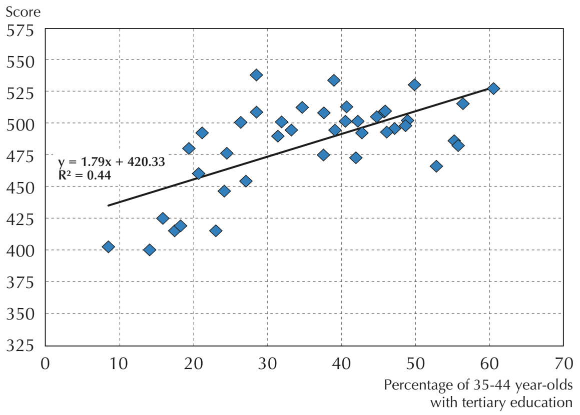
Figure I.2.9 ▪ **Science performance and parents' education**



Source: OECD, PISA 2015 Database, Table I.2.11.

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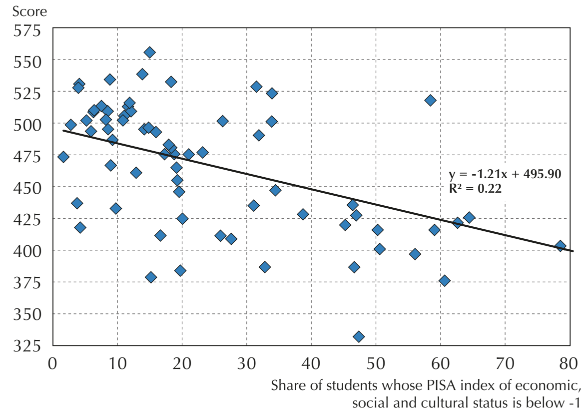
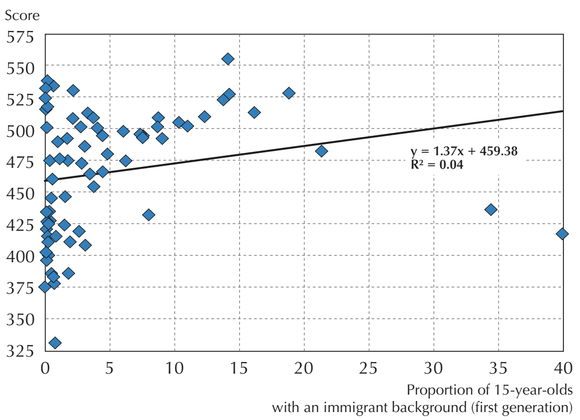
Figure I.2.10 ▪ **Science performance and share of disadvantaged students**



Source: OECD, PISA 2015 Database, Table I.2.11.

StatLink http://dx.doi.org/10.1787/888933432020

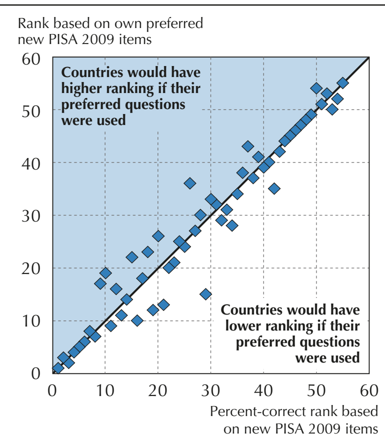
Figure I.2.11 ▪ **Science performance and proportion of students with an immigrant background**



Source: OECD, PISA 2015 Database, Table I.2.11.

StatLink http://dx.doi.org/10.1787/888933432033

Figure I.2.12 ▪ **Equivalence of the PISA assessment across cultures and languages**



Source: OECD, PISA 2012 Database, Table I.2.28, PISA 2012 Results, Volume I, http://dx.doi.org/10.1787/9789264208780-en.

StatLink http://dx.doi.org/10.1787/888933432042

Figure I.2.8 shows a positive relationship between spending per student and mean science performance. As expenditure on educational institutions per student increases, so does a country's mean performance; but the rate of increase diminishes fast, as indicated by the logarithmic scale on the horizontal axis. Expenditure per student accounts for 54% of the variation in mean performance between countries/economies (38% of the variation in OECD countries). Relatively low spending per student needs to be taken into account when interpreting the performance of countries such as Georgia and Peru (Mexico and Turkey among OECD countries). (For more details, see Figure II.6.2 in Volume II).

At the same time, deviations from the trend line suggest that moderate spending per student cannot automatically be equated with poor performance. For example, Estonia, which spends about USD 66 000 per student, and Chinese Taipei, which spends around USD 46 000 per student, perform above Austria, Luxembourg, Norway and Switzerland – all of which spend more than double this amount (more than USD 132 000 per student) (Table I.2.11).

Given the close inter-relationship between a student's performance and his or her parents' level of education, it is also important to bear in mind the educational attainment of adult populations when comparing the performance of OECD countries. Countries with more highly educated adults are at an advantage over countries where parents have less education. Figure I.2.9 shows the percentage of 35-44 year-olds who have attained tertiary education. This group corresponds roughly to the age group of parents of the 15-year-olds assessed in PISA. Parents' level of education accounts for 44% of the variation in mean performance between countries/economies (29% of the variation among OECD countries).

Socio-economic heterogeneity in student populations poses another major challenge for teachers and education systems. As shown in Chapter 6, teachers instructing socio-economically disadvantaged children are likely to face greater challenges than teachers teaching students from more advantaged backgrounds. Similarly, countries with larger proportions of disadvantaged children face greater challenges than countries with smaller proportions of these students.

Figure I.2.10 shows the proportion of students at the lower end of an international scale of the economic, social and cultural status of students, which is described in detail in Chapter 6, and how this relates to science performance. The relationship accounts for 22% of the performance variation among countries (47% of the variation among OECD countries). Among OECD countries, 64% of students in Turkey and 59% of students in Mexico belong to the most disadvantaged group, as do 34% of students in Chile and Portugal. These countries face much greater challenges than, for example, Iceland and Norway, where less than 3% of students are similarly disadvantaged (Table I.2.11). These challenges are even greater in some partner countries: 80% of students in Viet Nam and 78% of students in Indonesia are socio-economically disadvantaged.

Integrating students with an immigrant background also poses challenges to education systems (see Chapter 7). The performance of students who immigrated to the country in which they were assessed can be only partially attributed to their host country's education system. Figure I.2.11 shows the proportion of 15-year-olds with an immigrant background (excluding second-generation immigrants, who were born and educated in the country in which they were assessed) and how this relates to student performance. The relationship is positive, meaning that countries with large shares of first-generation immigrant students tend to perform better than average; but it is weak, indicating that differences in the percentage of immigrant students can, at best, account for only a small fraction of the variation in mean performance across countries.

When examining the results for individual countries, as shown in Table I.2.11, it is apparent that countries vary in their demographic, social and economic contexts. These differences need to be considered when interpreting PISA results. At the same time, the future economic and social prospects of both individuals and countries depend on the results they actually achieve, not on the performance they might have achieved under different social and economic conditions. That is why the results that are actually achieved by students, schools and countries are the focus of this volume.

Even after accounting for the demographic, economic and social context of education systems, the question remains: to what extent is an international test meaningful when differences in languages and cultures lead to very different ways in which subjects such as language, mathematics and science are taught and learned?

It is inevitable that not all tasks on the PISA assessments are equally appropriate in different cultural contexts and equally relevant in different curricular and instructional contexts. To gauge this, in 2009, PISA asked every country to identify, among the new tasks developed for use in PISA 2009, which tasks it considered most appropriate for an international test.

Countries were advised to give an on-balance rating for each task with regard to its usefulness in indicating "preparedness for life", its authenticity, and its relevance for 15-year-olds. Tasks given a high rating by a country are referred to as that country's most preferred questions for PISA. PISA then scored every country's performance on its own most preferred questions and compared the results with its performance on the entire set of new PISA tasks (see Figure I.2.12). It is clear that, in general, the proportion of questions that students answered correctly does not depend significantly on whether countries were scored only on their preferred questions or on the overall set of PISA tasks. This provides robust evidence that the results of the PISA assessments would not change markedly if countries had more influence in selecting texts that they thought might be "fairer" to their students.

STUDENTS' PROFICIENCY IN SCIENCE

PISA outcomes are reported in a variety of ways. The easiest way to summarise student performance and compare countries' relative standing in science performance is through the mean performance of students in each country. After presenting an overview of mean performance in science, this section discusses in detail the range of students' proficiency in different PISA-participating countries and economies. This range is presented in terms of the proficiency levels defined above and illustrated with sample items.

The percentage of students in each country/economy who reach each level of proficiency indicates how well countries are able to tackle underperformance while also nurturing excellence. Attaining at least Level 2 is particularly important, as Level 2 is considered a baseline level of proficiency that all young adults should be expected to attain in order to take advantage of further learning opportunities and participate fully in the social, economic and civic life of modern societies in a globalised world (OECD, 2016a; OECD, Hanushek and Woessmann, 2015).

In science, the difference between proficiency below Level 2 and proficiency at or above Level 2 corresponds to a qualitative distinction between being able to apply some limited knowledge of science in familiar contexts only (i.e. "common" knowledge), and demonstrating at least a minimum level of autonomous reasoning and understanding of the basic features of science, which, in turn, enables students to engage with science-related issues as critical and informed citizens. Students who perform below Level 2 often confuse key features of a scientific investigation, apply incorrect scientific information, and mix personal beliefs with scientific facts in support of a decision. Students who perform at or above Level 2, in contrast, can identify key features of a scientific investigation, recall single scientific concepts and information relating to a situation, and use the results of a scientific experiment represented in a data table in support of a personal decision (OECD, 2007). Education systems should strive to equip every 15-year-old with at least this basic level of proficiency in science. The percentage of students – and, more broadly, of 15-year-olds – who score at or above Level 2 on the science test indicates countries' success in achieving this goal.

Average performance in science

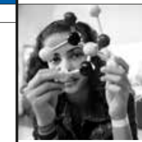
In 2006, the mean performance of the current 35 OECD countries was 498 score points (Table I.2.4a). In PISA 2015, the mean science score for OECD countries decreased to 493 points (an insignificant change, given the link error between the PISA 2006 and PISA 2015 scales; see the section on trends below and Annex A5). This establishes the benchmark against which each country's science performance in PISA 2015 is compared. Box I.2.1 shows how PISA score-point differences can be interpreted in terms of students' typical progression from one grade to the next.

Box I.2.1 **Interpreting differences in PISA scores: How large a gap?**

The PISA scores are represented on a scale whose units do not have a substantive meaning (unlike physical units, such as meters or grams) but are set in relation to the variation in results observed across all test participants. There is theoretically no minimum or maximum score in PISA; rather, the results are scaled to have approximately normal distributions, with means around 500 and standard deviations around 100. In statistical jargon, a one-point difference on the PISA scale therefore corresponds to an effect size of 1%; and a 10-point difference to an effect size of 10%.

A more natural, if indirect, way of representing differences in score on the PISA test is to translate scores into a grade equivalent: How far do 15-year-old students progress from one grade level to the next, in terms of PISA points?

...



Fifteen-year-old students who sit the PISA test may be enrolled in one of two or more grade levels. Based on this variation, past reports have estimated the average score-point difference across adjacent grades for countries in which a sizeable number of 15-year-olds are enrolled in at least two different grades. These estimates take into account some socio-economic and demographic differences that are also observed across grades (see Table A1.2 in OECD, 2013; 2010; 2007). On average across countries, the difference between adjacent grades is about 40 score points.

But comparisons of performance among students of the same age across different grades can only imperfectly describe how much students gain, in PISA points, over a school year. Indeed, the students who are enrolled below the expected grade for 15-year-olds differ in many ways from the students who are the same age but are enrolled in the modal grade for 15-year olds, as are those enrolled above the expected grade. Even analyses that account for differences in socio-economic and cultural status, gender and immigrant background can only imperfectly account for differences in motivation, aspirations, engagement, and many other intangible factors that influence what students know, the grade they are in, and how well they do on the PISA test.

Two types of studies can provide a better measure of the grade-equivalence of PISA scores: longitudinal follow-up studies, where the same students who took the PISA test are re-assessed later in their education, and cross-sectional designs that compare representative samples of students across adjacent age groups and grades.

In Germany, a longitudinal follow-up of the PISA 2003 cohort assessed the same 9th-grade students who participated in PISA one year later, when they were in grade 10. The comparisons showed that over this one-year period (which corresponds both to a different age and a different grade) students gained about 25 score points in the PISA mathematics test, on average, and progressed by a similar amount (21 points) in a test of science (Prenzel et al., 2006).

In Canada, the Youth in Transition Study (YITS) followed the first PISA cohort, which sat the PISA 2000 test in reading, over their further study and work career. The most recent data were collected in 2009, when these young adults were 24, and included a re-assessment of their reading score. The mean score in reading among 24-year-olds in 2009 was 598, compared to a mean score of 541 for the same young adults when they were 15 years old and in school (OECD, 2012). This shows that students continue to progress in the competencies assessed in PISA beyond age 15. At the same time, it must be borne in mind that the PISA test does not measure the more specialised kinds of knowledge and skills that young adults also acquire between the ages of 15 and 24.

In France, in 2012, 14-year-old students in grade 8 were assessed as part of a national extension to the PISA sample, at the same time as 15-year-old students who were part of the international PISA sample. The comparison of 14-year-old students in grade 8 (the modal grade for 14-year-old students in France) with students who were enrolled in the general academic track in grade 9 (15-year-old students) shows a score-point difference in mathematics of 44 points (Keskpaik and Salles, 2013). This represents an upper bound on the average progression between grades 8 and 9 in France, because some of the 14-year-olds who were included in the comparison went on to repeat grade 8 or moved to a vocational track in grade 9, and these were likely to be among the lower-performing students in that group.

Based on the PISA-based evidence cited in this box, as well as on the more general finding that learning gains on most national and international tests during one year are equal to between one-quarter and one-third of a standard deviation (Woessmann, 2016), this report equates 30 score points with about one year of schooling. This must be understood as an approximate equivalent and does not take into account national variations or differences across subjects.

When comparing mean performance across countries or across time, only those differences that are statistically significant should be taken into account (Box I.2.2 describes the different sources of uncertainty for country means and, more generally, for statistics based on PISA test results). Figure I.2.13 shows each country's/economy's mean score, and indicates for which pairs of countries/economies the differences between the means are statistically significant. For each country/economy shown in the middle column, the countries/economies whose mean scores are not statistically significantly different are listed in the right column. In all other cases, country/economy A scores higher than country/economy B if country/economy A is situated above country/economy B in the middle column, and scores lower if country/economy A is situated below country/economy B. For example: Singapore ranks first on the PISA science scale, but Japan, which appears second on the list, cannot be distinguished with confidence from Estonia and Chinese Taipei, which appear third and fourth, respectively.

In Figure I.2.13, countries and economies are divided into three broad groups: those whose mean scores are statistically around the OECD mean (highlighted in dark blue), those whose mean scores are above the OECD mean (highlighted in pale blue), and those whose mean scores are below the OECD mean (highlighted in medium blue).

Box I.2.2 **When is a difference statistically significant? Three sources of statistical uncertainty**

A difference is called statistically significant if it is unlikely that such a difference could be observed in the estimates based on samples, when in fact no true difference exists in the populations from which the samples are drawn.

The results of the PISA assessments for countries and economies are estimates because they are obtained from samples of students, rather than from a census of all students, and because they are obtained using a limited set of assessment tasks, not the universe of all possible assessment tasks. When students are sampled and assessment tasks are selected with scientific rigour, it is possible to determine the magnitude of the uncertainty associated with the estimate. This uncertainty needs to be taken into account when making comparisons so that differences that could reasonably arise simply due to the sampling of students and items are not interpreted as differences that actually hold for the populations. The design of the PISA test and sample are determined with respect to the objective of reducing, as much as possible, the statistical error associated with country-level statistics. Two sources of uncertainty are taken into account:

- **Sampling error:** The aim of a system-level assessment such as PISA is to generalise the results based on samples to the larger target population. The sampling methods used in PISA ensure not only that the samples are representative and provide a valid estimate of the population mean score and distribution, but also that the error due to sampling is reduced to a minimum. The sampling error decreases with the number of schools and (to a lesser extent) of students included in the assessment. The sampling error associated with a country's mean performance estimate is, for most countries, around 2 to 3 PISA score points. For the OECD average (which is based on 35 independent national samples) the sampling error is reduced to about 0.4 PISA score point.
- **Measurement error** (also called imputation error): No test is perfect and can fully measure broad concepts such as science literacy. The use of a limited number of items to assess broad domains, for instance, introduces some measurement uncertainty: would the use of a different set of items have resulted in different performance? This uncertainty is quantified in PISA. Among other things, it decreases with the number of items in a domain that underlie a proficiency estimate. It is therefore somewhat larger for minor domains than for major domains, and it is larger for individual students (who only see a fraction of all test items) than for country means (which are based on all test items). It also decreases with the amount of background information available. For country mean estimates, the imputation error is smaller than the sampling error (around 0.5 PISA score point).

When comparing results across different PISA cycles an additional source of uncertainty must be taken into account. Indeed, even if different PISA assessments use the same metric for measuring performance (for science, this metric was defined in PISA 2006, when science was, for the first time, the major focus of the PISA test), the test instruments and items used in the assessment change in each cycle, as do the calibration samples and sometimes the statistical models used for scaling results. To make the results directly comparable over time, scales have to be equated; this means that results are transformed so that they can be expressed on the same metric. The *link error* quantifies the uncertainty around the equating of scales. The procedures used for equating PISA 2015 results to prior scales are described in Annex A5; further details on the link error and the equating procedures are provided in the *PISA 2015 Technical Report* (OECD, forthcoming).

The link error affects all scaled values equally and is therefore independent of the size of the student sample. As a result, it is the same for estimates based on individual countries, on subpopulations, or on the OECD average. For comparisons between science results in PISA 2015 and science results in PISA 2006, the link error corresponds to about 4.5 score points, making it by far the most significant source of uncertainty in trend comparisons.

Figure I.2.13 ▪ **Comparing countries' and economies' performance in science**

Statistically significantly **above** the OECD average
Not statistically significantly different from the OECD average
Statistically significantly **below** the OECD average

Mean score	Comparison country/ economy	Countries and economies whose mean score is NOT statistically significantly different from the comparison country's/economy's score
556	Singapore	
538	Japan	Estonia, Chinese Taipei
534	Estonia	Japan, Chinese Taipei, Finland
532	Chinese Taipei	Japan, Estonia, Finland, Macao (China), Canada, Viet Nam
531	Finland	Estonia, Chinese Taipei, Macao (China), Canada, Viet Nam
529	Macao (China)	Chinese Taipei, Finland, Canada, Viet Nam, Hong Kong (China)
528	Canada	Chinese Taipei, Finland, Macao (China), Viet Nam, Hong Kong (China), B-S-J-G (China)
525	Viet Nam	Chinese Taipei, Finland, Macao (China), Canada, Hong Kong (China), B-S-J-G (China), Korea
523	Hong Kong (China)	Macao (China), Canada, Viet Nam, B-S-J-G (China), Korea
518	B-S-J-G (China)	Canada, Viet Nam, Hong Kong (China), Korea, New Zealand, Slovenia, Australia, United Kingdom, Germany, Netherlands
516	Korea	Viet Nam, Hong Kong (China), B-S-J-G (China), New Zealand, Slovenia, Australia, United Kingdom, Germany, Netherlands
513	New Zealand	B-S-J-G (China), Korea, Slovenia, Australia, United Kingdom, Germany, Netherlands
513	Slovenia	B-S-J-G (China), Korea, New Zealand, Australia, United Kingdom, Germany, Netherlands
510	Australia	B-S-J-G (China), Korea, New Zealand, Slovenia, United Kingdom, Germany, Netherlands, Switzerland
509	United Kingdom	B-S-J-G (China), Korea, New Zealand, Slovenia, Australia, Germany, Netherlands, Switzerland, Ireland
509	Germany	B-S-J-G (China), Korea, New Zealand, Slovenia, Australia, United Kingdom, Netherlands, Switzerland, Ireland
509	Netherlands	B-S-J-G (China), Korea, New Zealand, Slovenia, Australia, United Kingdom, Germany, Switzerland, Ireland
506	Switzerland	Australia, United Kingdom, Germany, Netherlands, Ireland, Belgium, Denmark, Poland, Portugal, Norway
503	Ireland	United Kingdom, Germany, Netherlands, Switzerland, Belgium, Denmark, Poland, Portugal, Norway, United States
502	Belgium	Switzerland, Ireland, Denmark, Poland, Portugal, Norway, United States
502	Denmark	Switzerland, Ireland, Belgium, Poland, Portugal, Norway, United States
501	Poland	Switzerland, Ireland, Belgium, Denmark, Portugal, Norway, United States, Austria, Sweden
501	Portugal	Switzerland, Ireland, Belgium, Denmark, Poland, Norway, United States, Austria, France, Sweden
498	Norway	Switzerland, Ireland, Belgium, Denmark, Poland, Portugal, United States, Austria, France, Sweden, Czech Republic, Spain
496	United States	Ireland, Belgium, Denmark, Poland, Portugal, Norway, Austria, France, Sweden, Czech Republic, Spain, Latvia
495	Austria	Poland, Portugal, Norway, United States, France, Sweden, Czech Republic, Spain, Latvia
495	France	Portugal, Norway, United States, Austria, Sweden, Czech Republic, Spain, Latvia
493	Sweden	Poland, Portugal, Norway, United States, Austria, France, Czech Republic, Spain, Latvia, Russia
493	Czech Republic	Norway, United States, Austria, France, Sweden, Spain, Latvia, Russia
493	Spain	Norway, United States, Austria, France, Sweden, Czech Republic, Latvia, Russia
490	Latvia	United States, Austria, France, Sweden, Czech Republic, Spain, Russia
487	Russia	Sweden, Czech Republic, Spain, Latvia, Luxembourg, Italy, CABA (Argentina)
483	Luxembourg	Russia, Italy, CABA (Argentina)
481	Italy	Russia, Luxembourg, Hungary, Lithuania, Croatia, CABA (Argentina)
477	Hungary	Italy, Lithuania, Croatia, CABA (Argentina), Iceland
475	Lithuania	Italy, Hungary, Croatia, CABA (Argentina), Iceland
475	Croatia	Italy, Hungary, Lithuania, CABA (Argentina), Iceland
475	CABA (Argentina)	Russia, Luxembourg, Italy, Hungary, Lithuania, Croatia, Iceland, Israel, Malta
473	Iceland	Hungary, Lithuania, Croatia, CABA (Argentina), Israel
467	Israel	CABA (Argentina), Iceland, Malta, Slovak Republic
465	Malta	CABA (Argentina), Israel, Slovak Republic
461	Slovak Republic	Israel, Malta, Greece
455	Greece	Slovak Republic, Chile, Bulgaria
447	Chile	Greece, Bulgaria
446	Bulgaria	Greece, Chile, United Arab Emirates
437	United Arab Emirates	Bulgaria, Uruguay, Romania, Cyprus[1]
435	Uruguay	United Arab Emirates, Romania, Cyprus[1]
435	Romania	United Arab Emirates, Uruguay, Cyprus[1], Moldova, Albania, Turkey
433	Cyprus[1]	United Arab Emirates, Uruguay, Romania, Moldova, Albania, Turkey
428	Moldova	Romania, Cyprus[1], Albania, Turkey, Trinidad and Tobago, Thailand
427	Albania	Romania, Cyprus[1], Moldova, Turkey, Trinidad and Tobago, Thailand
425	Turkey	Romania, Cyprus[1], Moldova, Albania, Trinidad and Tobago, Thailand, Costa Rica, Qatar
425	Trinidad and Tobago	Moldova, Albania, Turkey, Thailand
421	Thailand	Moldova, Albania, Turkey, Trinidad and Tobago, Costa Rica, Qatar, Colombia, Mexico
420	Costa Rica	Turkey, Thailand, Qatar, Colombia, Mexico
418	Qatar	Turkey, Thailand, Costa Rica, Colombia, Mexico
416	Colombia	Thailand, Costa Rica, Qatar, Mexico, Montenegro, Georgia
416	Mexico	Thailand, Costa Rica, Qatar, Colombia, Montenegro, Georgia
411	Montenegro	Colombia, Mexico, Georgia, Jordan
411	Georgia	Colombia, Mexico, Montenegro, Jordan
409	Jordan	Montenegro, Georgia, Indonesia
403	Indonesia	Jordan, Brazil, Peru
401	Brazil	Indonesia, Peru
397	Peru	Indonesia, Brazil
386	Lebanon	Tunisia, FYROM
386	Tunisia	Lebanon, FYROM
384	FYROM	Lebanon, Tunisia
378	Kosovo	Algeria
376	Algeria	Kosovo
332	Dominican Republic	

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus."

Source: OECD, PISA 2015 Database, Table I.2.3.

StatLink http://dx.doi.org/10.1787/888933432052

Twenty-four countries and economies perform above the OECD average in science. One country, Singapore, outperforms all other countries and economies in science, with a mean score of 556 points. Japan (538 points) scores below Singapore, but above all other countries, except Estonia (534 points) and Chinese Taipei (532 points), whose mean scores are not statistically significantly different. Together with Japan and Estonia, Finland (531 points) and Canada (528 points) are the four highest-performing OECD countries. The mean scores in Macao (China) (529 points), Viet Nam (525 points), Hong Kong (China) (523 points) and Beijing-Shanghai-Jiangsu-Guangdong (China) (hereafter "B-S-J-G [China]") (518 points), as well as in OECD countries Korea (516 points), New Zealand and Slovenia (513 points each), Australia (510 points), Germany, the Netherlands and the United Kingdom (509 points each), Switzerland (506 points), Ireland (503 points), Belgium and Denmark (502 points each), Poland and Portugal (501 points each), and Norway (498 points) also lie above the OECD average.

Countries that perform around the average include Austria, the Czech Republic, France, Latvia, Spain, Sweden and the United States. Thirty-nine participating countries and economies score below the OECD average.

The gap in performance between the highest- and the lowest-performing OECD countries is 123 score points. That is, while the average score of the highest-performing OECD country, Japan (538), is about half a standard deviation above the OECD average (the equivalent of more than one year of schooling; see Box I.2.1), the average score of the lowest-performing OECD country, Mexico (416 points), is more than three-quarters of a standard deviation, or the equivalent of more than two years of schooling, below the OECD average. But the performance difference observed among partner countries and economies is even larger, with a 224 score-point difference between Singapore (556 points) and the Dominican Republic (332 points).

Because the figures are derived from samples, and because of the statistical uncertainty associated with mean estimates, it is not possible to determine a country's/economy's precise ranking among all participating countries and economies. However, it is possible to identify, with 95% confidence, a range of rankings in which the country's/economy's performance level lies (Figure I.2.14). This range of ranks can be wide, particularly for countries/economies whose scores are similar to those of many other countries/economies. For example, the United States ranks between 21st and 31st among all countries/economies (between 15th and 25th among OECD countries only).

For subnational entities whose results are reported in Annex B2, a rank order was not estimated; but the mean score and its confidence interval allow for a comparison of performance with that of countries and economies. For example, Alberta (Canada) and British Columbia (Canada) show a score just below that of top-performer Singapore and similar to that of Japan.

Students at the different levels of proficiency in science

Figure I.2.15 shows the distribution of students at each of the seven proficiency levels. The percentage of students performing below Level 2 is shown on the left side of the vertical axis.

Proficiency above the baseline

Proficiency at Level 2 (scores higher than 410 but lower than 484 points)

At Level 2, students can draw on everyday content knowledge and basic procedural knowledge to identify an appropriate scientific explanation, interpret data, and identify the question being addressed in a simple experimental design. They can use common scientific knowledge to identify a valid conclusion from a simple data set. Level 2 students demonstrate basic epistemic knowledge by being able to identify questions that could be investigated scientifically.

Question 2 from the unit *METEOROIDS AND CRATERS* (Annex C1) is typical of Level 2 tasks. It asks a simple question about the relationship between a planet's atmosphere and the likelihood that meteoroids will burn up before hitting the planet's surface. The question focuses on the ability to make a correct prediction ("The thicker a planet's atmosphere is, the fewer craters its surface will have because more meteoroids will burn up in the atmosphere"), based on knowledge of earth and space systems. It is therefore categorised as a question requiring the competence of explaining phenomena scientifically, based on content knowledge, related to earth and space systems.

To answer the question correctly, students must demonstrate some basic knowledge about earth and space systems. The short introductory text provides numerous cues to help students identify the correct relationship ("Rocks in space that enter Earth's atmosphere are called meteoroids. Meteoroids heat up, and glow as they fall through Earth's atmosphere. Most meteoroids burn up before they hit Earth's surface."). Question 3B in the same unit is another Level 2 task related to the same categories. In contrast to Question 2, students are not given any cue, but the knowledge required to solve this question is familiar and simple.

Figure I.2.14 [Part 1/2] ■ Science performance among PISA 2015 participants, at national and subnational levels

	Science scale					
			Range of ranks			
			OECD countries		All countries/economies	
	Mean score	95% confidence interval	Upper rank	Lower rank	Upper rank	Lower rank
Singapore	556	553 - 558			1	1
Alberta (Canada)	541	533 - 549				
British Columbia (Canada)	539	530 - 547				
Japan	538	533 - 544	1	2	2	3
Quebec (Canada)[1]	537	528 - 546				
Estonia	534	530 - 538	1	3	2	5
Chinese Taipei	532	527 - 538			2	7
Finland	531	526 - 535	2	4	3	7
Massachusetts (United States)	529	516 - 542				
Macao (China)	529	526 - 531			5	8
Canada	528	524 - 532	3	4	5	9
Viet Nam	525	517 - 532			4	10
Ontario (Canada)	524	516 - 532				
Hong Kong (China)	523	518 - 528			7	10
Castile and Leon (Spain)	519	512 - 526				
B-S-J-G (China)	518	509 - 527			8	16
Nova Scotia (Canada)	517	508 - 526				
Korea	516	510 - 522	5	8	9	14
Madrid (Spain)	516	509 - 523				
Flemish community (Belgium)	515	510 - 521				
Bolzano (Italy)	515	511 - 520				
Prince Edward Island (Canada)	515	504 - 525				
New Zealand	513	509 - 518	5	9	10	15
Slovenia	513	510 - 515	5	9	11	15
England (United Kingdom)	512	506 - 518				
Navarre (Spain)	512	504 - 520				
Galicia (Spain)	512	506 - 518				
Trento (Italy)	511	506 - 515				
Australia	510	507 - 513	6	11	12	17
United Kingdom	509	504 - 514	6	13	12	19
Germany	509	504 - 514	6	13	12	19
Netherlands	509	504 - 513	7	13	13	19
Aragon (Spain)	508	498 - 517				
New Brunswick (Canada)	506	498 - 515				
Newfoundland and Labrador (Canada)	506	500 - 512				
Switzerland	506	500 - 511	8	17	14	23
German-speaking community (Belgium)	505	496 - 515				
Catalonia (Spain)	504	495 - 513				
Ireland	503	498 - 507	11	18	17	24
Lombardia (Italy)	503	493 - 512				
North Carolina (United States)	502	493 - 512				
Belgium	502	498 - 506	12	19	18	25
Denmark	502	497 - 507	12	19	18	25
Poland	501	497 - 506	12	19	18	25
Asturias (Spain)	501	494 - 509				
Portugal	501	496 - 506	12	19	18	25
Northern Ireland (United Kingdom)	500	495 - 506				
Manitoba (Canada)	499	490 - 509				
Norway	498	494 - 503	14	21	20	27
La Rioja (Spain)	498	487 - 509				
Castile-La Mancha (Spain)	497	490 - 505				
Scotland (United Kingdom)	497	492 - 501				
United States	496	490 - 502	15	25	21	31
Saskatchewan (Canada)	496	490 - 502				
Cantabria (Spain)	496	485 - 507				
Austria	495	490 - 500	17	24	23	30
France	495	491 - 499	18	24	24	30
Comunidad Valenciana (Spain)	494	488 - 500				
Sweden	493	486 - 500	18	25	24	32

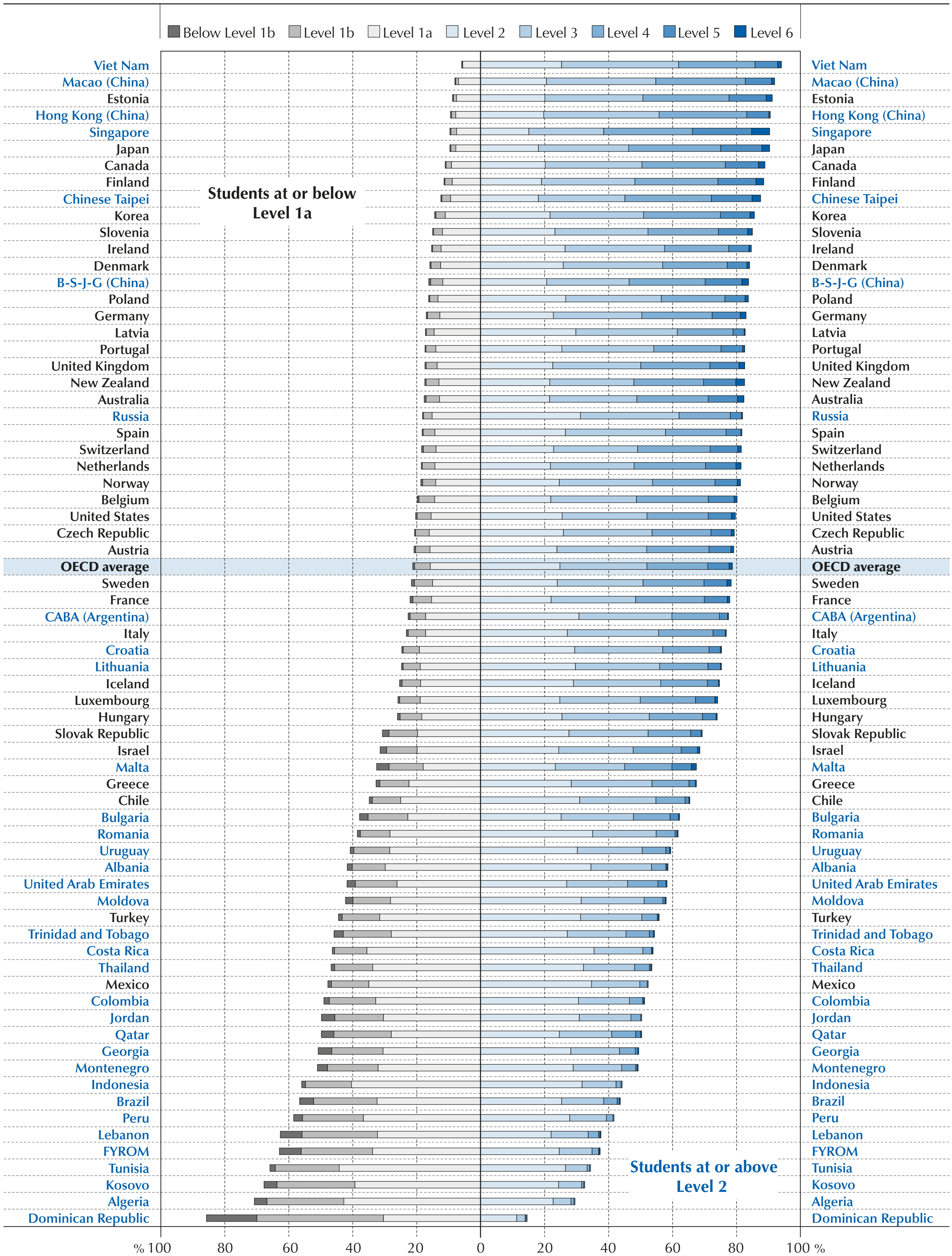
* See note 1 under Figure I.2.13.
1. Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
2. Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
Note: OECD countries are shown in bold black. Partner countries, economies and subnational entities that are not included in national results are shown in bold blue. Regions are shown in black italics (OECD countries) or blue italics (partner countries).
Countries and economies are ranked in descending order of mean science performance.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432060

Figure I.2.14 [Part 2/2] ■ Science performance among PISA 2015 participants, at national and subnational levels

	Science scale					
			Range of ranks			
			OECD countries		All countries/economies	
	Mean score	95% confidence interval	Upper rank	Lower rank	Upper rank	Lower rank
Czech Republic	493	488 - 497	19	25	25	31
Spain	493	489 - 497	20	25	25	31
Latvia	490	487 - 493	23	25	28	32
Russia	487	481 - 492			30	34
French community (Belgium)	485	477 - 494				
Balearic Islands (Spain)	485	476 - 493				
Wales (United Kingdom)	485	479 - 490				
Murcia (Spain)	484	476 - 491				
Basque Country (Spain)	483	477 - 489				
Luxembourg	483	481 - 485	26	27	32	34
Italy	481	476 - 485	26	28	32	36
Dubai (UAE)	480	477 - 483				
Hungary	477	472 - 481	27	29	34	39
Lithuania	475	470 - 481			34	39
Canary Islands (Spain)	475	468 - 482				
Croatia	475	471 - 480			35	39
CABA (Argentina)	475	463 - 487			32	41
Extremadura (Spain)	474	467 - 482				
Iceland	473	470 - 477	28	29	36	39
Andalusia (Spain)	473	465 - 481				
Região Autónoma dos Açores (Portugal)	470	465 - 474				
Israel	467	460 - 473	30	31	39	42
Malta	465	462 - 468			40	42
Slovak Republic	461	456 - 466	30	32	41	43
Bogotá (Colombia)	458	448 - 467				
Greece	455	447 - 463	31	32	42	44
Chile	447	442 - 452	33	33	44	45
Bulgaria	446	437 - 454			43	46
Campania (Italy)	445	435 - 455				
United Arab Emirates	437	432 - 441			46	49
Uruguay	435	431 - 440			46	49
Romania	435	429 - 441			46	50
Manizales (Colombia)	434	426 - 443				
Medellín (Colombia)	433	425 - 442				
Cyprus*	433	430 - 435			47	50
Sharjah (UAE)	432	414 - 451				
Moldova	428	424 - 432			49	53
Albania	427	421 - 434			49	54
Turkey	425	418 - 433	34	34	49	55
Trinidad and Tobago	425	422 - 427			51	54
Abu Dhabi (UAE)	423	414 - 432				
Thailand	421	416 - 427			51	57
Cali (Colombia)	421	412 - 430				
Costa Rica	420	416 - 424			53	57
Qatar	418	416 - 420			55	58
Colombia	416	411 - 420			55	60
Mexico	416	412 - 420	35	35	55	59
Montenegro	411	409 - 413			59	61
Georgia	411	406 - 416			58	61
Jordan	409	403 - 414			59	62
Indonesia	403	398 - 408			61	63
Puerto Rico[2]	403	391 - 415				
Ajman (UAE)	402	395 - 408				
Fujairah (UAE)	401	391 - 412				
Brazil	401	396 - 405			62	64
Ras Al Khaimah (UAE)	400	384 - 417				
Peru	397	392 - 401			63	64
Umm Al Quwain (UAE)	387	379 - 395				
Lebanon	386	380 - 393			65	67
Tunisia	386	382 - 391			65	67
FYROM	384	381 - 386			65	67
Kosovo	378	375 - 382			68	69
Algeria	376	371 - 381			68	69
Dominican Republic	332	327 - 337			70	70

* See note 1 under Figure I.2.13.
1. Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
2. Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
Note: OECD countries are shown in bold black. Partner countries, economies and subnational entities that are not included in national results are shown in bold blue. Regions are shown in black italics (OECD countries) or blue italics (partner countries).
Countries and economies are ranked in descending order of mean science performance.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432060

Figure I.2.15 ▪ **Students' proficiency in science**



Countries and economies are ranked in descending order of the percentage of students who perform at or above Level 2.

Source: OECD, PISA 2015 Database, Table I.2.1a.

StatLink http://dx.doi.org/10.1787/888933432072

Level 2 is considered the baseline level of science proficiency that is required to engage in science-related issues as a critical and informed citizen. Indeed, the baseline level of proficiency defines the level of achievement on the PISA scale at which students begin to demonstrate the science competencies that will enable them to participate effectively and productively in life situations related to science and technology. More than 90% of students in Viet Nam (94.1%), Macao (China) (91.9%), Estonia (91.2%), Hong Kong (China) (90.6%), and Singapore and Japan (both 90.4%) meet this benchmark. Across OECD countries, an average of 79% of students attains Level 2 or higher; more than one in two students in all OECD countries perform at these levels (Figure I.2.15 and Table I.2.1a).

In many middle- and low-income countries, many 15-year-olds are not eligible to participate in PISA because these young people have dropped out of school, never attended school, or are in school, but in grade 6 or below (see Chapter 6). Assuming that these 15-year-olds would not reach Level 2 if they sat the PISA science test, and based on the estimated total number of 15-year-olds in each country/economy, it is possible to estimate the proportion of all 15-year-olds who reach a baseline level of performance in science.

Similar assumptions of below-baseline skills among the population of 15-year-olds not covered by PISA are often made in related literature (UNESCO, 2004; Hanushek and Woessmann, 2008; Spaull and Taylor, 2015; Taylor and Spaull, 2015).[9] The PISA pilot initiative to survey out-of-school children in five countries, which will be implemented in 2017 (see Box I.6.3 in Chapter 6), will provide first-of-its-kind data on the reading and mathematics skills of this population in relation to the international PISA scale. In the absence of similar data for all PISA-participating countries, the hypothesis of below-baseline skills provides a lower bound on the percentage of 15-year-olds who are proficient above the baseline level.

In 22 countries and economies, including OECD countries Mexico and Turkey, as well as Viet Nam, whose mean performance in PISA is above the OECD average, fewer than one in two 15-year-olds is in school, in grade 7 or above, and reaches at least Level 2 on the PISA science scale. In Viet Nam, 94% of students who are in the PISA target population attain Level 2; but the PISA target population represents less than 50% of the overall population of 15-year-olds. In Algeria, the Dominican Republic, Kosovo and Lebanon, fewer than one in four 15-year-olds reaches this level of proficiency in science (Figure I.2.16 and Table I.2.1b).

Proficiency at Level 3 (scores higher than 484 but lower than 559 points)

At Level 3, students can draw upon moderately complex content knowledge to identify or construct explanations of familiar phenomena. In less familiar or more complex situations, they can construct explanations with relevant cueing or support. They can draw on elements of procedural or epistemic knowledge to carry out a simple experiment in a constrained context. Level 3 students are able to distinguish between scientific and non-scientific issues and identify the evidence supporting a scientific claim.

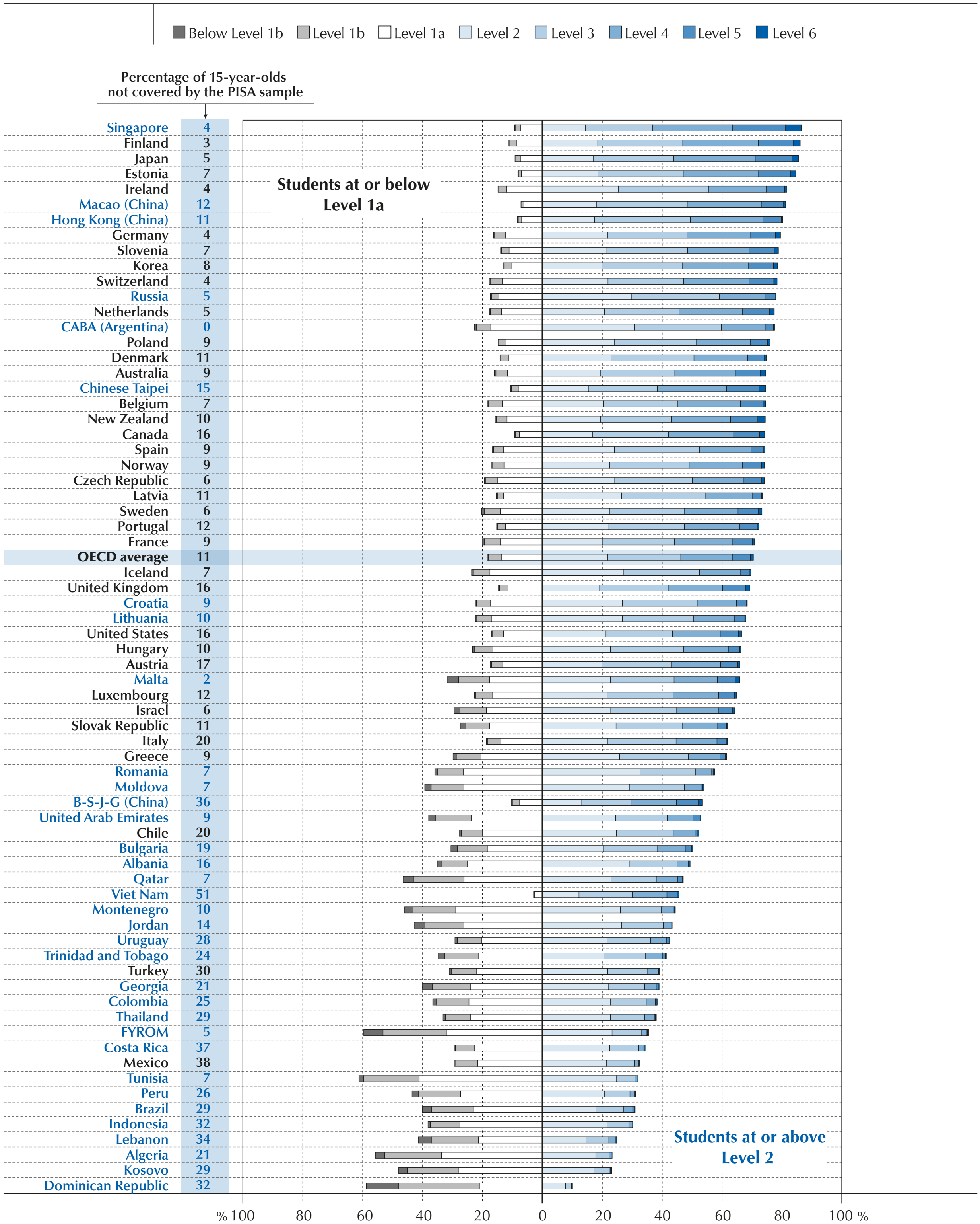
An example of a question at Level 3 is Question 1 in *BIRD MIGRATION* (Annex C1). Similar to the two questions used to illustrate proficiency at Level 2, this question requires the competency to explain phenomena scientifically based on content knowledge – in this case, a basic knowledge of the theory of evolution. The question states that most bird species migrate in large groups, rather than individually, and that this behaviour is the result of evolution. In order to answer this question correctly, students must identify which of the four possible explanations is consistent with the theory of evolution and with the observed facts: that birds that migrated individually or in small groups were less likely to survive and have offspring.

Question 1 in unit *SLOPE-FACE INVESTIGATION* is also a Level 3 task. In the introduction, test-takers are presented with the observation that there is a dramatic difference in the vegetation on the two slopes of a valley. The first question then presents the design used by a group of students for collecting data about the conditions that prevail on the two slopes. Students are asked to evaluate this design (the question is classified as "evaluating and designing scientific enquiry"), and to explain the rationale behind it. This is an open-ended question, where test-takers' answers must demonstrate epistemic knowledge – in this case, knowledge of (at least one) rationale for taking multiple, independent measurements in order to identify how conditions vary across the two slopes.

In most OECD countries, Level 3 corresponds to a median level of performance. The median score, i.e. the score that divides the population in two equal halves – one scoring above the median, and one below – falls within Level 3. On average across OECD countries, more than half of all students (54.0%) are proficient at Level 3 or higher (that is, at Level 3, 4, 5 or 6). Similarly, Level 3 corresponds to the median proficiency of students in 31 participating countries and economies. Across OECD countries on average, 27.2% of students score at Level 3, the largest share among the seven proficiency levels described in PISA. Similarly, in 31 countries and economies, the largest share of students performs at Level 3 (Figure I.2.15 and Table I.2.1a).

Figure I.2.16 ■ **Fifteen-year olds' proficiency in science**

Students at the different levels of proficiency in science, as a percentage of all 15-year-olds



Note: The length of each bar is proportional to the percentage of 15-year-olds covered by the PISA sample (Coverage index 3; see Annex A2).

Countries and economies are ranked in descending order of the number of students who perform at or above Level 2, expressed as a percentage of the total population of 15-year-olds in the country.

Source: OECD, PISA 2015 Database, Table I.2.1b.

StatLink http://dx.doi.org/10.1787/888933432083

Proficiency at Level 4 (scores higher than 559 but lower than 633 points)

At Level 4, students can use more sophisticated content knowledge, which is either provided or recalled, to construct explanations of more complex or less familiar events and processes. They can conduct experiments involving two or more independent variables in a constrained context. They can justify an experimental design, drawing on elements of procedural and epistemic knowledge. Level 4 students can interpret data drawn from a moderately complex data set or less familiar contexts and draw appropriate conclusions that go beyond the data and provide justifications for their choices.

Question 2 in unit *SLOPE-FACE INVESTIGATION* (Annex C1), which typifies a Level 4 question, requires students to evaluate two claims by interpreting the provided data (it is classified as "interpreting data and evidence scientifically"). The data include confidence intervals around the average of measurements of solar radiation, soil moisture and rainfall. Students are asked to demonstrate an understanding of how measurement error affects the degree of confidence associated with specific scientific measurements, one major aspect of epistemic knowledge. Question 2 in unit *BIRD MIGRATION* is located at the top of Level 4 (630 points on the PISA scale). It is an example of a question where students must draw on procedural knowledge to identify a factor that could result in an inadequate or inaccurate set of data, and explain its effect on the quality of scientific enquiry. Both tasks exemplify the more complex knowledge and more sophisticated understanding demonstrated by students who are proficient at Level 4, compared to students at the lower levels of proficiency.

On average across OECD countries, 26.7% of students perform at Level 4 or above, and score higher than 559 points on the PISA science scale. The largest share of students in Japan, Singapore and Chinese Taipei performs at this level (modal level); and Level 4 is the median level of performance in Singapore, where 51.9% of students score at or above this level (Figure I.2.15 and Table I.2.1a).

Proficiency at Level 5 (scores higher than 633 but lower than 708 points)

At Level 5, students can use abstract scientific ideas or concepts to explain unfamiliar and more complex phenomena, events and processes. They can apply more sophisticated epistemic knowledge to evaluate alternative experimental designs, justify their choices and use theoretical knowledge to interpret information or make predictions. Students at this level can evaluate ways of exploring a given question scientifically and identify limitations in interpretations of data sets, including sources and the effects of uncertainty in scientific data.

There are no released items from the PISA 2015 main survey to illustrate proficiency at Level 5 (although, as noted, Question 2 in unit *BIRD MIGRATION* is located near the limit between Level 4 and Level 5). Question 5 in the field trial unit *RUNNING IN HOT WEATHER* (Annex C1), however, presents an example of tasks that students at this level are typically able to solve. It requires students to use their knowledge of biology (content knowledge) to explain the role of sweating in regulating the body's temperature. This is a complex phenomenon due to the indirect nature of the effects; the requirement to provide the answer in an open text entry field also contributes to difficulty.

Level 5 on the science scale marks another qualitative difference. Students who can complete Level 5 tasks can be said to be top performers in science in that they are sufficiently skilled in and knowledgeable about science to be able to creatively and autonomously apply their knowledge and skills to a wide variety of situations, including unfamiliar ones.

On average across OECD countries, 7.7% of students are top performers, meaning that they are proficient at Level 5 or 6. About one in four (24.2%) students in Singapore, and just under one in six students in Chinese Taipei (15.4%) and Japan (15.3%) performs at this level. In 11 countries/economies (Australia, Canada, B-S-J-G [China], Estonia, Finland, Germany, Korea, the Netherlands, New Zealand, Slovenia and the United Kingdom), between 10% and 15% of all students perform at Level 5 or above. By contrast, in 20 countries/economies, including OECD countries Turkey (0.3%) and Mexico (0.1%), fewer than one in 100 students is a top performer (Figure I.2.15 and Table I.2.1a).

Proficiency at Level 6 (scores higher than 708 points)

Students at Level 6 on the PISA science scale can successfully complete the most difficult items in the PISA science assessment. At Level 6, students can draw on a range of interrelated scientific ideas and concepts from the physical, life, and earth and space sciences and use procedural and epistemic knowledge to offer explanatory hypotheses of novel scientific phenomena, events and processes that require multiple steps, or to make predictions. In interpreting data and evidence, they can discriminate between relevant and irrelevant information and can draw on knowledge external to the normal school curriculum. They can distinguish between arguments that are based on scientific evidence and theory and those based on other considerations. Level 6 students can evaluate competing designs of complex experiments, field studies or simulations, and justify their choices.

Question 1 in the example unit *SUSTAINABLE FISH FARMING* (Annex C1) requires Level 6 proficiency. This question requires students to understand an ecosystem (here, a fish farm) and the role of several organisms within that system. The main competency required is to explain phenomena scientifically. In order to answer correctly, students must understand the goal of the fish farm, the function of each of the three tanks therein, and which organisms will best fulfill each function. Students must use information provided in the stimulus and the diagram, including a footnote under the diagram. An additional component that adds difficulty is the open-ended nature of the task. Any of the four organisms can be placed in any of the three tanks and there is no restriction on the number of organisms in each tank. As a result, there are multiple ways of getting this incorrect. The issue of sustainable fish farming is in the “living systems” content area, and the solution of this item mainly draws on content knowledge.

On average across OECD countries, 1.1% of students attain Level 6. Singapore has the largest proportion of students (5.6%) who score at this level in science. In New Zealand and Chinese Taipei, 2.7% of students score at Level 6 in science. In 18 participating countries and economies, between one in 40 (2.5%) and one in 100 (1%) students score at this level, while in 49 other countries/economies, fewer than one in 100 students scores at the highest level (Figure I.2.15 and Table I.2.1a).

Proficiency below the baseline

Proficiency at Level 1a (scores higher than 335 but lower than 410 points)

At Level 1a, students can use common content and procedural knowledge to recognise or identify explanations of simple scientific phenomenon. With support, they can undertake structured scientific enquiries with no more than two variables. They can identify simple causal or correlational relationships and interpret graphical and visual data that require a low level of cognitive ability. Students at Level 1a can select the best scientific explanation for given data in familiar personal, local and global contexts.

There are no released items from the PISA 2015 main survey to illustrate proficiency at Level 1a. Paper-based questions developed for the PISA 2006 assessment of science can be used to illustrate the competencies of students who score at this Level (OECD, 2009).

Across OECD countries, 15.7% of students perform at Level 1a, and only 5.5% of students perform below Level 1a. In the Dominican Republic, fewer than one in two students (about 45%) attains this (or a higher) level of performance. In 17 countries and economies, including OECD countries Mexico and Turkey, the largest share of students performs at this level (Figure I.2.15 and Table I.2.1a).

Proficiency at Level 1b (scores higher than 261 but lower than 335 points)

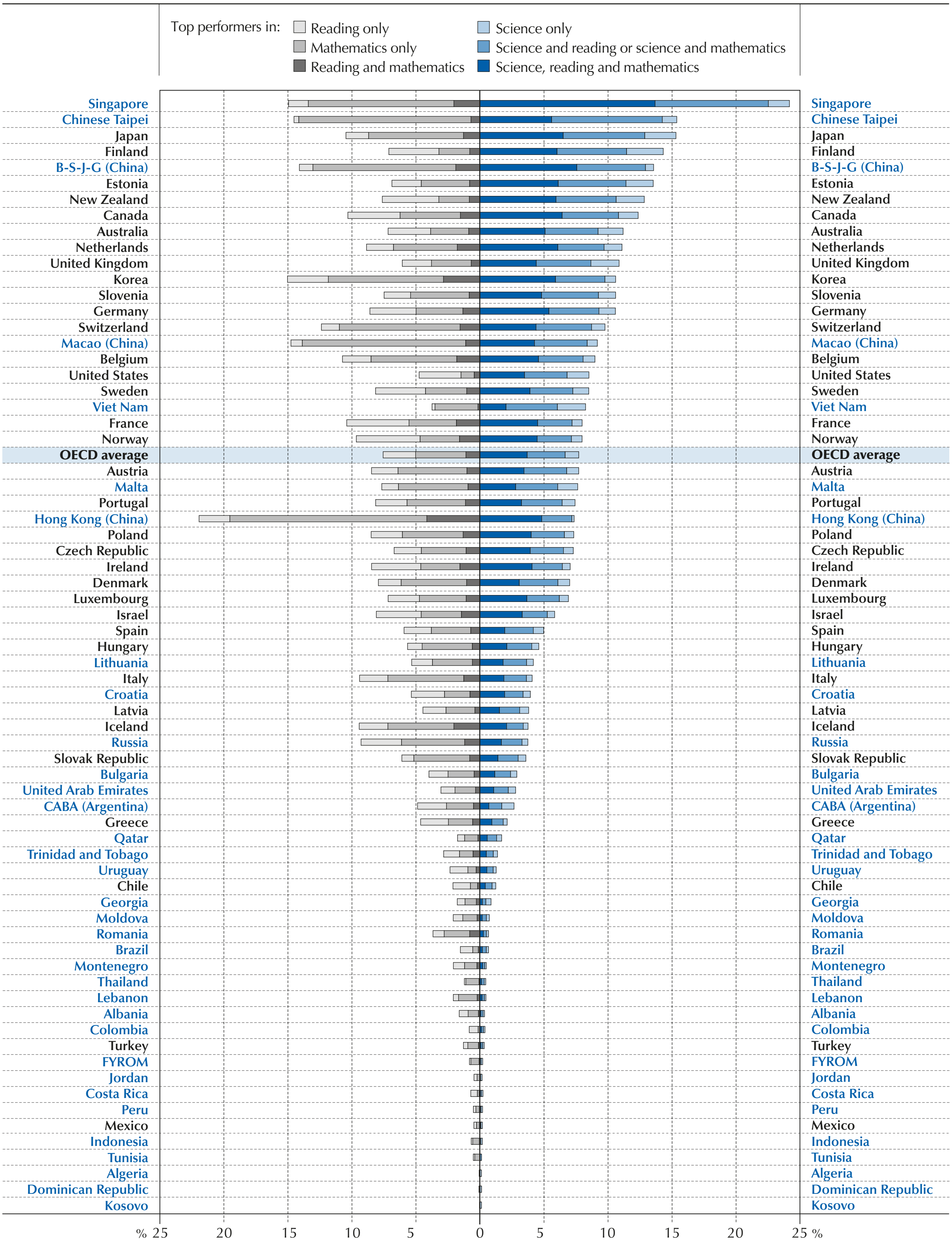
At Level 1b, students can use common content knowledge to recognise aspects of simple scientific phenomena. They can identify simple patterns in data, recognise basic scientific terms and follow explicit instructions to carry out a scientific procedure.

Question 3A in the unit *METEOROIDS AND CRATERS* (Annex C1) is an example of a task at Level 1b. In order to solve this question, students must use common scientific knowledge to match the size of a meteoroid with the size of the crater it would create on a planet’s surface, based on an image showing three craters of different sizes. Since it is common knowledge that a larger object would cause a larger crater and a smaller one would cause a smaller crater, the question is located at the bottom of the “interpret data and evidence scientifically” scale.

Across OECD countries, 4.9% of students perform at Level 1b and 0.6% performs below Level 1b. In 40 countries and economies, including Canada, Estonia, Hong Kong (China), Japan, Macao (China) and Viet Nam, less than 10% of students perform at or below Level 1b; in those six countries, less than 2% of students perform at this level (Figure I.2.15 and Table I.2.1a).

No item in the PISA assessment can indicate what students who perform below Level 1b can do. Students below Level 1b may have acquired some elements of science knowledge and skills, but based on the tasks included in the PISA test, their ability can only be described in terms of what they cannot do – and they are unlikely to be able to solve, other than by guessing, any of the PISA tasks. In some countries, the proportion of students who perform below Level 1b is substantial: 15.8% in the Dominican Republic, and between 4% and 7% in Lebanon, FYROM, Brazil, Georgia, Jordan and Kosovo (in descending order of that proportion).

Figure I.2.17 ▪ **Overlapping of top performers in science with top performers in reading and mathematics**



Countries and economies are ranked in descending order of the percentage of top performers in science only and in science with other domains.
Source: OECD, PISA 2015 Database, Table I.2.9a.

StatLink http://dx.doi.org/10.1787/888933432092

Where are the top performers in science?

Performance in PISA is measured by students' ability to complete increasingly complex tasks. Only a small proportion of students attains the highest levels of proficiency – Level 5 or 6 – and can be called top performers in science, reading or mathematics. Even fewer students are academic all-rounders: those who achieve proficiency Level 5 or higher in all three subjects. These students can draw on and use information from multiple and indirect sources to solve complex problems, and can integrate knowledge from across different areas. Such exceptional skills can provide a significant advantage in a competitive, knowledge-based global economy.

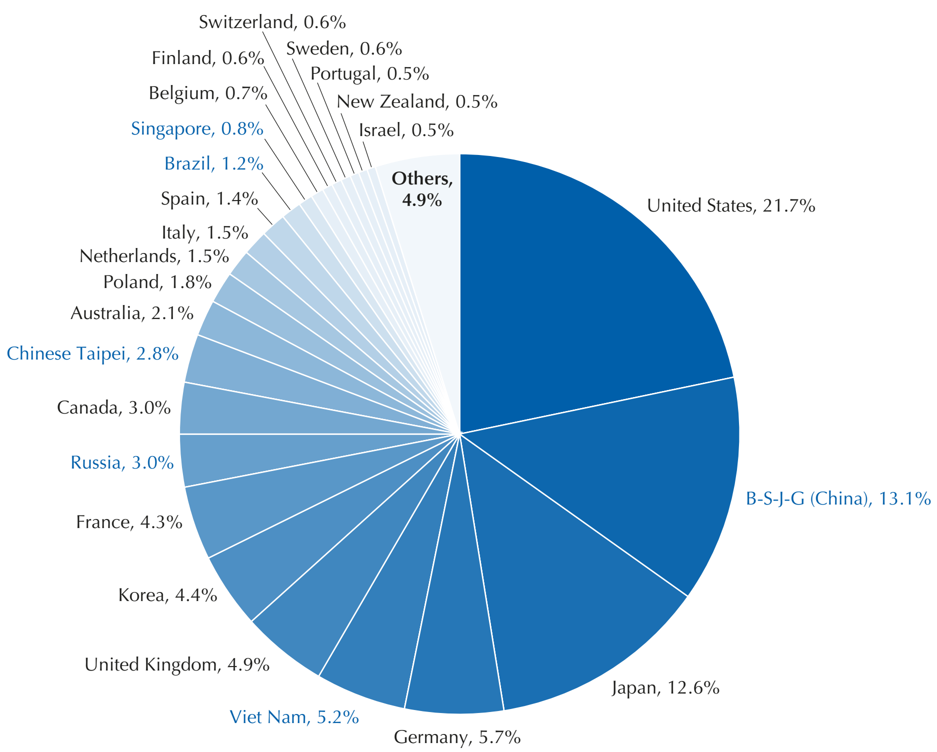
Figure I.2.17 shows the proportion of top performers in science and all-rounders across PISA-participating countries and economies. The parts of the diagram shaded in blue represent the percentage of 15-year-old students who are top performers in science, with darker tones for top-performing students in science who also excel at similar levels in reading and/or mathematics. The grey parts to the left of the diagram show the percentage of 15-year-old students who are top performers in mathematics and/or reading but not in science.

Figure I.2.18 depicts the number of 15-year-old students who are proficient at Level 5 or 6 on the PISA science scale, by country. While Figure I.217 shows the share of students in each country who perform at Level 5 or 6, it does not take into account that the student population varies in size across countries. Yet both the proportion of top performers within a country and the size of countries matter when establishing countries' contributions to the global pool of top-performing students. Even though the proportion of top performers in science is comparatively small in the United States, the United States represents a fifth of the total shown in Figure I.2.18 (which, of course, considers only countries participating in PISA), simply because of the size of the country and the overall number of 15-year-old students that the PISA sample represents.

In contrast, Singapore, which has the largest share of 15-year-olds performing at Level 5 or 6 on the PISA science scale, contributes less than 1% to the global pool of top-performing students because its population is relatively small.

Figure I.2.18 ▪ **The global pool of top performers: A PISA perspective**

Proportion of all PISA top performers in science in individual countries/economies



Source: OECD, PISA 2015 Database, Table I.2.9c.

StatLink http://dx.doi.org/10.1787/888933432102

As shown in Figure I.2.18, more than half of all top-performing students in PISA live in just four countries/economies: the United States (22%), B-S-J-G (China) (13%), Japan (13%) and Germany (6%). Ten countries/economies are home to over 75% of the global pool of top performers in science, as measured by PISA. In addition to the four countries with the largest talent pool listed above, the United Kingdom and Viet Nam each contribute 5%, France and Korea about 4%, and Canada and Russia about 3% to the global pool of top-performing students. When considered together, the 35 OECD countries represent 72% of the global pool of top-performing students, and the 28 European Union members represent 26% of that pool (Table I.2.9c).

GENDER DIFFERENCES IN SCIENCE PERFORMANCE

Table I.2.7 presents a summary of boys' and girls' performance on the PISA science assessment. On average across OECD countries, boys' mean performance in science is 4 points higher than girls' – a statistically significant, but numerically small difference. Boys score significantly above girls, on average, in 24 countries and economies. The largest advantage for boys is found in Austria, Costa Rica and Italy, where the difference between boys' and girls' scores is over 15 points. Girls score significantly above boys, on average, in 22 countries and economies. In Albania, Bulgaria, Finland, FYROM, Georgia, Jordan, Qatar, Trinidad and Tobago, and the United Arab Emirates, girls' mean score is more than 15 score points higher than boys'.

In general, boys show greater variation in performance than girls. In all but 18 countries and economies (where the difference is not significant), the variation in science performance (measured by the standard deviation) is larger among boys than among girls (Table I.2.7). As a result, on average across OECD countries, the share of top-performing students (those who perform at or above Level 5) is larger among boys than among girls, but so is the share of low-achieving students (those who perform below Level 2 on the science scale). Whereas 8.9% of boys perform at or above Level 5, only 6.5% of girls perform at that level (Figure I.2.20). At the same time, 21.8% of boys do not reach a baseline level of proficiency in science, a slightly larger proportion than that of girls (20.7%) (Figure I.2.19).

In 33 countries and economies, the share of top performers in science is larger among boys than among girls (Figure I.2.20). Among the countries where more than 1% of students are top performers in science, in Austria, Chile, Ireland, Italy, Portugal and Uruguay, around two out of three top-performing students are boys. Finland is the only country in which there are significantly more girls than boys among top performers.

Boys are over-represented compared to girls among low-achieving students in science in 28 countries/economies, while girls are over-represented in 5 countries/economies (Figure I.2.19). In the remaining countries/economies, the gender difference in the share of low performers and top performers is not statistically significant.

TRENDS IN STUDENTS' SCIENCE PERFORMANCE

PISA 2015 is the sixth round of PISA since the programme was launched in 2000. Every PISA test assesses students' science, reading and mathematics literacy; in each round, one of these subjects is the main domain and the other two are minor domains (see "What is PISA?" at the beginning of this volume).

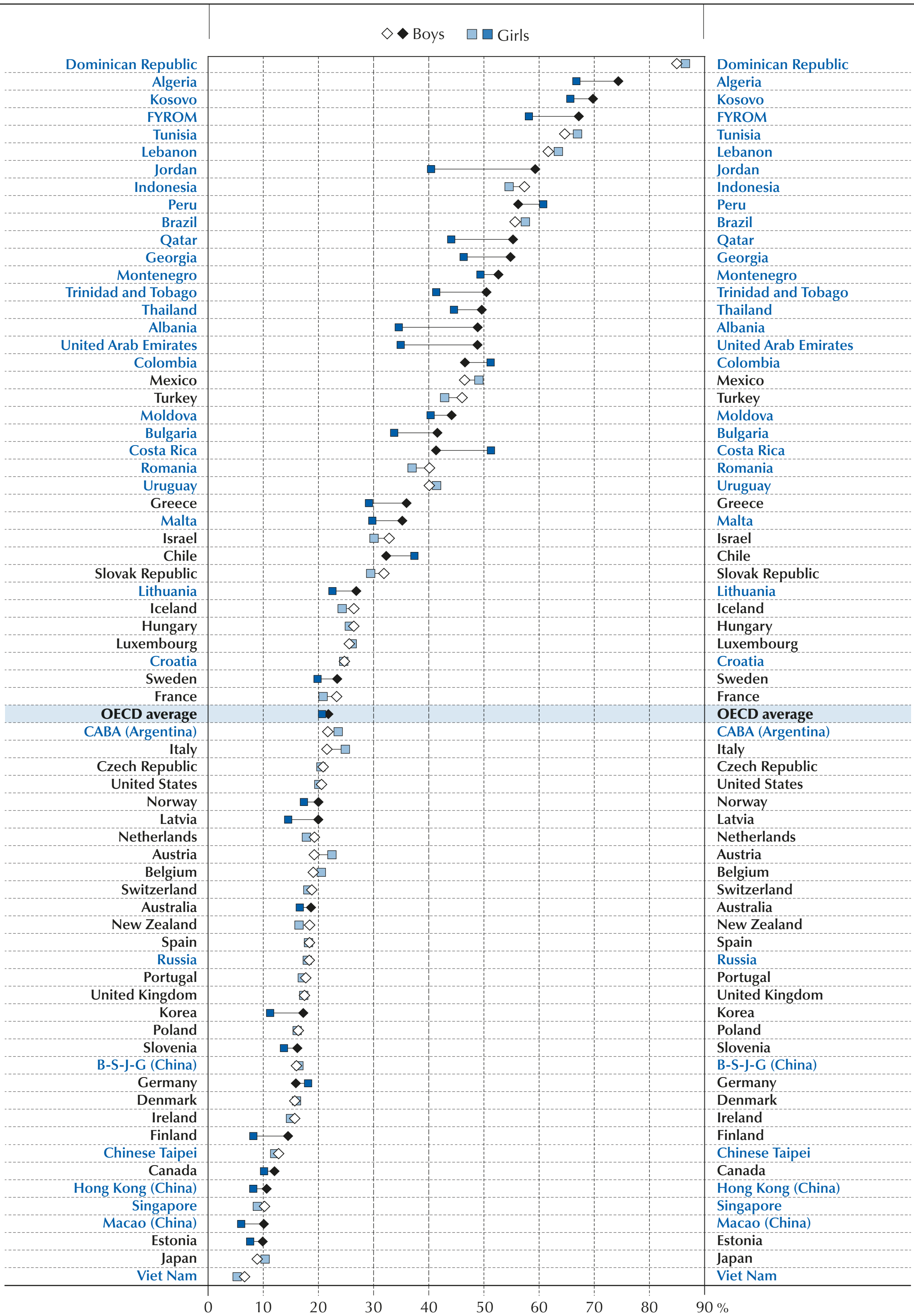
The first full assessment of each domain sets the scale and starting point for future comparisons. Science was the major domain for the first time in 2006, and is again the major domain in PISA 2015. This means that it is possible to measure the change in science performance between PISA 2015 and any prior PISA test, starting with PISA 2006, but not with respect to PISA 2000 or 2003. The most reliable way to establish a trend for science performance is to compare all available results between 2006 and 2015.

Trends in student performance indicate whether and how school systems are improving. Trends in science performance are available for 64 countries and economies that participated in PISA 2015. Fifty-one of these have science performance data for 2015 and data from the three previous comparable PISA assessments (2006, 2009 and 2012); five have data from 2015 and two additional assessments; and eight countries and economies have data from 2015 and one previous assessment.

To better understand a country's /economy's trends and maximise the number of countries in the comparisons, this report focuses on the average three-year trend in student performance. The three-year trend is the average rate of change observed over three-year intervals during the available period (three years correspond to the typical interval between two PISA assessments; the magnitude of the average three-year trend can therefore be directly compared to the change observed between two consecutive assessments, e.g. PISA 2012 and PISA 2015). For countries and economies that have participated in all four PISA assessments, the average three-year trend takes into account all four points in time; for those countries that have valid data for fewer assessments, the average three-year trend takes into account only the valid and available information.

Figure I.2.19 ▪ **Gender differences among low-achieving students in science**

Percentage of boys and girls performing below Level 2 in science

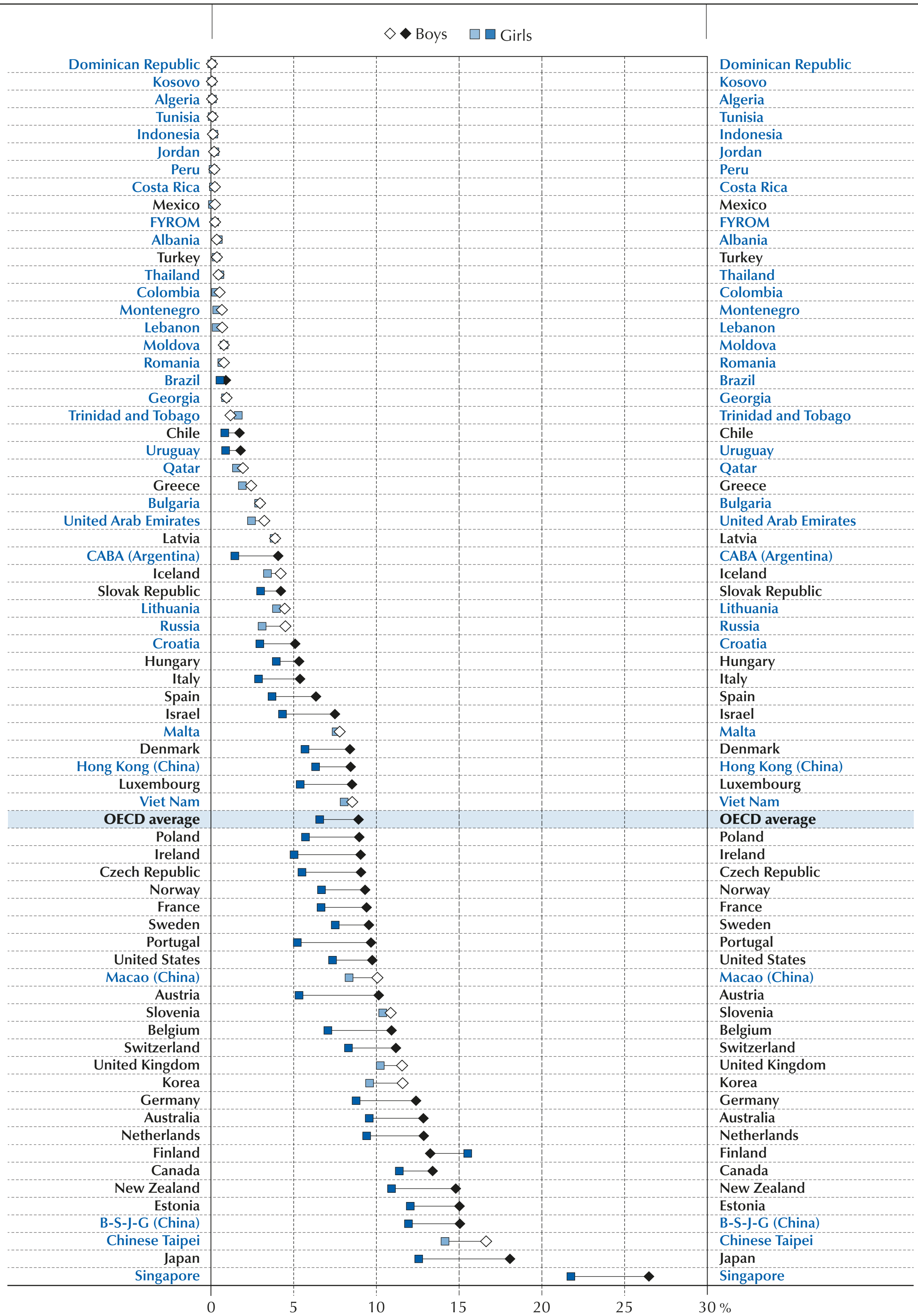


Note: Statistically significant differences between boys and girls are marked in a darker tone (see Annex A3).
Countries and economies are ranked in descending order of the percentage of low-achieving boys.
Source: OECD, PISA 2015 Database, Table I.2.6a.

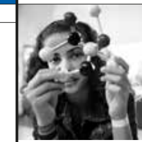
StatLink http://dx.doi.org/10.1787/888933432113

Figure I.2.20 ▪ **Gender differences among top performers in science**

Percentage of boys and girls performing at or above Level 5 in science



Note: Statistically significant differences between boys and girls are marked in a darker tone (see Annex A3).
Countries and economies are ranked in ascending order of the percentage of top-performing boys.
Source: OECD, PISA 2015 Database, Table I.2.6a.
StatLink http://dx.doi.org/10.1787/888933432129



The methodologies underpinning the analysis of performance trends in international studies of education are complex (see Annex A5). In order to ensure the comparability of successive PISA results, a number of conditions must be met.

First, successive assessments must include a sufficient number of common assessment items so that results can be reported on a common scale. The set of items included must adequately cover the different aspects of the framework for each domain. Because the results of Kazakhstan in 2015 are based only on multiple-choice items, they cannot be reliably compared to the results of other countries, nor to Kazakhstan's results in previous assessments (see Annex A4 for details).

Second, the sample of students in successive assessments must be equally representative of the target population, and only results from samples that meet the strict standards set by PISA can be compared over time. Even though they participated in successive PISA assessments, some countries and economies cannot compare all their PISA results over time. For example, the PISA 2015 sample for Malaysia did not meet the PISA response-rate standards, so comparisons with 2015 cannot be reported for Malaysia. The PISA 2015 sample for Argentina did not cover the full target population, due to the potential omission of schools from the sampling frame, except for the adjudicated region of Ciudad Autónoma de Buenos Aires (Argentina) (hereafter "CABA [Argentina]"); as a result, only results for CABA (Argentina) can be compared over time (see Annex A4 for details).

Even when PISA samples accurately reflect the target population (that of 15-year-olds enrolled in grade 7 and above), changes in enrolment rates and demographics can affect the interpretation of trends. To distinguish between changes that affect equivalent populations and changes related to the composition of the target population, adjusted trends that account for population changes are presented in addition to the basic measure of performance change across PISA samples.

Third, the assessment conditions must be sufficiently similar across time so that performance on the test reflects the same underlying proficiency in a domain.[10] Ensuring the equivalence of trend items across time is particularly important in the context of PISA 2015, when most countries/economies that participated in the assessment conducted the test on computer (see Box I.2.3 and Annex A5).

Box I.2.3 **Can past PISA results in science be compared to results from the computer-based PISA 2015 science test?**

PISA aims to measure, at each point in time, the knowledge and skills that are required to participate fully in society and the economy. Because these evolve slowly over time, every nine years PISA revisits the framework and the instruments used to measure the domains of reading, mathematics and science. This periodic revision of frameworks and instruments also provides an opportunity to align PISA with new developments in assessment techniques and with the latest understanding of the cognitive processes underlying proficiency in each domain.

The PISA 2015 assessment coincided with the development of an updated framework for science, the major domain, and with the development of new items to capture all aspects of this updated framework. The existing items (trend items) that were used in PISA 2006, 2009 and 2012 were also reviewed against this updated framework.

A major difference with previous assessments of science is the delivery of test questions on computers. Most of the countries/economies participating in the PISA 2015 test, including all OECD countries, assessed their students on computers (see "What is PISA" at the beginning of this volume). In order to compare the results of this test to those obtained by earlier cohorts of students on past PISA paper-based tests, it was necessary to establish first the equivalence of the paper- and the computer-based instruments (Janssen, 2011).

Paper and computer tests in PISA are linked through common items (so-called "link items", or "link tasks"); all of these items were developed, initially, for the paper-based tests in previous PISA rounds. The PISA 2015 field trial tested the equivalence of link items between computer-based tests and paper-based tests. Two levels of equivalence were distinguished: scalar (strong) and metric (weak) equivalence (Davidov, Schmidt and Billet, 2011; Meredith, 1993). Only items that passed the test of equivalence were retained for the main study; among these, a majority of items (61 out of 85 in science) attained the highest level of invarianceand were used as link items for science.

Comparing current PISA scores to past PISA scores, or PISA scores in one country to PISA scores in another country, is supported by a large number of link items that attain the highest level of equivalence (scalar invariance). Annex A5 and the *PISA 2015 Technical Report* (OECD, forthcoming) provide details about the number of scalar invariant items for other domains and about the mode-effect study conducted in the context of the PISA 2015 field trial.

Fourth, the same reporting scale must be used to report student proficiency. In PISA, the reporting scale is re-estimated in each cycle, and then equated to the scale constructed the first time a domain became the major domain. The uncertainty associated with equating scales is included when computing the significance of changes or trend estimates (see Box I.2.2). PISA 2015 introduced several changes in the scaling of the test. Annex A5 describes the technical details of these changes, and how they affect trend comparisons.

In addition, not all countries have participated in all PISA assessments. When computing the OECD average changes and trends in science performance, only those countries with valid data to compare among assessments are included in the average. While comparisons between the 2006 and 2015 results in science use data from all 35 OECD member countries, only 34 OECD countries can compare their 2009 and 2015 results. For this reason, tables and figures showing trends in science performance often include two distinct averages – the OECD average-35, which includes all OECD countries, and the OECD average-34, which excludes Austria.

Average three-year trend in performance

The average three-year trend is used as the main measure of trends in a country's/economy's science, reading and mathematics performance. The average three-year trend for the mean is the average rate at which a country's/economy's mean score in mathematics, reading and science has changed over consecutive three-year periods throughout its participation in PISA assessments. Similarly, the average three-year trend for the median (the score that divides a population in two equal halves – one scoring above the median, and one below) is the average rate at which a country's/economy's median score in mathematics, reading and science has changed over consecutive three-year periods throughout its participation in PISA assessments. The interval of three years is chosen to correspond to the usual interval between two PISA assessments. Thus, a positive average three-year trend of x points indicates that the country/economy has improved in performance by x points on average in each PISA assessment since its earliest comparable PISA results. For countries and economies that have participated in only two assessments, the average three-year trend is equal to the score-point difference between the two assessments, divided by the number of years that passed between the assessments and multiplied by three.

The average three-year trend is a more robust measure of a country's/economy's progress in education outcomes than the simple difference between two points in time as it is based on information available from all assessments. For countries that participated in more than two PISA assessments, it is thus less sensitive to statistical fluctuations that may alter a country's/economy's trends in PISA performance if results are compared between only two assessments. This robustness comes at the cost of ignoring accelerations, decelerations or reversals of the rate of change: the average three-year trend assumes that the rate of change is steady over the period considered (linear trend). The average three-year trend also takes into account the fact that, for some countries and economies, the period between PISA assessments is less than three years. This is the case for those countries and economies that participated in PISA 2009 as part of PISA+: they conducted the assessment in 2010 instead of 2009.

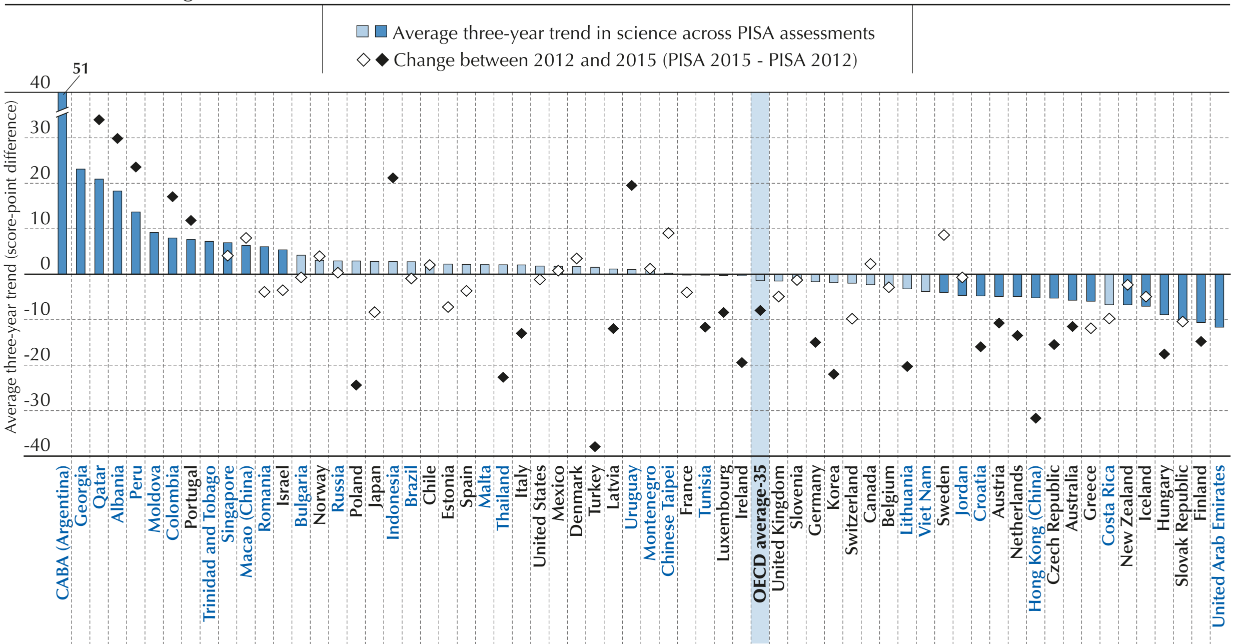
Table I.2.4a shows the average three-year trend in mean science performance. Table I.2.4b presents the three-year trend for the 10th, 25th, 75th and 90th percentiles, as well as for the median (50th percentile) in science performance.

On average across OECD countries with comparable data in PISA 2006 and PISA 2015, performance has remained stable (a non-significant decline of 1.4 points every 3 years was observed). But the stability of the average masks the significant changes observed in many countries and economies. Of the 64 countries/economies with valid results in more than one PISA round, about half (31) show no significant change in mean performance, 15 countries show a significant average improvement in science performance, and 18 show a significant average deterioration in performance.

As Figure I.2.21 shows, in CABA (Argentina), Georgia and Qatar, student performance in science improved by more than 20 score points every 3 years since these countries/economies began participating in PISA (however, Georgia only participated in PISA 2009 and PISA 2015, and CABA [Argentina] participated as a separate adjudicated entity since only PISA 2012). Albania, Moldova and Peru improved by between 9 and 20 score points every 3 years since 2009, and Colombia improved by 8 points, on average, every 3 years throughout its participation in PISA (since 2006).

Among OECD countries, improvements in mean science performance are observed in Portugal (with an average improvement of more than seven score points every three years), Israel (about five score points every three years), Norway and Poland (about three score points every three years). Partner countries/economies Macao (China), Romania, Singapore, and Trinidad and Tobago also show significant improvements over the period in which they participated in PISA. (Of these countries and economies, only Macao [China] and Romania participated in all four PISA cycles between 2006 and 2015.)

Figure I.2.21 ■ **Average three-year trend in science performance since 2006**



Notes: Statistically significant differences are shown in a darker tone (see Annex A3).

The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. This model takes into account that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+. For countries/economies with comparable data for PISA 2012 and PISA 2015 only, the average three-year trend coincides with the change between 2012 and 2015.

Only countries/economies with valid results for PISA 2015 and at least one prior assessment are shown.

Countries and economies are ranked in descending order of the average three-year trend in science performance.

Source: OECD, PISA 2015 Database, Table I.2.4a.

StatLink http://dx.doi.org/10.1787/888933432133

Among the 15 countries and economies that have a negative average three-year trend, 13 have comparable data for all four assessments between PISA 2006 and PISA 2015, the United Arab Emirates did not participate until PISA 2012, and results for PISA 2009 in Austria cannot be compared with previous or later assessments (see note 9 at the end of this chapter). In Finland, the Slovak Republic and the United Arab Emirates, student performance in science deteriorated by more than 10 points every three years, on average (i.e. assuming a steady rate of change). Performance in Australia, the Czech Republic, Greece, Hong Kong (China), Hungary, Iceland and New Zealand deteriorated between five and ten points every three years; and mean performance in science in Austria, Croatia, Jordan, the Netherlands and Sweden declined by less than five points every three years on average.

Change in science performance between 2012 and 2015

For countries that participated in both PISA 2012 and PISA 2015, Figure I.2.21 also displays the change in PISA results over the most recent period. By contrasting the change over the three years from 2012 to 2015, indicated by the diamonds, and the average three-year trend over a longer period of time, indicated by the bars, it is possible to assess whether a country's/economy's improvement or deterioration over the most recent period confirms, or contradicts, the trend observed over a longer period of time. For countries that have valid data only in PISA 2012 and PISA 2015, the two values coincide, and diamonds are therefore not shown; but in general, when more than two assessments are available, the two do not necessarily coincide, and long-term trends are more precisely estimated than short-term changes. On average across OECD countries, performance was similar in 2015 and 2006, but significantly lower (by eight score points) in 2015 than in 2012.

Among countries/economies with a significant, negative trend, in Croatia, the Czech Republic and Hong Kong (China), average science scores decreased over the most recent period more than 10 points faster than the average rate of change over PISA assessments, indicating an acceleration or inversion of the trend observed between 2006 and 2012. By contrast, in Sweden, the most recent period shows a non-significant improvement of nine points. This reflects a deceleration, or perhaps inversion, of the negative trend observed over the longer period.

Among countries with a significant, positive trend, in Albania and Qatar, mean science scores improved between 2012 and 2015 more than 10 points faster than the average rate of change over PISA cycles, indicating a possible acceleration of the trend.

Some countries/economies that show no significantly positive or negative trend, on average, nevertheless show a significant improvement, or deterioration, over the most recent period. Germany, Ireland, Italy, Korea, Latvia, Lithuania, Luxembourg, Poland, Thailand, Tunisia and Turkey,[11] for example, all have significantly lower mean scores in 2015 than in 2012. Meanwhile, Indonesia and Uruguay have a significantly higher score in 2015 than in 2012, but show no significant average improvement over a longer period of time.

Average three-year trend in performance, accounting for changes in enrolment rates

Changes in a country's or economy's science performance can have many sources. In some countries, a decline in mean performance may result from a lower quality of education than in the past. But in other cases, a similar decline may, in fact, reflect an improvement in the capacity of education systems to include students who would not have attended school in previous years, or who, at age 15, would still have been in primary school. Changes can also result from demographic shifts in the country's population. By following strict sampling and methodological standards, PISA ensures that all countries and economies measure the science performance of their 15-year-old students in grades 7 and above; but because of changes in enrolment rates, migration or other demographic and social trends, the characteristics of this reference population may change.

Adjusted trends neutralise some of the changes observed in the composition and coverage of the PISA sample so that it becomes possible to identify some of the sources of the trends observed. In this volume, two types of adjusted trends are presented. The first accounts for changes in enrolment rates over time, and is presented in this section. The second accounts for changes in the age (measured in quarters), gender, and immigrant background, and is presented in the next section. Annex A5 provides details on how these adjusted trends were calculated.

Over the past 10 years, many countries – particularly low- and middle-income countries – have made great efforts to ensure that every child completes primary school (at least), and to reduce dropout rates in secondary education. Some countries, such as Brazil and Turkey, have raised the age at which students can leave compulsory education to over 15; and these reforms have been accompanied by a significant increase in the share of 15-year-olds who are included in the PISA target population. This expansion in education opportunities makes it more difficult to interpret the observed trends in performance for the countries concerned.

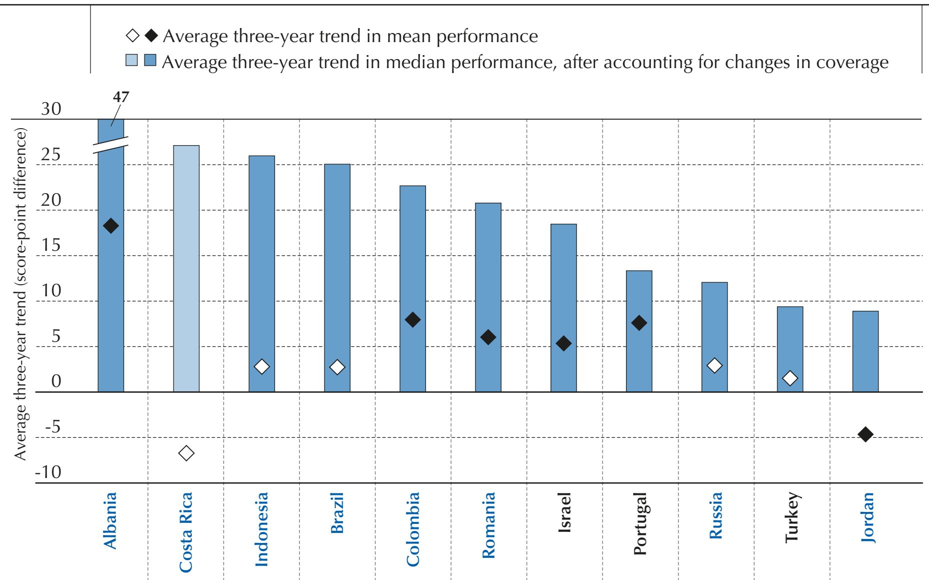
It is impossible to know for certain what the PISA score of the 15-year-olds who were not enrolled in school or who were still in grades 1 through 6 would have been, had they been tested. Without attributing an exact score to these students, it is nevertheless possible to assume, with some confidence, that they would have scored in the bottom half of a country's performance distribution (see Hanushek and Woessmann, 2008; Spaull and Taylor, 2015; Taylor and Spaull, 2015; as well as note 8 at the end of this chapter for related assumptions). Given this assumption, it is possible to track, over time, the change in the median performance of 15-year-olds in a country – i.e. the minimum level achieved by at least 50% of the country's/economy's population of 15-year olds. It is also possible to compute the change in the share of 15-year-olds (both those enrolled in school and those not enrolled) who attain higher levels of performance in PISA.

Figure I.2.22 presents the average three-year trend in the median performance of 15-year-olds after accounting for changes over time in the percentage of 15-year-olds that the PISA sample represents (known as Coverage index 3). Only countries where the Coverage index 3 for PISA increased by more than 3 percentage points every three years, on average, are included in this figure (see Chapter 6 for a discussion of Coverage index 3).

The adjusted trend for the median presented in Figure I.2.22 (and for all countries, in Table I.2.4d) neutralises the impact of changes across time in the coverage of the population of 15-year-olds. These changes are related to differences in the selectivity of secondary education. A positive adjusted trend for the median indicates that the quality of education improved for most 15-year-olds: the minimum level of proficiency attained by a majority of 15-year-olds scores has increased over time. By comparing the adjusted trend for the median with the observed (non-adjusted) trend for mean PISA scores over a similar period of time, it is possible to assess the extent to which differences in sample coverage, particularly those related to expansion of secondary education, influence the trends.

Figure I.2.22 ■ **Average three-year trend in median science performance since 2006, after accounting for changes in coverage**

Selected countries



Notes: Statistically significant differences for the average three-year trend are shown in a darker tone (see Annex A3).
The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model.
Only countries where the Coverage index 3 for PISA increased by more than 3% every three years, on average since 2006, are included in this figure.
Countries are ranked in descending order of the average three-year trend in median science performance, after accounting for changes in coverage.
Source: OECD, PISA 2015 Database, Tables I.2.4a and I.2.4d.
StatLink http://dx.doi.org/10.1787/888933432142

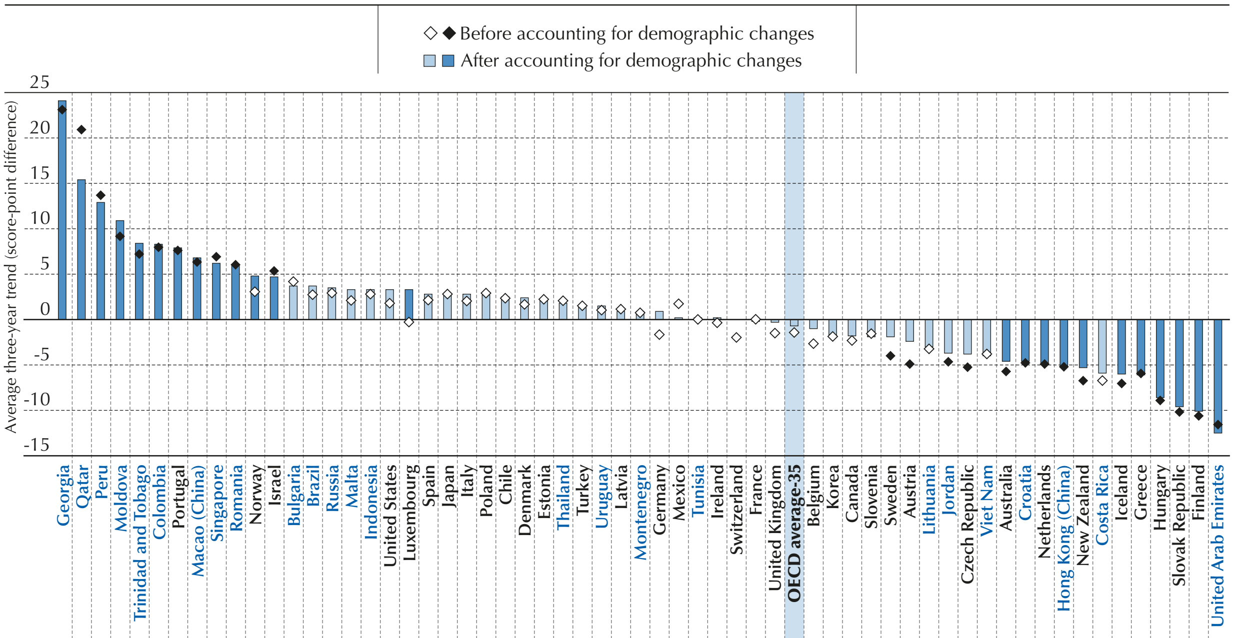
Eleven countries show average increases of at least 3 percentage points every 3 years in the coverage of the PISA sample, indicating that secondary education up to age 15 has become more inclusive in these countries since 2006 (or since the country first participated in PISA). Of these 11 countries and economies, Jordan shows a significant negative mean trend in performance; Brazil, Costa Rica, Indonesia, Russia and Turkey show non-significant trends in performance; and the remaining five (Albania, Colombia, Israel, Portugal and Romania) show a significant positive trend in mean performance (Tables I.2.4a and I.2.4d).

But in all of these countries and economies, the level at which at least 50% of their 15-year-olds perform (the adjusted median) increased significantly between 2006 and 2015 (or since the earliest available assessment), except in Costa Rica, where the increase is not significant. Moreover, the level attained by the 25% best-performing 15-year-olds (adjusted 75th percentile) and the level attained by the 10% best-performing 15-year-olds (adjusted 90th percentile) also rose over the same period in Albania, Brazil, Colombia, Israel, Macao (China), Portugal, Romania and Turkey (in Russia and Indonesia, the increase is significant only at the 75th percentile). This shows that the PISA-participating countries that made their education systems more inclusive over the past decade, as indicated by larger shares of 15-year-olds who are in secondary school, have not done so at the expense of the quality of education for most 15-year-olds – including those students who would have gone to secondary school under the more exclusive conditions of the past (Table I.2.4d).

Average three-year trend in performance, adjusted for demographic changes

In some countries, the demographics of the student population and of the PISA sample have changed considerably across PISA assessments. It is possible to analyse the impact of changes in the immigrant background, age and gender of the student population in each country and economy by contrasting the (unadjusted) changes in mean performance, reported in previous sections, with those that would have been observed had the overall profile of the student population been the same, throughout the period, as that observed in 2015. Adjusted trends in this section provide an estimate of what the performance trend would have been if past PISA samples had the same proportion of immigrant students (first- and second-generation) and the same composition by gender and age (defined in three-month increments) as the target population in 2015.

Figure I.2.23 ■ **Average three-year trend in science performance since 2006, after accounting for demographic changes**



Notes: Statistically significant differences are shown in a darker tone (see Annex A3).

The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. This model takes into account that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

The average three-year trend after accounting for demographic changes shows how the performance of a population with the same demographic profile of the PISA 2015 population has changed over time. Demographic characteristics considered are: students' age (in three-month increments), gender, and immigrant background.

Only countries/economies with valid results for PISA 2015 and at least one prior assessment are shown.

Countries and economies are ranked in descending order of the average three-year trend in science performance, after accounting for demographic changes.

Source: OECD, PISA 2015 Database, Tables I.2.4a and I.2.4e.

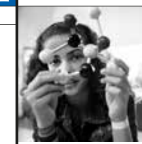
StatLink http://dx.doi.org/10.1787/888933432151

On average across OECD countries, if the student population in 2006 had the same demographic profile as the population in 2015, the average score in science would have been 496 points. In reality, the average observed score in 2006 was 498 points, and the observed score in 2015 was 493 points. Both the observed and the adjusted trends, therefore, show no significant change, on average, since 2006 (Table I.2.4e).

However, Figure I.2.23 highlights that in Luxembourg, the adjusted trend that neutralises the effects of shifts in the demographic composition of the target population, particularly (in this case) the increase in the percentage of immigrant students, is significant and positive: it corresponds to an increase of about three points every three years since 2006. But the observed trend is flat and not significant: -0.3 points every three years since 2006. This difference in trends before and after accounting for demographic changes means that were it not for these demographic changes, average science performance in Luxembourg would have improved since 2006. Similarly, in Norway, the adjusted trend is significant and positive (+4.8 points per three-year period), but the observed trend is not significant (+3.1 points per three-year period).

Other countries with significantly negative observed trends would not have seen such steep declines in performance were it not for demographic shifts in the composition of the target population. In Austria, the observed trend corresponds to a decline in performance of 4.9 points every three years; but the trend would have been reported as a non-significant decrease of 2.4 points every three years if there had been no concurrent demographic changes. Similarly, in Sweden, the observed trend is negative and significant (-4.0 points), but the adjusted trend is not significant (-2.1 points).

Figure I.2.23 highlights other countries/economies where the demographic shifts in the sample or in the target population influence the observed trends, but where the conclusion about the non-significance of the trend is not affected by these shifts.[12] In Belgium, Germany and Switzerland,[13] in particular, the adjusted trends that account for demographic shifts are more positive, by at least 1.5 points every three years, than the observed trends.



At the opposite end of the spectrum is Qatar, whose positive trends in PISA performance partly reflect favourable shifts in the demographic composition of the target population. In this case, the observed trend shows faster improvement than the adjusted trend that accounts for these shifts; nevertheless, both the observed and the adjusted trends are significant and positive.

Informative as they may be, adjusted trends are merely hypothetical scenarios that help to show the sources of changes in student performance over time. Observed (unadjusted) trends shown in Figure I.2.21 and throughout this chapter summarise the overall evolution of a school system. Comparing observed trends with hypothetical, adjusted trends can, nevertheless, highlight the challenges that countries and economies face in improving students' and schools' science performance.

Comparing mean science performance between 2006 and 2015

At any given point in time, some countries and economies perform similarly. But as time passes and school systems evolve, certain countries and economies improve their performance, pull ahead of the group of countries with which they had shared similar performance levels, and catch up to another group of countries; in other countries and economies, performance falters, and these countries/economies fall behind in rankings relative to other countries. Figure I.2.24 shows, for each country and economy with comparable results in 2006 and 2015, those other countries and economies that performed similarly in science in 2006 but better or worse in 2015.

For example, in 2006, Japan scored at about the same level as Australia, Canada, Korea, the Netherlands and New Zealand, and scored significantly below Finland and Hong Kong (China). But as a result of these countries' negative trends in performance between 2006 and 2015, Japan pulled ahead of all those countries in 2015. In 2006, Portugal scored below France and Spain; but as a result of improvements in Portugal's performance over the same period, by 2015 its mean score in science was higher than that of Spain, and was at the same level as that of France.

Figure I.2.25 shows the relationship between each country's/economy's average science performance in 2006 and the average rate of change between 2006 and 2015. Countries and economies that show the largest improvement throughout the various assessments (top half of the graph) are more likely to be those that performed comparatively poorly in the initial years. The correlation between a country's/economy's earliest comparable science score and the average rate of change is -0.59. This means that 34% of the variation in the rate of change can be explained by a country's/economy's initial score, and that countries with a lower initial score tend to improve at a faster rate.[14]

Although countries that improve the most are more likely to be those that performed relatively poorly in 2006, some countries and economies that scored at or above the average in 2006 also saw improvements in their students' performance over time. Such was the case in Macao (China), which saw improvements in science performance even after its PISA 2006 science scores placed it above the OECD average (results for countries and economies that began their participation in PISA after PISA 2006 are reported in Table I.2.4a).

Other high-performing countries and economies that began their participation in PISA after the 2006 assessment, like Singapore, also show improvements in performance. In addition, there are many countries and economies that performed similarly in 2006 but evolved differently. For instance, Greece and Portugal had scores that were not significantly different from each other's in 2006 (473 points and 474 points, respectively), but in 2015, more than 40 points (the equivalent of more than a year of schooling) separated their mean scores (455 points for Greece and 501 points for Portugal).

Trends in performance among low- and high-achieving students

Changes in a country's or economy's average performance can result from changes at different levels of the performance distribution. For example, for some countries and economies, the average score increased when the share of students scoring at the lowest levels of the science scale shrank because of improved performance among these students. In other countries and economies, improvements in mean scores were largely the result of improvements in performance among the highest-achieving students and an increase in share of students who perform at the highest levels.

Across OECD countries on average, the proportion of students scoring below Level 2 in science increased by 1.5 percentage points between 2006 and 2015 (a non-significant increase), whereas the proportion of students scoring at or above Level 5 decreased by 1.0 percentage point (a non-significant decrease) (Figure I.2.26). Between 2006 and 2015, four countries/economies reduced the share of students who perform below Level 2: Colombia, Macao (China), Portugal and Qatar. While all of these countries reduced the share of low performers, Macao (China), Portugal and Qatar were also able to simultaneously increase the share of students performing at or above Level 5.

Figure I.2.24 [Part 1/4] ■ **Multiple comparisons of science performance between 2006 and 2015**

Comparison country/economy	Science performance in 2006	Science performance in 2015	Countries/economies with… ... similar performance in 2006 and in 2015	... similar performance in 2006, but higher performance in 2015	... similar performancein 2006, but lower performance in 2015
Japan	531	538	Estonia, Chinese Taipei		Canada, Korea, New Zealand, Australia, Netherlands
Estonia	531	534	Japan, Chinese Taipei		Canada, New Zealand, Australia, Netherlands
Chinese Taipei	532	532	Japan, Estonia, Canada		New Zealand, Australia, Netherlands
Finland	563	531			
Macao (China)	511	529			United Kingdom, Germany, Switzerland, Ireland, Belgium, Austria, Czech Republic
Canada	534	528	Chinese Taipei	Japan, Estonia	New Zealand
Hong Kong (China)	542	523			
Korea	522	516	New Zealand, Slovenia, Australia, United Kingdom, Germany, Netherlands	Japan	Czech Republic
New Zealand	530	513	Korea, Australia, Netherlands	Japan, Estonia, Chinese Taipei, Canada	
Slovenia	519	513	Korea, United Kingdom, Germany		Austria, Czech Republic
Australia	527	510	Korea, New Zealand, Netherlands	Japan, Estonia, Chinese Taipei	
United Kingdom	515	509	Korea, Slovenia, Germany, Switzerland, Ireland	Macao (China)	Belgium, Austria, Czech Republic
Germany	516	509	Korea, Slovenia, United Kingdom, Switzerland, Ireland	Macao (China)	Belgium, Austria, Czech Republic
Netherlands	525	509	Korea, New Zealand, Australia	Japan, Estonia, Chinese Taipei	
Switzerland	512	506	United Kingdom, Germany, Ireland, Belgium	Macao (China)	Austria, Czech Republic, Hungary
Ireland	508	503	United Kingdom, Germany, Switzerland, Belgium	Macao (China)	Austria, Sweden, Czech Republic, Hungary
Belgium	510	502	Switzerland, Ireland	Macao (China), United Kingdom, Germany	Austria, Czech Republic, Hungary
Denmark	496	502	Poland, United States		France, Sweden, Spain, Latvia, Hungary, Lithuania, Croatia, Iceland, Slovak Republic
Poland	498	501	Denmark, United States, Sweden		France, Hungary, Croatia
Portugal	474	501			Russia, Italy, Greece
Norway	487	498	United States, France, Spain		Latvia, Russia, Luxembourg, Lithuania, Croatia, Iceland, Slovak Republic
United States	489	496	Denmark, Poland, Norway, France, Spain, Latvia		Russia, Luxembourg, Lithuania, Croatia, Iceland, Slovak Republic
Austria	511	495	Sweden, Czech Republic	Macao (China), Slovenia, United Kingdom, Germany, Switzerland, Ireland, Belgium	Hungary
France	495	495	Norway, United States, Spain, Latvia	Denmark, Poland	Lithuania, Croatia, Iceland, Slovak Republic
Sweden	503	493	Poland, Austria	Ireland, Denmark	Hungary
Czech Republic	513	493	Austria	Macao (China), Korea, Slovenia, United Kingdom, Germany, Switzerland, Ireland, Belgium	
Spain	488	493	Norway, United States, France, Latvia	Denmark	Luxembourg, Lithuania, Croatia, Iceland, Slovak Republic
Latvia	490	490	United States, France, Spain	Denmark, Norway	Luxembourg, Lithuania, Croatia, Iceland, Slovak Republic
Russia	479	487	Luxembourg, Italy	Portugal, Norway, United States	Lithuania, Greece
Luxembourg	486	483	Russia	Norway, United States, Spain, Latvia	Lithuania, Slovak Republic
Italy	475	481	Russia	Portugal	Greece

Note: Only countries and economies with valid results for the PISA 2006 and PISA 2015 assessments are shown.
Countries and economies are ranked in descending order of mean science performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432161

Figure I.2.24 [Part 2/4] ▪ **Multiple comparisons of science performance between 2006 and 2015**

Comparison country/economy	Science performance in 2006	Science performance in 2015	Countries/economies with… ... higher performance in 2006, but similar performance in 2015	... higher performance in 2006, but lower performance in 2015	... lower performance in 2006, but similar performance in 2015	... lower performance in 2006, but higher performance in 2015
Japan	531	538		Finland, Hong Kong (China)		
Estonia	531	534	Finland	Hong Kong (China)		
Chinese Taipei	532	532	Finland	Hong Kong (China)	Macao (China)	
Finland	563	531			Estonia, Chinese Taipei, Macao (China), Canada	Japan
Macao (China)	511	529	Chinese Taipei, Finland, Canada, Hong Kong (China)	Korea, New Zealand, Slovenia, Australia, Netherlands		
Canada	534	528	Finland, Hong Kong (China)		Macao (China)	
Hong Kong (China)	542	523			Macao (China), Canada, Korea	Japan, Estonia, Chinese Taipei
Korea	522	516	Hong Kong (China)			Macao (China)
New Zealand	530	513			Slovenia, United Kingdom, Germany	Macao (China)
Slovenia	519	513	New Zealand, Australia, Netherlands			Macao (China)
Australia	527	510			Slovenia, United Kingdom, Germany, Switzerland	Macao (China)
United Kingdom	515	509	New Zealand, Australia, Netherlands			
Germany	516	509	New Zealand, Australia, Netherlands			
Netherlands	525	509			Slovenia, United Kingdom, Germany, Switzerland, Ireland	Macao (China)
Switzerland	512	506	Australia, Netherlands		Denmark, Poland, Portugal, Norway	
Ireland	508	503	Netherlands		Denmark, Poland, Portugal, Norway, United States	
Belgium	510	502			Denmark, Poland, Portugal, Norway, United States	
Denmark	496	502	Switzerland, Ireland, Belgium	Austria, Czech Republic	Portugal, Norway	
Poland	498	501	Switzerland, Ireland, Belgium, Austria	Czech Republic	Portugal, Norway	
Portugal	474	501	Switzerland, Ireland, Belgium, Denmark, Poland, Norway, United States, Austria, France, Sweden	Czech Republic, Spain, Latvia, Luxembourg, Hungary, Lithuania, Croatia, Iceland, Slovak Republic		
Norway	487	498	Switzerland, Ireland, Belgium, Denmark, Poland, Austria, Sweden, Czech Republic	Hungary	Portugal	
United States	489	496	Ireland, Belgium, Austria, Sweden, Czech Republic	Hungary	Portugal	
Austria	511	495			Poland, Portugal, Norway, United States, France, Spain, Latvia	Denmark
France	495	495	Austria, Sweden, Czech Republic	Hungary	Portugal	
Sweden	503	493	Czech Republic		Portugal, Norway, United States, France, Spain, Latvia, Russia	
Czech Republic	513	493			Norway, United States, France, Sweden, Spain, Latvia, Russia	Denmark, Poland, Portugal
Spain	488	493	Austria, Sweden, Czech Republic	Hungary	Russia	Portugal
Latvia	490	490	Austria, Sweden, Czech Republic	Hungary	Russia	Portugal
Russia	479	487	Sweden, Czech Republic, Spain, Latvia	Hungary, Croatia, Iceland, Slovak Republic		
Luxembourg	486	483		Hungary, Croatia, Iceland	Italy	Portugal
Italy	475	481	Luxembourg, Hungary, Lithuania, Croatia	Iceland, Slovak Republic		

Note: Only countries and economies with valid results for the PISA 2006 and PISA 2015 assessments are shown.
Countries and economies are ranked in descending order of mean science performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432161

Figure I.2.24 [Part 3/4] ■ Multiple comparisons of science performance between 2006 and 2015

Comparison country/economy	Science performance in 2006	Science performance in 2015	Countries/economies with… ... similar performance in 2006 and in 2015	... similar performance in 2006, but higher performance in 2015	... similar performancein 2006, but lower performance in 2015
Hungary	504	477		Switzerland, Ireland, Belgium, Denmark, Poland, Austria, Sweden	
Lithuania	488	475	Croatia, Iceland	Denmark, Norway, United States, France, Spain, Latvia, Russia, Luxembourg	Slovak Republic
Croatia	493	475	Lithuania, Iceland	Denmark, Poland, Norway, United States, France, Spain, Latvia	Slovak Republic
Iceland	491	473	Lithuania, Croatia	Denmark, Norway, United States, France, Spain, Latvia	Slovak Republic
Israel	454	467			
Slovak Republic	488	461		Denmark, Norway, United States, France, Spain, Latvia, Luxembourg, Lithuania, Croatia, Iceland	
Greece	473	455		Portugal, Russia, Italy	
Chile	438	447	Bulgaria		
Bulgaria	434	446	Chile		Uruguay, Turkey, Jordan
Uruguay	428	435	Romania	Bulgaria	Turkey, Jordan
Romania	418	435	Uruguay, Turkey		Thailand, Mexico, Montenegro, Jordan
Turkey	424	425	Romania, Thailand	Bulgaria, Uruguay	Jordan
Thailand	421	421	Turkey	Romania	Jordan
Qatar	349	418			
Colombia	388	416			Indonesia, Brazil, Tunisia
Mexico	410	416	Montenegro	Romania	
Montenegro	412	411	Mexico	Romania	
Jordan	422	409		Bulgaria, Uruguay, Romania, Turkey, Thailand	
Indonesia	393	403	Brazil	Colombia	Tunisia
Brazil	390	401	Indonesia	Colombia	Tunisia
Tunisia	386	386		Colombia, Indonesia, Brazil	

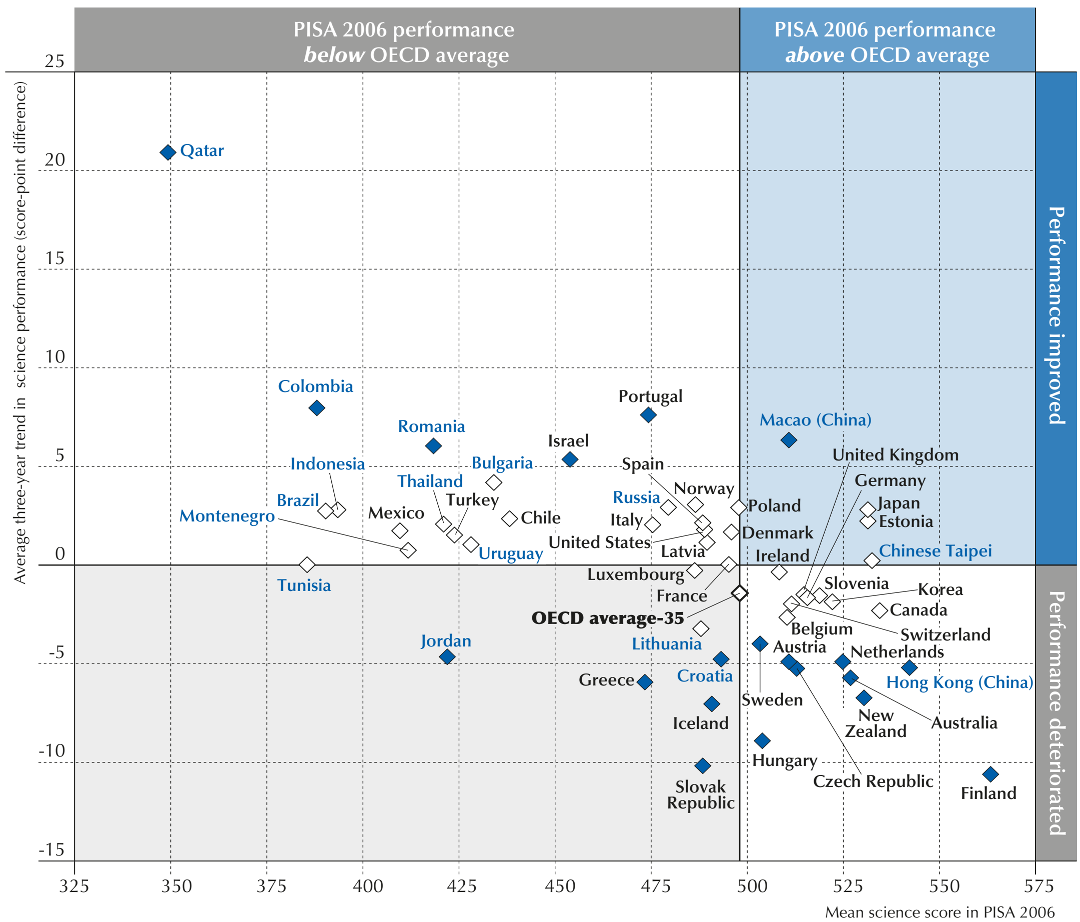
Note: Only countries and economies with valid results for the PISA 2006 and PISA 2015 assessments are shown.
Countries and economies are ranked in descending order of mean science performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432161

Figure I.2.24 [Part 4/4] ■ Multiple comparisons of science performance between 2006 and 2015

Comparison country/economy	Science performance in 2006	Science performance in 2015	Countries/economies with… ... higher performance in 2006, but similar performance in 2015	... higher performance in 2006, but lower performance in 2015	... lower performance in 2006, but similar performance in 2015	... lower performance in 2006, but higher performance in 2015
Hungary	504	477			Italy, Lithuania, Croatia, Iceland	Portugal, Norway, United States, France, Spain, Latvia, Russia, Luxembourg
Lithuania	488	475	Hungary		Italy	Portugal
Croatia	493	475	Hungary		Italy	Portugal, Russia, Luxembourg
Iceland	491	473	Hungary		Israel	Portugal, Russia, Luxembourg, Italy
Israel	454	467	Iceland, Slovak Republic	Greece		
Slovak Republic	488	461			Israel, Greece	Portugal, Russia, Italy
Greece	473	455	Slovak Republic		Chile, Bulgaria	Israel
Chile	438	447	Greece			
Bulgaria	434	446	Greece			
Uruguay	428	435				
Romania	418	435				
Turkey	424	425			Qatar	
Thailand	421	421			Qatar, Colombia, Mexico	
Qatar	349	418	Turkey, Thailand, Colombia, Mexico	Montenegro, Jordan, Indonesia, Brazil, Tunisia		
Colombia	388	416	Thailand, Mexico, Montenegro	Jordan	Qatar	
Mexico	410	416	Thailand	Jordan	Qatar, Colombia	
Montenegro	412	411	Jordan		Colombia	Qatar
Jordan	422	409			Montenegro, Indonesia	Qatar, Colombia, Mexico
Indonesia	393	403	Jordan			Qatar
Brazil	390	401				Qatar
Tunisia	386	386				Qatar

Note: Only countries and economies with valid results for the PISA 2006 and PISA 2015 assessments are shown.
Countries and economies are ranked in descending order of mean science performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432161

Figure I.2.25 ▪ **Relationship between average three-year trend in science performance and average PISA 2006 science scores**



Notes: Average three-year trends in science that are statistically significant are indicated in a darker tone (see Annex A3).

The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. This model considers that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

The correlation between a country's/economy's mean score in 2006 and its average three-year trend is -0.6.

Only countries and economies with available data since 2006 are shown.

Source: OECD, PISA 2015 Database, Table I.2.4a.

StatLink http://dx.doi.org/10.1787/888933432175

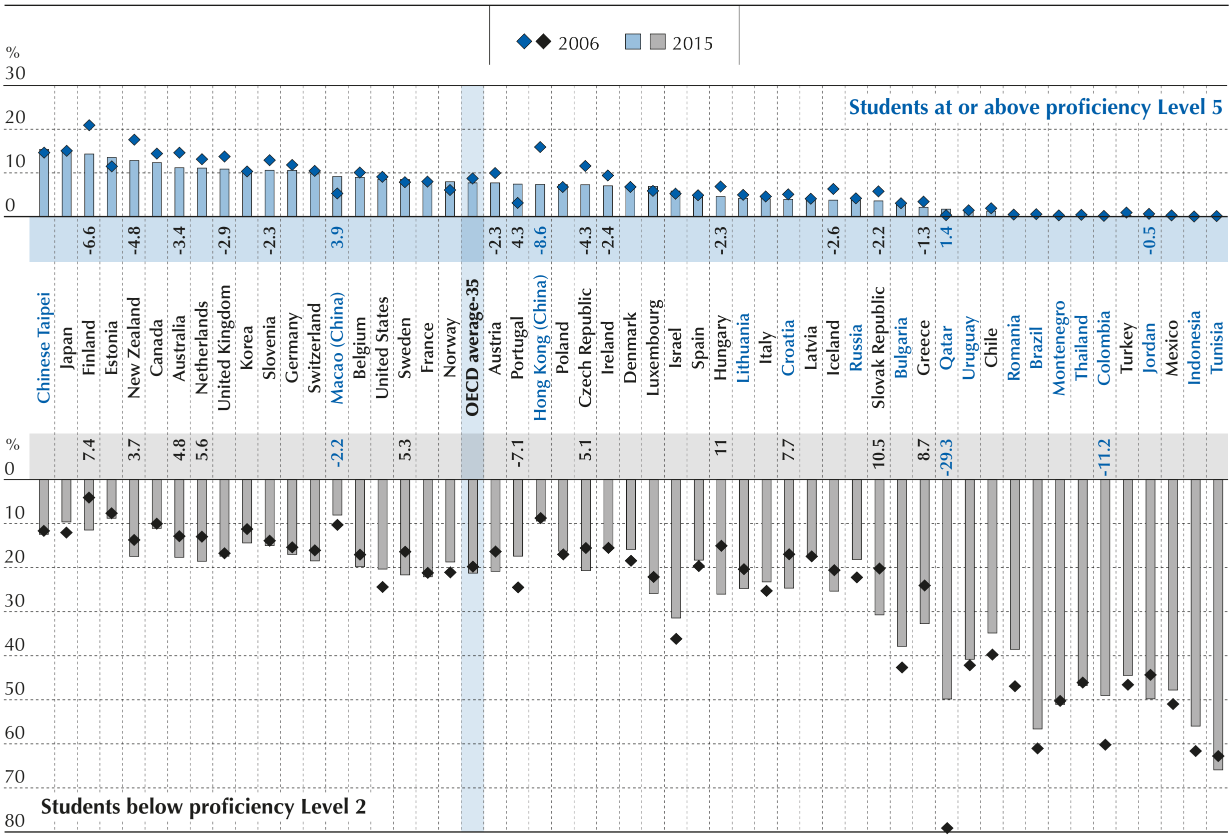
Meanwhile, in Australia, the Czech Republic, Finland, Greece, Hungary, New Zealand and the Slovak Republic, the share of students performing at or above Level 5 shrank and, at the same time, the share of students performing below Level 2 grew. In Croatia, the Netherlands and Sweden, the share of low-achieving students increased, but no significant change was observed in the share of top-performing students. And in Austria, Hong Kong (China), Iceland, Ireland, Jordan, Slovenia and the United Kingdom, the share of top performers shrank, but the share of low-achieving students remained stable.

On average across OECD countries, the variation in students' science proficiency remained broadly stable between 2006 and 2015, with similar, non-significant changes across the performance distribution (Tables I.2.4b and I.2.4c).

Between 2006 and 2015, a widening of differences in student performance – measured by the distance between the 10th and the 90th percentile in performance – was observed in Estonia, Finland, Hungary, Korea, Luxembourg, Montenegro, Qatar, the Slovak Republic and Sweden. In Qatar, science performance improved at all levels of the distribution; but the improvement was significantly larger at the top (90th percentile) than at the bottom (10th percentile). In Estonia, Korea, Luxembourg and Montenegro, performance trends at the top (among the highest-achieving students) and at the bottom (among the lowest-achieving students) show non-significant improvements or declines – but the difference between these trends is significant. In Korea and Sweden, performance remained stable at the top, but declined among the lowest-achieving students. And in Finland, Hungary and the Slovak Republic, performance deteriorated at all levels of proficiency, but more so among the lowest-achieving students (Figure I.2.27 and Table I.2.4c).

Demographic shifts, particularly increases in the immigrant population, sometimes contributed to widening disparities in performance. This is the case in Qatar, where immigrant students typically perform better than non-immigrant students; and in Luxembourg and Sweden, where immigrant students perform worse than non-immigrant students, and their number increased significantly in recent years. In all three countries, however, demographic shifts account for only part of the observed trend. In the remaining countries/economies with widening performance differences, the observed trend at the top and bottom of the performance distribution differs by fewer than 1.5 points from the trends adjusted for shifts in the country's/economy's demographic composition (Table I.2.4f).

Figure I.2.26 ▪ **Percentage of low-achieving students and top performers in science in 2006 and 2015**



Notes: Only countries/economies that participated in both 2006 and 2015 PISA assessments are shown.
The change between PISA 2006 and PISA 2015 in the share of students performing below Level 2 in science is shown below the country/economy name.
The change between PISA 2006 and PISA 2015 in the share of students performing at or above Level 5 in science is shown above the country/economy name.
Only statistically significant changes are shown (see Annex A3).
Countries and economies are ranked in descending order of the percentage of students performing at or above Level 5 in 2015.
Source: OECD, PISA 2015 Database, Table I.2.2a.
StatLink http://dx.doi.org/10.1787/888933432188

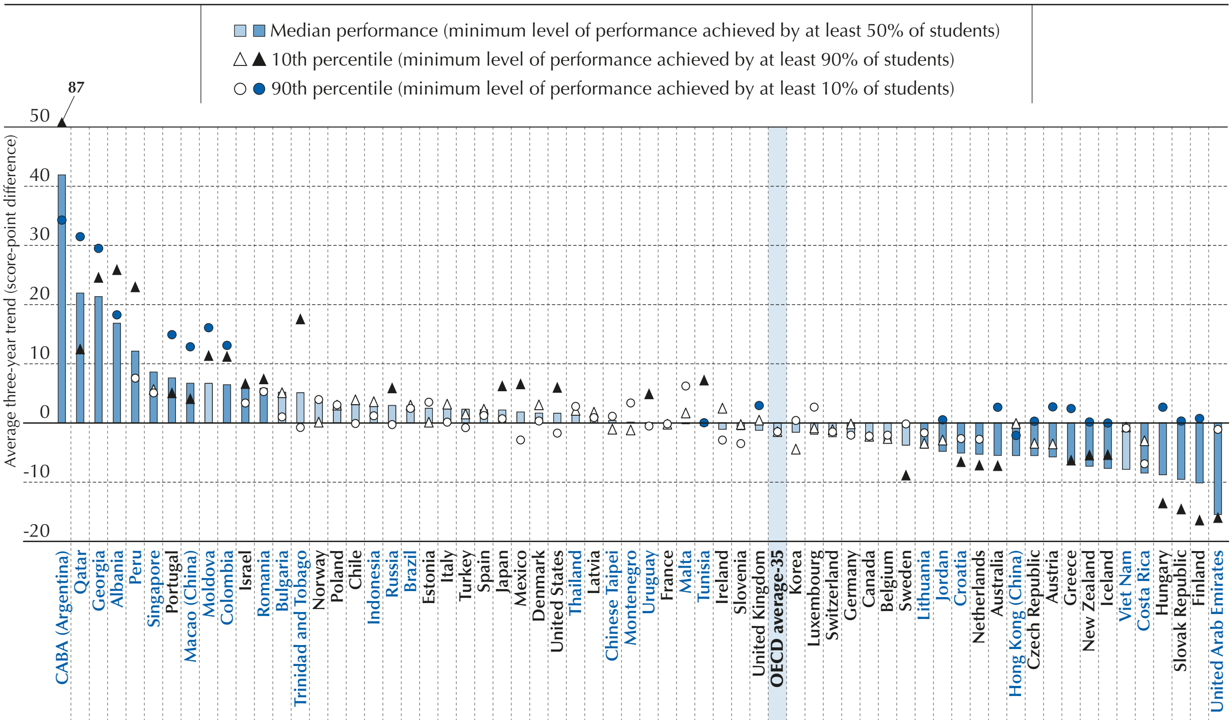
Meanwhile, nine other countries and economies (Hong Kong [China], Iceland, Ireland, Mexico, Russia, Tunisia, the United Kingdom, the United States and Uruguay) saw a narrowing of differences in PISA performance. In Mexico, Tunisia, the United States and Uruguay, this reduction reflects improvements among the lowest-performing students, with no significant improvement (and, in the case of Tunisia, a concurrent decline) in performance among the highest-performing students. In Hong Kong (China) and the United Kingdom, performance remained stable at the

A corrigendum has been issued for this page. See: http://www.oecd.org/about/publishing/Corrigenda-PISA2015-VolumeI.pdf

10th percentile, but decreased significantly at the top (90th percentile). In Ireland and Russia, neither the positive trend among the lowest-performing students nor the negative trend among the highest-performing students is significant; but the difference between the two trends is significant, and signals a shrinking gap between the top and the bottom. In Iceland, the trend is negative both at the 90th percentile and at the 10th percentile, but more so at the bottom (10th percentile) (Figure I.2.27; Tables I.2.4c and I.2.4f).

Figure I.2.27 ▪ **Trends in science performance among high and low achievers**

Average three-year trends in science since 2006



Notes: Statistically significant differences are marked in a darker tone (see Annex A3).

The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. This model takes into account that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Only countries/economies with valid results for PISA 2015 and at least one prior assessment are shown.

Countries and economies are ranked in descending order of the median average three-year trend in science performance.

Source: OECD, PISA 2015 Database, Table I.2.4b.

StatLink http://dx.doi.org/10.1787/888933432199

STUDENTS' PERFORMANCE IN DIFFERENT AREAS OF SCIENCE

In general, scores on any section of the PISA science test are highly correlated with the overall science score. Students who perform well on items classified in one framework category tend to perform well in the other areas of science too. However, at the country level, there is some variation in performance across different subscales. This variation could reflect differences in emphasis in the country's/economy's curriculum. Within the broad domain of science, countries tend to have strong points, where they perform clearly above other countries with otherwise similar performance, and weak points, where they perform worse than countries with similar performance in the remaining areas. This section analyses country's/economy's strong and weak points by looking at differences in mean performance across the PISA science subscales.[15]

Because the science test used in the countries that conducted the PISA 2015 assessment on paper includes only a sample of all science questions, it is not possible to compute subscale scores for these countries with the same reliability as for countries that conducted the PISA 2015 test on computer. For this reason, only countries that used the computer-based science test are included in the following figures and discussion.

Figure I.2.28 ■ Comparing countries and economies on the different science competency subscales

	Mean performance in science (overall science scale)	Mean performance on each science competency subscale			Relative strengths in science: Mean performance on the science competency subscale…[1]		
		Explain phenomena scientifically	Evaluate and design scientific enquiry	Interpret data and evidence scientifically	… explain phenomena scientifically (ep) is higher than on…	… evaluate and design scientific enquiry (ed) is higher than on …	… interpret data and evidence scientifically (id) is higher than on…
Singapore	556	553	560	556		ep id	
Japan	538	539	536	541			ed
Estonia	534	533	535	537			
Chinese Taipei	532	536	525	533	ed		ed
Finland	531	534	529	529	id		
Macao (China)	529	528	525	532			ep ed
Canada	528	530	530	525	id	id	
Hong Kong (China)	523	524	524	521			
B-S-J-G (China)	518	520	517	516			
Korea	516	510	515	523		ep	ep ed
New Zealand	513	511	517	512		ep id	
Slovenia	513	515	511	512	ed		
Australia	510	510	512	508			
United Kingdom	509	509	508	509			
Germany	509	511	506	509	ed		ed
Netherlands	509	509	511	506	id	id	
Switzerland	506	505	507	506			
Ireland	503	505	500	500	ed id		
Belgium	502	499	507	503		ep id	ep
Denmark	502	502	504	500			
Poland	501	501	502	501			
Portugal	501	498	502	503		ep	ep
Norway	498	502	493	498	ed id		ed
United States	496	492	503	497		ep id	ep
Austria	495	499	488	493	ed id		ed
France	495	488	498	501		ep	ep
Sweden	493	498	491	490	ed id		
OECD average	**493**	**493**	**493**	**493**			ed
Czech Republic	493	496	486	493	ed		ed
Spain	493	494	489	493	ed		ed
Latvia	490	488	489	494			ep ed
Russia	487	486	484	489			ed
Luxembourg	483	482	479	486	ed		ep ed
Italy	481	481	477	482			ed
Hungary	477	478	474	476			
Lithuania	475	478	478	471	id	id	
Croatia	475	476	473	476			
Iceland	473	468	476	478		ep	ep
Israel	467	463	471	467		ep id	ep
Slovak Republic	461	464	457	459	ed id		
Greece	455	454	453	454			
Chile	447	446	443	447	ed		
Bulgaria	446	449	440	445	ed id		
United Arab Emirates	437	437	431	437	ed		ed
Uruguay	435	434	433	436			
Cyprus*	433	432	430	434			ed
Turkey	425	426	428	423		id	
Thailand	421	419	423	422			
Costa Rica	420	420	422	415	id	id	
Qatar	418	417	414	418			ed
Colombia	416	412	420	416		ep id	ep
Mexico	416	414	415	415			
Montenegro	411	411	408	410			
Brazil	401	403	398	398	id		
Peru	397	392	399	398		ep	ep
Tunisia	386	385	379	390	ed		ep ed
Dominican Republic	332	332	324	330	ed		ed

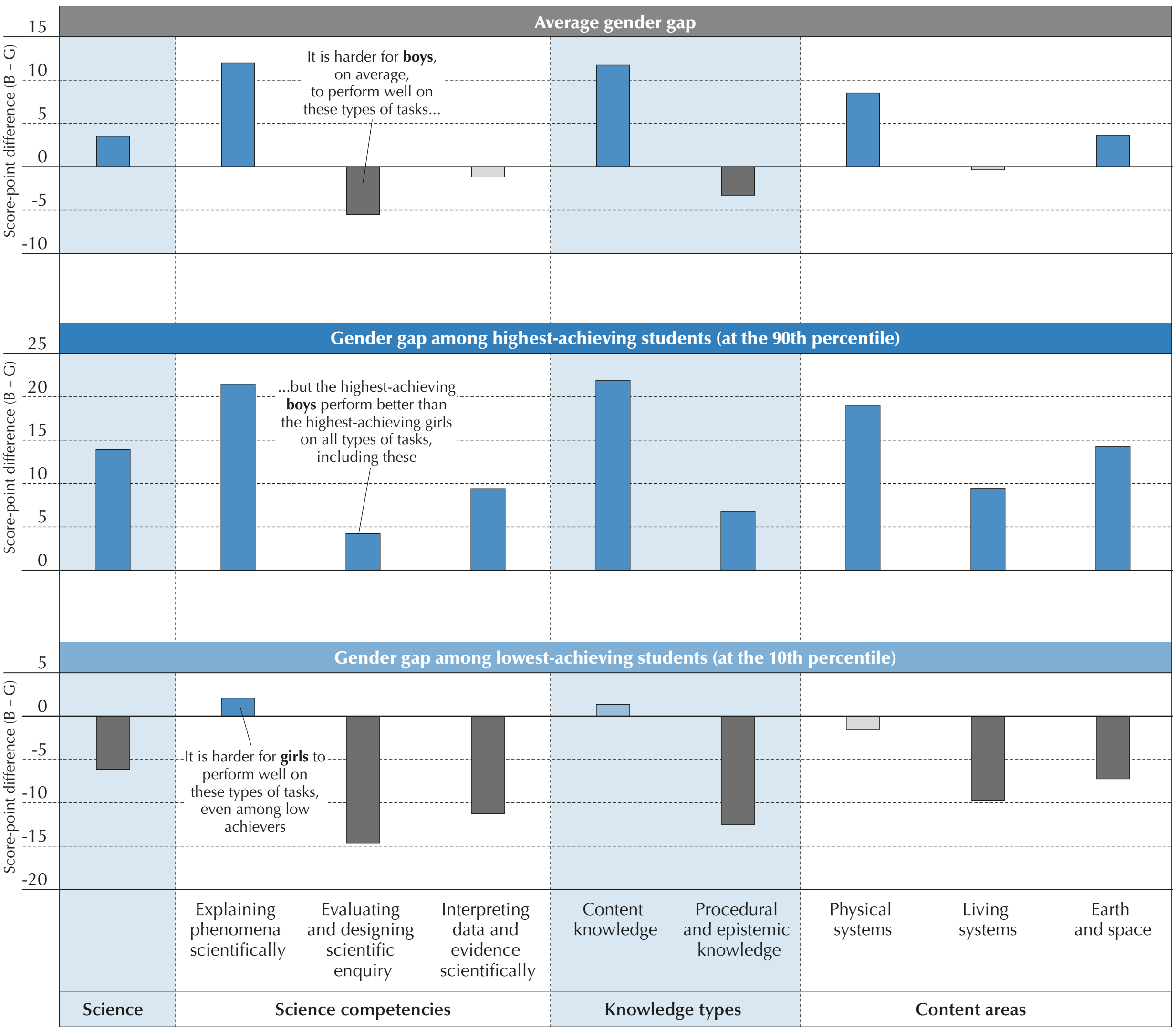
* See note 1 under Figure I.2.13.
1. Relative strengths are highlighted in a darker tone; empty cells indicate cases where the subscale score is not significantly higher compared to other subscales, including cases in which it is lower. Competency subscales are indicated by the following abbreviations: ep – explain phenomena scientifically; ed – evaluate and design scientific enquiry; id - interpret data and evidence scientifically.
Note: Only countries and economies where PISA 2015 was delivered on computers are shown.
Countries and economies are ranked in descending order of mean science performance.
Source: OECD, PISA 2015 Database, Table I.2.13.
StatLink http://dx.doi.org/10.1787/888933432201

Relative strengths and weaknesses of countries/economies in science competency subscales

As discussed above, each item in the PISA 2015 science test was assigned to one of the competency categories, even if solving an item often involved more than one of these competencies. Almost half of all items required that students mainly explain phenomena scientifically; about 30% required them to interpret data and evidence scientifically; and the remaining quarter emphasised the capacity to evaluate and design scientific enquiry. Sometimes, within the same unit, the different items emphasised, in turns, different competencies. Such is the case, for instance, in the released unit *BIRD MIGRATION* (see Annex C1). After a question that asks students to explain phenomena scientifically, in the second question, students must evaluate and design scientific enquiry, and in the last question, they must interpret data and evidence scientifically.

Figure I.2.29 ▪ **Boys' and girls' strengths and weaknesses in science**

Score-point difference between boys and girls, OECD average



Notes: All gender differences are statistically significant among the highest-achieving students. Gender differences among average and the lowest-achieving students that are statistically significant are marked in a darker tone (see Annex A3).

Gender differences in favour of girls are shown in grey.

Source: OECD, PISA 2015 Database, Tables I.2.7, I.2.16d, I.2.17d, I.2.18d, I.2.19d, I.2.20d, I.2.21d, I.2.22d and I.2.23d.

StatLink http://dx.doi.org/10.1787/888933432213

Figure I.2.28 shows the country/economy mean for the overall science scale and for each of the competency subscales. It also includes an indication of which differences among the subscale means are significant, through which a country's strengths and weaknesses can be inferred. For instance, while Singapore is the top-performing country in science and in each of the three scientific competencies, it is relatively stronger in students' capacity to evaluate and design scientific enquiry, where the mean performance of students lies clearly above the country's mean performance in the other two competencies (explaining phenomena scientifically and interpreting data and evidence scientifically).

In contrast, students in Chinese Taipei, which appears fourth in the list, are relatively stronger in explaining phenomena scientifically and in interpreting data and evidence scientifically. Korea performs strongest in interpreting data and evidence scientifically, followed by evaluating and designing scientific enquiry, and is comparatively weaker in explaining phenomena scientifically.

Among the remaining countries/economies, Belgium, Israel and the United States stand out for their strong performance in evaluating and designing scientific enquiry in comparison with their performance in explaining phenomena scientifically. France is also relatively weaker in explaining phenomena scientifically. Its comparative strengths are in both evaluating and designing scientific enquiry, and interpreting data and evidence scientifically.

A closer look at gender differences in performance across the different types of science tasks reveals that, in most countries, girls lag behind boys in explaining phenomena scientifically (by 12 score points, on average across OECD countries) (Table I.2.16d). Boys' strength in science lies in their greater capacity, on average, to recall and apply their knowledge of science, identify or generate explanatory models for a situation, and make predictions based on such models. At the same time, boys and girls perform at similar levels when they are asked to interpret data and evidence scientifically (Table I.2.18d). In most countries, girls' relative strength lies in their competency in evaluating and designing scientific enquiry (Table I.2.17d) (Figure I.2.29).

Relative strengths and weaknesses of countries/economies in science knowledge subscales

Science literacy requires an understanding of the major facts, concepts and explanatory theories that form the basis of scientific knowledge. Such understanding encompasses both knowledge of the natural world and of technological artefacts (content knowledge), knowledge of how such ideas are produced (procedural knowledge), and an understanding of the underlying rationale for these procedures and the justifications for using them (epistemic knowledge).

While all items in the PISA 2015 science test were assigned to one of those three knowledge categories, for the purposes of deriving subscales, the latter two categories were combined in the "procedural and epistemic knowledge" subscale. Indeed, there were too few "epistemic knowledge" tasks to support a separate subscale with desirable properties. Approximately half of all the assessment items mainly tested students' content knowledge. Three-quarters of the remaining items assessed procedural knowledge, and the other items (or one-tenth of all science items) aimed to assess students' epistemic knowledge.

Figure I.2.30 shows the country/economy mean for the overall science scale and for the two science knowledge subscales. A dark highlight on the right side of the figure indicates when one of the subscale mean scores is significantly higher than the other. For example, among countries performing close to the OECD average, France and the United States are relatively stronger in their students' capacity to solve questions relating to procedural and epistemic knowledge, whereas Austria, the Czech Republic, Norway and Sweden are relatively stronger in their students' capacity to solve questions relating to content knowledge. Despite these differences on the knowledge subscales, however, the mean scores of these four countries on the overall science scale are not statistically different from each other.

Gender differences in science performance, in favour of boys, are more pronounced when students respond to questions that require content knowledge than when the questions are about procedural or epistemic knowledge (Figure I.2.29). On average across OECD countries, the difference between boys' and girls' scores in science is only 4 points (Table I.2.7); but boys score 12 points higher than girls, on average, on the content knowledge subscale (Table I.2.19d), and girls score 3 points higher than boys on the procedural and epistemic knowledge subscale (Table I.2.20d). This may suggest that, compared with boys, girls are more interested in knowing how scientists enquire and build scientific theories, while boys are relatively more interested in the explanations of natural and technological phenomena that science provides.

Figure I.2.30 ▪ Comparing countries and economies on the different science knowledge subscales

	Mean performance in science (overall science scale)	Mean performance on each science knowledge subscale		Relative strengths in science: mean performance on the science knowledge subscale…[1]	
		Content knowledge	Procedural and epistemic knowledge	… content knowledge (co) is higher than on…	… procedural and epistemic knowledge (pe) is higher than on…
Singapore	556	553	558		co
Japan	538	539	538		
Estonia	534	534	535		
Chinese Taipei	532	538	528	pe	
Finland	531	534	528	pe	
Macao (China)	529	527	531		co
Canada	528	528	528		
Hong Kong (China)	523	526	521	pe	
B-S-J-G (China)	518	520	516	pe	
Korea	516	513	519		co
New Zealand	513	512	514		
Slovenia	513	515	512	pe	
Australia	510	508	511		
United Kingdom	509	508	510		
Germany	509	512	507	pe	
Netherlands	509	507	509		
Switzerland	506	506	505		
Ireland	503	504	501	pe	
Belgium	502	498	506		co
Denmark	502	502	502		
Poland	501	502	501		
Portugal	501	500	502		
Norway	498	502	496	pe	
United States	496	490	501		co
Austria	495	501	490	pe	
France	495	489	499		co
Sweden	493	498	491	pe	
OECD average	**493**	**493**	**493**		
Czech Republic	493	499	488	pe	
Spain	493	494	492		
Latvia	490	489	492		co
Russia	487	488	485		
Luxembourg	483	483	482		
Italy	481	483	479	pe	
Hungary	477	480	474	pe	
Lithuania	475	478	474	pe	
Croatia	475	476	475		
Iceland	473	468	477		co
Israel	467	462	470		co
Slovak Republic	461	463	458	pe	
Greece	455	455	454		
Chile	447	448	446		
Bulgaria	446	447	445		
United Arab Emirates	437	437	435		
Uruguay	435	434	436		
Cyprus*	433	430	434		co
Turkey	425	425	425		
Thailand	421	420	422		
Costa Rica	420	421	417	pe	
Qatar	418	416	418		
Colombia	416	413	417		co
Mexico	416	414	416		
Montenegro	411	409	411		
Brazil	401	400	401		
Peru	397	392	399		co
Tunisia	386	386	386		
Dominican Republic	332	331	330		

* See note 1 under Figure I.2.13.
1. Relative strengths are highlighted in a darker tone; empty cells indicate cases where the subscale score is not significantly higher compared to other subscales, including cases in which it is lower. Knowledge subscales are indicated by the following abbreviations: co - content knowledge; pe - procedural and epistemic knowledge.
Note: Only countries and economies where PISA 2015 was delivered on computers are shown.
Countries and economies are ranked in descending order of mean science performance.
Source: OECD, PISA 2015 Database, Table I.2.14.
StatLink http://dx.doi.org/10.1787/888933432228

Relative strengths and weaknesses of countries/economies in science content subscales

The content for the PISA 2015 assessment of science came from topics in the major fields of physics, chemistry, biology, and earth and space science. In order to ensure a balanced representation of different content domains, all items were classified into one of three content areas:

- the "physical" systems content area, comprising all items that require, for example, knowledge of the structure and properties of matter, including its chemical properties, chemical reactions, motion and forces, magnetic fields, energy and its transformation, and interactions between energy and matter
- the "living" systems content area, comprising all items that require, for example, knowledge of the cell and its structures (e.g. DNA), the concept of an organism, human biology, populations (e.g. species and their evolutionary dynamics), ecosystems and the biosphere
- the "earth and space" systems content area, comprising all items that require, for example, knowledge about the structure of earth systems (e.g. atmosphere), changes in earth systems (e.g. plate tectonics), the earth's history, the solar system, and the history and scale of the universe.

Each content category is represented in about one-third of the units in the PISA 2015 assessment. Items, rather than units, were classified according to content system. The classification describes the content knowledge that is required to answer a particular question, rather than general features of the stimulus material. For instance, within the unit *SUSTAINABLE FISH FARMING,* the first three questions are classified in the "living systems" content category while the last question is classified in the "physical systems" category.

Different countries emphasise different topics in their curricula and, depending on their interests and perhaps on the extent to which they are affected by related phenomena (e.g. earthquakes, air pollution or disease), students may be more or less familiar with particular topics that are related to the three content categories in PISA.

Figure I.2.31 shows the country/economy mean for the overall science scale and for the three science content subscales. A highlight on the right side of the panel indicates score differences between subscales that are statistically significant, and signals, for each country/economy, content areas in which performance is relatively strong compared to other areas.

In general, differences across countries/economies mirror those found on the overall science scale, and mean score differences across subscales amount to only a few points. Many countries performing below the OECD average, however, are relatively stronger in the "living systems" content area. This relative strength compared to the two other content areas is particularly marked in Brazil, Peru and Qatar. In these countries/economies, the mean score is at least eight points higher on the living systems subscale than on each of the two other content subscales.

Gender differences in performance across different content areas are broadly similar to overall gender differences in science, with narrower variations than observed across competency or knowledge subscales (Figure I.2.29). Boys outperform girls by nine points, on average across OECD countries, on the physical systems subscale (Table I.2.21d), and by four points on the earth and space systems subscale (Table I.2.23d). Boys and girls have the same mean performance on the living systems subscale, on average (Table I.2.22d).

STUDENTS' EPISTEMIC BELIEFS ABOUT SCIENCE

Science literacy, as defined in PISA, encompasses not only knowledge of the natural world and of technological artefacts (content knowledge), but also knowledge of how such ideas are produced by scientists, and an understanding of the goal of scientific enquiry and of the nature of scientific claims (procedural and epistemic knowledge) (OECD, 2016b). PISA measured whether students are able to use their knowledge about the means and goals of science in order to interpret scientific claims through test items that are classified in the "epistemic knowledge" category, such as those in the unit *SLOPE-FACE INVESTIGATION*.

Through the background questionnaire, PISA 2015 asked students to answer questions about their personal epistemic beliefs about science, i.e. their beliefs about the nature of knowledge in science and about the validity of scientific methods of enquiry as a source of knowing. Students whose epistemic beliefs are in agreement with current views about the nature of science can be said to value scientific approaches to enquiry.

Figure I.2.31 ▪ **Comparing countries and economies on the different science content subscales**

	Mean performance in science (overall science scale)	Mean performance on each science content subscale			Relative strengths in science: mean performance on the science content subscale…[1]		
		Physical systems	Living systems	Earth and space systems	… physical systems (ph) is higher than on…	… living systems (li) is higher than on …	… earth and space systems (es) is higher than on…
Singapore	556	555	558	554		ph es	
Japan	538	538	538	541			
Estonia	534	535	532	539	li		ph li
Chinese Taipei	532	531	532	534			
Finland	531	534	527	534	li		li
Macao (China)	529	533	524	533	li		li
Canada	528	527	528	529			
Hong Kong (China)	523	523	523	523			
B-S-J-G (China)	518	520	517	516			
Korea	516	517	511	521	li		ph li
New Zealand	513	515	512	513			
Slovenia	513	514	512	514			
Australia	510	511	510	509			
United Kingdom	509	509	509	510			
Germany	509	505	509	512		ph	ph
Netherlands	509	511	503	513	li		li
Switzerland	506	503	506	508			ph
Ireland	503	507	500	502	li es		
Belgium	502	499	503	503		ph	ph
Denmark	502	508	496	505	li		li
Poland	501	503	501	501			
Portugal	501	499	503	500		ph	
Norway	498	503	494	499	li		li
United States	496	494	498	496		ph	
Austria	495	497	492	497	li		li
France	495	492	496	496		ph	ph
Sweden	493	500	488	495	li es		li
OECD average	**493**	**493**	**492**	**494**	li		li
Czech Republic	493	492	493	493			
Spain	493	487	493	496		ph	ph
Latvia	490	490	489	493			ph li
Russia	487	488	483	489	li		li
Luxembourg	483	478	485	483		ph	ph
Italy	481	479	479	485			ph li
Hungary	477	481	473	477	li		
Lithuania	475	478	476	471	es	es	
Croatia	475	472	476	477		ph	ph
Iceland	473	472	476	469	es	ph es	
Israel	467	469	469	457	es	es	
Slovak Republic	461	466	458	458	li es		
Greece	455	452	456	453		ph es	
Chile	447	439	452	446		ph es	ph
Bulgaria	446	445	443	448			li
United Arab Emirates	437	434	438	435			
Uruguay	435	432	438	434		ph	
Cyprus*	433	433	433	430		es	
Turkey	425	429	424	421	li es		
Thailand	421	423	422	416	es	es	
Costa Rica	420	417	420	418		ph	
Qatar	418	415	423	409	es	ph es	
Colombia	416	414	419	411		ph es	
Mexico	416	411	415	419		ph	ph
Montenegro	411	407	413	410		ph	
Brazil	401	396	404	395		ph es	
Peru	397	389	402	393		ph es	
Tunisia	386	379	390	387		ph	ph
Dominican Republic	332	332	332	324	es	es	

* See note 1 under Figure I.2.13.
1. Relative strengths are highlighted in a darker tone; empty cells indicate cases where the subscale score is not significantly higher compared to other subscales, including cases in which it is lower. Content subscales are indicated by the following abbreviations: ph - physical systems; li - living systems; es - earth and space systems.
Note: Only countries and economies where PISA 2015 was delivered on computers are shown.
Countries and economies are ranked in descending order of mean science performance.
Source: OECD, PISA 2015 Database, Table I.2.15.
StatLink http://dx.doi.org/10.1787/888933432235

Epistemic beliefs are individuals' representations about the nature, organisation and source of knowledge, e.g. what counts as "true" and how the validity of an argument can be established (Hofer and Pintrich, 1997). When students seek knowledge and understanding, adopt a questioning approach to all statements, search for data and their meaning, demand verification, respect logic and pay attention to premises, they can be said to have a "scientific attitude" and to support scientific approaches to enquiry. Indeed, these are the features that characterise scientific thinking. Such beliefs and dispositions have been shown to be directly related both to students' ability to acquire new knowledge in science and to their grades in school science (Mason et al., 2012).

Epistemic beliefs change with age, as a result of cognitive development and education (Kuhn, Cheney and Weinstock, 2000). In the domain of science, older students are more likely to believe that scientific knowledge is complex, tentative and evolving, is not the property of omniscient authorities, and can be validated in the light of corroborative evidence (Mason et al. 2012). Beliefs about science as an evolving and constantly changing body of knowledge, and about the need for scientific experiments in justifying scientific knowledge, are also related to students' beliefs about learning – particularly to the belief that ability is an incremental, rather than a fixed, attribute (Chen and Pajares, 2010).

PISA did not measure all epistemic beliefs, but focused on measuring students' beliefs about the validity and limitations of scientific experiments and about the tentative and evolving nature of scientific knowledge. It did so through students' responses ("strongly agree", "agree", "disagree" or "strongly disagree") to the statements: "a good way to know if something is true is to do an experiment"; "ideas in science sometimes change"; "good answers are based on evidence from many different experiments"; "it is good to try experiments more than once to make sure of [your] findings"; "sometimes scientists change their minds about what is true in science"; and "the ideas in science books sometimes change". These statements are related to beliefs that scientific knowledge is tentative (to the extent that students recognise that scientific theories are not absolute truths, but evolve over time) and to beliefs about the validity and limitations of empirical methods of enquiry as a source of knowing.

Average levels of support for scientific approaches to enquiry

On average across OECD countries, 84% of students reported that they agree or strongly agree that a good way to know if something is true is to do an experiment; 81% reported that ideas in science sometimes change; 86% reported that good answers are based on evidence from many different experiments; 85% reported that it is good to try experiments more than once to make sure of [your] findings; 80% reported that sometimes scientists change their minds about what is true in science; and 79% reported that the ideas in science books sometimes change (Figure I.2.32).

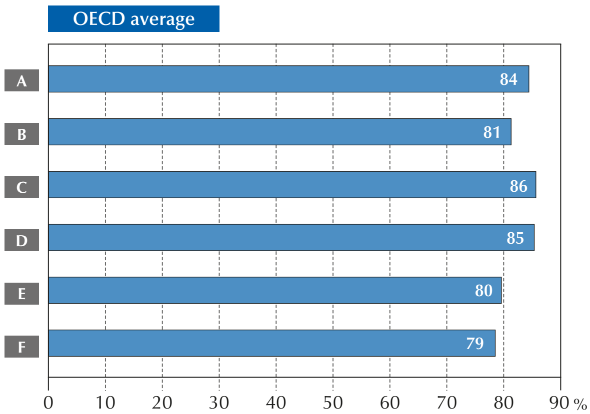
These high percentages reflect broad support for scientific approaches to enquiry, but responses vary markedly among countries and economies. While in Ireland, Singapore and Chinese Taipei more than 93% of students reported that good answers are based on evidence from many different experiments, less than 77% of students in Albania, Algeria, Austria, Montenegro and Turkey agreed with that statement (and more than 23% disagreed) (Table I.2.12a). And while more than nine out of ten students in Australia, Ireland, New Zealand, Portugal, Chinese Taipei, the United Kingdom and the United States agreed that ideas in science sometimes change – reflecting an understanding of science as a changing and evolving body of knowledge – more than one in three students in Austria, Indonesia, Lebanon, Romania and Tunisia disagreed.

Country differences in indices and proportions derived from questionnaire scales must be interpreted with caution, as it is not possible to investigate, with the same rigour applied to test items, whether questionnaire items are equivalent across languages and countries. Because the number of items used to measure self-reported attitudes is limited, a single item whose wording is not understood in the same way across languages may have a disproportionate impact on country/economy rankings on the index derived from these items. Also, a lack of response to the background questionnaire (whether to the entire questionnaire, which is separate from the cognitive test, or to individual questions within the questionnaire) can affect international comparisons. However, the uncertainty about the cross-cultural equivalence of questionnaire scales has less impact on within-country comparisons (e.g. between boys and girls) or on comparisons of associations between questionnaire scales and performance (see Box I.2.4).

Figure I.2.32 ■ Students' epistemic beliefs

Percentage of students who "agree" or "strongly agree" with the following statements

- **A** A good way to know if something is true is to do an experiment
- **B** Ideas in <broad science> sometimes change
- **C** Good answers are based on evidence from many different experiments
- **D** It is good to try experiments more than once to make sure of your findings
- **E** Sometimes <broad science> scientists change their minds about what is true in science
- **F** The ideas in <broad science> science books sometimes change



		A	B	C	D	E	F
OECD	Australia	89	92	92	93	87	86
	Austria	73	63	76	77	67	67
	Belgium	88	82	88	86	82	79
	Canada	89	89	91	92	88	87
	Chile	80	77	81	83	75	71
	Czech Republic	82	79	84	83	81	77
	Denmark	88	85	89	87	89	81
	Estonia	88	85	89	89	83	85
	Finland	84	84	87	87	78	81
	France	88	83	86	84	81	80
	Germany	78	71	79	76	65	66
	Greece	80	70	85	84	75	70
	Hungary	78	71	81	80	68	70
	Iceland	87	88	90	90	87	85
	Ireland	93	92	93	94	82	82
	Israel	86	84	86	86	81	78
	Italy	86	80	84	87	77	76
	Japan	81	82	85	81	76	77
	Korea	86	89	87	88	88	86
	Latvia	81	79	81	77	79	78
	Luxembourg	80	68	80	78	68	68
	Mexico	84	76	83	80	75	77
	Netherlands	85	81	85	85	77	72
	New Zealand	90	91	91	93	86	84
	Norway	84	83	87	85	84	80
	Poland	86	78	85	85	80	83
	Portugal	90	91	91	93	89	90
	Slovak Republic	75	75	78	77	75	73
	Slovenia	89	87	89	90	81	78
	Spain	85	82	87	88	81	81
	Sweden	86	86	87	88	86	84
	Switzerland	81	70	81	80	71	71
	Turkey	73	72	76	76	72	71
	United Kingdom	90	92	91	93	87	87
	United States	90	92	91	92	86	87
Partners	Albania	85	78	75	85	75	89
	Algeria	79	71	75	78	64	65
	CABA (Argentina)	84	85	84	87	80	75
	Brazil	85	84	88	88	82	79
	Bulgaria	81	77	82	80	77	77
	B-S-J-G (China)	89	83	91	87	82	82
	Chinese Taipei	88	94	94	94	93	94
	Colombia	81	77	82	84	75	72
	Costa Rica	79	75	81	83	78	77
	Croatia	89	87	89	85	83	83
	Dominican Republic	78	77	80	80	74	71
	FYROM	78	78	81	84	75	77
	Georgia	86	86	86	86	82	78
	Hong Kong (China)	85	89	90	90	88	86
	Indonesia	92	62	84	90	69	58
	Jordan	75	75	79	81	72	71
	Kosovo	84	80	85	87	74	77
	Lebanon	79	65	81	81	68	67
	Lithuania	81	79	81	79	77	77
	Macao (China)	88	88	91	82	86	85
	Malta	85	86	89	89	76	77
	Moldova	82	83	87	85	80	74
	Montenegro	71	74	77	79	75	75
	Peru	82	79	82	84	76	75
	Qatar	80	78	82	83	77	76
	Romania	76	66	82	79	67	63
	Russia	79	79	83	82	81	78
	Singapore	91	89	94	95	88	87
	Thailand	89	88	89	89	87	87
	Trinidad and Tobago	86	80	87	88	75	75
	Tunisia	78	66	80	82	69	69
	United Arab Emirates	84	82	85	87	80	80
	Uruguay	79	80	80	82	77	77
	Viet Nam	82	82	88	83	78	78

Source: OECD, PISA 2015 Database, Table I.2.12a.

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Box I.2.4 **Cross-country comparability of questionnaire scales**

Most of the indicators of students' science-related beliefs, behaviours and attitudes are based on self-reports. Such measures can suffer from a degree of measurement error, e.g. because students are asked to report their past behaviour retrospectively. Cultural differences in attitudes towards self-enhancement can influence country-level results in students' self-reported beliefs, behaviours and attitudes (Bempechat, Jimenez and Boulay, 2002). The literature consistently shows that response biases, such as social desirability, acquiescence and extreme response choice, are more common in countries with low GDP than in more affluent countries, as they are, within countries, among students from disadvantaged and less-educated families (Buckley, 2009).

In PISA 2015, new scaling methods were introduced to enhance the validity of questionnaire indices, especially for cross-country comparisons. For each item within each scale, an index of item fit was produced for each country-by-language group during the estimation procedure. This fit index provides information about differential item functioning (DIF) across groups and can be used to gauge the overall comparability of scales across countries and language groups.

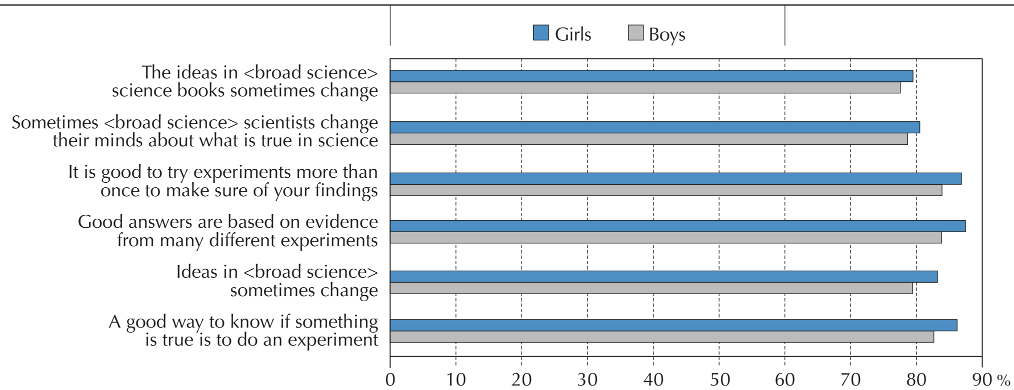
Non-response bias can also affect analyses based on questionnaire items. While statistics based on the science, reading and mathematics proficiency of students are computed on the full PISA sample, student characteristics that are measured through questionnaires are reported as "missing" in the PISA database if the student did not respond to the corresponding question or to the entire questionnaire. The analyses in this report assume that such non-response can be ignored. However, if non-response rates among PISA-participating students are high (e.g., higher than 5% of the sample) and differ significantly across countries, selection bias in the sample used for the analysis may compromise the cross-country comparability of population statistics (such as simple means or correlations with performance). Annex A1 provides for each questionnaire variable used in this volume the percentage of observations for which the information is not missing.

Box I.2.5 **Interpreting PISA questionnaire indices**

Indices used to characterise students' beliefs and attitudes about science were constructed so that, when they were first developed, the average OECD student would have an index value of zero and about two-thirds of the OECD student population would be between the values of -1 and 1 (i.e. the index has a standard deviation of 1). Therefore, negative values on the index do not imply that students responded negatively to the underlying question. Rather, students with negative values on the index are those who responded less positively than the average response across OECD countries. Likewise, students with positive values on the index are those who responded more positively than the average student in OECD countries (see Annex A1 for a detailed description of how indices were constructed).

Figure I.2.33 ■ **Gender differences in students' epistemic beliefs**

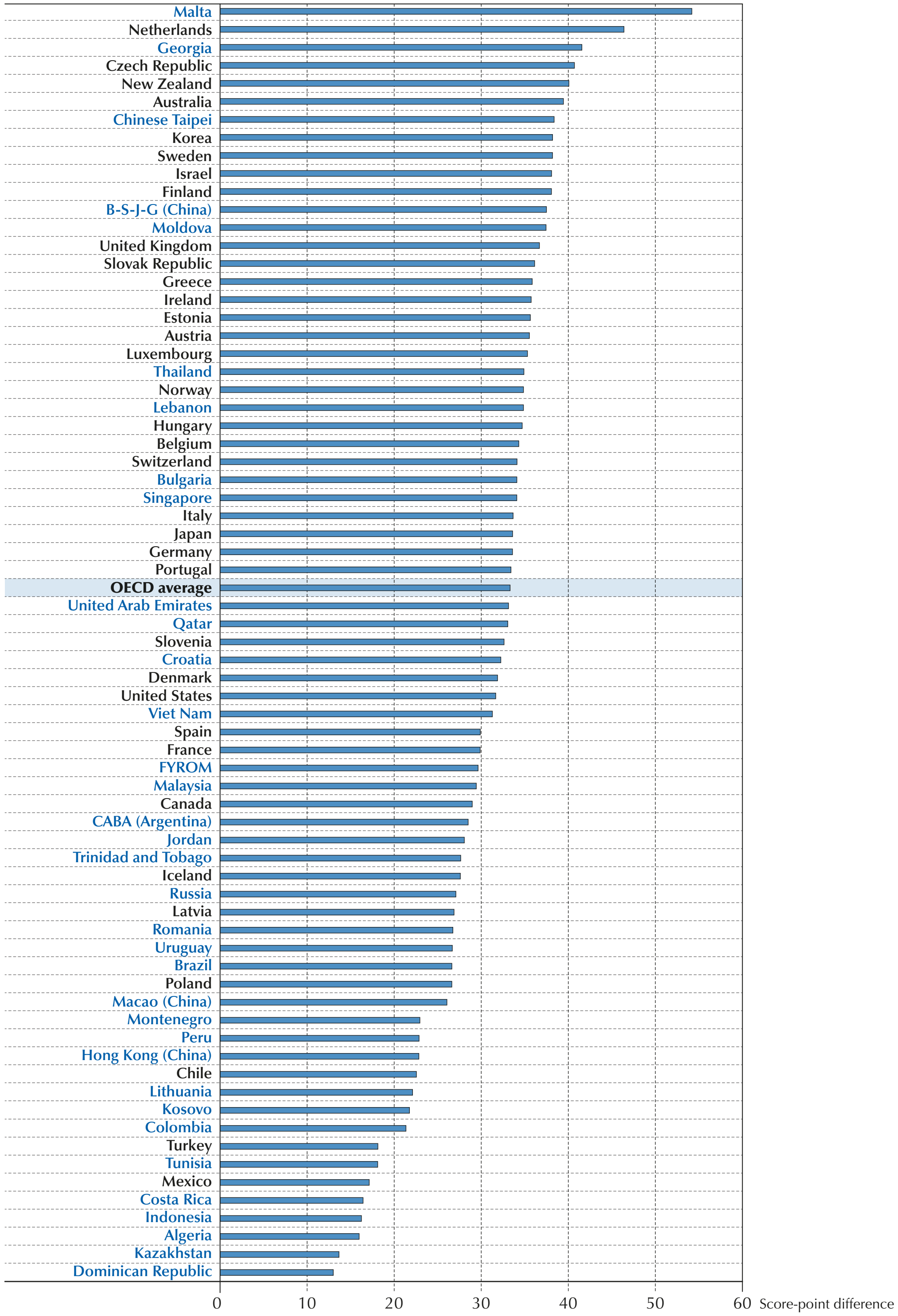
Percentage of students who "agree" or "strongly agree" with the following statements, OECD average



Note: All differences between boys and girls are statistically significant (see Annex A3).
Source: OECD, PISA 2015 Database, Table I.2.12c.
StatLink http://dx.doi.org/10.1787/888933432254

Figure I.2.34 ■ **Relationship between students' belief in scientific approaches to enquiry and science performance**

Score-point difference in science, associated with a one-unit increase on the index of epistemic beliefs



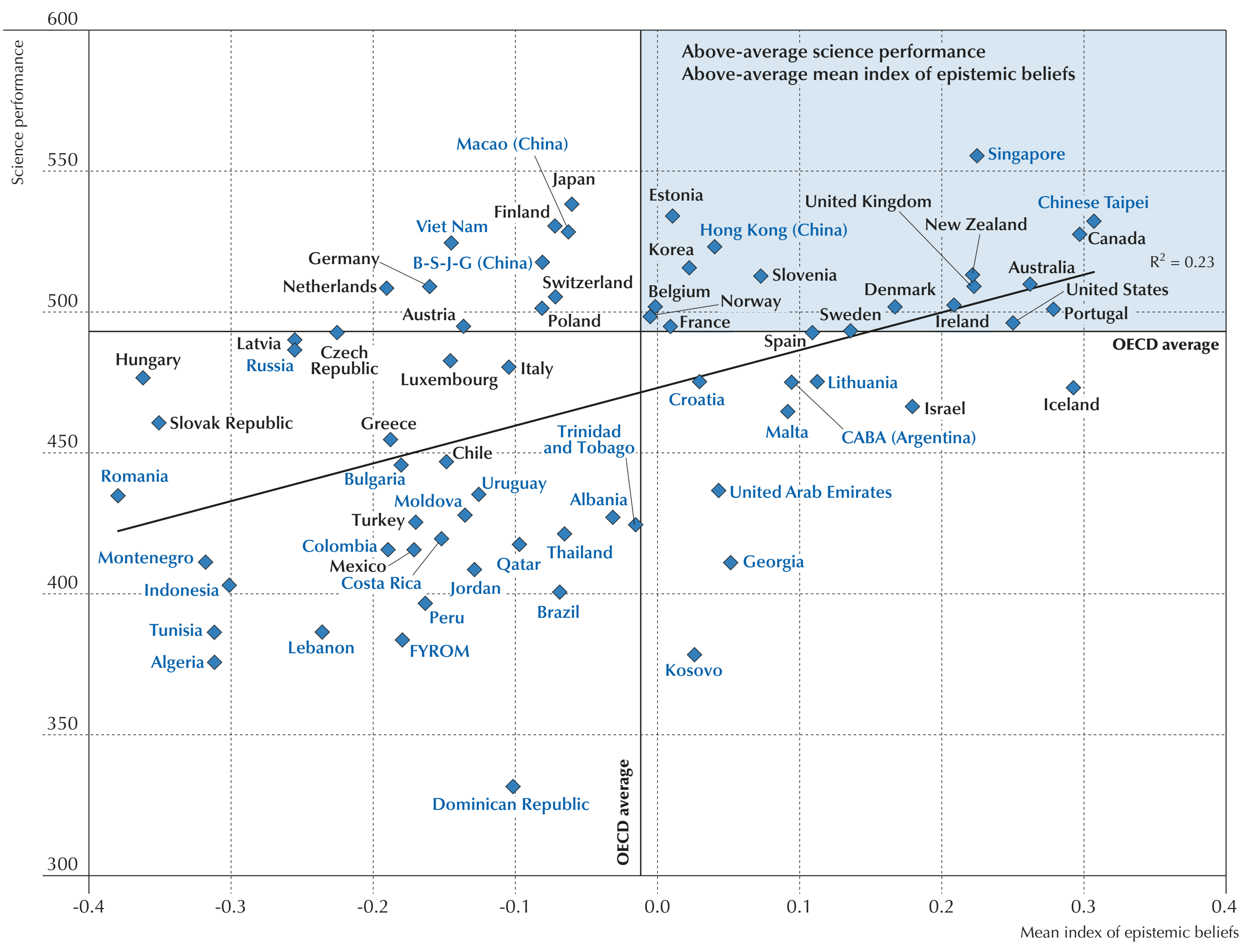
Note: All differences are statistically significant (see Annex A3).
Countries and economies are ranked in descending order of the average score-point difference in science associated with a one-unit increase on the index of epistemic beliefs.
Source: OECD, PISA 2015 Database, Table I.2.12d.
StatLink http://dx.doi.org/10.1787/888933432261

Gender disparities in students' epistemic beliefs are generally small (Figure I.2.33). Where there are differences, the pattern most frequently observed is that of girls reporting more than boys that they support empirical approaches to enquiry as a source of knowing, and that they agree that scientific ideas are tentative and subject to change. The largest such difference between girls and boys is found in Jordan, where 86% of girls reported that a good way to know if something is true is to do an experiment, but only 62% of boys agreed with that statement (Table I.2.12c). Wide differences in favour of girls are also found in FYROM, Georgia, Lithuania and Slovenia.

As Figure I.2.34 indicates, the more strongly students agreed that ideas in science change over time and that experiments provide good ways for establishing whether something is true, the better their performance on the PISA science test, on average. Findings emerging from PISA 2015 cannot be used to establish a direct causal link between personal epistemic beliefs and students' performance on a science test; but PISA shows that the two are closely associated.

The blue bars in Figure I.2.34 denote the estimated difference in science performance that is associated with a difference of one unit on the index of epistemic beliefs about science. This difference corresponds roughly to the difference between a student who "strongly agreed" with the view that a good way to know if something is true is to do an experiment and that it is good to try experiments more than once to make sure of [your] findings, and "agreed" with all other statements; and a student who "agreed" with all statements but one: "disagreeing" with the statement that ideas in science books sometimes change. The former pattern of responses corresponds to an index value of 0.49, half a standard deviation above the OECD average; the latter, to an index value of -0.51.

Figure I.2.35 ■ **System-level association between science performance and students' belief in scientific approaches to enquiry**



Source: OECD, PISA 2015 Database, Tables I.2.3 and I.2.12a.

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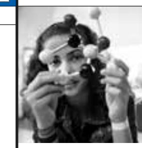


On average across OECD countries, stronger agreement about the tentative, evolving and cumulative nature of scientific knowledge, and stronger support for empirical approaches to scientific enquiry is associated with higher performance on the PISA science assessment. A one-unit increase on the index corresponds to a 33 score-point difference on the science scale – or about the equivalent of one year of schooling. The fact that all the blue bars represent positive values indicates that in all countries and economies, greater levels of agreement with the questions reflecting students' epistemic beliefs are associated with higher performance. Conversely, higher-performing students tended to "agree" more than lower-performing students with the statements that make up this index.

Differences among students in their epistemic beliefs about science account for about 12% of the variation in students' science performance – similar to the proportion of performance variation that is associated with students' socio-economic status (see Chapter 6). While this association is positive and significant in all countries, the association is markedly weaker in Algeria, Costa Rica, the Dominican Republic, Indonesia, Kazakhstan, Mexico and Tunisia. In these countries/economies, less than 6% of the variation in science performance can be explained by differences in students' science-related epistemic beliefs, and the difference in science performance that is associated with a change of one unit on the index of science epistemic beliefs is less than 20 score points (Table I.2.12b).

At the country/economy level, the mean index of epistemic beliefs has a moderately positive association with science performance, as indicated by a correlation of 0.5. Figure I.2.35 shows that in countries with lower mean performance in science, students were less likely to agree that scientific knowledge is tentative and to support scientific approaches to enquiry. At the same time, among countries with higher mean performance in science, there is a greater variation in students' average beliefs about the nature of scientific knowledge and how such knowledge can be acquired. While this indicates a plausible association that may stem from a cause-effect relationship, the cross-sectional nature of the data and the uncertainty about the cross-cultural equivalence of questionnaire scales does not support firm conclusions about the causal mechanisms at play.

Notes

1. Items that require mainly procedural or epistemic knowledge were also classified depending on the content area or system that provides the context for that knowledge.

2. The results of three countries, however, are not fully comparable, because of issues with sample coverage (Argentina), school response rates (Malaysia), or construct coverage (Kazakhstan); see Annex A4. As a consequence, results for these three countries are not included in most figures.

3. Item difficulty on the PISA scale was defined in PISA 2000 for the purpose of defining proficiency levels as corresponding to a 62% probability of a correct response (Adams and Wu [eds.], 2003, Chapter 16).

4. PISA 2015 science subscales are not directly comparable to PISA 2006 subscales, because they reflect a different way of organising the broad domain of science literacy.

5. In PISA 2006, the mean science score for OECD countries was initially set at 500 points (for 30 OECD countries). Chile, Estonia, Israel and Slovenia acceded to the OECD in 2010. Latvia acceded to the OECD on 1 July 2016. Throughout this report, results for these five countries are included in the OECD average for all cycles of PISA in which they are available. As a result of the inclusion of new countries, the OECD average science score in PISA 2006 is reported as 498 score points.

6. The GDP values represent per capita GDP in 2014 at current prices, adjusted for differences in purchasing power.

7. It should be borne in mind, however, that the number of countries involved in this comparison is small, and that the trend line is therefore strongly affected by the particular characteristics of the countries included in the comparison.

8. Spending per student is approximated by multiplying public and private expenditure on educational institutions per student in 2015 at each level of education by the theoretical duration of education at the respective level, up to the age of 15. Cumulative expenditure for a given country is approximated as follows: let *n(0), n(1)* and *n(2)* be the typical number of years spent by a student from the age of 6 up to the age of 15 years in primary, lower secondary and upper secondary education. Let *E(0), E(1)* and *E(2)* be the annual expenditure per student in USD converted using purchasing power parities in primary, lower secondary and upper secondary education, respectively. The cumulative expenditure is then calculated by multiplying current annual expenditure *E* by the typical duration of study *n* for each level of education *i* using the following formula:

$$CE = \sum_{i=0}^{2} n(i) * E(i)$$

9. The first international comparisons of student proficiency introduced similar assumptions. For instance, the authors of the First International Science Study (FISS) made “the sweeping, but not in general unjustifiable, assumption […] that the members of the population who did not take the test because they had dropped out from secondary school, would have made scores under the 25th percentile, since they had not taken the Science courses” (Comber and Keeves, 1973, pp. 179). In a related exercise, the authors of the First International Mathematics Study (FIMS) compared subgroups of students from each country’s total sample that represented the same proportion of the age group as in the country with the lowest coverage rate. For countries with higher coverage rates, only the top part of the distribution was used (Husén 1967, pp. 120-127).

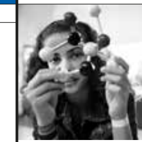
10. For the PISA 2009 assessment, a dispute between teachers’ unions and the education minister had led to a boycott of PISA in Austria, which was only withdrawn after the first week of testing. The boycott required the OECD to remove identifiable cases from the Austrian dataset. Although the dataset met the PISA 2009 technical standards after the removal of these cases, the negative atmosphere regarding assessments of education has affected the conditions under which the assessment was administered and could have adversely affected student motivation to respond to the PISA tasks. The comparability of the 2009 data with data from earlier or later PISA assessments cannot, therefore, be ensured for Austria, and 2009 data for Austria have been excluded from trend comparisons.

11. Note by Turkey: In Turkey, students are placed into high schools according to results of national examinations at grade 8. Some 97% of students in the PISA 2015 sample are enrolled in grade 9 or above (21% in grade 9, 73% in grade 10 and 3% in grade 11) and have passed the national examination. The results on the grade 8 exams of students in the PISA 2015 sample who were enrolled in grade 9 or above do not match the expected distribution of results for a representative population of exam-takers. In particular, the top three and the bottom two deciles of exam-takers are under-represented in the PISA sample.

12. The significance of the difference between observed and adjusted trends is not formally tested. Because both trends share a common link error and a perfectly correlated sampling and measurement error (they are estimated on the same samples and data), while each of the estimates is subject to statistical uncertainty, the difference between the two estimates is not subject to these sources of uncertainty.

13. Note by Switzerland: In Switzerland, the increase in the weighted share of students between previous rounds of PISA and PISA 2015 samples is larger than the corresponding shift in the target population according to official statistics.

14. The correlation coefficient exceeds what would be expected under regression to the mean driven solely by (independent) measurement error. In a simulation study, country mean scores were generated using a normal distribution (S.D. = 50 – or about the standard deviation across country mean estimates observed in PISA 2015), along with two independent, noisy measures of these means (with normally distributed noise, S.D. = 3 – or about the typical sampling error for country means in PISA). A Monte Carlo study based on 10 000 simulations shows that the correlation of one of the noisy measures with the difference between the two noisy measures is, on average, -0.04 (95% confidence interval: -0.30 to 0.22).



15. Subscale scores are reported on the same scale as the main science scale. This allows for comparisons across subscales within a particular classification of assessment tasks. Comparisons between subscales related to different classifications – e.g. between a competency subscale and a knowledge-type subscale – or between subscales and the main scale are avoided, however, as it is not possible to correctly estimate from the data the uncertainty associated with such comparisons.

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3

Students' attitudes towards science and expectations of science-related careers

This chapter focuses on student engagement with science and attitudes towards science as measured through students' responses to the PISA background questionnaire. The chapter examines differences in students' career expectations, science activities, intrinsic and extrinsic motivation for learning science, and beliefs about their abilities in science. It investigates how students' attitudes towards science are associated with their expectations of future study and work in science- and technology-related fields, particularly among students who are highly proficient in science, and how students' beliefs about their abilities in science are related to performance in science.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

In recent decades, educationalists and policy makers have become more attentive to the affective dimensions of learning science. Concerns have grown that the proportions of students – particularly girls – who choose careers in science are insufficient. The assumption is that nurturing motivation and interest in science at the critical ages when students begin to think about their future careers will help increase the share of students who pursue a career in science or in science-based technology (OECD, 2008).

While educating and encouraging the next generation of scientists, engineers and health professionals is one of the goals of science education, experts in many countries – including Australia (Tytler, 2007), the European Union (Gago et al., 2004), and the United States (Holdren, Lander and Varmus, 2010; Olson and Gerardi Riordan, 2012) – have recently expressed concern about declines in enrolment and graduation rates for science-related fields or about perceived shortages of science graduates in the labour market. Beyond all this, in a world that is increasingly shaped by science-based technology, strong foundation skills in science are essential if people want to participate fully in society.

Students' current and future engagement with science is shaped by two forces: how students think about themselves – what they think they are good at and what they think is good for them – and students' attitudes towards science and towards science-related activities – that is, whether they perceive these activities as important, enjoyable and useful. Self-beliefs, identity, value judgements and affective states are shaped, in turn, by the wider social context in which students live; they are all intertwined. Together, they form the basis of major theories about motivation for learning and career choice, such as the expectancy-value theory (Wigfield and Eccles, 2000) and the social-cognitive career theory (Lent et al., 2008).

What the data tell us

- On average across OECD countries, 25% of boys and 24% of girls reported that they expect to work in an occupation that requires further science training beyond compulsory education. Boys and girls tend to think of working in different fields of science. Girls envisage themselves as health professionals more than boys do; and in almost all countries, boys see themselves as becoming information and communication technology (ICT) professionals, scientists or engineers more than girls do.
- Boys are more likely than girls to participate in science-related activities, such as watching TV programmes about science, visiting websites about science topics, or reading science articles in newspapers or magazines.
- Countries that saw increases in their students' instrumental motivation to learn science – their perception that studying science in school is useful to their future lives and careers – also saw increases between 2006 and 2015 in their students' enjoyment of learning science, on average.
- Expectations of future careers in science are positively related to performance in science and to enjoyment of learning science, even after accounting for performance. The relationship with enjoyment is stronger among higher-achieving students than among lower-achieving students. But socio-economic status also matters: in a majority of countries and economies, more advantaged students are more likely to expect a career in science – even among students who perform similarly in science and reported similar enjoyment of learning science.
- Girls often reported less self-efficacy in science than boys. Performance gaps between high-achieving boys and girls tend to be larger in countries/economies with large differences in how confident boys and girls feel in understanding scientific information, discussing scientific issues or explaining phenomena scientifically.

In 2015, PISA examined students' engagement with science and their expectations of having a science-related career. Students were asked about the occupation they expect to be working in when they are 30 years old. Students' responses were later grouped into major categories of science-related and non-science-related careers for the purpose of the analysis. Another question asked students to report their current participation in a range of (elective) science-related activities.

PISA also measured a range of aspects that relate to students' motivation to learn science through questions about their enjoyment of science (how interesting and fun students find learning science), their interest in broad science topics, and their instrumental motivation for science learning (whether they perceive school science as useful for their future study and career plans).

Science self-efficacy – the extent to which students believe in their own ability to handle science tasks effectively and overcome difficulties – was also measured in PISA. Self-efficacy is not the only aspect of students' self-image that is expected to influence their engagement in science; but while self-efficacy was the explicit focus of a question in the student questionnaire, the influence of other self-beliefs, such as whether students believe a career in science is good for them, can only be indirectly assessed by relating students' engagement and career expectations to their gender, socio-economic status, and other information available through the student and parent questionnaires. Figure I.3.1 summarises the aspects of science engagement, motivation and self-beliefs discussed in this chapter.

Figure I.3.1 ■ **Science engagement and career expectations, science self-beliefs and motivation for learning science**

Science engagement	Motivation for learning science	Science self-beliefs
Science career expectations: A categorical variable based on students' open-entry answers to the question "What kind of job do you expect to have when you are about 30 years old?"	**Enjoyment of science:** Constructed index based on students' responses to questions about their enjoyment of doing and learning science	**Self-efficacy in science:** Constructed index based on students' responses to questions about their perceived ability to use their knowledge of science in real-world situations (e.g. to understand and analyse news reports or to participate in discussions about science topics)
Science activities: Constructed index based on students' responses to questions about their participation in a range of science-related activities	**Interest in broad science topics:** Students' reports about their interest in topics such as "the biosphere", "motion and forces", "the universe and its history", "the prevention of disease"	
	Instrumental motivation for learning science: Constructed index based on students' responses to questions about their perceptions of how useful school science is for their study and career plans	

Students' engagement with science, motivation for learning science and science self-beliefs are discussed in this chapter in the order in which they appear in Figure I.3.1. The chapter also discusses how motivation and performance help nurture the choice of a science-related study and career path.

CURRENT AND FUTURE ENGAGEMENT WITH SCIENCE AMONG 15-YEAR-OLDS

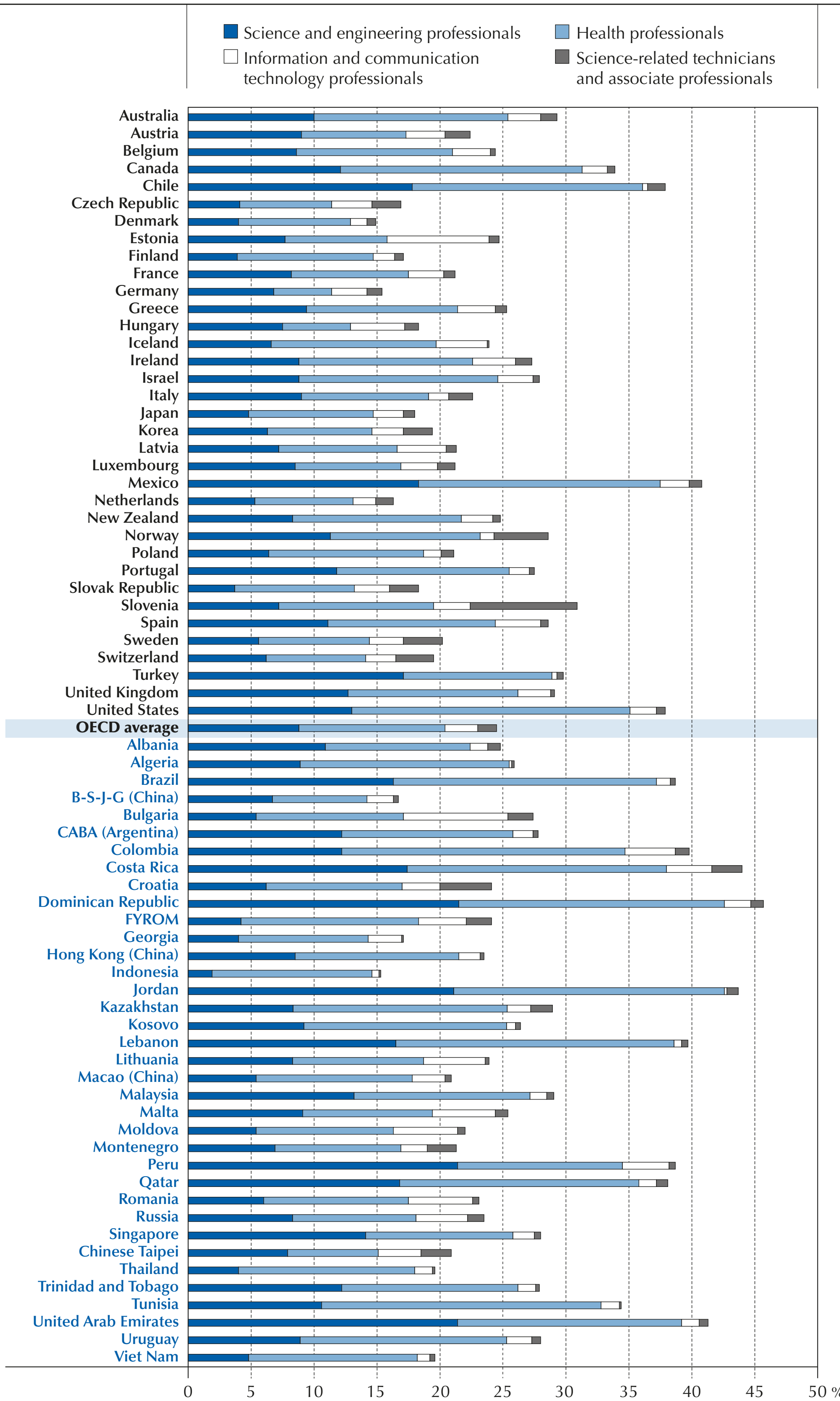
Science-related career expectations

PISA 2015 asked students what occupation they expect to be working in when they are 30 years old. Students could enter any job title or description in an open-entry field; their answers were classified according to the International Standard Classification of Occupations, 2008 edition (ISCO-08). These coded answers were used to create an indicator of science-related career expectations, defined as those career expectations whose realisation requires the study of science beyond compulsory education, typically in formal tertiary education. Within this large group of science-related occupations, the following major groups were distinguished: science and engineering professionals; health professionals; science technicians and associate professionals; and information and communication technology (ICT) professionals (see Annex A1 for details).

Many 15-year-old students are still undecided about their future. They may be weighing two or more options, or they may feel that they have insufficient knowledge about careers to answer this question in anything but the most general terms. In some PISA-participating countries and economies, many students did not answer the question on career expectations, gave vague answers (such as "a good job", "in a hospital") or explicitly indicated that they were undecided ("I do not know"). This chapter focuses on students with a well-defined expectation of a career in a science-related field. Among the remaining students, a distinction is made between those who expect to work in other occupations, and those whose answer about their future career is vague, missing or indecisive.

Figure I.3.2 ▪ **Students' career expectations**

Percentage of students who expect to work in science-related professional and technical occupations when they are 30



Note: Results for Belgium refer to the French and German-speaking communities only.
Source: OECD, PISA 2015 Database, Table I.3.10a.

StatLink http://dx.doi.org/10.1787/888933432284

On average across OECD countries, almost one in four students (24%) reported that they expect to work in an occupation that requires further science training beyond compulsory education. Some 57% of students reported that they expect to pursue a career outside of science-related fields, and the remaining 19% of students gave a vague answer about their expected occupation, or skipped the question entirely. Specifically, 8.8% of students expect to work as professionals who use science and engineering training (e.g. engineer, architect, physicist or astronomer), 11.6% as health professionals (e.g. medical doctor, nurse, veterinarian, physiotherapist), 2.6% as ICT professionals (e.g. software developer, applications programmer), and 1.5% as science-related technicians and associate professionals (e.g. electrical or telecommunications engineering technician) (Figure I.3.2 and Table I.3.10a).

However, the share of students expecting a science-related career varies widely across countries. For instance, it is more than twice as large in Canada, Chile, Mexico and the United States as in Denmark, Germany and the Netherlands. The largest proportions of students who expect a career in a science-related occupation are found in Costa Rica, the Dominican Republic, Jordan and the United Arab Emirates; among OECD countries, Mexico tops the list, with over 40% of students expecting to work in science by the time they turn 30. (In the Dominican Republic and Mexico, however, students who sat the PISA test represent only about two in three of all 15-year-olds in the country; see Chapter 6 and Table I.6.1).

Students' expectations about their future work partly reflect their academic successes and skills; they also reflect the opportunities and support available to them, in their country and in their local environment, to turn an aspiration into reality. Box I.3.1 discusses how differences across countries and within countries in career expectations can be interpreted.

Box I.3.1. **A context for interpreting 15-year-olds' expectations of working in a science-related career**

Opportunities for pursuing a career in science-related fields do not depend solely on individual skills and preferences, but also on the social and economic resources available to students, and on employers' current and future demand for science professionals and technicians. This, in turn, depends on the wider economic context, including a country's level of development, and on broader policy responses than education policy alone.

On average across OECD countries, 24% of students reported that they expect to work in science-related occupations when they are 30 years old. This average level is close to the share of young people who, based on current enrolment patterns, can be expected to enrol in a tertiary science-related programme. Indeed, if current patterns of enrolment in tertiary education persist, about two in three of today's 15-year-olds (67%) in OECD countries can be expected to pursue tertiary education, on average; and more than one in four (i.e. 27%, or 41% of 67%) can be expected to do so in a science-related field: 7% in sciences; 11% in engineering, manufacturing and construction; 1% in agriculture; and 8% in health and welfare (OECD, 2015).

At the country/economy level, however, the variation in the share of students in PISA who reported that they expect to work in science-related occupations when they are 30 years old (expressed as a percentage of the total population of 15-year-olds) is only weakly correlated with the countries'/economies' per capita level of gross expenditure on research and development (r=-0.1) and with per capita GDP (r=0.1). It is also only weakly related to the share of tertiary graduates among 35-44 year-olds (r=0.2) and to the variation in expected rates of enrolment in tertiary science-related programmes (r=0.1). The share of students who expect a career in science is negatively related to differences in mean science performance (correlation: 0.5) and positively related to average levels of engagement and attitudes towards science, as measured in PISA (such as the index of science activities or the index of instrumental motivation to learn science) (Tables I.3.7 and I.3.12).

The lack of positive associations with country-level variables measuring educational or occupational opportunities to pursue a career in science may suggest that students' answers reflect aspirations, more than realities. But this interpretation is at odds with the evidence about within-country associations. Students with greater proficiency in science, students who come from more advantaged backgrounds, and students with tertiary-educated parents are more likely to report that they expect to work in science-related occupations (see Tables I.3.10b and I.3.13b, and the related discussion in this chapter and in Chapter 6). In virtually all countries, students' responses reflect, to some extent, the reality of the resources available to them.

...

At the country/economy level, the lack of an association may reflect differences in how well-informed students are about careers in general, with better-informed students having more realistic expectations. Indeed, in countries where the first age at selection in the education system is younger than 15, 15-year-old students are less likely to expect to work in science-related occupations (the correlation between first age at selection and the share of students expecting a career in science is 0.38 among all countries, and 0.54 among OECD countries; see Table I.3.12). Some of the variation across countries and economies could also reflect cross-cultural differences, related to social desirability, in how students answer questions about themselves (see Box I.2.4 in Chapter 2).[1] Because of the difficulty associated with interpreting the variation in students' career expectations across countries, this report focuses on comparing within-country associations.

Within countries, career expectations at age 15 have been shown to be highly predictive of actual career choices and outcomes later in life (Aschbacher, Ing, and Tsai, 2014; Tai et al., 2006). Other research has shown career interests to be relatively stable throughout upper secondary education (Sadler et al., 2012). Early adolescence, when children are between the ages of 10 and 14, has been identified as a critical time during which students are exposed to science at school and their career aspirations are formed (DeWitt and Archer, 2015). Students this age begin to think concretely about future careers and start preparing for their chosen career (Bandura et al., 2001; Riegle-Crumb, Moore and Ramos-Wada, 2011).

Although economic theory links the number of scientists and engineers to innovation and growth (e.g. Aghion and Howitt, 1992; Grossmann, 2007), the existence of such a link at the country level has been difficult to prove empirically (Aghion and Howitt, 2006; Jones, 1995). Without this proof, one is left to conclude that this link depends on contextual factors, such as the "distance to the frontier" (the relative level of economic development), or that the number of scientists and engineers is a poor measure of their quality, or perhaps that, in the absence of other policy responses, increasing the number of science and engineering graduates will do little to improve competitiveness and innovation (see OECD, 2014a for a discussion and review of the role of human resources devoted to science and technology in innovation policy).

What, then, is the optimal number of science-trained graduates? In some countries, the evidence on current and projected employment, wages and vacancy rates in science-related occupations suggests that the current supply of graduates from science-related fields may be sufficient for the needs of the economy (Bosworth et al., 2013; Salzman, Kuehn and Lowell, 2013). Where shortages are evident, they may not reliably predict the demand for scientists over the entire working life of today's 15-year-olds. Ultimately, in most countries, the argument for increasing the number of science graduates rests on the hope that this larger supply of human resources for science and technology will generate future economic growth, through new ideas and technologies that are yet to be invented, rather than on the anticipated and more predictable needs of the economy in the absence of structural changes.

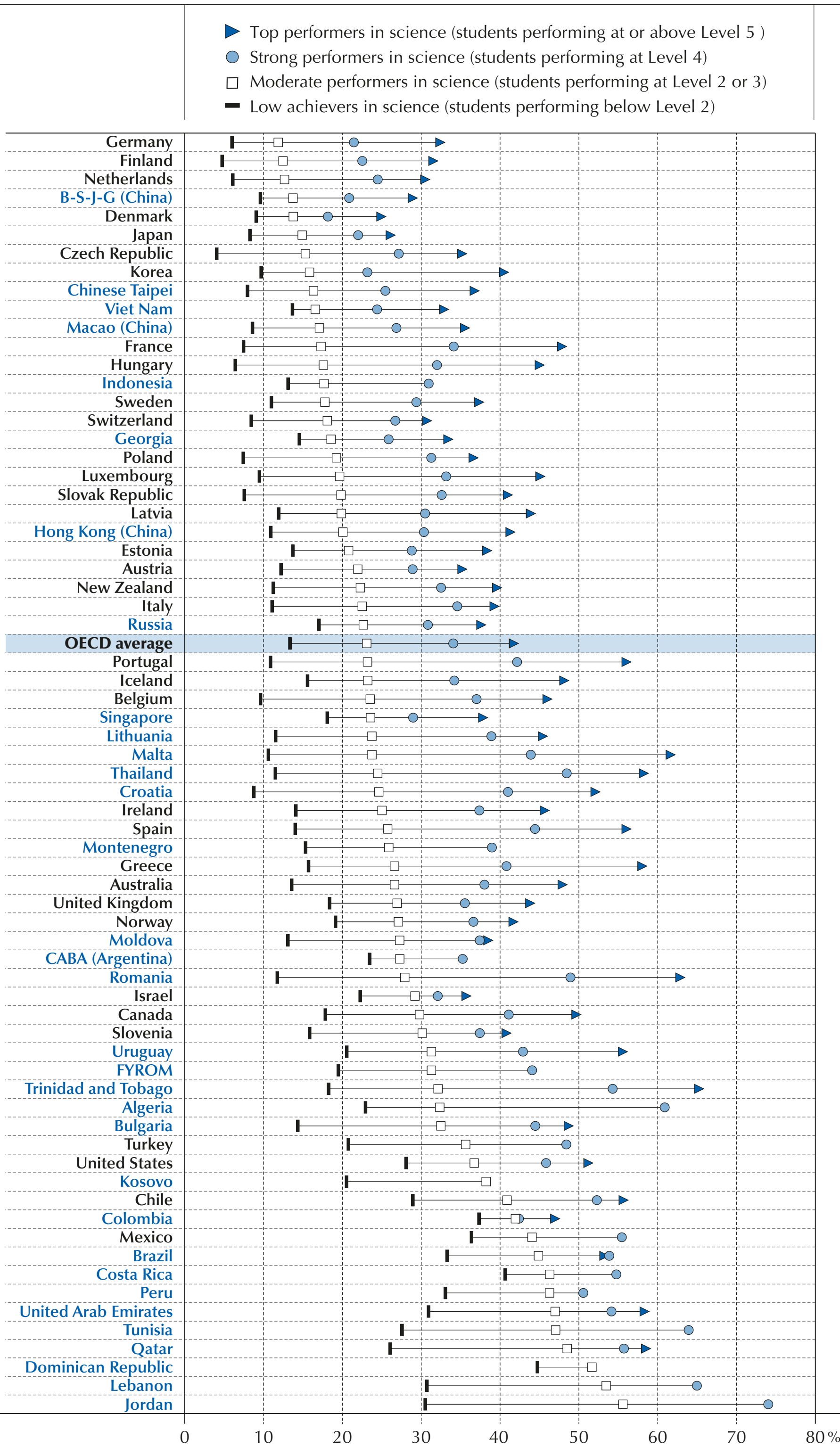
1. While the question about career expectations is less affected by issues related to the use of subjective response scales, how students report their own expectations may still depend on social desirability considerations, which vary across countries.

In almost all countries/economies, the expectation of pursuing a career in science is strongly related to proficiency in science. On average across OECD countries, only 13% of students who score below PISA proficiency Level 2 in science hold such expectations, but that percentage increases to 23% for those scoring at Level 2 or 3, to 34% among those scoring at Level 4, and to 42% among top performers in science (those who score at or above Level 5). In all countries and economies that have more than 1% of students who score at or above Level 5, these students are the most likely to expect that they will work in science-related occupations (Figure I.3.3 and Table I.3.10b).

PISA 2015 marks the second time that the question about career expectations was asked of all students, making it possible to analyse changes in students' expectations of a science-related career between 2006 and 2015.[1] On average across OECD countries, the share of students who expect to be working in a science-related occupation at age 30 increased by 3.9 percentage points between 2006 and 2015, largely because of an increase in the share of students who expect to be working as health professionals (+3 percentage points over the period). In most countries, this increase was not realised at the expense of other occupations: the percentage of students with career expectations outside of science-related occupations remained stable. Rather, the share of students who did not respond to the question other than with a vague answer shrank by 4.2 percentage points over the period, perhaps reflecting greater salience of career concerns among 15-year-olds (Table I.3.10a). In contrast to the average increase observed across OECD countries, a few countries show decreasing shares of students who expect to work in a science related career.

Figure I.3.3 ■ **Students' career expectations, by proficiency in science**

Percentage of students who expect to work in science-related professional and technical occupations when they are 30



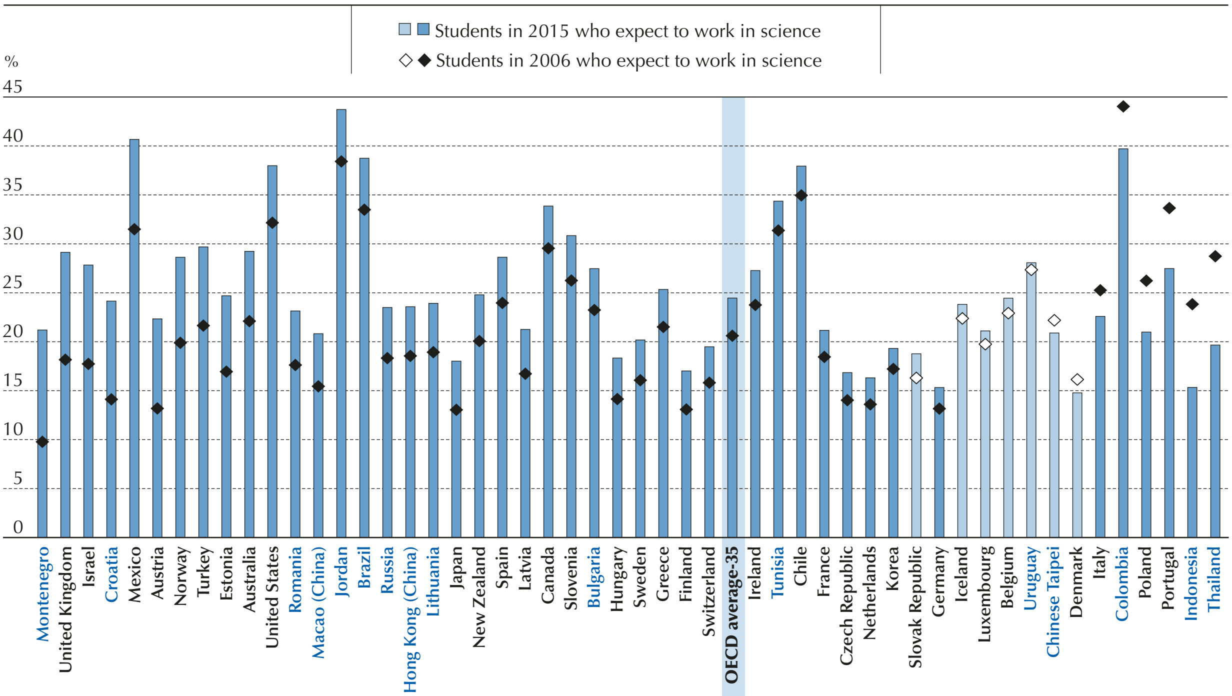
Note: Results for Belgium refer to the French and German-speaking communities only.
Countries and economies are ranked in ascending order of the percentage of moderate performers in science who expect to work in a science-related career.
Source: OECD, PISA 2015 Database, Table I.3.10b.
StatLink http://dx.doi.org/10.1787/888933432295

In Indonesia and Thailand, the share of these students shrank by nine percentage points, and in Portugal the share decreased by six percentage points. By contrast, in Croatia, Israel, Montenegro and the United Kingdom, this share increased by ten percentage points or more (Figure I.3.4 and Table I.3.10e).

On average across OECD countries, boys and girls are almost equally likely to expect to work in a science-related field – although this does not apply for all fields in the sciences. Some 25% of boys and 24% of girls expect to be working in a science-related occupation when they are 30, a small (yet statistically significant) difference. Among countries and economies participating in PISA, gender differences are most marked in Hungary, Indonesia and Thailand. In Hungary, boys are almost twice as likely (24%) as girls (13%) to report that they expect to pursue a career in science. In Indonesia and Thailand, the opposite is true: girls are significantly more likely than boys to expect to work in a science-related career. In Indonesia, 22% of girls, but 9% of boys, hold such expectations; in Thailand, 25% of girls, but only 12% of boys, do (Table I.3.10b).

Figure I.3.4 ▪ **Change between 2006 and 2015 in students' expectations of a science-related career**

Percentage of students who expect to work in science-related occupations at age 30



Notes: Statistically significant differences between 2006 and 2015 are marked in a darker tone (see Annex A3).
Results for Belgium refer to the French and German-speaking communities only.
Only countries and economies with available data since 2006 are shown.
Countries and economies are ranked in descending order of the difference in students' expectations of a science related-career between 2006 and 2015.
Source: OECD, PISA 2015 Database, Tables I.3.10b, I.3.10d and I.3.10e.
StatLink http://dx.doi.org/10.1787/888933432307

In Australia, Canada, Germany, Hungary, Singapore, Spain and Sweden, not only are there fewer girls than boys performing at or above Level 5 in science (see Chapter 2, Table I.2.6a), but girls are also less likely than boys to expect to work in a science-related occupation, including among top performers (Table I.3.10c). But in most countries, similar shares of top-performing boys and girls expect a career in a science-related field; and in Denmark and Poland, top-performing girls are significantly more likely than top-performing boys to expect a career in one of these fields.

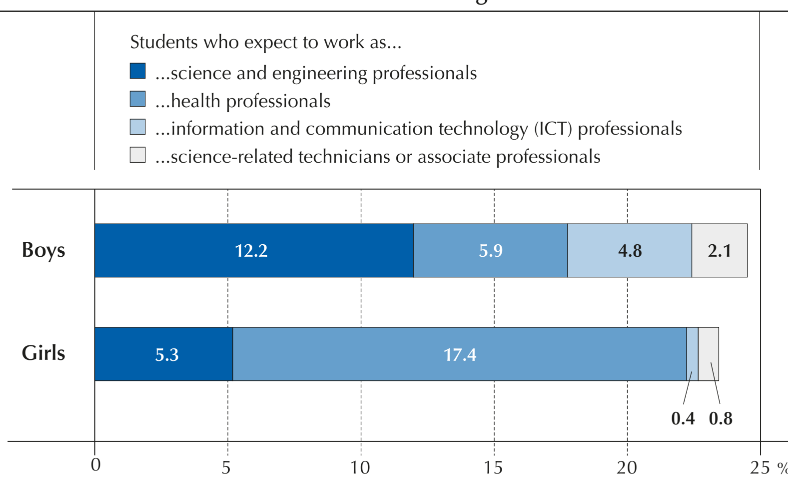
Even when the shares of boys and girls who expect a science-related career are balanced, boys and girls tend to think of working in different fields of science. In all countries, girls envisage themselves as health professionals more than boys do; and in almost all countries, boys see themselves as becoming ICT professionals, scientists or engineers more than girls do (Tables I.3.11a, I.3.11b and I.3.11c). Figure I.3.5 shows that boys are more than twice as likely as girls to expect to work as engineers, scientists or architects (science and engineering professionals), on average across OECD countries;

only 0.4% of girls, but 4.8% of boys, expect to work as ICT professionals. Girls are almost three times as likely as boys to expect to work as doctors, veterinarians or nurses (health professionals). This is consistent with recent patterns of enrolment in tertiary bachelor's degree programmes. In 2013, and on average across OECD countries, women accounted for 78% of new entrants in health and welfare programmes, but for only 30% of new entrants in science and engineering programmes (OECD, 2014b). The similarity of these findings may indicate that the career paths of boys and girls are already starting to diverge before the age of 15, and well before crucial career choices are made.

Particularly large differences between boys' and girls' expectations for their future are observed in some countries. In Norway, for example, 29% of boys and 28% of girls expect a career in a science-related occupation; but there are seven times more girls than boys (21% compared to 3%) who expect to work as doctors, nurses or other health professionals. In Finland, boys are more than four times as likely as girls to expect a career as an engineer, scientist or architect (6.2%, compared to 1.4% of girls); but girls are more than three times more likely than boys to expect a career as a health professional (17%, compared to 5% of boys) (Tables I.3.10b, I.3.11a and I.3.11b).

Figure I.3.5 ▪ **Expectations of a science career, by gender**

OECD average



Source: OECD, PISA 2015 Database, Tables I.3.11a-d.

StatLink http://dx.doi.org/10.1787/888933432311

Figure I.3.6 presents a selection from the list of science-related occupations that boys and girls expect to work in as young adults. While it contains no information on where a particular occupation ranks among the choices of 15-year-olds, it shows a variety of careers that were among the five most popular science-related occupations for boys and for girls in at least one country/economy that participated in PISA 2015. It also shows the number of OECD countries, and the number of all participating countries and economies, in which each of these occupations was among the top five cited by boys and by girls.[2]

The data represented in Figure I.3.6 suggest that boys and girls generally expect careers in different science subfields and, within those subfields, in different occupations. "Medical doctors" is the only occupation that ranks among the five most frequently mentioned science-related careers by boys and girls alike in all 72 countries and economies. Careers as "architects and designers" also appear near the top in both lists. In more than 60 countries and economies, boys cite the careers of "engineers" or "software and application developers and analysts"; but in only 34 countries and economies are "engineers" among girls' top choices for a career, and in just 7 countries and economies (not including any OECD country) are "software and application developers and analysts" one of girls' top choices. Meanwhile, in almost all countries and economies, "dentists, pharmacists, physiotherapists, dieticians and other health professionals" are among the most popular science-related career expectations among girls; as are, in 45 countries and economies, "nurses and midwives" and "veterinarians". But in most countries, these health-related occupations do not appear among boys' top choices.

Figure I.3.6 ▪ **Most popular career choices in science among boys and girls**

Number of countries/economies in which a particular occupation appears among the top five science-related careers that boys and girls expect for themselves

Boys			Girls		
ISCO-08 code and occupation	Number of countries/ economies	Number of OECD countries	ISCO-08 code and occupation	Number of countries/ economies	Number of OECD countries
221-Medical doctors	72	35	**221-Medical doctors**	72	35
214-Engineers (excluding electrotechnology engineers)	66	34	**226-Dentists, pharmacists, physiotherapists, dieticians and other health professionals**	71	35
251-Software and applications developers and analysts	61	30	**216-Architects and designers**	53	22
216-Architects and designers	55	27	225-Veterinarians	45	32
226-Dentists, pharmacists, physiotherapists, dieticians and other health professionals	35	18	222-Nurses and midwives	45	22
311-Physical and engineering science technicians	21	10	**214-Engineers (excluding electrotechnology engineers)**	34	12
215-Electrotechnology engineers	17	7	213-Life science professionals (e.g. biologist)	17	10
211-Physical and earth science professionals (e.g. chemist)	12	7	211-Physical and earth science professionals (e.g. chemist)	8	3
213-Life science professionals (e.g. biologist)	11	4	321-Medical and pharmaceutical technicians	7	4
225-Veterinarians	5	2	251-Software and applications developers and analysts	7	0
252-Database and network professionals	4	1	224-Paramedical practitioners	1	0
222-Nurses and midwives	1	0			

Note: ISCO-08 refers to the International Standard Classification of Occupations; occupations are defined at the three-digit level. Occupations that appear among the most popular science occupations in at least 20 countries/economies for boys and in at least 10 countries/economies for girls are indicated in bold.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432321

Students' participation in science activities

PISA 2015 asked students to report how often they participate in selected science-related activities at or outside of school. Students were asked to report the frequency with which they did the activities ("very often", "regularly", "sometimes", or "never or hardly ever"). In general, only a minority of students reported doing any of the activities "regularly" or "very often". On average across OECD countries, 23% of 15-year-old students reported watching TV programmes about science, and 19% reported visiting websites about science topics at least "regularly". But only 16% of students reported reading science magazines or science articles in newspapers and 15% reported following news of science, environmental or ecology organisations via blogs or microblogging (e.g. twitter) with similar frequency. About one in ten students, at most, reported visiting websites of ecology organisations, borrowing or buying books on science topics, using computer programs/virtual labs to simulate natural or technical processes, and attending a science club "regularly" or "very often" (Figure I.3.7).

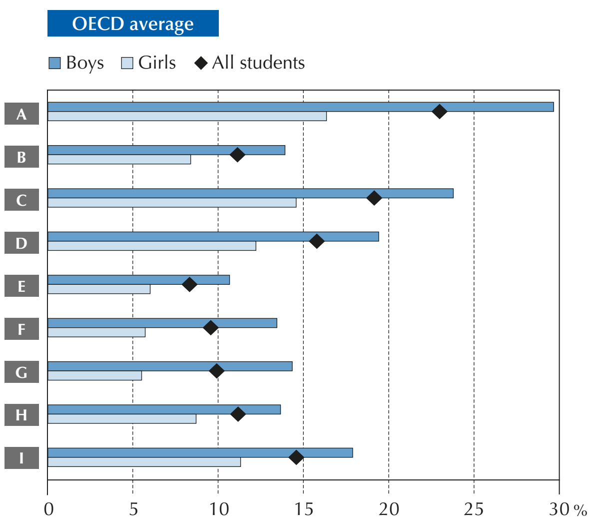
As these percentages show, while some activities tend to be more common than others among 15-year-olds, in general students seldom participate in science-related activities outside of school requirements. This underlines the critical role of science education in school, as many students do not have, or take advantage of, opportunities to learn science outside of school. But it also shows that science education in school has, in some countries at least, limited success in making science attractive enough that students choose to engage in science activities during their free time.

As shown in Figure I.3.7, the level of students' engagement with science varies considerably across countries and economies (but some caution is needed when interpreting cross-country differences in self-report scales; see Box I.2.4 in Chapter 2). Students' reports about their participation in the nine activities were also aggregated into an index of science activities. Higher values on the index indicate that students reported more frequent participation or a larger number of activities in which they participate (see Annex A1 and Box I.2.5 for details on how to interpret this and other indices discussed in this chapter). Students in Finland, Japan and the Netherlands reported among the lowest levels of engagement with science outside of school, as seen in the low average values on the index of science activities, whereas students in the Dominican Republic, Thailand and Tunisia reported more regular and varied activities (Table I.3.5a).

Figure I.3.7 ▪ **Students' science activities, by gender**

Percentage of students who reported doing these things "very often" or "regularly"

- A Watch TV programmes about <broad science>
- B Borrow or buy books on <broad science> topics
- C Visit web sites about <broad science> topics
- D Read <broad science> magazines or science articles in newspapers
- E Attend a <science club>
- F Simulate natural phenomena in computer programs/virtual labs
- G Simulate technical processes in computer programs/virtual labs
- H Visit web sites of ecology organisations
- I Follow news of science, environmental or ecology organisations via blogs and microblogging



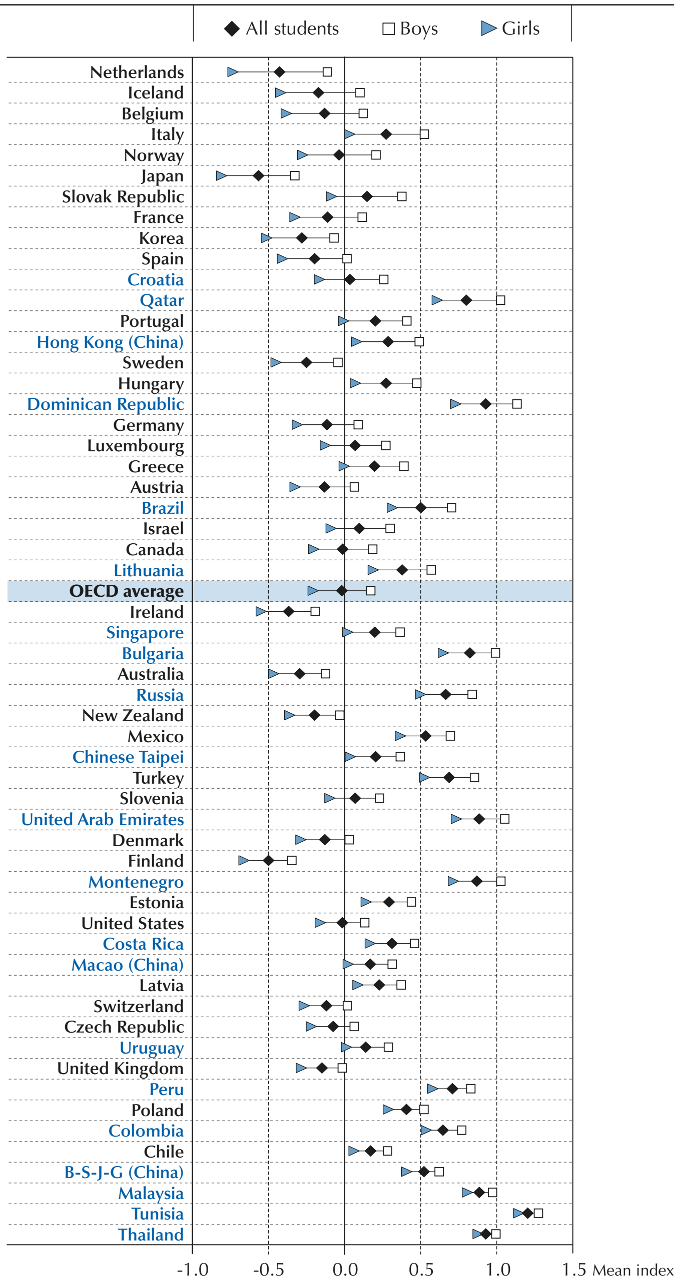
		A	B	C	D	E	F	G	H	I
OECD	Australia	17	7	19	9	4	6	6	7	13
	Austria	18	8	15	14	6	8	9	11	17
	Belgium	29	11	17	16	6	8	8	9	12
	Canada	22	12	21	15	6	9	10	11	18
	Chile	34	13	27	17	9	12	12	15	18
	Czech Republic	17	9	12	13	7	7	8	8	8
	Denmark	22	6	20	15	4	6	7	7	14
	Estonia	30	11	25	24	11	11	11	12	12
	Finland	12	5	7	10	3	4	4	5	5
	France	21	10	23	15	5	8	8	9	13
	Germany	18	9	16	13	6	8	8	11	17
	Greece	27	18	26	22	14	15	15	21	21
	Hungary	30	16	22	19	15	14	15	15	14
	Iceland	19	8	21	16	4	5	6	8	16
	Ireland	17	6	14	9	2	6	7	5	13
	Israel	30	20	25	22	16	17	18	18	21
	Italy	29	14	28	19	11	13	14	16	23
	Japan	11	5	10	7	3	3	3	3	3
	Korea	8	9	7	10	13	4	4	5	10
	Latvia	24	11	19	18	9	11	11	13	14
	Luxembourg	23	13	21	18	7	11	11	14	15
	Mexico	40	22	33	29	13	17	18	22	24
	Netherlands	26	6	11	11	4	6	7	6	11
	New Zealand	17	9	18	10	5	6	7	8	13
	Norway	22	8	21	15	8	9	9	12	14
	Poland	40	13	24	20	15	11	11	15	17
	Portugal	34	13	21	22	8	12	12	13	17
	Slovak Republic	24	15	19	19	12	13	13	14	15
	Slovenia	28	10	16	16	10	9	9	8	10
	Spain	16	7	14	12	6	8	9	9	12
	Sweden	14	6	13	11	5	6	7	8	11
	Switzerland	17	8	14	15	8	8	8	11	15
	Turkey	30	27	32	29	22	26	24	25	24
	United Kingdom	18	11	20	10	8	6	6	6	13
	United States	19	10	18	13	8	11	11	12	16
Partners	Brazil	41	26	35	29	19	22	22	24	27
	B-S-J-G (China)	29	19	16	23	10	12	12	13	26
	Bulgaria	48	25	39	29	21	24	24	26	30
	Chinese Taipei	22	9	17	15	7	6	6	7	10
	Colombia	52	26	34	30	19	22	22	27	31
	Costa Rica	44	18	26	25	12	15	16	21	25
	Croatia	27	10	17	15	7	10	10	11	11
	Dominican Republic	49	35	41	38	25	31	31	34	36
	Hong Kong (China)	21	14	15	15	12	10	10	12	13
	Lithuania	31	18	31	26	13	17	16	16	17
	Macao (China)	19	10	14	13	7	8	7	9	14
	Montenegro	52	31	39	38	22	25	25	29	31
	Peru	48	30	34	33	15	21	21	26	29
	Qatar	37	30	36	31	22	27	27	28	30
	Russia	33	22	36	24	18	18	19	21	25
	Singapore	21	11	22	19	7	9	9	11	18
	Thailand	33	23	26	23	27	21	20	24	23
	Tunisia	53	40	48	42	31	32	33	39	41
	United Arab Emirates	40	31	39	34	25	29	29	29	34
	Uruguay	30	16	21	17	12	13	13	16	20

Note: All gender differences are statistically significant (see Annex A3).
Source: OECD, PISA 2015 Database, Tables I.3.5a and I.3.5c.

StatLink http://dx.doi.org/10.1787/888933432336

In most countries and economies, the most popular activity among those listed is watching TV programmes about science, perhaps reflecting the fact that TV programmes (in contrast to other activities) are often readily available to all students. In Bulgaria, Colombia, the Dominican Republic, Montenegro, Peru and Tunisia, about half of all students reported watching science-related TV programmes regularly (in Finland, Japan, Korea and Sweden, less than 15% of students so reported). But there are notable exceptions. In Korea, for instance, only a small minority of students (around 8%) reported that they watch science programmes on TV, but 13% of students – one of the largest shares among OECD countries – attend a science club. Meanwhile, in some countries – most notably Australia, France, the Russian Federation (hereafter "Russia") and the United Kingdom – more students visit websites about science topics than watch TV programmes about science (Figure I.3.7 and Table I.3.5a).

Figure I.3.8 ■ **Gender differences in students' science activities**



Note: All gender differences are statistically significant (see Annex A3).
Countries and economies are ranked in descending order of gender differences in the index of science activities.
Source: OECD, PISA 2015 Database, Tables I.3.5a and I.3.5c.

StatLink http://dx.doi.org/10.1787/888933432343

As Figures I.3.7 and I.3.8 show, boys are more likely than girls to participate in science-related activities. On average, boys reported almost twice as often as girls that they regularly engage in each of the listed science activities. Across OECD countries, 11% of boys, but only 6% of girls, reported that they regularly attend a science club. Some 24% of boys, but 15% of girls, reported visiting websites about science topics regularly; and 30% of boys, but 16% of girls, reported watching TV programmes about science. Gender differences in favour of boys are observed across all nine activities and in all 57 countries and economies that included this question as part of the student questionnaire (the question was not included in the paper-based version of the questionnaire). The gender difference is statistically significant in all but a few countries/economies (Table I.3.5c).

Students in 2015 reported participating more in science activities than their counterparts in 2006 did. For example, in 43 out of 49 countries with comparable data, more students in 2015 reported that they regularly attend a science club than did their counterparts in 2006. On average across OECD countries, only 5% of students reported regularly attending a science club in 2006; in 2015, 8% of students so reported. And while the proportion of students who reported reading science magazines or science articles in newspapers has shrunk, this decrease may largely reflect disengagement from the medium, rather than from the content. In many countries, the percentage of students who reported visiting websites about science topics, or even borrowing or buying books on science topics, increased over the same period (Tables I.3.5a, I.3.5e and I.3.5f).

Countries that saw increases in the shares of students engaging in science activities outside of school often also saw increases in students' intrinsic motivation to learn science (students' enjoyment of doing and learning science; see below) and their sense of self-efficacy in science (students' beliefs in their own science abilities). At the country/economy level, the correlation between changes in students' engagement with science activities and changes in enjoyment of science learning over the nine-year period is 0.4, and the correlation with changes in science self-efficacy is 0.5 (Table I.3.8). Canada, Sweden and the United Kingdom, for instance, saw relatively large improvements in both students' engagement with science and their enjoyment of science (Tables I.3.1f and I.3.5f).

MOTIVATION FOR LEARNING SCIENCE

Motivation can be regarded as a driving force behind engagement, learning and choice of occupation in all fields. To nurture students' engagement with science, school systems need to ensure that students have not only the basic knowledge that is necessary to engage with complex scientific issues, but also the interest and motivation that will make them want to do so. PISA distinguishes between two forms of motivation to learn science: students may learn science because they enjoy it (intrinsic motivation) and/or because they perceive learning science to be useful for their future plans (instrumental motivation). These two constructs are central in expectancy-value theory (Wigfield and Eccles, 2000) and in self-determination theory, which emphasises the importance of intrinsic motivation (Ryan and Deci, 2009).

Enjoyment of science

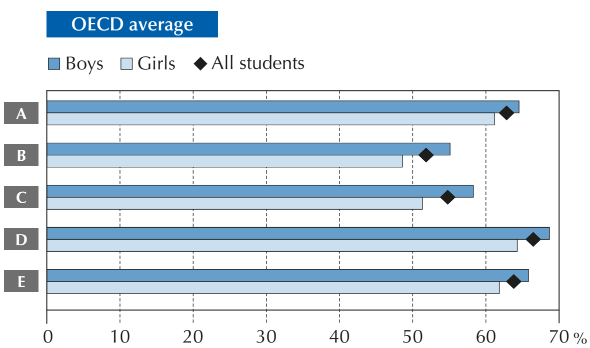
Intrinsic motivation refers to the drive to perform an activity purely for the joy gained from the activity itself. Students are intrinsically motivated to learn science when they want to do so not because of what they will be able to achieve upon mastering new science concepts, but because they find learning science and working on science problems enjoyable (Ryan and Deci, 2009). Enjoyment of science affects students' willingness to spend time and effort in science-related activities, the choice of electives, students' self-image, and the type of careers students aspire to and choose to pursue (Nugent et al., 2015).

Among young children, enjoyment of science has been found to predict participation in science-related activities, whereas the opposite is not true: more opportunities to learn about science do not, in themselves, stimulate enjoyment of science (Alexander, Johnson and Kelley, 2012). Generally, students' enjoyment of science declines from elementary to high school (Archer et al., 2010). Results from the 2011 Trends in Mathematics and Science Study (TIMSS), for instance, show that in all 21 countries that teach science as an integrated subject in eighth grade, and for which there are comparable data for fourth-grade students, the percentage of students who "agreed a lot" with the statement "I enjoy learning science" was lower among eighth-grade students (43%, on average) than among fourth-grade students (68%, on average) (Martin et al., 2012). This may reflect the fact that as students grow older, their interests become increasingly differentiated and specialised. The decline in or durability of enjoyment has also been linked to teaching practices that can either undermine or nurture students' natural motivation to learn science (Hampden-Thompson and Bennett, 2013; Krapp and Prenzel, 2011; Logan and Skamp, 2013).

Figure I.3.9 ■ Students' enjoyment of learning science, by gender

Percentage of students who reported that they "agree" or "strongly agree" with the following statements

- **A** I generally have fun when I am learning <broad science> topics
- **B** I like reading about <broad science>
- **C** I am happy working on <broad science> topics
- **D** I enjoy acquiring new knowledge in <broad science>
- **E** I am interested in learning about <broad science>



		A	B	C	D	E
OECD	Australia	65	53	67	72	67
	Austria	53	38	42	47	49
	Belgium	62	49	60	64	69
	Canada	75	63	69	79	79
	Chile	67	53	57	68	67
	Czech Republic	53	40	35	61	42
	Denmark	65	54	64	64	70
	Estonia	71	59	58	77	63
	Finland	64	56	50	50	61
	France	69	45	45	68	72
	Germany	59	40	43	50	56
	Greece	65	56	58	73	72
	Hungary	47	47	51	59	52
	Iceland	66	58	62	70	63
	Ireland	64	56	71	78	74
	Israel	62	55	60	69	67
	Italy	58	55	64	66	69
	Japan	50	35	35	55	48
	Korea	59	43	48	60	54
	Latvia	69	59	64	74	64
	Luxembourg	66	52	53	65	68
	Mexico	86	70	59	84	80
	Netherlands	40	36	30	50	46
	New Zealand	66	52	71	76	72
	Norway	64	53	63	70	66
	Poland	61	60	51	72	58
	Portugal	74	66	63	84	78
	Slovak Republic	57	43	39	60	51
	Slovenia	48	43	34	52	50
	Spain	62	50	57	65	71
	Sweden	65	57	46	66	63
	Switzerland	66	47	48	63	64
	Turkey	62	62	61	70	70
	United Kingdom	67	52	72	72	69
	United States	72	57	69	76	73
Partners	Albania	84	81	78	90	85
	Algeria	76	76	70	83	79
	CABA (Argentina)	47	47	31	64	72
	Brazil	67	64	65	80	77
	B-S-J-G (China)	81	79	70	81	77
	Bulgaria	74	68	65	79	75
	Chinese Taipei	66	52	50	59	53
	Colombia	76	65	66	79	79
	Costa Rica	74	67	65	80	78
	Croatia	55	55	49	69	57
	Dominican Republic	75	76	72	83	84
	FYROM	76	77	76	82	79
	Georgia	76	73	73	82	71
	Hong Kong (China)	76	66	61	78	75
	Indonesia	90	88	82	95	89
	Jordan	77	75	74	80	78
	Kosovo	86	88	85	92	89
	Lebanon	70	65	71	80	79
	Lithuania	73	66	61	79	74
	Macao (China)	77	64	58	76	74
	Malta	68	52	64	73	70
	Moldova	66	78	60	87	85
	Montenegro	65	63	59	68	66
	Peru	80	73	73	81	79
	Qatar	74	68	73	78	76
	Romania	50	55	50	74	74
	Russia	66	58	49	66	66
	Singapore	84	77	81	86	83
	Thailand	85	77	81	88	85
	Trinidad and Tobago	67	56	64	74	71
	Tunisia	75	74	72	88	86
	United Arab Emirates	76	73	77	82	79
	Uruguay	59	47	48	64	64
	Viet Nam	89	87	88	84	87

Note: All gender differences are statistically significant (see Annex A3).
Source: OECD, PISA 2015 Database, Tables I.3.1a and I.3.1c.
StatLink http://dx.doi.org/10.1787/888933432354

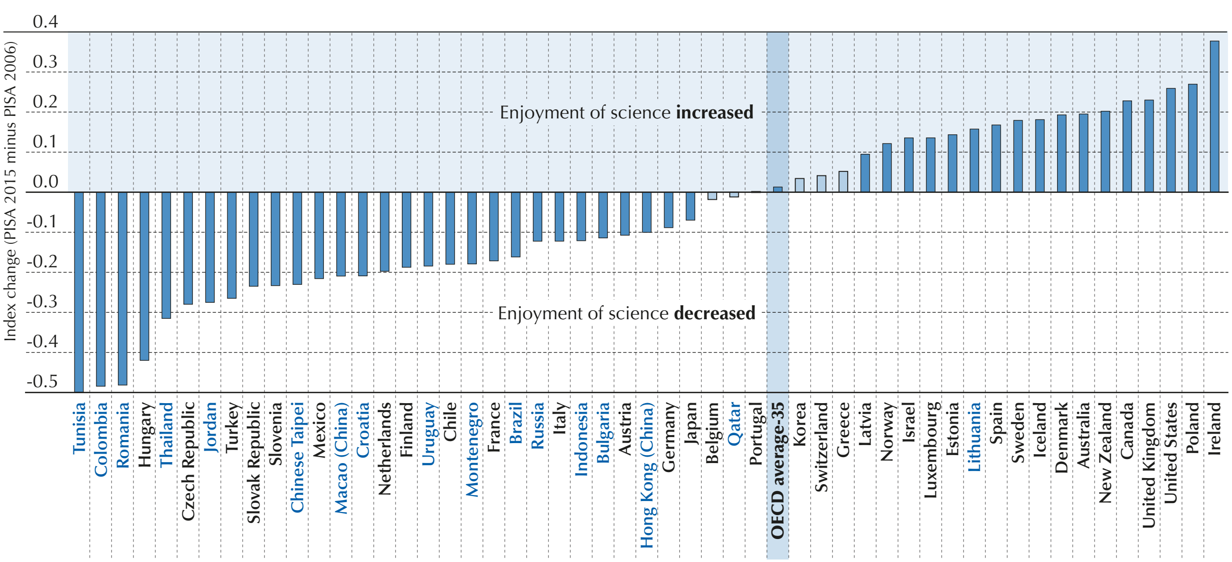
PISA measures students' enjoyment of learning science through students' responses ("strongly agree", "agree", "disagree" or "strongly disagree") to statements affirming that they generally have fun when learning science topics; that they like reading about science; that they are happy working on science topics; that they enjoy acquiring new knowledge in science; and that they are interested in learning about science. The index of enjoyment of science was constructed to summarise students' answers; the scale of the index was set to allow for comparisons with the corresponding index in PISA 2006. The difference between a student disagreeing with all statements, and a student disagreeing with only the statement "I am happy working on science topics", but agreeing with all four remaining statements, corresponds approximately to a one-unit increase (0.97) in the value of this index.

As Figure I.3.9 shows, across OECD countries, 66% of students reported that they agree or strongly agree that they enjoy acquiring new science knowledge, and 64% reported that they are interested in learning about science. However, the OECD average masks significant differences across countries and economies. For example, at least 90% of students in Indonesia and Kosovo reported that they enjoy acquiring new knowledge in science. In Austria and the Netherlands, by contrast, only 50% of students, at most, enjoy acquiring new knowledge in science, and a similarly small proportion is interested in learning about science (Figure I.3.9).

Between 2006 and 2015, students' enjoyment of science improved in 17 countries and economies.[3] In Ireland and Poland, for example, the index of enjoyment of science increased by around 0.4 and 0.3 unit, respectively. Indeed, the share of students who agreed that they enjoy acquiring new knowledge in science grew by more than 10 percentage points during the period, and similar, if not larger, increases were found across all statements used to construct this index (Figure I.3.10 and Table I.3.1f).

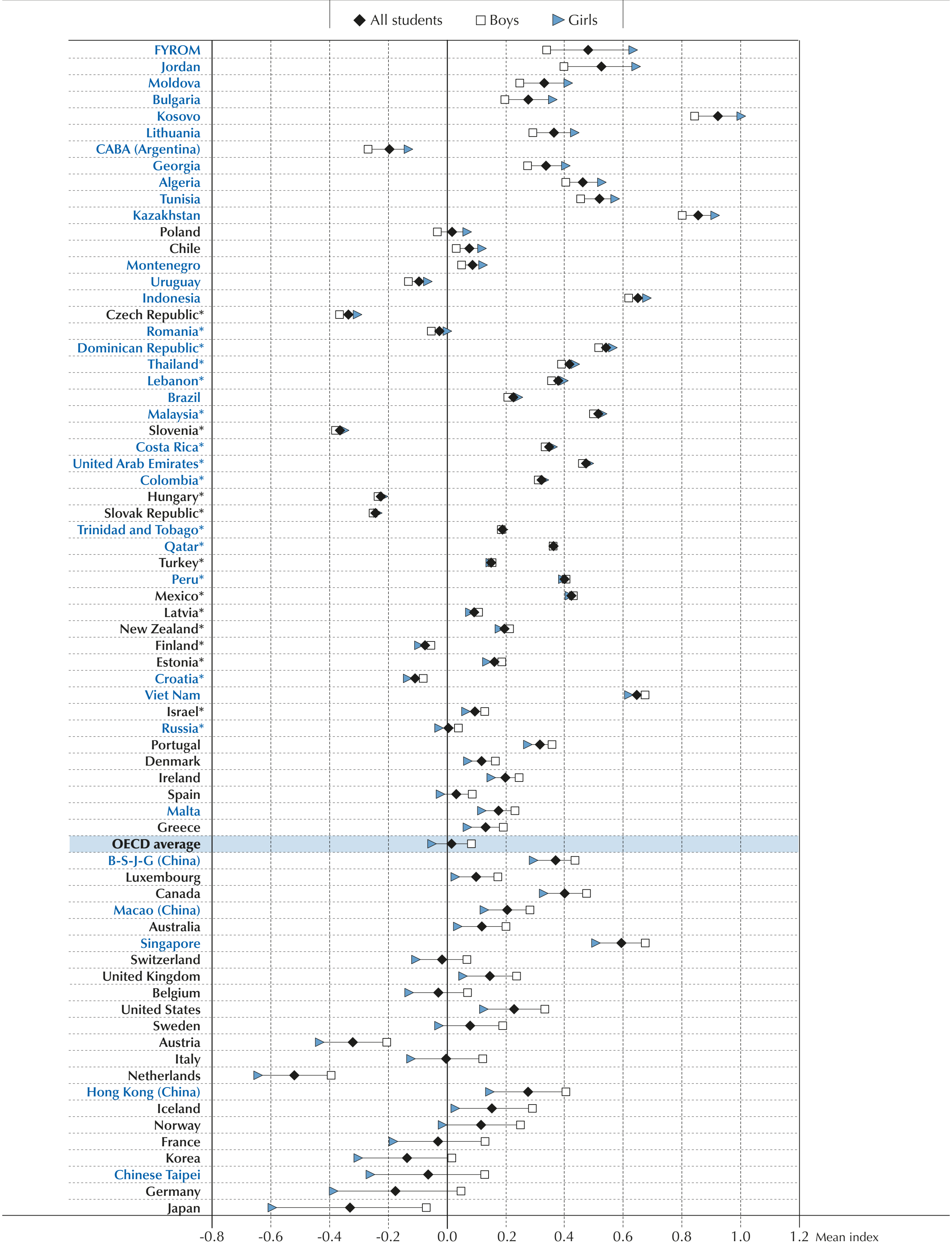
Similarly, in Australia, Canada, Denmark, Iceland, New Zealand, Spain, Sweden, the United Kingdom and the United States, more students reported greater intrinsic motivation to learn science, and the index of enjoyment of science increased by more than 0.17 unit. In the United Kingdom and the United States, for example, the percentage of students who reported having fun when learning science topics increased by about ten percentage points between 2006 and 2015, from 55% to 67% in the United Kingdom, and from 62% to 72% in the United States. In 2006, 54% of students in Canada, and only about 43% in Australia and New Zealand, reported that they like reading about science topics; by 2015, all of these shares had increased by about nine percentage points. In Denmark, Iceland and Sweden, among other countries, the proportion of students interested in learning about science increased by at least six percentage points over this period (Figure I.3.10 and Tables I.3.1a, I.3.1e and I.3.1f).

Figure I.3.10 ■ **Change between 2006 and 2015 in students' enjoyment of learning science**



Note: Statistically significant differences are shown in a darker tone (see Annex A3).
Countries and economies are ranked in ascending order of the change in the index of students' enjoyment of learning science between 2006 and 2015.
Source: OECD, PISA 2015 Database, Table I.3.1f.
StatLink http://dx.doi.org/10.1787/888933432362

Figure I.3.11 ■ **Gender differences in students' enjoyment of learning science**



Note: Gender differences that are not statistically significant are marked with an asterisk next to the country/economy name (see Annex A3).
Countries and economies are ranked in ascending order of the difference between boys' and girls' enjoyment of learning science.
Source: OECD, PISA 2015 Database, Tables I.3.1a and I.3.1c.

StatLink http://dx.doi.org/10.1787/888933432373

By contrast, the index of enjoyment of science decreased by more than 0.17 unit in 20 countries/economies. In Finland and Chinese Taipei, for example, the proportion of students who reported that they enjoy acquiring new knowledge in science shrank by more than 20 percentage points, to about 60% in Chinese Taipei and to about 50% in Finland. In the Czech Republic and Hungary, the proportion of students who reported being interested in learning about science was 20 percentage points smaller in 2015 than in 2006 (Figure I.3.10 and Table I.3.1f).

As discussed above, increases in students' intrinsic motivation to learn science are related to more frequent participation in science activities in 2015, compared to 2006 (correlation across all countries/economies: 0.4). Greater intrinsic motivation also tends to be observed more often in countries and economies where students' instrumental motivation (the drive to learn science because students perceive it as useful to their future studies and careers; see below) increased between 2006 and 2015 (correlation: 0.5; Table I.3.8), indicating, perhaps, that intrinsic and extrinsic motivation need not be in opposition to each other (Hidi and Harackiewicz, 2000).

A majority of students who participated in PISA 2015 reported that they enjoy and are interested in learning science, but boys tended to report so more than girls. On average across OECD countries, boys were more likely than girls to agree with each of the statements that make up the index of enjoyment of science. For instance, boys were four percentage points more likely than girls to agree with the statements, "I enjoy acquiring new knowledge in science" and "I am interested in learning about science", on average across OECD countries. Gender differences in intrinsic motivation to learn science are especially wide, in favour of boys, in France, Germany, Japan, Korea and Chinese Taipei. These gender differences in enjoyment of science are found in 29 countries and economies. But in 18 countries and economies, the opposite pattern is found: girls were more likely than boys to report enjoying and being interested in science, particularly so in the Former Yugoslav Republic of Macedonia (hereafter "FYROM") and Jordan (Figure I.3.11 and Table I.3.1c).

Interest in broad science topics

Interest is one of the components of intrinsic motivation and one of the reasons why students may enjoy learning. What distinguishes it from other sources of enjoyment is that an interest is always directed towards an object, activity, field of knowledge or goal. Having an interest means being interested *in something* (Krapp and Prenzel, 2011). Interest in science can be defined generally (interest in science) or specifically (interest in science topics, be it a broader discipline or school subject, such as biology, or a more specific domain or research question, such as bacterial infections).

PISA measures the extent to which students are interested in five broad science topics, or subjects, through students' responses ("not interested", "hardly interested", "interested" or "highly interested") to topics related to the biosphere (e.g. ecosystem services, sustainability); to motion and forces (e.g. velocity, friction, magnetic and gravitational forces); to energy and its transformation (e.g. conservation, chemical reactions); to the universe and its history; and in how science can help us prevent disease. A fifth response offered students the possibility to report that "[they] don't know what this is".

Current theories of how children develop interests emphasise that interests are not developed in isolation. While an "interesting" or "curious" first contact with an object, activity or field of knowledge may trigger an initial, transitory interest, in order for this "situational" interest to become a more stable disposition, it must be supported and sustained (Hidi and Renninger, 2006; Krapp, 2002). Individual differences in interests may stem both from differences in opportunities to access the object or activity (one cannot be interested in things one does not know about; and without repeated interaction with the object, it is unlikely that one can develop a durable interest) and from differences in the support received to develop an initial attraction or curiosity into a more stable motivational state. These differences may also be a by-product of the process through which students, particularly during adolescence, critically review their abilities and interests as they try to define and shape their identity. All interests that do not appear compatible with the ideal self-concept are then devalued (Krapp and Prenzel, 2011).

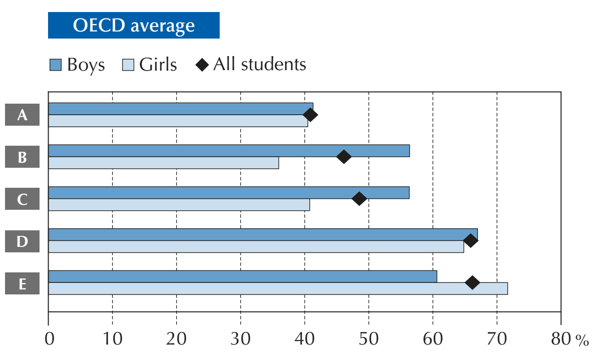
On average across OECD countries, two out of three students (66%) reported being interested in "how science can help us prevent disease", and a similar percentage (66%) reported interest in "the universe and its history". Less than half of all students reported interest in energy and its transformation (49%), motion and forces (46%), and in topics related to the biosphere (41%). Across most countries and economies, students preferred the topics of disease prevention and astronomy (the universe and its history) to the remaining three topics. In Thailand, however, the topic of biosphere attracted the highest percentage of students among all the proposed topics. The Czech Republic is the only PISA-participating country in which the share of students who reported interest in a topic was below 50% in all five topics (Figure I.3.12).

PISA data show that boys are more interested than girls in physics and chemistry ("motion and forces", "energy and its transformation"), while girls tend to be more interested in health-related topics ("how science can help us prevent disease"). Gender differences are narrower with respect to the topic of biosphere, or to the topic of the universe and its history. In all countries and economies, more boys than girls reported being interested in the topics of motion and forces (e.g. velocity, friction, magnetic and gravitational forces); but in the Dominican Republic, the difference is not significant. Similarly, in all countries and economies except the Dominican Republic and Thailand, more boys than girls reported being interested in the topics of energy and its transformation (e.g. conservation, chemical reactions). In the Dominican Republic and Thailand, the difference between boys and girls is not significant. Meanwhile, in all countries and economies, girls were more likely than boys to report being interested in how science can help us prevent disease. In Chinese Taipei, this gender difference is not significant (Figure I.3.12 and Table I.3.2c).

Figure I.3.12 ▪ **Students' interest in broad science topics, by gender**

Percentage of students who reported that they are "interested" or "highly interested" in the following topics

A Biosphere (e.g. ecosystem services, sustainability)
B Motion and forces (e.g. velocity, friction, magnetic and gravitational forces)
C Energy and its transformation (e.g. conservation, chemical reactions)
D The Universe and its history
E How science can help us prevent disease



		A	B	C	D	E
OECD	Australia	43	48	53	67	69
	Austria	50	46	47	66	61
	Belgium	42	52	52	66	73
	Canada	53	55	63	69	74
	Chile	41	46	48	68	68
	Czech Republic	16	20	23	44	36
	Denmark	45	57	55	73	71
	Estonia	30	45	49	71	65
	Finland	27	45	45	65	63
	France	36	43	47	67	69
	Germany	54	43	41	61	68
	Greece	34	51	52	66	65
	Hungary	28	38	37	59	58
	Iceland	51	62	58	74	75
	Ireland	37	47	54	69	78
	Israel	23	41	42	55	60
	Italy	48	48	57	75	78
	Japan	55	37	38	72	54
	Korea	56	39	41	64	61
	Latvia	37	53	55	73	70
	Luxembourg	47	53	56	68	71
	Mexico	63	62	68	75	80
	Netherlands	32	40	38	54	60
	New Zealand	39	53	57	66	66
	Norway	41	53	54	69	66
	Poland	22	34	37	59	59
	Portugal	62	55	57	75	79
	Slovak Republic	29	38	40	57	52
	Slovenia	27	29	33	63	57
	Spain	49	46	50	72	75
	Sweden	42	44	45	64	61
	Switzerland	49	49	53	70	70
	Turkey	38	47	49	54	58
	United Kingdom	38	45	50	71	73
	United States	44	48	54	67	73
Partners	Brazil	51	56	61	71	73
	B-S-J-G (China)	65	68	63	80	79
	Bulgaria	57	56	59	75	75
	Colombia	59	59	63	76	79
	Costa Rica	53	49	53	72	75
	Croatia	33	37	41	69	64
	Dominican Republic	70	78	79	86	87
	Hong Kong (China)	64	57	59	68	69
	Lithuania	35	50	51	73	70
	Macao (China)	53	49	45	67	61
	Montenegro	44	38	44	58	65
	Peru	60	63	67	82	85
	Qatar	54	58	63	71	73
	Russia	39	44	46	67	63
	Singapore	48	57	61	71	77
	Chinese Taipei	60	38	36	64	66
	Thailand	90	77	78	78	85
	Tunisia	48	55	57	67	73
	United Arab Emirates	49	52	56	67	71
	Uruguay	44	42	49	64	69

Note: All gender differences are statistically significant (see Annex A3).
Source: OECD, PISA 2015 Database, Tables I.3.2a and I.3.2c.
StatLink http://dx.doi.org/10.1787/888933432380

Figure I.3.13 ■ **Students' instrumental motivation to learn science, by gender**

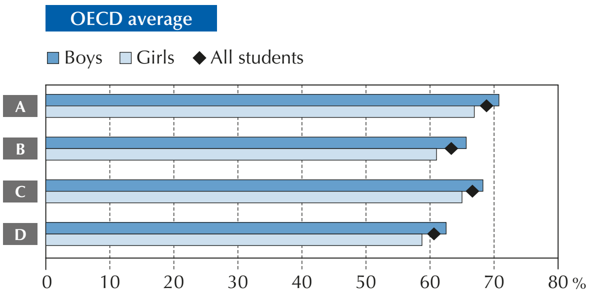
Percentage of students who reported that they "agree" or "strongly agree" with the following statements

A Making an effort in my <school science> subject(s) is worth it because this will help me in the work I want to do later on

B What I learn in my <school science> subject(s) is important for me because I need this for what I want to do later on

C Studying my <school science> subject(s) is worthwhile for me because what I learn will improve my career prospects

D Many things I learn in my <school science> subject(s) will help me to get a job



		A	B	C	D
OECD	Australia	70	62	67	61
	Austria	53	47	50	45
	Belgium	66	56	63	53
	Canada	81	74	80	74
	Chile	76	70	75	68
	Czech Republic	57	51	52	48
	Denmark	60	61	62	53
	Estonia	74	73	71	61
	Finland	65	71	66	64
	France	63	57	64	50
	Germany	54	46	49	44
	Greece	74	72	72	62
	Hungary	68	58	57	53
	Iceland	70	67	68	66
	Ireland	78	68	76	71
	Israel	70	64	71	64
	Italy	69	66	73	64
	Japan	61	56	57	52
	Korea	66	57	63	64
	Latvia	68	65	60	59
	Luxembourg	61	55	59	53
	Mexico	85	81	85	80
	Netherlands	55	48	55	47
	New Zealand	79	71	76	72
	Norway	69	64	67	60
	Poland	68	60	70	58
	Portugal	73	72	75	72
	Slovak Republic	65	59	64	57
	Slovenia	72	66	63	57
	Spain	68	65	71	68
	Sweden	74	67	74	65
	Switzerland	54	48	53	43
	Turkey	80	79	75	71
	United Kingdom	80	68	77	71
	United States	81	72	74	70
Partners	Albania	93	91	90	88
	Algeria	82	82	80	76
	Brazil	82	79	85	76
	B-S-J-G (China)	91	87	88	82
	Bulgaria	71	65	71	62
	CABA (Argentina)	71	60	72	59
	Colombia	82	77	79	72
	Costa Rica	79	74	80	74
	Croatia	70	66	67	62
	Dominican Republic	84	81	85	79
	FYROM	85	81	80	75
	Georgia	71	64	76	68
	Hong Kong (China)	73	72	75	69
	Indonesia	95	95	94	91
	Jordan	91	85	85	83
	Kosovo	92	89	88	85
	Lebanon	83	81	80	77
	Lithuania	81	77	70	68
	Macao (China)	75	69	77	65
	Malta	70	60	65	64
	Moldova	74	77	75	74
	Montenegro	82	75	72	69
	Peru	89	85	87	77
	Qatar	86	82	82	79
	Romania	76	76	76	74
	Russia	77	77	70	67
	Singapore	88	83	86	79
	Chinese Taipei	76	70	77	72
	Thailand	92	91	90	90
	Trinidad and Tobago	81	74	79	78
	Tunisia	88	86	84	78
	United Arab Emirates	86	82	82	79
	Uruguay	80	70	71	66
	Viet Nam	91	88	85	72

Note: All gender differences are statistically significant (see Annex A3).
Source: OECD, PISA 2015 Database, Tables I.3.3a and I.3.3c.
StatLink http://dx.doi.org/10.1787/888933432397

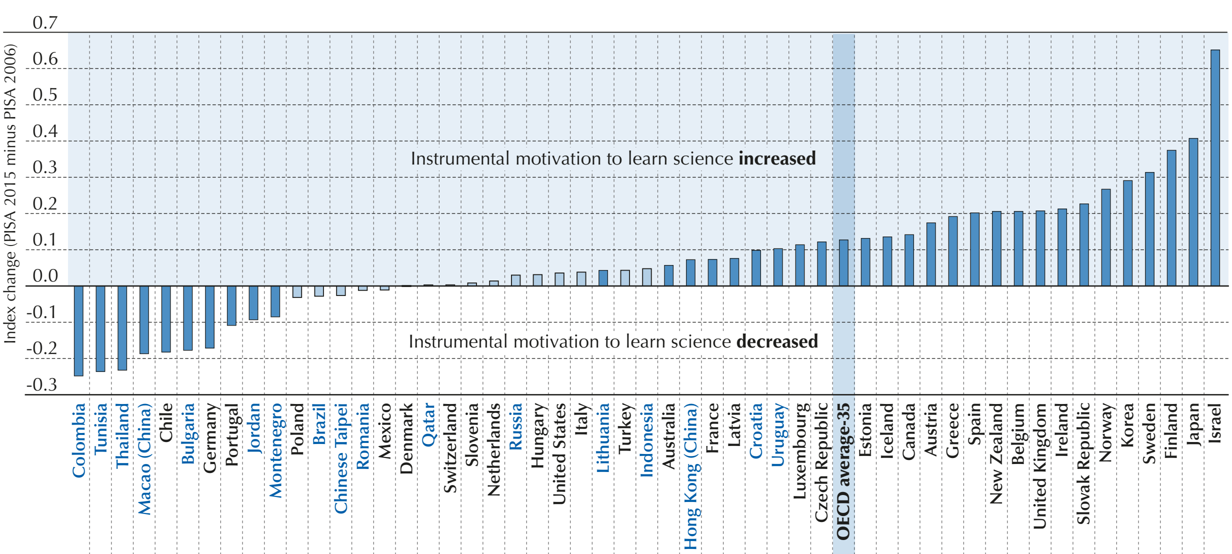
Instrumental motivation to learn science

Instrumental motivation to learn science refers to the drive to learn science because students perceive it to be useful to them and to their future studies and careers (Wigfield and Eccles, 2000). PISA measures the extent to which students feel that science is relevant to their own study and career prospects through students' responses ("strongly agree", "agree", "disagree" or "strongly disagree") to statements that affirm that making an effort in their school science subject(s) is worthwhile because it will help them in the work they want to do later on; that what they learn in school science subject(s) is worthwhile because they need it for what they want to do later on; that studying science at school is worthwhile because what they learn will improve their career prospects; and that many things they learn in their school science subject(s) will help them get a job. The index of instrumental motivation to learn science was constructed to summarise students' answers; the scale of this index was set to allow for comparisons with the corresponding index in PISA 2006. The difference between a student who agrees with all four statements, and a student who disagrees with the statements, corresponds to 1.15 points on this scale, or about the average standard deviation in OECD countries (which equals 0.98).

In general, a majority of students recognises the instrumental value of studying science as a way to improve their career prospects and work in their desired field. On average across OECD countries, 69% of students agreed or strongly agreed that making an effort in science subjects at school is worth it because it will help them in the work they want to do later on; 67% of students agreed that studying science subjects at school is worthwhile because what they learn will improve their career prospects. These percentages are somewhat lower than those observed in response to similar questions about mathematics in PISA 2012. In 2012, 78% of students, on average across OECD countries, agreed or strongly agreed that learning mathematics is worthwhile because it will improve their career prospects (OECD, 2013). Nevertheless, these data reveal that at least two out of three students appreciate the value of science in their future studies and careers (Figure I.3.13).

Two of the four items used in PISA 2015 to measure students' instrumental motivation to learn science are identical to those included in the PISA 2006 questionnaires. Both of these items reveal that instrumental motivation to learn science has increased among students, on average across OECD countries. The share of students who agreed or strongly agreed that making an effort in science subjects at school is worth it because it will help them in the work they want to do later on, and the proportion who agreed that studying science subjects at school is worthwhile because what they learn will improve their career prospects, both increased between five and six percentage points between 2006 and 2015. This is reflected in an OECD average increase of 0.12 unit on the index of instrumental motivation to learn science (Table I.3.3f).[4]

Figure I.3.14 ■ **Change between 2006 and 2015 in students' instrumental motivation to learn science**



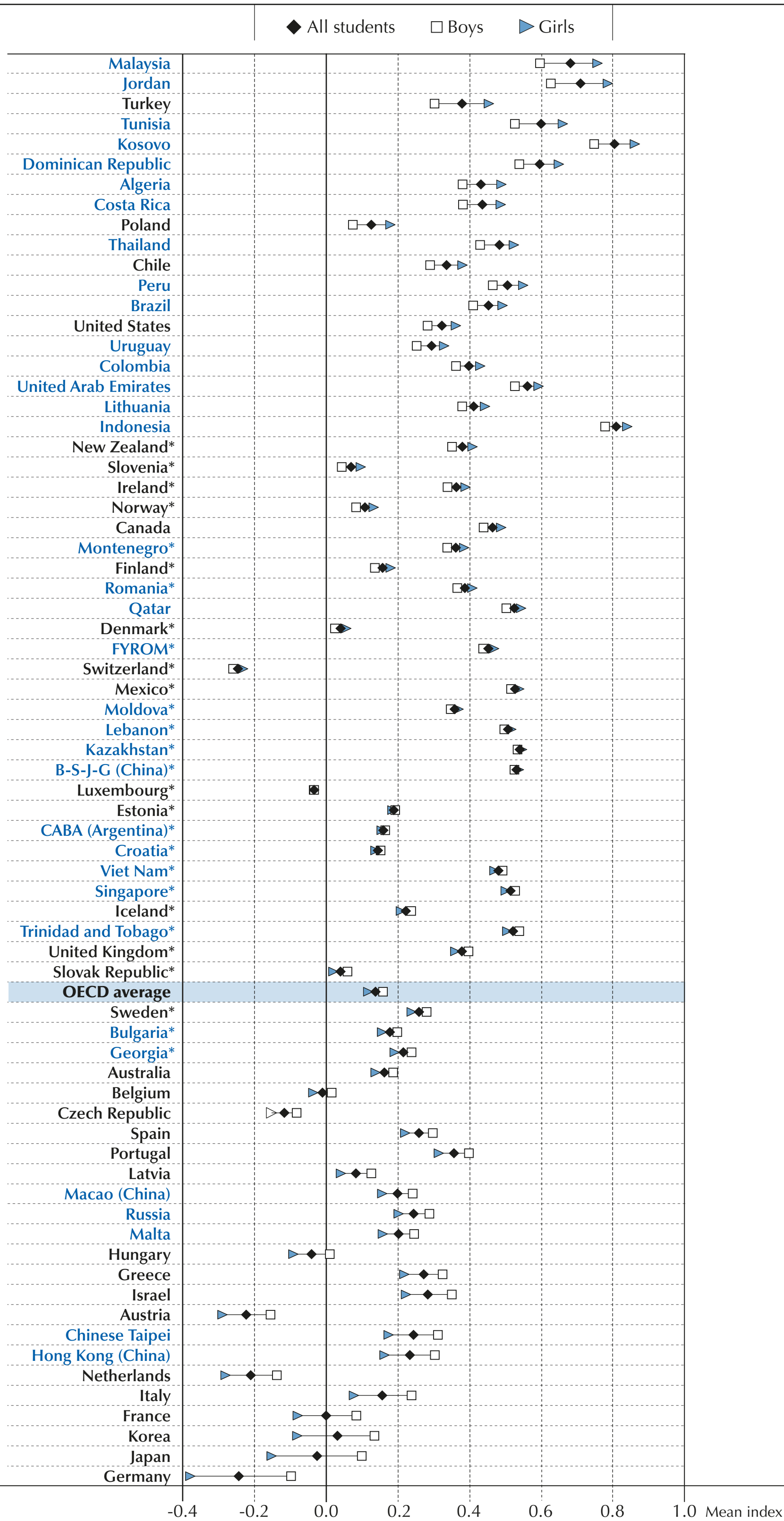
Note: Statistically significant differences are marked in a darker tone (see Annex A3).

Countries and economies are ranked in ascending order of the change in the index of students' instrumental motivation to learn science between 2006 and 2015.

Source: OECD, PISA 2015 Database, Table I.3.3f.

StatLink http://dx.doi.org/10.1787/888933432403

Figure I.3.15 ■ **Gender differences in students' instrumental motivation to learn science**



Note: Gender differences that are not statistically significant are marked with an asterisk next to the country/economy name (see Annex A3).
Countries and economies are ranked in ascending order of the difference between boys' and girls' instrumental motivation to learn science.
Source: OECD, PISA 2015 Database, Tables I.3.3a and I.3.3c.
StatLink http://dx.doi.org/10.1787/888933432417

In Finland, Israel, Japan and Sweden, the proportion of students who responded positively to each of these two items increased by more than 10 percentage points; the index of instrumental motivation to learn science increased by at least 0.3 point in these four countries. In Belgium, Ireland, New Zealand, Norway, the Slovak Republic and the United Kingdom, the index increased by between 0.2 and 0.3 point. By contrast, in ten countries and economies, including OECD countries Chile, Germany and Portugal, instrumental motivation to learn science was lower in 2015 than in 2006 (Figure I.3.14 and Table I.3.3f).

As noted above, improvements between 2006 and 2015 in students' instrumental motivation to learn science are related to improvements in students' enjoyment of science. At the country level, changes in students' instrumental motivation to learn science over the period are unrelated to changes in science performance, engagement with science or self-efficacy (all correlations are between -0.4 and 0.4) (Table I.3.8).

In 21 countries/economies, as well as on average across OECD countries, the index of instrumental motivation to learn science is significantly higher among boys than among girls (Figure I.3.15). Table I.3.3c shows that, in Germany, 56% of boys, but only 43% of girls, agreed that studying science subjects at school is worthwhile because what they learn will improve their career prospects; similarly, in Japan and Korea, the share of boys who reported so exceeds the corresponding share of girls by more than ten percentage points. By contrast, in 21 other countries/economies, the index of instrumental motivation to learn science is significantly higher among girls than among boys. At the country level, gender differences in instrumental motivation to learn science are related to differences in the shares of boys and girls who expect to have careers in occupations that require further science studies. The correlation between these two gender gaps is 0.4 (Table I.3.9).

Instrumental motivation to learn science and expectations of a science career

By comparing levels of instrumental motivation for learning science across students with different career expectations, it is possible to explore the breadth of students' views concerning the usefulness of school science. Are students equally likely to perceive science as useful when they expect to work in science-related occupations as when they expect to work in occupations requiring similar levels of qualifications but that are not science-related?

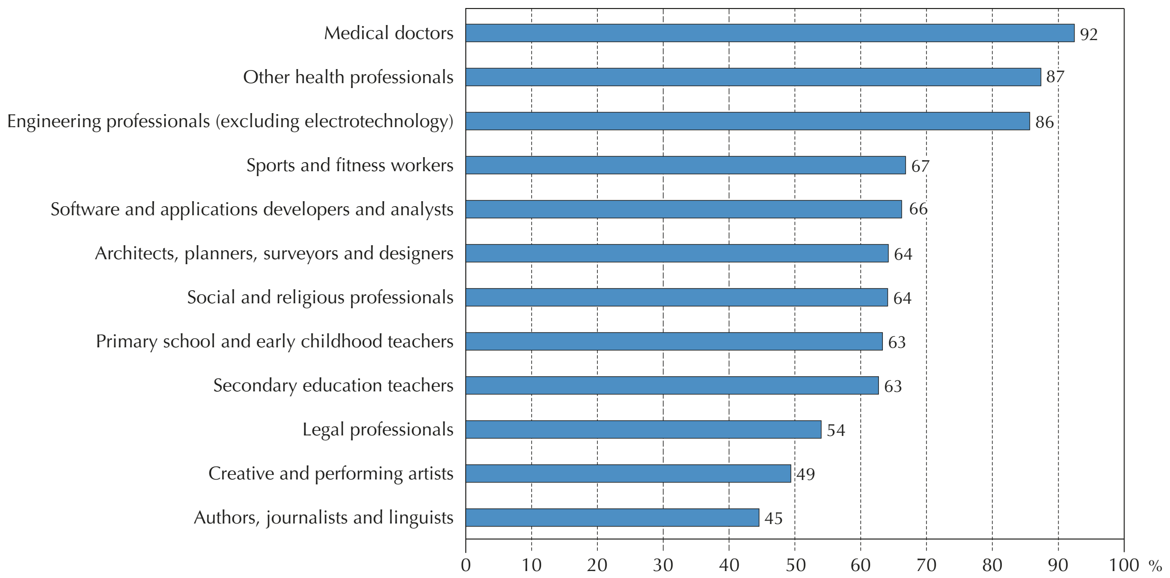
Figure I.3.16 shows, for 12 major professional or technical occupations (chosen among those that students most frequently cited when asked what occupation they expect to work in when they are 30), the corresponding share of students who agreed that making an effort in science subjects at school is worth it because this will help them in the work they want to do later on. On average across OECD countries, more than 90% of students who expect to work as medical doctors perceived efforts in school science as useful for what they want to do later in life, as did 87% of students who expect to work as dentists, pharmacists, physiotherapists or dieticians, and 86% of prospective engineers. But only about two in three of the students who expect to work as software and applications developers or as architects and designers perceived such efforts as useful – a similar proportion as among prospective sports and fitness workers, school teachers, and social and religious workers. Only 54% of students who expect to work as legal professionals reported that they think that school science is useful for their future career, as did less than 50% of students who expect to work as creative and performing artists, or as authors and journalists.

The significant differences in students' perceptions about the usefulness of school science, including among those students who were classified as having science-related career expectations, indicate that many students may have somewhat narrow views of the utility of school science. Perhaps, when prompted to think about what they learn in science at school, students mainly refer to content knowledge – the facts and theories learned in biology, chemistry, physics or earth science classes – rather than to procedural or epistemic knowledge that can be applied outside of science-related careers too (e.g. "What constitutes a valid argument based on data?", "How can experiments be used to identify cause and effect?").

But students' perceptions about how useful school science is for specific careers also differ across countries. For instance, in Finland, Germany and Switzerland, less than half of all students who expect to work as "software and applications developers and analysts" agreed that making an effort in school science is useful for the work they want to do later on, a similar percentage as among students who expect to work as lawyers or journalists ("legal professionals", "authors, journalists and linguists"). Meanwhile, in Canada, France, Greece, Hong Kong (China) and Macao (China), among others, more than 80% of students who expect to work as software developers perceive school science to be useful for their career – a significantly higher percentage than among students who expect to work as lawyers or journalists (Table I.3.11f). Such differences may partly reflect disparities in which science content is emphasised in school. They may also reflect country differences in tertiary studies that lead to these careers.

Figure I.3.16 ▪ **Students' expectations of future careers and instrumental motivation to learn science**

Percentage of students who "agree"or "strongly agree" that "making an effort in my <school science> subject(s) is worth it because this will help [them] in the work [they] want to do later on", by expected occupation



Source: OECD, PISA 2015 Database, Table I.3.11f.
StatLink http://dx.doi.org/10.1787/888933432425

NURTURING FUTURE SCIENTISTS: THE ROLE OF SKILLS AND MOTIVATION

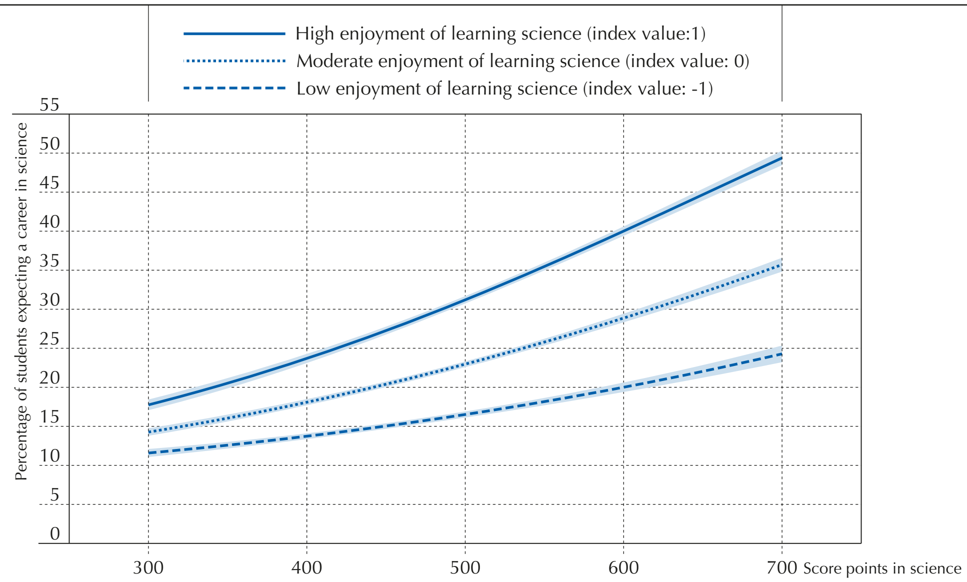
Knowledge of and about science does not automatically translate into the ability to apply scientific knowledge in real-life situations, nor into an interest in pursuing a career in science. Assuming otherwise gives little or no recognition to the range of interests, attitudes, beliefs and values that influence personal decisions (Bybee and McCrae, 2011).

As Figure I.3.17 shows, the likelihood that a student expects to pursue a career in science increases as his or her performance in science improves, and this association is positive among both students who do not value science as something particularly interesting and enjoyable (those who are one standard deviation below the OECD average on the index of enjoyment of science) and students who do (those who are one standard deviation above the OECD average on that index). But the association with performance depends on the degree to which students enjoy science. Among students with a value of 0 (or close to the mean) on the index of enjoyment of science, an estimated 23% expect a career in a science-related occupation if they score about 500 points on the science scale (or slightly above the OECD average score); that share increases to 29% if the science score is about 600 points (boys of average socio-economic status are taken as the reference here; all results are presented after accounting for gender and socio-economic status). But for students with a value of one on the index of enjoyment of science, the likelihood increases from 31% to 40%. In other words, among students who enjoy learning science and participating in science-related activities, aptitude or performance have a stronger impact on the likelihood that they expect a career in science. And among high-performing students, interest in science and intrinsic motivation are more strongly associated with whether or not they expect a career in science. (Results for individual countries and economies are presented in Tables I.3.13a and I.3.13b).

In most countries, PISA data show that expectations of future careers in science are positively related to performance in science and, even after accounting for performance, to enjoyment of science activities. They also show that the relationship with performance is not independent of the level of enjoyment (and that the relationship with enjoyment is not independent of the level of performance). This interplay between performance and enjoyment is identified in the statistical analysis by a significant, positive relationship with the interaction term (performance×enjoyment).

Figure I.3.17 ■ **Students expecting a career in science, by performance and enjoyment of learning**

Estimate, after accounting for gender and socio-economic status, OECD average



Note: The lines represent the predicted share of students expecting a career in a science-related occupation, based on a logistic model with the index of enjoyment of science, performance in science, their product, gender and the PISA index of economic, social and cultural status introduced as predictors. The shaded area around the curves indicates the upper and lower bounds of the 95% confidence interval for these estimates.

Source: OECD, PISA 2015 Database, Table I.3.13b.

StatLink http://dx.doi.org/10.1787/888933432435

The interplay of aptitude and attitudes has important implications for any effort to increase the share of students who want to pursue the study of science beyond compulsory education. It is probably difficult to work in a science-related job without being good at science, and students seem to be aware of this. However, being capable in science does not necessarily mean that a student will enjoy science, science-related activities or pursue a science career. Therefore, in addition to cognitive ability, the beliefs in one's own competence, one's interests and the value that one attaches to relevant subjects are key factors in students' decisions about their careers (Wang and Degol, 2016).

These results also suggest that higher cognitive ability and positive attitudes towards science do not compensate for each other: low scores in one domain cannot be offset by higher scores in the other. To the extent that these associations reflect underlying causal mechanisms, they imply that it is not sufficient to enhance academic proficiency or to develop positive attitudes; if teachers focus on one to the exclusion of the other, then the influence of each is undermined (Nagengast et al., 2011).

While Figure I.3.17 identifies two factors that predict, with some accuracy, whether a student expects a career in science, it does not cover all of the elements that influence that expectation. For instance, in 17 countries and economies, girls remain significantly less likely than boys to expect a science-related career even among students who perform similarly and enjoy science to the same extent. This includes, among OECD countries, Austria, the Czech Republic, Estonia, Hungary, Luxembourg, Mexico, Slovenia and Turkey (as highlighted by negative coefficients for the "girl" indicator in Table I.3.13b). And this is true in many more countries for careers outside of the health sector. This gender difference could be related to other elements of the subjective value of science that were not included in the model, such as attainment value, i.e. how important science is to the student and how well-aligned science is with the student's own identity (Wigfield, Tonks and Klauda, 2009), which in turn is shaped by the social and cultural context in which the student lives, or to differences in self-efficacy, which are discussed at the end of this chapter. As shown in a study of 10-11 year-old girls in England (United Kingdom), despite being highly proficient in science and enjoying the subject, girls may perceive certain science occupations as not appropriate for women and thus devalue related activities as not important for them (Archer et al., 2013).

Similarly, even among students of similar proficiency in science and who reported the same level of enjoyment of science, socio-economic status has an influence on career expectations. Students from more advantaged families (as indicated by higher values on the PISA index of economic, social and cultural status) are more likely to expect to work in science-related

occupations, compared to students from more disadvantaged backgrounds. On average across OECD countries, and even after accounting for differences in science performance and reported level of enjoyment of science, a one-unit increase on the PISA index of economic, social and cultural status is associated with a higher likelihood (+1.7 percentage points) of expecting a career in science. A significant socio-economic difference, even after accounting for students' performance, enjoyment of science and gender, is found in 41 countries and economies (Table I.3.13b). Similar findings inspired several initiatives aimed at raising the profile of science-related careers among high-performing students, particularly from under-represented backgrounds (see e.g. OECD, 2008; Department for Business, Innovation and Skills, 2016).

BIVARIATE ASSOCIATIONS OF ENGAGEMENT WITH SCIENCE AND MOTIVATION FOR LEARNING SCIENCE WITH PERFORMANCE

This section presents simple associations between science engagement and performance, and between motivation for learning science and performance. Such associations do not necessarily reflect a causal relationship. In fact, cause and effect may go both ways; the causal links may also be indirect, mediated by other important factors; or the links may be spurious, reflecting associations with a third, confounding factor that influences both the degree of proficiency in science and the reported frequency of students' engagement in science-related activities or motivation for learning science. More robust causal links could be identified if it were possible to compare the changes in performance over time with concurrent changes in attitudes towards science. However, due to the repeated cross-sectional nature of data in PISA, comparisons across different years are only possible at the country/economy level, i.e. on a small number of observations and with limited scope for accounting for other concurrent changes.

Within-country associations with performance

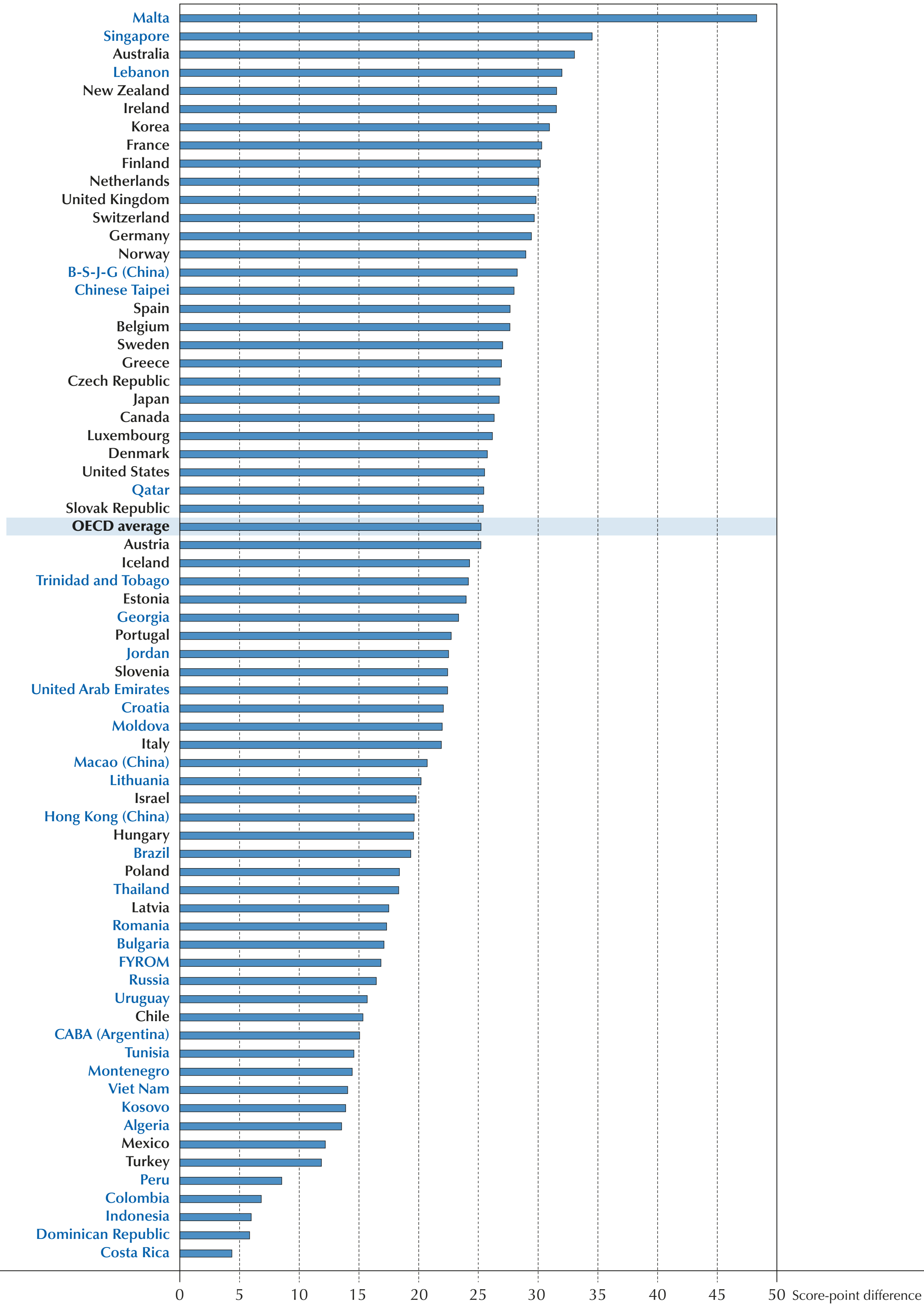
Participation in science-related activities is not strongly related to performance, on average, but the relationship varies greatly depending on the country. In many countries, students who reported participating more frequently in science activities (as indicated by higher values on the index of science activities) tend to score higher, on average. In particular, in Australia, France, Ireland, Japan, Korea and Chinese Taipei, the difference in performance between the 25% of students who reported the most frequent participation in science activities and the 25% of students who reported the least frequent participation is over 40 score points, on average. But in other countries, the opposite pattern is found. In Bulgaria, Colombia, the Dominican Republic, Israel, Peru, Qatar, Tunisia and the United Arab Emirates, for example, students who reported the most frequent participation in science-related activities were often among the lowest performers in science (Table I.3.5b).

Enjoyment of science is, in all countries, positively related to performance in science. As Figure I.3.18 indicates, students who reported less interest in and enjoyment of learning science, and who reported not having fun when learning about science topics, generally scored lower in science than those who reported that they enjoy science and are happy working on science topics. On average across OECD countries, a change of one unit on the index of enjoyment of science corresponds to a 25 score-point difference in science performance. In every country/economy, the 25% of students who reported the most enjoyment scored higher than the 25% of students who reported the least enjoyment – 75 points higher, on average across OECD countries (Table I.3.1b). But the strength of this association varies greatly across countries. In Australia, Malta, New Zealand and Sweden, more than 95 score points separate the most intrinsically motivated students from the least intrinsically motivated, while in Colombia, Costa Rica, the Dominican Republic, Indonesia and Peru, less than 20 score points, on average, separate these two groups of students. Across OECD countries, 9% of the variation in students' science performance can be explained by differences in students' enjoyment of science. In Ireland and Malta, more than 15% of the variation is so explained, and in all but five countries/economies, the association is positive and significant.

Instrumental motivation to learn science also tends to be positively related to performance. As Figure I.3.19 indicates, students who reported less instrumental motivation to learn science generally scored somewhat below those who reported that what they learn in science at school is important for them because they need this knowledge for what they want to do later on. But the association between instrumental motivation and performance is weaker than the association between intrinsic motivation and performance. On average across OECD countries, a one-unit increase on the index of instrumental motivation corresponds to only a nine-point improvement in performance. The relationship is flat, or slightly negative, in a few countries/economies. In 31 countries and economies, the relationship between students' instrumental motivation and science performance is significantly more positive among the highest-achieving students (those scoring at the 90th percentile) than among the lowest-achieving students (those scoring at the 10th percentile). This implies that there is greater variation in science performance among students with high instrumental motivation than among students with low instrumental motivation (Table I.3.3d).

Figure I.3.18 ▪ **Students' enjoyment of science and science performance**

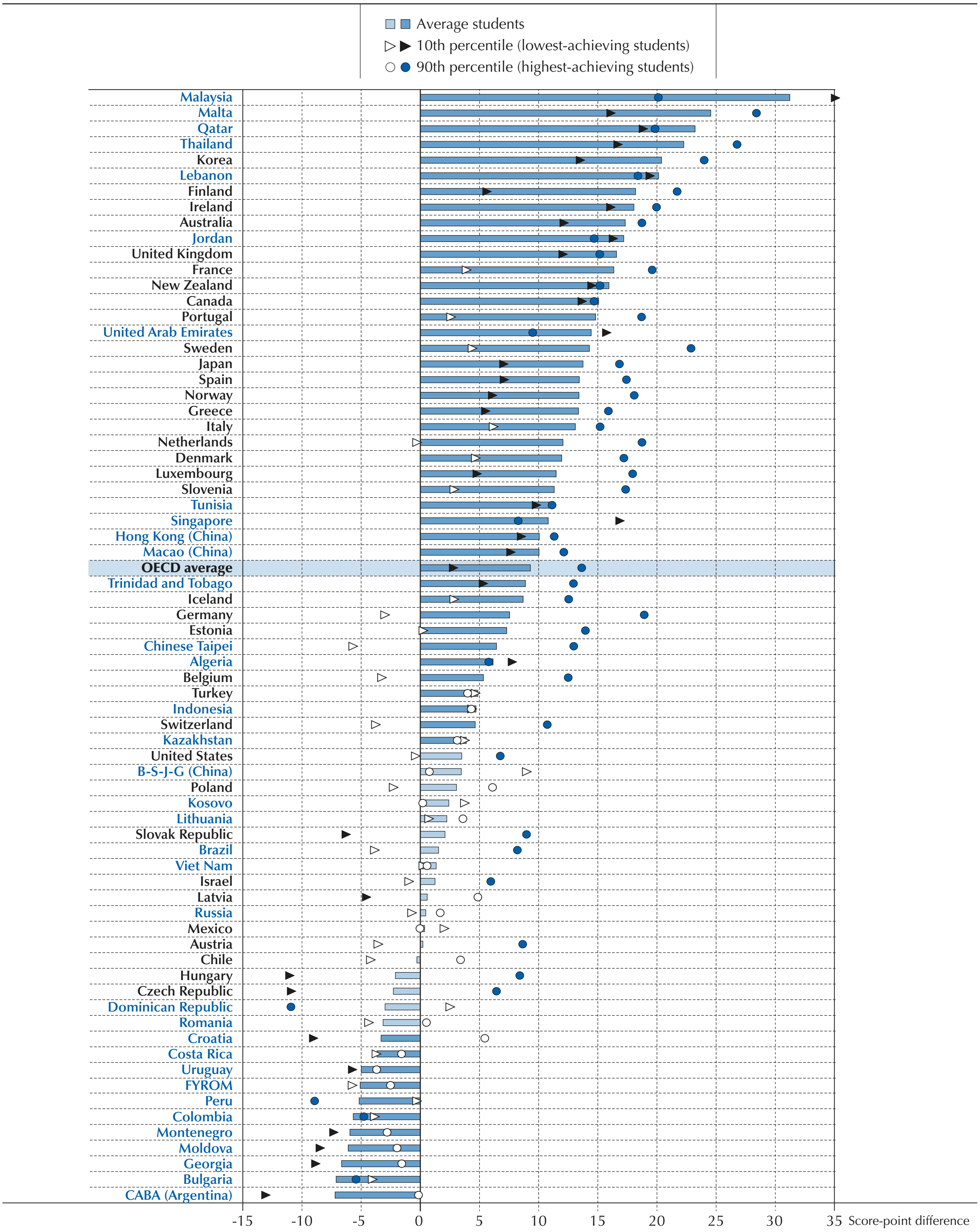
Score-point difference associated with one-unit increase in the index of enjoyment of science



Note: All score-point differences are statistically significant (see Annex A3).
Countries and economies are ranked in descending order of the score-point difference associated with the index of enjoyment of science.
Source: OECD, PISA 2015 Database, Table I.3.1d.
StatLink http://dx.doi.org/10.1787/888933432440

Figure I.3.19 ▪ **Students' instrumental motivation to learn science and science performance**

Score-point difference associated with one-unit increase in the index of instrumental motivation



Note: Statistically significant differences are marked in a darker tone (see Annex A3).

Countries and economies are ranked in descending order of the score-point difference of average students associated with the index of instrumental motivation.

Source: OECD, PISA 2015 Database, Table I.3.3d.

StatLink http://dx.doi.org/10.1787/888933432452

Associations with performance at the country/economy level

Average levels of participation in science activities, of enjoyment of science and of instrumental motivation reported in PISA are all negatively related to mean performance in PISA (Table I.3.7), a finding often referred to as the attitude-achievement paradox (Bybee and McCrae, 2011; Lu and Bolt, 2015). This paradox illustrates the difficulty of comparing self-reported scales across countries and cultural contexts (see Box I.2.4 in Chapter 2).

Comparing changes across time at the country/economy level avoids the problem of accounting for varying cultural standards for self-reporting because direct comparisons of student responses are limited to students from the same country, albeit at different points in time. Changes between 2006 and 2015 in student participation in science activities, in students' enjoyment of science and in students' instrumental motivation to learn science are all unrelated, or only weakly related, to concurrent changes in students' science scores (correlations lower than 0.3 in absolute value; see Table I.3.8). This may indicate that student performance in science can improve even in the absence of greater motivation to learn science, and, conversely, that students can develop greater motivation to learn science even if there is no improvement in their science scores.

SCIENCE SELF-EFFICACY

The term "self-efficacy" is used to describe students' belief that, through their actions, they can produce desired effects, such as solving a difficult problem or achieving a personal goal. This, in turn, is a powerful incentive to act or to persevere in the face of difficulties (Bandura, 1977).

Science self-efficacy refers to future-oriented judgements about one's competency in accomplishing particular goals in a specific context, where meeting these goals requires scientific abilities, such as explaining phenomena scientifically, evaluating and designing scientific enquiry, or interpreting data and evidence scientifically (Mason et al., 2012). Better performance in science leads to higher levels of self-efficacy, through positive feedback received from teachers, peers and parents, and the positive emotions associated with it. At the same time, students who have low self-efficacy are at high risk of underperforming in science, despite their abilities (Bandura, 1997). If students do not believe in their ability to accomplish particular tasks, they may not exert the effort needed to complete the task, and a lack of self-efficacy becomes a self-fulfilling prophecy. Self-efficacy in science has been related to students' performance, but also to their career orientation and their choice of courses (Nugent et al., 2015).

While younger children have often been found to hold more positive beliefs about their general ability than older children, domain-specific self-efficacy tends to increase with age. This can reflect the fact that as children become better at understanding and interpreting the feedback received from parents, peers or teachers, they become more accurate and realistic in their self-assessments (Wigfield and Eccles, 2000).

PISA 2015 asked students to report on how easy they thought it would be for them to: recognise the science question that underlies a newspaper report on a health issue; explain why earthquakes occur more frequently in some areas than in others; describe the role of antibiotics in the treatment of disease; identify the science question associated with the disposal of garbage; predict how changes to an environment will affect the survival of certain species; interpret the scientific information provided on the labelling of food items; discuss how new evidence can lead them to change their understanding about the possibility of life on Mars; and identify the better of two explanations for the formation of acid rain. For each of these, students could report that they "could do this easily", "could do this with a bit of effort", "would struggle to do this on [their] own", or "couldn't do this". Students' responses were used to create the index of science self-efficacy. The values of this index were equated with the values of the corresponding index for PISA 2006 to allow for comparisons across PISA cycles. A one-unit increase on the index corresponds to the difference between a student who reported that he or she would struggle to do any of the eight science-related tasks on his or her own (average index of science self-efficacy: -1.05), and a student who reported that he/she could do, with a bit of effort, at least six of the tasks, but would struggle with the remaining two (average index: -0.05).

Figure I.3.20 and Table I.3.4c show that girls are more likely than boys to have low self-efficacy. In 41 countries and economies, the mean index of science self-efficacy among boys is significantly higher than that among girls. Gender differences in science self-efficacy are particularly large in Denmark, France, Germany, Iceland and Sweden, where they exceed 0.3 unit on the self-efficacy scale. In eight countries/economies, girls reported higher science self-efficacy than boys, on average; and in 23 countries/economies, the difference between boys and girls in science self-efficacy is not significant.

A detailed analysis of each task reveals that the gender gap in self-confidence depends on the type of problem or situation boys and girls encounter. Boys were more likely to report that they can "easily" discuss how new evidence can lead them to change their understanding about the possibility of life on Mars, recognise the science question that underlies a newspaper report on a health issue, or identify the better of two explanations for the formation of acid rain.

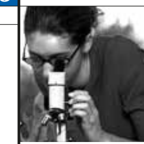
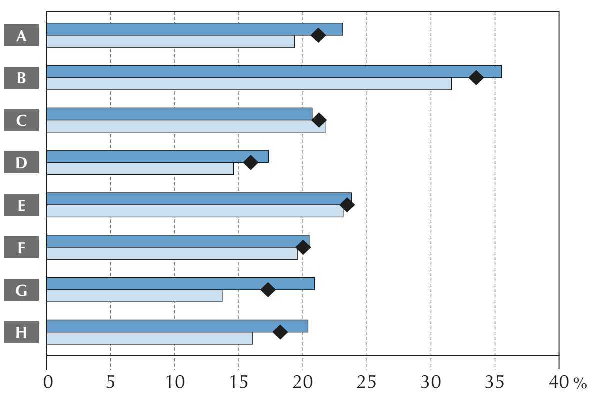


Figure I.3.20 ▪ Students' self-efficacy in science, by gender

Percentage of students who reported that "[they] could easily do" the following tasks

- **A** Recognise the science question that underlies a newspaper report on a health issue
- **B** Explain why earthquakes occur more frequently in some areas than in others
- **C** Describe the role of antibiotics in the treatment of disease
- **D** Identify the science question associated with the disposal of garbage
- **E** Predict how changes to an environment will affect the survival of certain species
- **F** Interpret the scientific information provided on the labelling of food items
- **G** Discuss how new evidence can lead you to change your understanding about the possibility of life on Mars
- **H** Identify the better of two explanations for the formation of acid rain



		A	B	C	D	E	F	G	H
OECD	Australia	21	41	22	12	32	17	17	13
	Austria	18	37	21	14	21	15	15	18
	Belgium	21	33	23	12	23	21	18	17
	Canada	28	36	25	22	36	25	22	22
	Chile	17	32	15	13	19	18	15	16
	Czech Republic	28	38	28	13	21	21	19	14
	Denmark	25	47	17	17	27	26	21	15
	Estonia	19	32	18	16	16	20	14	15
	Finland	15	43	18	14	15	20	18	11
	France	18	30	26	11	20	20	20	12
	Germany	21	37	24	13	23	17	13	19
	Greece	27	34	26	18	24	18	17	23
	Hungary	22	22	20	19	17	18	15	19
	Iceland	28	37	24	19	30	27	23	21
	Ireland	17	49	21	21	25	20	14	30
	Israel	32	25	21	21	25	34	22	19
	Italy	25	33	19	18	26	26	19	20
	Japan	8	19	6	10	12	7	7	5
	Korea	13	21	15	18	18	10	12	11
	Latvia	19	29	16	16	20	18	16	17
	Luxembourg	21	38	26	15	25	19	17	16
	Mexico	26	24	20	25	27	18	18	21
	Netherlands	17	41	24	11	19	15	16	18
	New Zealand	17	37	17	12	27	15	14	15
	Norway	14	29	23	15	24	17	19	20
	Poland	21	30	25	16	21	30	17	21
	Portugal	25	34	20	16	31	27	20	24
	Slovak Republic	23	24	21	14	18	21	17	18
	Slovenia	22	30	18	18	17	18	15	24
	Spain	17	39	22	12	23	21	20	20
	Sweden	16	33	17	15	26	17	17	20
	Switzerland	18	33	20	12	20	14	15	14
	Turkey	29	30	26	26	27	25	22	29
	United Kingdom	25	43	35	14	34	19	20	24
	United States	28	35	26	19	34	25	22	17
Partners	Albania	26	32	21	17	30	26	17	29
	Algeria	29	33	23	32	25	25	17	18
	Brazil	33	31	23	23	27	23	19	21
	B-S-J-G (China)	16	20	12	18	15	23	10	20
	Bulgaria	32	29	27	27	28	27	23	23
	CABA (Argentina)	31	36	17	17	31	25	18	19
	Colombia	23	20	17	22	24	17	14	17
	Costa Rica	18	25	17	24	24	16	14	16
	Croatia	20	28	32	19	22	16	17	24
	Dominican Republic	38	36	29	38	36	32	27	30
	FYROM	32	26	25	17	29	23	22	22
	Georgia	26	36	28	35	34	25	21	22
	Hong Kong (China)	12	21	12	12	15	18	10	18
	Indonesia	12	12	10	19	11	10	7	7
	Jordan	37	35	40	42	35	36	29	38
	Kosovo	25	23	23	16	22	23	16	20
	Lebanon	38	24	27	25	31	31	22	27
	Lithuania	23	34	27	19	23	20	21	19
	Macao (China)	14	28	14	14	18	18	9	22
	Malta	23	26	17	16	33	27	18	25
	Moldova	19	30	22	28	26	22	15	19
	Montenegro	33	32	29	27	29	27	24	27
	Peru	23	29	19	28	29	22	18	20
	Qatar	32	28	30	28	33	25	22	30
	Romania	18	20	18	15	19	18	16	16
	Russia	25	27	22	24	19	24	16	17
	Singapore	17	33	15	13	28	16	13	31
	Chinese Taipei	17	29	16	21	22	18	14	22
	Thailand	17	17	13	20	16	16	13	15
	Trinidad and Tobago	24	31	22	27	37	24	18	23
	Tunisia	31	23	19	21	21	23	18	17
	United Arab Emirates	32	31	32	29	32	27	24	32
	Uruguay	30	36	20	18	23	22	19	18
	Viet Nam	16	17	21	24	26	13	5	14

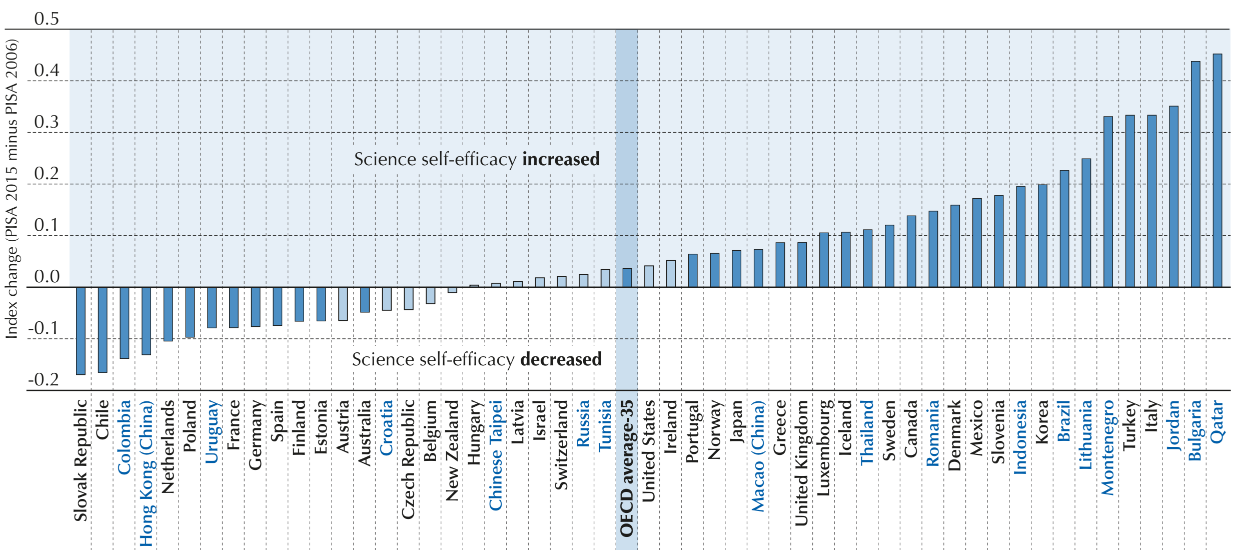
Note: All gender differences are statistically significant (see Annex A3).
Source: OECD, PISA 2015 Database, Tables I.3.4a and I.3.4c.

StatLink http://dx.doi.org/10.1787/888933432466

But in the majority of PISA-participating countries and economies, girls reported at least as frequently as boys did that they feel confident in describing the role of antibiotics in the treatment of disease. In the Netherlands, for instance, in contrast to the pattern observed for all other tasks, more girls than boys reported that they could easily explain the role of antibiotics (27% of girls, but only 20% of boys so reported). For this task, a significant difference, in favour of girls, is found in 26 countries and economies, as well as on average across OECD countries.

Between 2006 and 2015, students' science self-efficacy remained broadly stable, on average across OECD countries. In 2015, students were more likely to report that they could easily describe the role of antibiotics in the treatment of disease (+3 percentage points), but less likely to report that they could easily interpret the scientific information provided on the labels of food items. However, this average stability masks the significant improvement in students' science self-efficacy observed in 26 countries and economies, and the significant deterioration in self-efficacy observed in 12 countries and economies (Figure I.3.21). In Italy, for example, only 10% of students in 2006 reported that they could easily recognise the science question that underlies a newspaper report on a health issue; by 2015, 25% of students so reported. Similarly, only 8% of students in 2006 felt confident explaining the role of antibiotics in the treatment of disease; by 2015, 19% of students felt confident in doing so (Tables I.3.4a, I.3.4e and I.3.4f).

Figure I.3.21 ▪ **Change between 2006 and 2015 in students' self-efficacy in science**

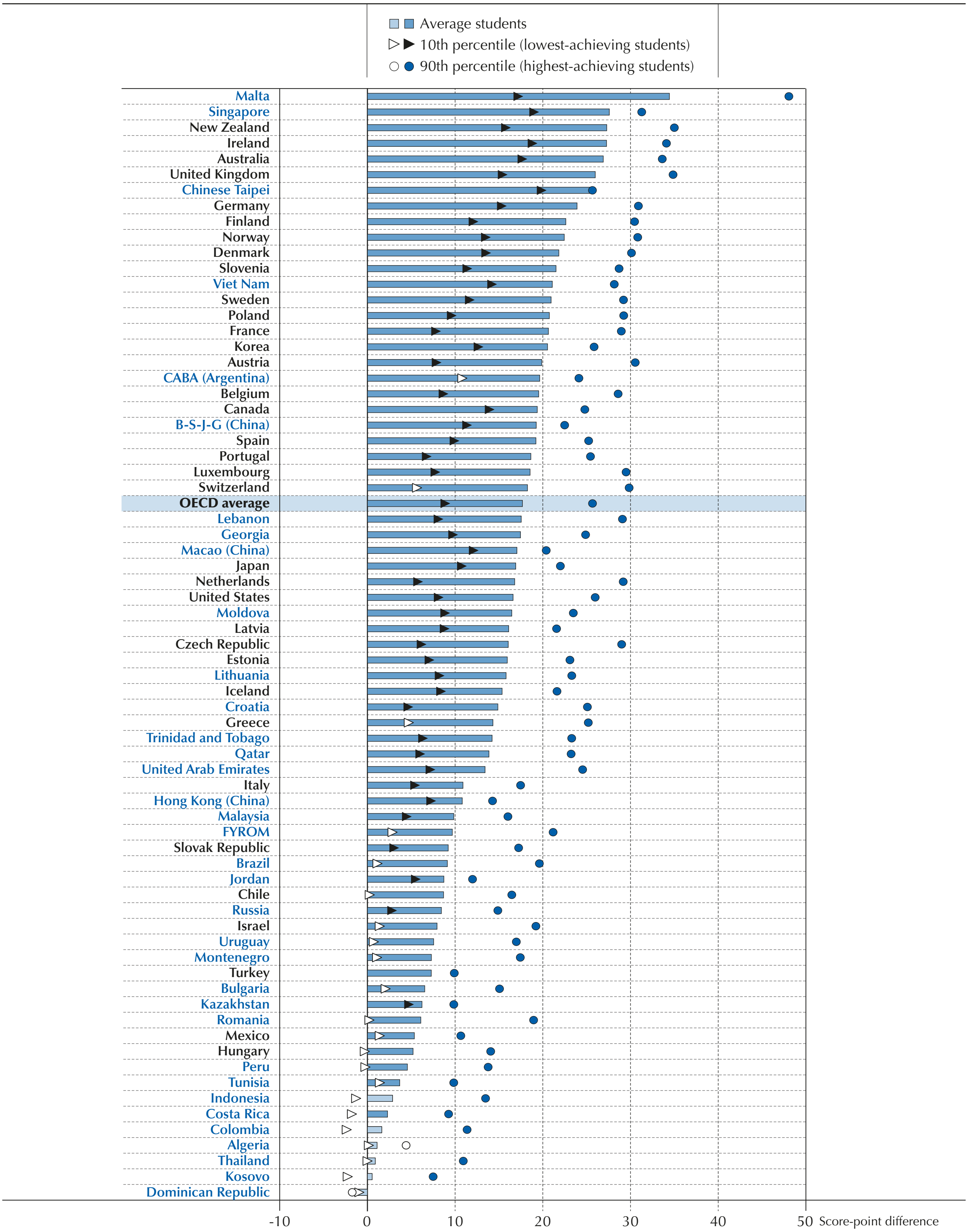


Note: Statistically significant differences are marked in a darker tone (see Annex A3).
Countries and economies are ranked in ascending order of the change in the index of self-efficacy in science between 2006 and 2015.
Source: OECD, PISA 2015 Database, Table I.3.4f.
StatLink http://dx.doi.org/10.1787/888933432476

As Figure I.3.22 shows, students who have low science self-efficacy perform worse in science than students who are confident about their ability to use their science knowledge and skills in everyday contexts. The blue bars in Figure I.3.22 indicate the estimated score-point difference in science performance associated with a difference of one unit on the index of science self-efficacy. On average across OECD countries, science self-efficacy is associated with a difference of 17 score points. The association is positive and significant in almost all PISA-participating countries and economies. The difference in science performance associated with students' self-efficacy is more than 25 score points in Australia, Ireland, Malta, New Zealand, Singapore, Chinese Taipei and the United Kingdom (all of which, except Malta, have mean scores above the OECD average). The association is flat, and not significant, in Algeria, Colombia, the Dominican Republic, Indonesia, Kosovo and Thailand (as well as in Bulgaria, Costa Rica, Hungary and Peru, after accounting for gender and socio-economic status) – all countries with mean scores below the OECD average. On average across OECD countries, however, only 6% of the variation in students' science performance can be explained by differences in how confident students feel about their ability to handle a range of situations in which they need to use their science skills and knowledge (Tables I.3.4b and I.3.4d).

Figure I.3.22 ▪ **Students' self-efficacy in science and science performance**

Score-point difference associated with one-unit increase in the index of self-efficacy



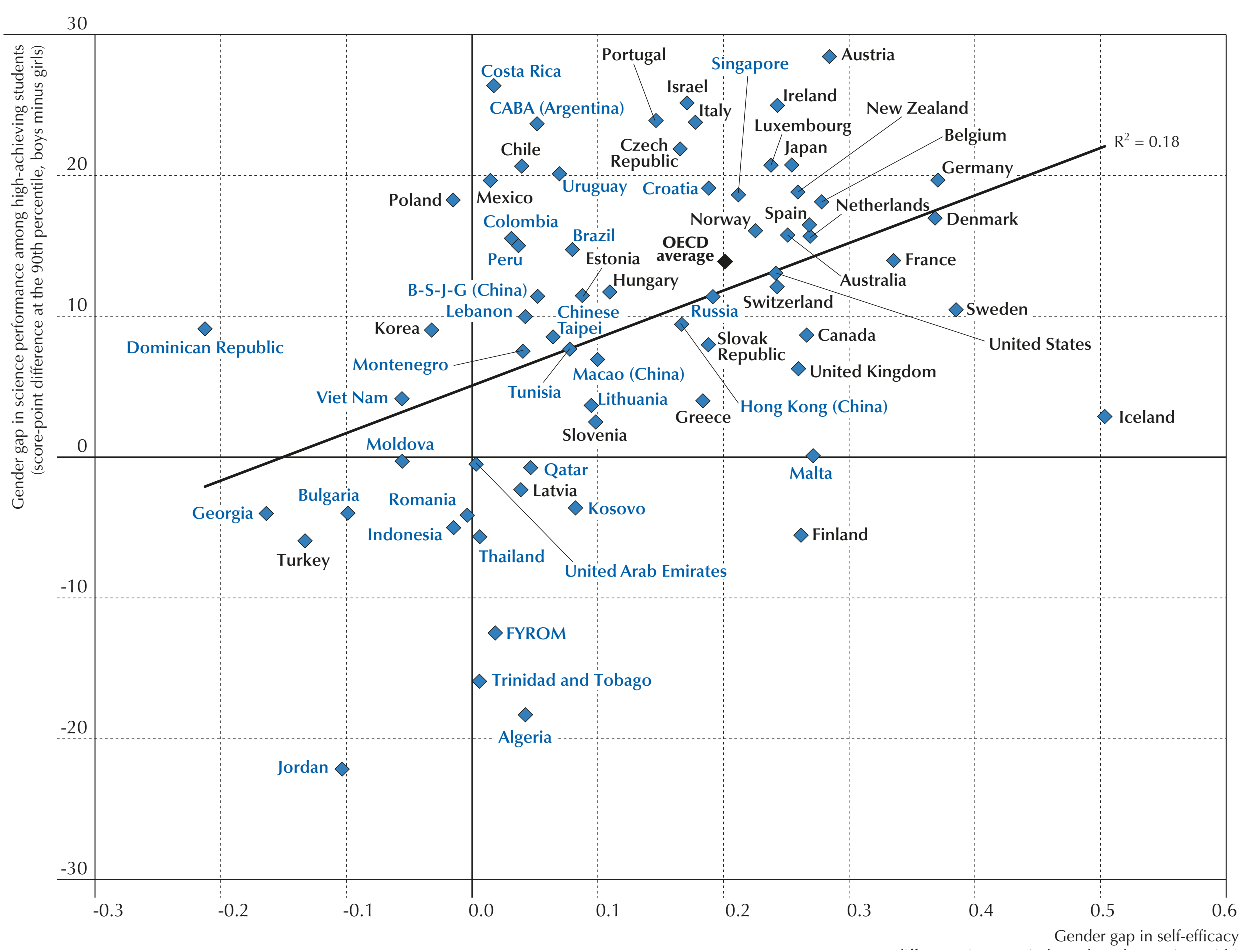
Note: Statistically significant differences are marked in a darker tone (see Annex A3).
Countries and economies are ranked in descending order of the score-point difference of average students associated with the index of self-efficacy.
Source: OECD, PISA 2015 Database, Table I.3.4d.

StatLink http://dx.doi.org/10.1787/888933432481

The blue bars in Figure I.3.22 show the association between science self-efficacy and science performance at the mean; the triangles and the circles symbolise the relationship between science self-efficacy and science performance near the top and the bottom of the performance distribution. Across OECD countries, science self-efficacy is positively associated with science performance; but while the association is 17 points at the mean, similar increases in self-efficacy are associated with greater improvements in performance near the top of the performance distribution, among the highest-achieving students, than among the lowest-achieving students. Specifically, a change of one unit on the index is associated with a 25 score-point difference at the 90th percentile of the performance distribution, but with only a 9 score-point difference at the 10th percentile of the performance distribution. The association between self-efficacy and performance among the highest-achieving students is positive and significantly stronger than among the lowest-achieving students in all but two countries and economies (Algeria and the Dominican Republic). In Austria, the Czech Republic, France, Lebanon, Luxembourg, the Netherlands, Poland and Switzerland, for example, a one-unit increase on the self-efficacy index corresponds to a difference of about 30 score points in performance at the 90th percentile, but of less than 10 score points at the 10th percentile. Among the lowest-achieving students, the association is significant and positive in only 51 out of 72 countries and economies (Table I.3.4d).

Students' average science self-efficacy is not associated with a country's mean science performance (correlation: -0.2). In some of the highest-performing countries, such as Japan and Viet Nam, students reported some of the lowest levels of self-efficacy in science; in others, such as Canada, both performance and self-efficacy are above average. Similarly, among low-performing countries, there is great variation in students' science self-efficacy, with no clear pattern emerging.

Figure I.3.23 ▪ **Gender gaps in self-efficacy and performance in science**



Source: OECD, PISA 2015 Database, Tables I.2.7 and I.3.4c.

StatLink http://dx.doi.org/10.1787/888933432491

But levels of self-efficacy tend to be positively associated with the percentage of students expecting a career in science-related occupations (r=0.5) or with the average frequency of participation in science-related activities (r=0.5), as discussed earlier (Tables I.2.3, I.3.4b and I.3.7).

These correlations involving mean index values are greatly affected by differences in how self-report scales are used (see Box I.2.4 in Chapter 2). One way to account for the variation in response style in cross-country comparisons is to explore associations of *changes* in index values across time with concurrent performance changes, or of *differences* in index values across boys and girls with gender gaps in performance. Indeed, the country-level variation in response style is, under plausible assumptions, netted out when index values are compared first within countries, across time or gender, and when only the resulting differences are compared across countries.

At the system level, changes in students' self-efficacy are weakly correlated with changes in students' performance in science (r=0.37), but they are related, as discussed previously, to changes in students' participation in science activities (r=0.48) (Table I.3.8). The gender gap in science self-efficacy is also moderately related to the gender gap in science performance, particularly among high-achieving students (r=0.43) (Table I.3.9). Countries and economies where the 10% best-performing boys in science score significantly above the 10% best-performing girls tend to have larger gender gaps in self-efficacy, in favour of boys. Meanwhile, in countries and economies where girls reported greater self-efficacy than boys, the gender gap among high-achieving students is not statistically significant; and in Jordan, the gender gap is to girls' advantage (Figure I.3.23 and Tables I.2.8a and I.3.4c).

These moderate correlations between students' self-efficacy and performance show that differences in self-efficacy can explain some of the variation in science performance observed across countries. In particular, they may explain why there are fewer top-performing girls than boys, despite similar average performance. At the same time, gender-related disparities in self-efficacy clearly do not account for all gender gaps in performance.

Notes

1. In 2006, the question was administered in paper format; in 2015, most countries/economies administered the question in computer format. In 2006, responses were coded according to the International Standard Classification of Occupations (ISCO), 1988 edition; in 2015, responses were coded according to the International Standard Classification of Occupations (ISCO), 2008 edition. These contextual changes in the methods used to measure career expectations must be borne in mind when comparing student responses across these two cycles.

2. Occupations are defined by the first three digits in the International Standard Classification of Occupations (ISCO), 2008 edition.

3. In 2006, students reported their level of agreement with four out of the five items retained for the PISA 2015 questionnaire. They responded on a scale from "strongly agree" to "strongly disagree" to the question "How much do you agree with the statements below?". In 2015, the response scale was inverted (from "strongly disagree" to "strongly agree"), and the question stem was changed ("How much do you disagree or agree with the statements about yourself below?"). These minor changes are expected to have a negligible influence on comparisons between 2006 and 2015, and values for the PISA 2015 index of enjoyment of science are reported on the scale originally developed in PISA 2006.

4. The PISA 2015 index of instrumental motivation to learn science is reported on the scale as the corresponding index for PISA 2006.

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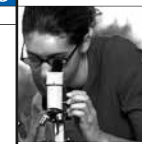

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4

Reading performance among 15-year-olds

How well can 15-year-old students understand, use, reflect on and engage with written texts? This chapter compares countries' and economies' performance in reading in 2015 and analyses changes over the various PISA assessments. It highlights the differences between girls' and boys' performance.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

The PISA assessment of reading focuses on students' ability to use written information in real-life situations. PISA defines reading literacy as "understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society" (OECD, 2016a). This definition goes beyond the traditional notion of decoding information and literally interpreting what is written. PISA's conception of reading literacy encompasses the range of situations in which people read, the different ways written texts are presented (e.g. in printed books, but also in fact sheets, online fora and news feeds), and the variety of ways in which readers approach and use texts, from the functional and finite, such as finding a particular piece of practical information, to the deep and far-reaching, such as understanding other ways of doing, thinking and being.

Reading was the major domain assessed in 2000, the first PISA assessment, and in 2009, the fourth PISA assessment. In this sixth PISA assessment, science is the major domain; thus, fewer students were assessed, and a smaller set of tasks (103 questions) was used in the reading assessment than in the science assessment. As a result, only an update on overall performance is possible, rather than the kind of in-depth analysis of knowledge and skills shown in the PISA 2009 report (OECD, 2010c).

What the data tell us

- Singapore is the highest-performing country in reading; the provinces of Alberta (Canada) and British Columbia (Canada) score close to Singapore's results.
- About 20% of students in OECD countries, on average, do not attain the baseline level of proficiency in reading (Level 2). In Canada, Estonia, Finland, Hong Kong (China), Ireland, Macao (China) and Singapore, less than 12% of students do not attain this level.
- On average across OECD countries, students' mean reading proficiency has not improved since 2000. Among the 42 countries/economies with valid data in at least five rounds of PISA, 12 saw an improving trend in performance, 6 a declining trend, and the remaining 24 a non-significant improvement or deterioration in performance.
- Between 2009 and 2015, Albania, Estonia, Georgia, Ireland, Macao (China), Moldova, Montenegro, the Russian Federation (hereafter "Russia"), Slovenia and Spain saw an increase in the share of students who attain the highest reading proficiency levels in PISA and a simultaneous decrease in the share of students who do not attain the baseline level of proficiency.
- On average across OECD countries, the gender gap in reading in favour of girls narrowed by 12 points between 2009 and 2015: boys' performance improved, particularly among the highest-achieving boys, while girls' performance deteriorated, particularly among the lowest-achieving girls.

This chapter presents the results of the assessment of reading in PISA 2015. Fifty-seven of the 72 participating countries and economies conducted the test on computer, and students were required to use such devices as a monitor, keyboard and mouse. The transfer of reading units from paper-based to computer-based delivery required some minor adjustments to the reading framework (see Box I.4.1). The remaining 15 countries and economies, as well as Puerto Rico, an unincorporated territory of the United States, delivered the test in pencil-and-paper format, as in previous cycles of PISA. The countries/economies that administered the paper-based test in 2015 are: Albania, Algeria, Argentina, the Former Yugoslav Republic of Macedonia (hereafter "FYROM"), Georgia, Indonesia, Jordan, Kazakhstan, Kosovo, Lebanon, Malta, Moldova, Romania, Trinidad and Tobago, and Viet Nam.

Despite differences in the assessment mode, the results for all countries are reported on the same scale.[1] Indeed, all countries, regardless of how the assessment was delivered, used the same reading questions, most of which were developed for the 2009 pencil-and-paper test and a few of which were used in the PISA 2000 assessment. Box I.4.1 summarises the measures taken to ensure the comparability of test results between the two modes of delivery; Annex A5 describes in greater detail how the reporting scales were linked.

STUDENT PROFICIENCY IN READING

The metric for the overall reading scale was set when reporting the results of the first PISA reading assessment, conducted in 2000. It is based on a mean for the 28 OECD countries that took part in the first PISA assessment equal to 500 score points, with a standard deviation of 100 points (OECD, 2001). To help interpret what students'

scores mean in substantive terms, the scale is divided into levels of proficiency that indicate the kinds of tasks that students at those levels are capable of completing successfully. The descriptions of the proficiency levels are revisited and updated each time a domain returns as a major domain, to reflect revisions in the framework as well as the demands of the new tasks developed for the assessment. The most recent descriptions of reading proficiency levels are based on the PISA 2009 assessment (OECD, 2010c).

Box I.4.1. **Assessing reading on screen: Changes in the PISA reading framework and in test questions between 2009 and 2015**

The main mode of delivery for the previous PISA assessments was paper. In moving to computer-based delivery in 2015, great care was taken to maintain comparability between the paper-based and the computer-based versions of test questions so that results could be reported on the same scale as in previous assessments, and to allow for comparisons of performance across countries that conducted the test in paper and computer modes.

Given that all the reading questions used in PISA 2015 were originally developed in prior cycles for testing on paper, only minor revisions to the framework were required. These were limited to clarifying the terminology, particularly distinguishing the text-display space (paper sheets or digital screens) from the text type (which is typically "fixed", in a paper space, but can be "fixed" or "dynamic" in a digital space; the adjective "dynamic" refers to hypertexts, i.e. texts that, with navigation tools and certain features, make possible and even require non-sequential reading). The PISA 2015 reading test was delivered on paper or computer, but used only fixed-text formats; hypertexts that included links or other navigation features were not used.

In revisiting the items for delivery on computer, the following design principles were considered:

- **Item types:** The computer provides a range of new item formats, such as drag-and-drop and hotspots. Since the purpose of the 2015 assessment of reading is to compare results with prior cycles and observe trends, the vast majority of response formats remained unchanged in 2015, although some hotspot items were used to enable computer-coding of items that were previously scored by experts. The use of hotspot formats (where students must click on a part of a figure, highlight an excerpt, or connect two or more elements in the response space) was limited to items where no expert judgement was required to assign credit.
- **Text presentation:** A defining feature of fixed texts is that the length or amount of the text is immediately visible to the reader. Clearly, displaying long texts on a single page or screen is impossible, both on paper and on a computer, and the space available on an assessment form displayed on a screen is even smaller than that available on a sheet of paper in a test booklet. To allow readers to quickly grasp the length or amount of text, long texts were presented on several pages/screens, without requiring readers to scroll down. The test platform ensured that students would browse through all pages of the stimulus text before they saw the first question.
- **Computer skills:** Just as paper-based assessments rely on a set of fundamental skills for working with printed materials, so computer-based assessments rely on a set of fundamental skills for using computers. These include knowledge of basic hardware (e.g. keyboard and mouse) and basic conventions (e.g. arrows to move forward and specific buttons to press to execute commands). Every effort was made to keep the requirements of computer skills to a minimum, and students could practice interacting with different response formats and stimulus presentations before starting the test. Of course, this practice was not expected to be sufficient to remediate a fundamental lack of experience or familiarity with computers.

The equivalence of the paper-based and computer-based versions of each question, and of the overall scale formed by the test questions, was then tested during the field trial for PISA 2015. About two-thirds (65) of the test questions included in the main study were found to be fully equivalent, and to support the comparison of levels of performance across modes and with respect to previous PISA assessments. The difficulty of the remaining 38 questions was found to differ across modes, and that was taken into account when results for the main study were scaled. Annex A5 provides further details on the mode-effect study in the field trial and the scaling models used in PISA 2015.

Average performance in reading

One way to summarise student performance and to compare the relative standing of countries in reading is through countries' and economies' mean performance, both relative to each other and to the OECD mean. For PISA 2015, the mean performance across the 35 OECD countries is 493 score points, with an average standard deviation of 96 points.

When interpreting mean performance, only those differences among countries and economies that are statistically significant should be taken into account (see Box I.2.3 in Chapter 2). Figure I.4.1 shows each country's/economy's mean score and also indicates for which pairs of countries/economies the differences between the means are statistically significant. For country/economy A, shown in the middle column, the mean score achieved by students is shown in the left column, and the countries/economies whose mean scores are not statistically significantly different are listed in the right column. For all other countries/economies that are not listed in the right column, country/economy B scores higher than country/economy A if country/economy B is situated above country/economy A in the middle column, and scores lower if country/economy B is situated below country/economy A. For example: Singapore, whose mean score is 535 points, has a higher score than all other PISA-participating countries/economies; but the performance of Hong Kong (China), which appears second on the list with a mean score of 527 points, cannot be distinguished with confidence from that of Canada, Finland and Ireland.

In Figure I.4.1, countries and economies are divided into three broad groups: those whose mean scores are statistically around the OECD mean (highlighted in dark blue), those whose mean scores are above the OECD mean (highlighted in pale blue), and those whose mean scores are below the OECD mean (highlighted in medium blue).

As shown in Figure I.4.1, Singapore is the highest-performing country in reading, with a mean score of 535 points – about 40 points above the OECD average. Three countries perform below Singapore, but at least 30 points above the OECD average (Canada, Finland and Hong Kong [China]), and five countries perform between 20 and 30 points higher than the OECD average (Estonia, Ireland, Japan, Korea and Norway). Thirteen other countries and economies – Australia, Belgium, Denmark, France, Germany, Macao (China), the Netherlands, New Zealand, Poland, Portugal, Slovenia, Sweden and the United Kingdom – also score above the OECD average. Meanwhile, Beijing-Shanghai-Jiangsu-Guangdong (China) (hereafter "B-S-J-G [China]"), the Russian Federation (hereafter "Russia"), Spain, Switzerland, Chinese Taipei, the United States and Viet Nam perform around the OECD average; and 41 countries and economies perform below the OECD average.

Across OECD countries, performance differences are large: about 100 score points, the equivalent of three years of school (see Box I.2.2 in Chapter 2), separate the mean scores of the highest-performing OECD countries (Canada and Finland) from the lowest-performing OECD countries (Mexico and Turkey). When the partner countries and economies are considered along with OECD countries, this difference amounts to 189 score points.

Because the figures are derived from samples, it is not possible to determine a country's or economy's precise ranking among all countries and economies. However, it is possible to determine, with confidence, a range of rankings in which the country's/economy's performance lies (Figure I.4.2). For subnational entities whose results are reported in Annex B2, a rank order was not estimated; but the mean score and its confidence interval allow for a comparison of performance of these subnational entities against that of countries and economies. For example, students in public schools in Massachusetts (United States) shows a mean score of 527 points in reading, close to the score achieved, on average, by students in Canada, Finland and Hong Kong (China), and clearly above the national average for the United States (497 points).

Trends in average reading performance since 2009

The change in a school system's average performance over time indicates how and to what extent the system is progressing towards achieving the goal of providing its students with the knowledge and skills needed to become full participants in a knowledge-based society. This section focuses on recent trends since 2009, the last time reading was the major domain. Trends over a longer period of time, since PISA 2000, are discussed in the following section. Trends in reading performance up to 2015 are available for 64 countries and economies. PISA 2015 results for 59 countries and economies can be compared with data from PISA 2009, the last time reading was a major domain. For five countries and economies, however, only PISA 2012 results in reading are available and can be compared with 2015 results. The average three-year trend up to 2015 can be calculated and compared across all 64 countries. It indicates the average rate of change in performance observed, per three-year period, between 2009 and 2015. (For further details on the estimation of the three-year trend, see Annex A5).

Figure I.4.1 ▪ Comparing countries' and economies' performance in reading

	Statistically significantly **above** the OECD average
	Not statistically significantly different from the OECD average
	Statistically significantly **below** the OECD average

Mean score	Comparison country/ economy	Countries and economies whose mean score is NOT statistically significantly different from the comparison country's/economy's score
535	Singapore	
527	Hong Kong (China)	Canada, Finland, Ireland
527	Canada	Hong Kong (China), Finland, Ireland
526	Finland	Hong Kong (China), Canada, Ireland
521	Ireland	Hong Kong (China), Canada, Finland, Estonia, Korea, Japan
519	Estonia	Ireland, Korea, Japan, Norway
517	Korea	Ireland, Estonia, Japan, Norway, New Zealand, Germany
516	Japan	Ireland, Estonia, Korea, Norway, New Zealand, Germany
513	Norway	Estonia, Korea, Japan, New Zealand, Germany, Macao (China)
509	New Zealand	Korea, Japan, Norway, Germany, Macao (China), Poland, Slovenia, Netherlands
509	Germany	Korea, Japan, Norway, New Zealand, Macao (China), Poland, Slovenia, Netherlands, Australia, Sweden
509	Macao (China)	Norway, New Zealand, Germany, Poland, Slovenia
506	Poland	New Zealand, Germany, Macao (China), Slovenia, Netherlands, Australia, Sweden, Denmark, France
505	Slovenia	New Zealand, Germany, Macao (China), Poland, Netherlands, Australia, Sweden, Denmark
503	Netherlands	New Zealand, Germany, Poland, Slovenia, Australia, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, B-S-J-G (China)
503	Australia	Germany, Poland, Slovenia, Netherlands, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, B-S-J-G (China)
500	Sweden	Germany, Poland, Slovenia, Netherlands, Australia, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
500	Denmark	Poland, Slovenia, Netherlands, Australia, Sweden, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
499	France	Poland, Netherlands, Australia, Sweden, Denmark, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
499	Belgium	Netherlands, Australia, Sweden, Denmark, France, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
498	Portugal	Netherlands, Australia, Sweden, Denmark, France, Belgium, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
498	United Kingdom	Netherlands, Australia, Sweden, Denmark, France, Belgium, Portugal, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
497	Chinese Taipei	Netherlands, Australia, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, United States, Spain, Russia, B-S-J-G (China), Switzerland
497	United States	Netherlands, Australia, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, Spain, Russia, B-S-J-G (China), Switzerland
496	Spain	Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Russia, B-S-J-G (China), Switzerland
495	Russia	Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, B-S-J-G (China), Switzerland, Latvia, Czech Republic, Croatia, Viet Nam
494	B-S-J-G (China)	Netherlands, Australia, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, Switzerland, Latvia, Czech Republic, Croatia, Viet Nam, Austria, Italy
492	Switzerland	Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Latvia, Czech Republic, Croatia, Viet Nam, Austria, Italy
488	Latvia	Russia, B-S-J-G (China), Switzerland, Czech Republic, Croatia, Viet Nam, Austria, Italy, CABA (Argentina)
487	Czech Republic	Russia, B-S-J-G (China), Switzerland, Latvia, Croatia, Viet Nam, Austria, Italy, Iceland, Luxembourg, Israel, CABA (Argentina)
487	Croatia	Russia, B-S-J-G (China), Switzerland, Latvia, Czech Republic, Viet Nam, Austria, Italy, Iceland, Luxembourg, Israel, CABA (Argentina)
487	Viet Nam	Russia, B-S-J-G (China), Switzerland, Latvia, Czech Republic, Croatia, Austria, Italy, Iceland, Luxembourg, Israel, CABA (Argentina)
485	Austria	B-S-J-G (China), Switzerland, Latvia, Czech Republic, Croatia, Viet Nam, Italy, Iceland, Luxembourg, Israel, CABA (Argentina)
485	Italy	B-S-J-G (China), Switzerland, Latvia, Czech Republic, Croatia, Viet Nam, Austria, Iceland, Luxembourg, Israel, CABA (Argentina)
482	Iceland	Czech Republic, Croatia, Viet Nam, Austria, Italy, Luxembourg, Israel, CABA (Argentina)
481	Luxembourg	Czech Republic, Croatia, Viet Nam, Austria, Italy, Iceland, Israel, CABA (Argentina)
479	Israel	Czech Republic, Croatia, Viet Nam, Austria, Italy, Iceland, Luxembourg, CABA (Argentina), Lithuania
475	CABA (Argentina)	Latvia, Czech Republic, Croatia, Viet Nam, Austria, Italy, Iceland, Luxembourg, Israel, Lithuania, Hungary, Greece
472	Lithuania	Israel, CABA (Argentina), Hungary, Greece
470	Hungary	CABA (Argentina), Lithuania, Greece
467	Greece	CABA (Argentina), Lithuania, Hungary, Chile
459	Chile	Greece, Slovak Republic
453	Slovak Republic	Chile, Malta
447	Malta	Slovak Republic, Cyprus[1]
443	Cyprus[1]	Malta
437	Uruguay	Romania, United Arab Emirates, Bulgaria, Turkey
434	Romania	Uruguay, United Arab Emirates, Bulgaria, Turkey, Costa Rica, Trinidad and Tobago, Montenegro, Colombia
434	United Arab Emirates	Uruguay, Romania, Bulgaria, Turkey, Costa Rica, Trinidad and Tobago
432	Bulgaria	Uruguay, Romania, United Arab Emirates, Turkey, Costa Rica, Trinidad and Tobago, Montenegro, Colombia, Mexico
428	Turkey	Uruguay, Romania, United Arab Emirates, Bulgaria, Costa Rica, Trinidad and Tobago, Montenegro, Colombia, Mexico
427	Costa Rica	Romania, United Arab Emirates, Bulgaria, Turkey, Trinidad and Tobago, Montenegro, Colombia, Mexico
427	Trinidad and Tobago	Romania, United Arab Emirates, Bulgaria, Turkey, Costa Rica, Montenegro, Colombia, Mexico
427	Montenegro	Romania, Bulgaria, Turkey, Costa Rica, Trinidad and Tobago, Colombia, Mexico
425	Colombia	Romania, Bulgaria, Turkey, Costa Rica, Trinidad and Tobago, Montenegro, Mexico
423	Mexico	Bulgaria, Turkey, Costa Rica, Trinidad and Tobago, Montenegro, Colombia, Moldova
416	Moldova	Mexico, Thailand
409	Thailand	Moldova, Jordan, Brazil, Albania, Georgia
408	Jordan	Thailand, Brazil, Albania, Georgia
407	Brazil	Thailand, Jordan, Albania, Qatar, Georgia
405	Albania	Thailand, Jordan, Brazil, Qatar, Georgia, Peru, Indonesia
402	Qatar	Brazil, Albania, Georgia, Peru, Indonesia
401	Georgia	Thailand, Jordan, Brazil, Albania, Qatar, Peru, Indonesia
398	Peru	Albania, Qatar, Georgia, Indonesia
397	Indonesia	Albania, Qatar, Georgia, Peru
361	Tunisia	Dominican Republic
358	Dominican Republic	Tunisia, FYROM, Algeria
352	FYROM	Dominican Republic, Algeria, Lebanon
350	Algeria	Dominican Republic, FYROM, Kosovo, Lebanon
347	Kosovo	Algeria, Lebanon
347	Lebanon	FYROM, Algeria, Kosovo

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.
Source: OECD, PISA 2015 Database, Table I.4.3.
StatLink http://dx.doi.org/10.1787/888933432504

Figure I.4.2 [Part 1/2] ■ **Reading performance among PISA 2015 participants, at national and subnational levels**

	Reading scale					
			Range of ranks			
			OECD countries		All countries/economies	
	Mean score	95% confidence interval	Upper rank	Lower rank	Upper rank	Lower rank
British Columbia (Canada)	536	525 - 547				
Singapore	535	532 - 538			1	1
Alberta (Canada)	533	523 - 544				
Quebec (Canada)[1]	532	523 - 541				
Ontario (Canada)	527	519 - 536				
Massachusetts (United States)	527	515 - 539				
Hong Kong (China)	527	521 - 532			2	5
Canada	527	522 - 531	1	3	2	4
Finland	526	521 - 531	1	3	2	5
Castile and Leon (Spain)	522	513 - 530				
Ireland	521	516 - 526	2	6	4	8
Madrid (Spain)	520	512 - 529				
Estonia	519	515 - 523	3	6	5	8
Korea	517	511 - 524	3	8	4	9
Nova Scotia (Canada)	517	508 - 527				
Japan	516	510 - 522	3	8	5	10
Prince Edward Island (Canada)	515	503 - 527				
Navarre (Spain)	514	504 - 524				
Norway	513	508 - 518	5	9	7	11
Trento (Italy)	512	506 - 517				
Flemish community (Belgium)	511	505 - 516				
New Zealand	509	505 - 514	7	11	9	14
Germany	509	503 - 515	6	12	8	15
Galicia (Spain)	509	500 - 518				
Macao (China)	509	506 - 511			10	13
Aragon (Spain)	506	494 - 519				
Poland	506	501 - 511	8	14	10	17
New Brunswick (Canada)	505	495 - 516				
Slovenia	505	502 - 508	9	13	12	17
Lombardia (Italy)	505	496 - 514				
Newfoundland and Labrador (Canada)	505	498 - 512				
Netherlands	503	498 - 508	9	17	12	21
Australia	503	500 - 506	10	16	13	19
Bolzano (Italy)	503	486 - 519				
Cantabria (Spain)	501	490 - 512				
German-speaking community (Belgium)	501	493 - 509				
Sweden	500	493 - 507	10	21	13	26
North Carolina (United States)	500	489 - 511				
Denmark	500	495 - 505	12	21	14	25
England (United Kingdom)	500	493 - 506				
Catalonia (Spain)	500	491 - 508				
France	499	494 - 504	12	21	15	26
Castile-La Mancha (Spain)	499	491 - 507				
Comunidad Valenciana (Spain)	499	492 - 506				
Belgium	499	494 - 503	13	21	16	26
Manitoba (Canada)	498	489 - 508				
Portugal	498	493 - 503	13	22	16	27
United Kingdom	498	493 - 503	13	22	16	27
Asturias (Spain)	498	485 - 510				
Chinese Taipei	497	492 - 502			17	27
Northern Ireland (United Kingdom)	497	488 - 506				
United States	497	490 - 504	13	22	16	28
Saskatchewan (Canada)	496	489 - 503				
Spain	496	491 - 500	16	22	19	28
Russia	495	489 - 501			19	30
B-S-J-G (China)	494	484 - 504			15	33
Scotland ((United Kingdom)	493	489 - 498				
Switzerland	492	486 - 498	18	24	22	32
Basque Country (Spain)	491	482 - 501				
La Rioja (Spain)	491	472 - 509				
Latvia	488	484 - 491	22	26	28	34
Czech Republic	487	482 - 492	22	27	27	35
Croatia	487	482 - 492			27	35
Viet Nam	487	479 - 494			27	37
Murcia (Spain)	486	477 - 496				

* See note 1 under Figure I.4.1.
1. Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
2. Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
Note: OECD countries are shown in bold black. Partner countries, economies and subnational entities that are not included in national results are shown in bold blue. Regions are shown in black italics (OECD countries) or blue italics (partner countries).
Countries and economies are ranked in descending order of mean reading performance.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432516

Figure I.4.2 [Part 2/2] ■ **Reading performance among PISA 2015 participants, at national and subnational levels**

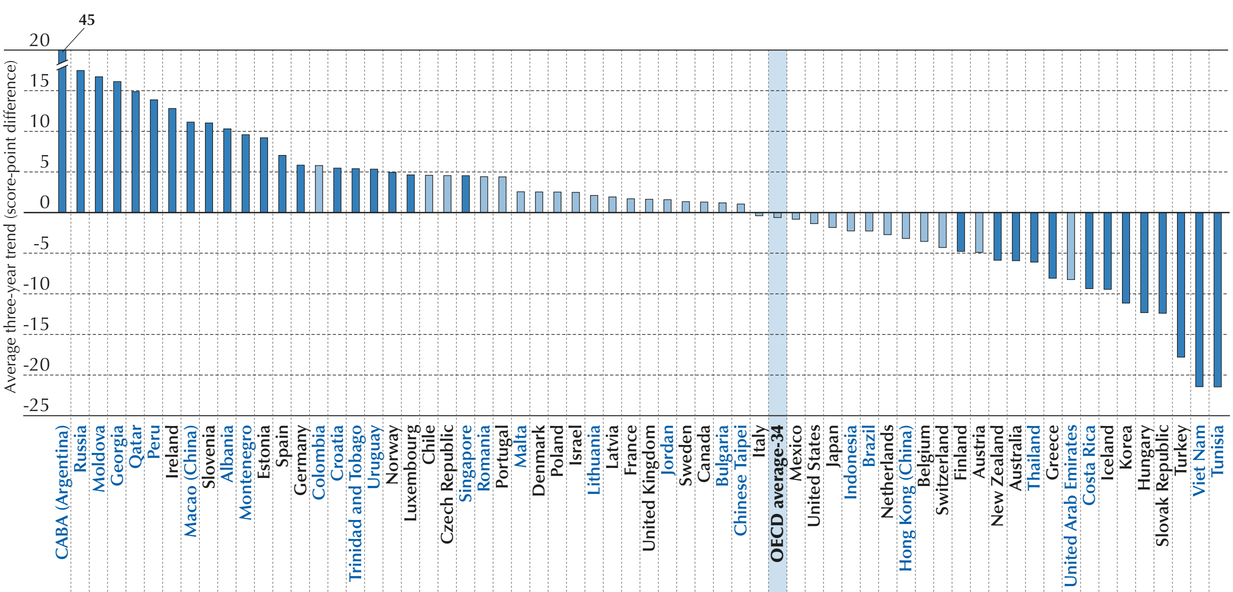
	Reading scale					
			Range of ranks			
			OECD countries		All countries/economies	
	Mean score	95% confidence interval	Upper rank	Lower rank	Upper rank	Lower rank
Austria	485	479 - 490	23	29	29	37
Italy	485	480 - 490	23	28	29	37
Balearic Islands (Spain)	485	469 - 500				
French community (Belgium)	483	474 - 493				
Canary Islands (Spain)	483	475 - 491				
Iceland	482	478 - 485	25	29	33	38
Luxembourg	481	479 - 484	26	29	33	38
Israel	479	472 - 486	25	30	32	39
Andalusia (Spain)	479	470 - 487				
Wales (United Kingdom)	477	470 - 484				
Dubai (UAE)	475	472 - 479				
Extremadura (Spain)	475	467 - 484				
CABA (Argentina)	475	461 - 489			30	41
Lithuania	472	467 - 478			38	41
Região Autónoma dos Açores (Portugal)	470	464 - 475				
Hungary	470	464 - 475	30	31	38	41
Bogotá (Colombia)	469	460 - 478				
Greece	467	459 - 476	30	32	38	42
Chile	459	454 - 464	32	33	41	43
Campania (Italy)	455	444 - 466				
Slovak Republic	453	447 - 458	32	33	42	43
Medellín (Colombia)	451	441 - 461				
Manizales (Colombia)	449	440 - 458				
Malta	447	443 - 450			44	45
Cyprus*	443	440 - 446			44	46
Uruguay	437	432 - 442			46	49
Sharjah (UAE)	435	415 - 455				
Romania	434	426 - 442			46	52
United Arab Emirates	434	428 - 439			46	50
Cali (Colombia)	432	422 - 443				
Bulgaria	432	422 - 442			46	55
Turkey	428	421 - 436	34	35	47	55
Costa Rica	427	422 - 433			49	55
Trinidad and Tobago	427	424 - 430			49	54
Montenegro	427	424 - 430			49	54
Colombia	425	419 - 431			50	55
Mexico	423	418 - 428	34	35	51	55
Abu Dhabi (UAE)	419	409 - 429				
Moldova	416	411 - 421			55	57
Puerto Rico[2]	410	396 - 424				
Thailand	409	403 - 416			56	60
Jordan	408	402 - 414			57	61
Brazil	407	402 - 413			57	61
Albania	405	397 - 413			57	63
Qatar	402	400 - 404			60	63
Ajman (UAE)	401	390 - 413				
Georgia	401	395 - 407			59	64
Fujairah (UAE)	398	383 - 412				
Peru	398	392 - 403			61	64
Indonesia	397	392 - 403			61	64
Ras Al Khaimah (UAE)	391	371 - 412				
Umm Al Quwain (UAE)	386	375 - 396				
Tunisia	361	355 - 367			65	66
Dominican Republic	358	352 - 364			65	67
FYROM	352	349 - 355			67	69
Algeria	350	344 - 356			67	70
Kosovo	347	344 - 350			68	70
Lebanon	347	338 - 355			67	70

* See note 1 under Figure I.4.1.
1. Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
2. Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
Note: OECD countries are shown in bold black. Partner countries, economies and subnational entities that are not included in national results are shown in bold blue. Regions are shown in black italics (OECD countries) or blue italics (partner countries).
Countries and economies are ranked in descending order of mean reading performance.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432516

Of the 64 countries and economies with comparable data in reading performance, 20 show a positive trend in mean reading performance across the most recent PISA assessments, 31 show a stable trend, and the remaining 13 countries and economies show a deteriorating trend in average student performance. Among OECD countries, average improvements (i.e. positive three-year trends) in reading performance between 2009 and 2015 are observed in Estonia, Germany, Ireland, Luxembourg, Norway, Slovenia and Spain.

Figure I.4.3 shows that Ciudad Autónoma de Buenos Aires (Argentina) (hereafter "CABA [Argentina]"), Georgia, Moldova and Russia, saw an average improvement every three years of more than 15 score points in reading (or the equivalent of half a year of school; see Box I.2.2 in Chapter 2) throughout their participation in PISA assessments. Albania, Ireland, Macao (China), Peru, Qatar and Slovenia saw an average improvement of more than ten score points every three years. These are rapid and significant improvements. Most of these countries and economies have participated in all three PISA assessments since 2009; CABA (Argentina) participated as an adjudicated region in 2012 for the first time, and Moldova and Georgia participated in 2010 (as part of PISA 2009+) and 2015. Ten other countries and economies show a significant positive trend in reading performance of between four and ten score points per three-year period.

Figure I.4.3 ▪ **Average three-year trend in reading performance since 2009**



Notes: Statistically significant differences are shown in a darker tone (see Annex A3).
The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. This model takes into account that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
Only countries/economies with valid results for PISA 2015 and for PISA 2009 and/or PISA 2012 are shown.
Countries and economies are ranked in descending order of the average three-year trend in reading performance.
Source: OECD, PISA 2015 Database, Table I.4.4a.
StatLink http://dx.doi.org/10.1787/888933432525

In 2009, the average 15-year-old in Russia scored 459 points on the PISA reading assessment, 475 score points in 2012, and 495 points in 2015. Improvements over time were also consistent in Qatar, where the average reading performance improved steadily from 372 points in 2009 to 388 points in 2012 and 402 points in 2015; and in Peru, where performance improved from 370 points in 2009 to 384 points in 2012 and 398 points in 2015.

At any point in time, countries and economies share similar levels of performance with other countries and economies. But as time passes and school systems evolve, certain countries and economies improve their performance, pull ahead of the group of countries with which they shared similar performance levels, and catch up to another group of countries. Other countries and economies see a decline in their performance, and fall behind in rankings relative to other countries. Figure I.4.4 shows, for each country and economy, those other countries and economies that had similar reading performance in 2009 but whose performance differed in 2015, reflecting a faster, or slower, improvement or deterioration over time.

Figure I.4.4 also shows those countries and economies that had similar reading performance in 2015, at the end of the period, but whose performance differed in 2009. In 2009, for example, Spain performed similarly in reading to Croatia, the Czech Republic, Greece, Israel, Italy, Latvia, the Slovak Republic and Slovenia. Spain scored higher in 2015 than in 2009, but Slovenia improved faster than Spain, and scored even higher than Spain in 2015. Croatia also improved, but less than Spain, the Slovak Republic saw a deterioration of performance, and in the Czech Republic, Greece, Israel, Italy and Latvia, performance remained stable, so that by 2015, all of these countries/economies scored below Spain in reading.

Compared with Japan, whose performance remained stable between 2009 and 2015, Figure I.4.4 shows that Canada and Singapore performed similarly in 2009, but in 2015 scored significantly above Japan. Korea, whose mean score was higher in 2009, performed similarly to Japan in 2015 as a result of a deteriorating trend. Estonia, Germany, Ireland and Norway also scored at the same level as Japan in 2015, but as a result of improvements over the period.

Figure I.4.5 shows the relationship between each country's/economy's average reading performance in PISA 2009 and the average trend between 2009 and 2015. Countries and economies that show the largest improvement in this period are found both among countries that performed around the OECD average in 2009, such as Estonia and Ireland, and among countries that had comparatively low performance in PISA 2009, such as Moldova, Qatar and Russia. The correlation between a country's/economy's PISA 2009 reading score and the average trend in reading in that country/economy is -0.3 – indicating a weak association.

Annex A5 discusses the extent to which changes in the scaling procedures used for PISA 2015 influence the results of reported changes between PISA 2009 and PISA 2015. Most of the negative changes observed are similar under alternative scaling models, but the negative change reported for Korea over these six years (-22 score points; see Table I.4.4a) is, in part, the result of the change in scaling approach. PISA 2009 results would have been lower than reported had they been generated under the 2015 scaling approach, and the difference between 2015 and 2009 would have been only -9 points. The negative change reported for Thailand (-12 points) would, in turn, have been only -3 points had the PISA 2009 results been revised to reflect the PISA 2015 scaling approach. Under the 2015 approach, PISA 2009 results would also have been lower for Denmark; as a consequence, the improvement between 2009 and 2015, which is reported as non-significant for Denmark, would have been larger if the most recent scaling approach had been used throughout the years.

Annex A5 also shows that the improvement between PISA 2009 and PISA 2015 in the mean scores for Colombia, Trinidad and Tobago and Uruguay would have been smaller and most likely been reported as not significant (+7 points for Colombia and Trinidad and Tobago, +2 points for Uruguay) had PISA 2009 results been generated under the same scaling approach as PISA 2015 results. In all remaining cases, the significance and/or direction of changes do not vary depending on whether the PISA 2015 approach to scaling is applied to previous PISA assessments, or whether the original results are used for trend comparisons.

Trends in reading performance accounting for changes in enrolment rates and demographic changes

Improvements in a country's or economy's overall reading performance may be the result of specific education policies; they may also be due to demographic or socio-economic changes in the country's/economy's population profile. For example, because of trends in enrolment rates or migration, the characteristics of the PISA reference population – 15-year-old students in grade 7 or above – may have shifted.

Adjusted trends shed light on changes in reading performance that are not due to alterations in the demographic characteristics of the student population or the sample. Table I.4.4d presents the average three-year trend in reading performance at the median and at the top of the distribution among all 15-year-olds – assuming that 15-year-olds who are not represented in the PISA sample would have performed among the weakest 50%, had they been assessed.[2] The differences between observed and adjusted trends thus reflect changes in the percentage of the 15-year-olds that the PISA sample represents.

Among the countries and economies where the PISA sample covers less than 80% of the population of 15-year-olds (Coverage Index 3; see Chapter 6 for a detailed discussion), and that have comparable data for PISA 2009 and PISA 2015, the coverage of the PISA sample grew by more than 10 percentage points in Brazil, Colombia, Costa Rica, Indonesia and Turkey, and by about 8 percentage points in Uruguay (see Table I.6.1 and the related discussion in Chapter 6). Table I.4.4d shows that in Colombia and Uruguay, whose mean scores improved by 12 and 11 score points over this period, respectively, the level at which at least 50% of all 15-year-olds perform (adjusted median) improved even faster – by 61 and 38 score points, respectively. For Costa Rica, Figure I.4.3 shows a negative trend in mean performance; but the minimum level reached by at least 50% of all 15-year-olds was 47 score points higher in 2015 than in 2009.

Figure I.4.4 [Part 1/4] ■ **Multiple comparisons of reading performance between 2009 and 2015**

Comparison country/economy	Reading performance in PISA 2009	Reading performance in PISA 2015	Countries/economies with… ... similar performance in 2009 and in 2015	... similar performance in 2009, but higher performance in 2015	... similar performance in 2009, but lower performance in 2015
Singapore	526	535			Canada, Japan, New Zealand
Hong Kong (China)	533	527	Finland		Korea
Canada	524	527		Singapore	Japan, New Zealand
Finland	536	526	Hong Kong (China)		Korea
Ireland	496	521	Estonia		Norway, Germany, Poland, Sweden, Denmark, France, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary
Estonia	501	519	Ireland, Norway		Germany, Poland, Netherlands, Sweden, Denmark, France, Belgium, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary
Korea	539	517		Hong Kong (China), Finland	
Japan	520	516	New Zealand	Singapore, Canada	Netherlands, Australia
Norway	503	513	Estonia, Germany	Ireland	Poland, Netherlands, Sweden, France, Belgium, United States, Switzerland, Iceland
New Zealand	521	509	Japan	Singapore, Canada	Australia
Germany	497	509	Norway, Poland, Netherlands, Sweden	Ireland, Estonia	Denmark, France, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary
Macao (China)	487	509			Portugal, Latvia, Italy, Greece
Poland	500	506	Germany, Netherlands, Sweden, Denmark, France	Ireland, Estonia, Norway	Belgium, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary
Slovenia	483	505			Portugal, Spain, Latvia, Czech Republic, Italy, Greece
Netherlands	508	503	Germany, Poland, Australia, Sweden, Belgium, United States	Estonia, Japan, Norway	Switzerland, Iceland
Australia	515	503	Netherlands	Japan, New Zealand	
Sweden	497	500	Germany, Poland, Netherlands, Denmark, France, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland	Ireland, Estonia, Norway	Iceland, Hungary
Denmark	495	500	Poland, Sweden, France, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland	Ireland, Estonia, Germany	Hungary
France	496	499	Poland, Sweden, Denmark, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland	Ireland, Estonia, Norway, Germany	Iceland, Hungary
Belgium	506	499	Netherlands, United States, Switzerland	Estonia, Norway, Poland	
Portugal	489	498	Sweden, Denmark, France, United Kingdom, Chinese Taipei	Ireland, Macao (China), Slovenia	Latvia, Italy, Hungary, Greece
United Kingdom	494	498	Sweden, Denmark, France, Portugal, Chinese Taipei, United States, Switzerland	Ireland, Estonia, Germany, Poland	Hungary
Chinese Taipei	495	497	Sweden, Denmark, France, Portugal, United Kingdom, United States, Switzerland	Ireland, Estonia, Germany, Poland	Iceland, Hungary
United States	500	497	Netherlands, Sweden, Denmark, France, Belgium, United Kingdom, Chinese Taipei, Switzerland	Ireland, Estonia, Norway, Germany, Poland	Iceland, Hungary
Spain	481	496		Slovenia	Latvia, Czech Republic, Croatia, Italy, Israel, Greece, Slovak Republic

Notes: Only countries and economies with valid results from the PISA 2009 and PISA 2015 assessments are shown.
Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
Countries and economies are ranked in descending order of mean reading performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432539

Figure I.4.4 [Part 2/4] ■ **Multiple comparisons of reading performance between 2009 and 2015**

Countries/economies with…				Reading performance in PISA 2009	Reading performance in PISA 2015	Comparison country/economy
... higher performance in 2009, but similar performance in 2015	... higher performance in 2009, but lower performance in 2015	... lower performance in 2009, but similar performance in 2015	... lower performance in 2009, but higher performance in 2015			
	Hong Kong (China), Finland, Korea			526	535	Singapore
		Canada, Ireland	Singapore	533	527	Hong Kong (China)
Hong Kong (China), Finland	Korea	Ireland		524	527	Canada
		Canada, Ireland	Singapore	536	526	Finland
Hong Kong (China), Canada, Finland, Korea, Japan	New Zealand, Netherlands, Australia, Belgium			496	521	Ireland
Korea, Japan	New Zealand, Australia			501	519	Estonia
		Ireland, Estonia, Japan, Norway, New Zealand, Germany	Singapore, Canada	539	517	Korea
Korea		Ireland, Estonia, Norway, Germany		520	516	Japan
Korea, Japan, New Zealand	Australia	Macao (China)		503	513	Norway
Korea		Norway, Germany, Macao (China), Poland, Slovenia, Netherlands	Ireland, Estonia	521	509	New Zealand
Korea, Japan, New Zealand, Australia	Belgium	Macao (China), Slovenia		497	509	Germany
Norway, New Zealand, Germany, Poland	Netherlands, Australia, Sweden, Denmark, France, Belgium, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary	Slovenia		487	509	Macao (China)
New Zealand, Australia		Macao (China), Slovenia		500	506	Poland
New Zealand, Germany, Macao (China), Poland, Netherlands, Australia, Sweden, Denmark	France, Belgium, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary			483	505	Slovenia
New Zealand		Slovenia, Denmark, France, Portugal, United Kingdom, Chinese Taipei	Ireland, Macao (China)	508	503	Netherlands
		Germany, Poland, Slovenia, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States	Ireland, Estonia, Norway, Macao (China)	515	503	Australia
Australia, Belgium		Slovenia, Spain, Russia	Macao (China)	497	500	Sweden
Netherlands, Australia, Belgium	Iceland	Slovenia, Spain, Russia	Macao (China)	495	500	Denmark
Netherlands, Australia, Belgium		Spain, Russia	Macao (China), Slovenia	496	499	France
Australia		Sweden, Denmark, France, Portugal, United Kingdom, Chinese Taipei, Spain, Russia	Ireland, Germany, Macao (China), Slovenia	506	499	Belgium
Netherlands, Australia, Belgium, United States, Switzerland	Iceland	Spain, Russia		489	498	Portugal
Netherlands, Australia, Belgium	Iceland	Spain, Russia	Macao (China), Slovenia	494	498	United Kingdom
Netherlands, Australia, Belgium		Spain, Russia	Macao (China), Slovenia	495	497	Chinese Taipei
Australia		Portugal, Spain, Russia	Macao (China), Slovenia	500	497	United States
Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland	Iceland, Hungary	Russia		481	496	Spain

Notes: Only countries and economies with valid results from the PISA 2009 and PISA 2015 assessments are shown.
Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
Countries and economies are ranked in descending order of mean reading performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432539

Figure I.4.4 [Part 3/4] ■ Multiple comparisons of reading performance between 2009 and 2015

Comparison country/economy	Reading performance in PISA 2009	Reading performance in PISA 2015	Countries/economies with…		
			… similar performance in 2009 and in 2015	… similar performance in 2009, but higher performance in 2015	… similar performance in 2009, but lower performance in 2015
Russia	459	495			Turkey
Switzerland	501	492	Sweden, Denmark, France, Belgium, United Kingdom, Chinese Taipei, United States	Ireland, Estonia, Norway, Germany, Poland, Netherlands	Iceland, Hungary
Latvia	484	488	Czech Republic, Italy	Macao (China), Slovenia, Portugal, Spain	Greece, Slovak Republic
Czech Republic	478	487	Latvia, Croatia, Luxembourg, Israel	Slovenia, Spain	Greece, Slovak Republic
Croatia	476	487	Czech Republic, Luxembourg, Israel	Spain	Lithuania, Greece, Slovak Republic
Italy	486	485	Latvia	Macao (China), Slovenia, Portugal, Spain	Greece
Iceland	500	482		Ireland, Estonia, Norway, Germany, Poland, Netherlands, Sweden, France, Chinese Taipei, United States, Switzerland	Hungary
Luxembourg	472	481	Czech Republic, Croatia, Israel		Lithuania, Slovak Republic
Israel	474	479	Czech Republic, Croatia, Luxembourg, Lithuania	Spain	Greece, Slovak Republic, Turkey
Lithuania	468	472	Israel	Croatia, Luxembourg	Turkey
Hungary	494	470		Ireland, Estonia, Germany, Poland, Sweden, Denmark, France, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland	
Greece	483	467		Macao (China), Slovenia, Portugal, Spain, Latvia, Czech Republic, Croatia, Italy, Israel	Slovak Republic
Chile	449	459			Costa Rica
Slovak Republic	477	453		Spain, Latvia, Czech Republic, Croatia, Luxembourg, Israel, Greece	
Malta	442	447			Bulgaria, Costa Rica
Uruguay	426	437	Romania, Bulgaria		Mexico, Thailand
Romania	424	434	Uruguay, Bulgaria, Trinidad and Tobago		Mexico, Thailand
Bulgaria	429	432	Uruguay, Romania, Costa Rica, Trinidad and Tobago, Mexico	Malta	Thailand
Turkey	464	428		Russia, Israel, Lithuania	
Costa Rica	443	427	Bulgaria	Chile, Malta	
Trinidad and Tobago	416	427	Romania, Bulgaria, Colombia		Thailand, Brazil
Montenegro	408	427	Colombia		Jordan, Brazil, Indonesia, Tunisia
Colombia	413	425	Trinidad and Tobago, Montenegro		Thailand, Jordan, Brazil
Mexico	425	423	Bulgaria	Uruguay, Romania	Thailand
Moldova	388	416			Albania
Thailand	421	409		Uruguay, Romania, Bulgaria, Trinidad and Tobago, Colombia, Mexico	
Jordan	405	408	Brazil	Montenegro, Colombia	Indonesia, Tunisia
Brazil	412	407	Jordan	Trinidad and Tobago, Montenegro, Colombia	
Albania	385	405		Moldova	
Qatar	372	402	Georgia, Peru		
Georgia	374	401	Qatar, Peru		
Peru	370	398	Qatar, Georgia		
Indonesia	402	397		Montenegro, Jordan	Tunisia
Tunisia	404	361		Montenegro, Jordan, Indonesia	

Notes: Only countries and economies with valid results from the PISA 2009 and PISA 2015 assessments are shown.
Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
Countries and economies are ranked in descending order of mean reading performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432539

Figure I.4.4 [Part 4/4] ■ **Multiple comparisons of reading performance between 2009 and 2015**

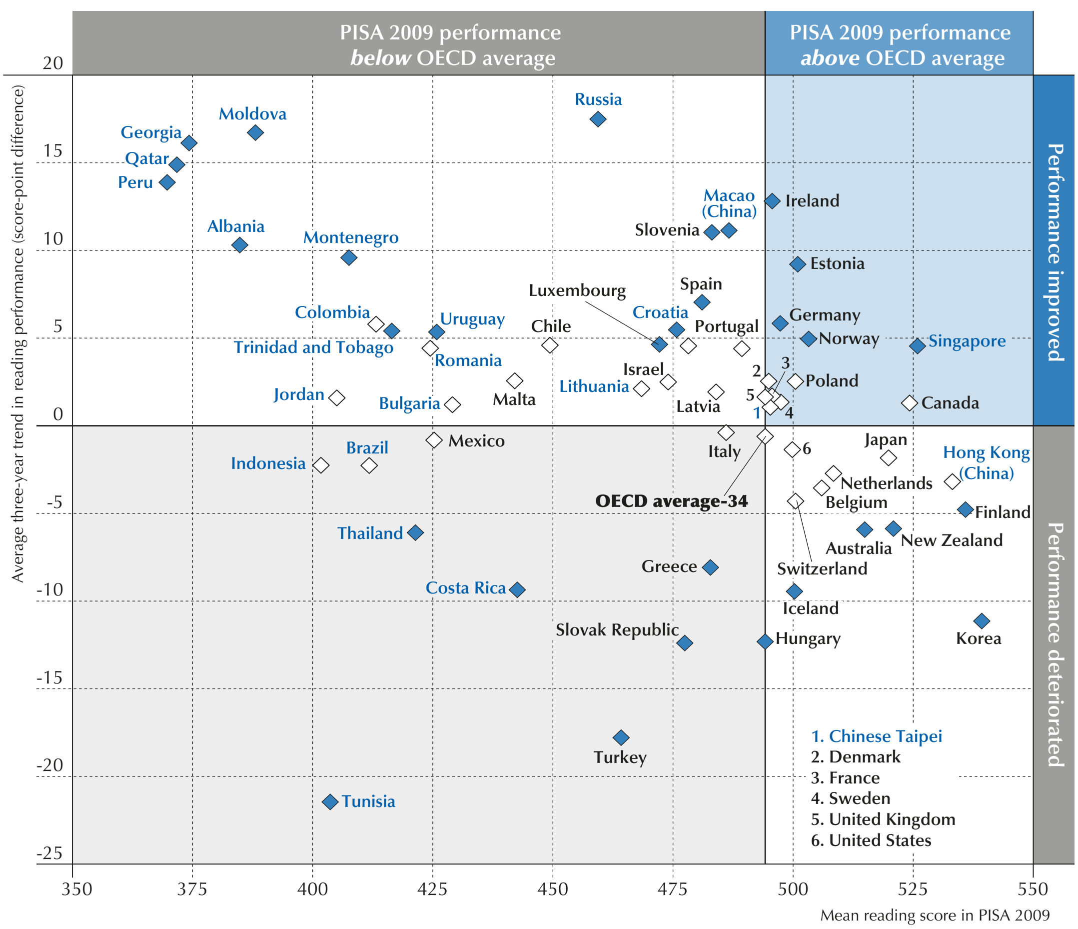
Countries/economies with…				Reading performance in PISA 2009	Reading performance in PISA 2015	Comparison country/economy
... higher performance in 2009, but similar performance in 2015	**... higher performance in 2009, but lower performance in 2015**	**... lower performance in 2009, but similar performance in 2015**	**... lower performance in 2009, but higher performance in 2015**			
Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Switzerland, Latvia, Czech Republic, Croatia	Italy, Iceland, Luxembourg, Israel, Lithuania, Hungary, Greece, Slovak Republic			459	495	Russia
		Portugal, Spain, Russia, Latvia, Czech Republic, Croatia, Italy	Macao (China), Slovenia	501	492	Switzerland
Switzerland	Iceland, Hungary	Russia, Croatia		484	488	Latvia
Switzerland, Italy, Iceland	Hungary	Russia		478	487	Czech Republic
Switzerland, Latvia, Italy, Iceland	Hungary	Russia		476	487	Croatia
Switzerland, Iceland	Hungary	Czech Republic, Croatia, Luxembourg, Israel	Russia	486	485	Italy
		Czech Republic, Croatia, Italy, Luxembourg, Israel	Macao (China), Slovenia, Denmark, Portugal, United Kingdom, Spain, Russia, Latvia	500	482	Iceland
Italy, Iceland	Hungary, Greece		Russia	472	481	Luxembourg
Italy, Iceland	Hungary		Russia	474	479	Israel
Hungary, Greece	Slovak Republic		Russia	468	472	Lithuania
		Lithuania, Greece	Macao (China), Slovenia, Spain, Russia, Latvia, Czech Republic, Croatia, Italy, Luxembourg, Israel	494	470	Hungary
Hungary		Lithuania, Chile	Russia, Luxembourg	483	467	Greece
Greece, Slovak Republic	Turkey			449	459	Chile
		Chile, Malta	Russia, Lithuania	477	453	Slovak Republic
Slovak Republic	Turkey			442	447	Malta
Turkey	Costa Rica			426	437	Uruguay
Turkey, Costa Rica		Montenegro, Colombia		424	434	Romania
Turkey		Montenegro, Colombia		429	432	Bulgaria
		Uruguay, Romania, Bulgaria, Costa Rica, Trinidad and Tobago, Montenegro, Colombia, Mexico	Chile, Malta	464	428	Turkey
Turkey		Romania, Trinidad and Tobago, Montenegro, Colombia, Mexico	Uruguay	443	427	Costa Rica
Turkey, Costa Rica, Mexico		Montenegro		416	427	Trinidad and Tobago
Romania, Bulgaria, Turkey, Costa Rica, Trinidad and Tobago, Mexico	Thailand			408	427	Montenegro
Romania, Bulgaria, Turkey, Costa Rica, Mexico				413	425	Colombia
Turkey, Costa Rica		Trinidad and Tobago, Montenegro, Colombia, Moldova		425	423	Mexico
Mexico, Thailand	Jordan, Brazil, Indonesia, Tunisia			388	416	Moldova
		Moldova, Jordan, Brazil, Albania, Georgia	Montenegro	421	409	Thailand
Thailand		Albania, Georgia	Moldova	405	408	Jordan
Thailand		Albania, Qatar, Georgia	Moldova	412	407	Brazil
Thailand, Jordan, Brazil, Indonesia	Tunisia	Qatar, Georgia, Peru		385	405	Albania
Brazil, Albania, Indonesia	Tunisia			372	402	Qatar
Thailand, Jordan, Brazil, Albania, Indonesia	Tunisia			374	401	Georgia
Albania, Indonesia	Tunisia			370	398	Peru
		Albania, Qatar, Georgia, Peru	Moldova	402	397	Indonesia
			Moldova, Albania, Qatar, Georgia, Peru	404	361	Tunisia

Notes: Only countries and economies with valid results from the PISA 2009 and PISA 2015 assessments are shown.
Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
Countries and economies are ranked in descending order of mean reading performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432539

Similarly, for Brazil, Figure I.4.3 shows a non-significant trend, but the adjusted median increased by 13 score points, on average, every three years. And in Turkey, the negative trend reported in Figure I.4.3 does not necessarily correspond to a decline in the level reached by those students who would have been in school, in grade 7 or above, even in 2009; instead, it most likely reflects the expansion of secondary education between 2009 and 2015 to include more students from disadvantaged backgrounds. The adjusted median shows no significant change for Turkey.

Table I.4.4e presents an estimate of the change in mean performance between PISA 2015 and prior assessments that would have been observed had the proportion of students with an immigrant background, the share of girls and the age distribution of students in the PISA sample stayed constant across all assessments. In some countries, the demographics of the student population have changed considerably in recent years. In these countries, the adjusted trends may differ significantly from those reported in previous sections. If countries and economies see a more negative trend than the adjusted trend reported here, that means that changes in the student population are having adverse effects on performance. Conversely, if a country's observed trend is more positive than the adjusted trend discussed here, that means that changes in the student population contribute to improvements in the mean level of performance.

Figure I.4.5 ▪ **Relationship between average three-year trend in reading performance and average PISA 2009 reading scores**



Notes: Average three-year trends in reading that are statistically significant are indicated in a darker tone (see Annex A3).
The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. This model takes into account that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
The correlation between a country's/economy's mean score in 2009 and its average three-year trend is -0.3.
Only countries and economies with available data since 2009 are shown.
Source: OECD, PISA 2015 Database, Table I.4.4a.
StatLink http://dx.doi.org/10.1787/888933432541

While the observed levels of performance measure the overall quality of education in a school system, comparing the observed trends with the hypothetical, adjusted trends can highlight the challenges that countries and economies face in improving students' and schools' performance in reading.

For countries where the demographic makeup of the student population changed little, adjusted changes in mean scores for this period closely track observed changes. The largest differences between adjusted and observed trends are found in Qatar and Sweden. For Sweden, both the observed trend and the adjusted trend are not significant (observed: +1 point every three years; adjusted: +5 points), but the comparison highlights the challenge faced by Sweden to accommodate the growth in the immigrant population. The reverse is found for Qatar. There, the observed trend is larger (a 15-point increase every three years) than the adjusted trend (9 points), indicating that changes in the student population in Qatar contributed to improvements in the mean level of performance (Tables I.4.4a and I.4.4e).

Long-term trends in reading since PISA 2000

The students who sat the PISA test in 2015 were only just born when the first PISA test was conducted in 2000. Four more cohorts of students sat the PISA test in the meantime, in three-year intervals. In contrast to science and mathematics results, the results of all six PISA reading assessments since 2000 have consistently been reported on the same scale, making it possible to compare results and compute trends over 15 years.[3] Over such a long period, not just education systems, but societies and economies as a whole have changed considerably.

In 2000, only 26% of the population, on average across OECD countries, used the Internet; in 2015, more than 80% did (International Telecommunication Union, 2016). New technologies, as well as greater international trade and competition, have arguably increased the minimum level of competence in reading required to fully participate in work and society. Meanwhile, across OECD countries, expenditure per primary and secondary student rose by almost 20% between 2005 and 2013 (OECD, 2016b). Yet, on average across OECD countries with comparable results across all six PISA assessments since 2000, students' mean reading proficiency has remained flat (I.4.4a). Greater demand for reading skills and greater investment in education have not (yet) been followed by improvements in students' results, on average across countries.

Twenty-nine countries/economies can compare trends across all six PISA assessments since PISA 2000. Thirteen more countries/economies have collected comparable data on student performance in at least five PISA assessments, including 2015. This section focuses on the trajectory of mean reading performance in these 42 countries/economies.

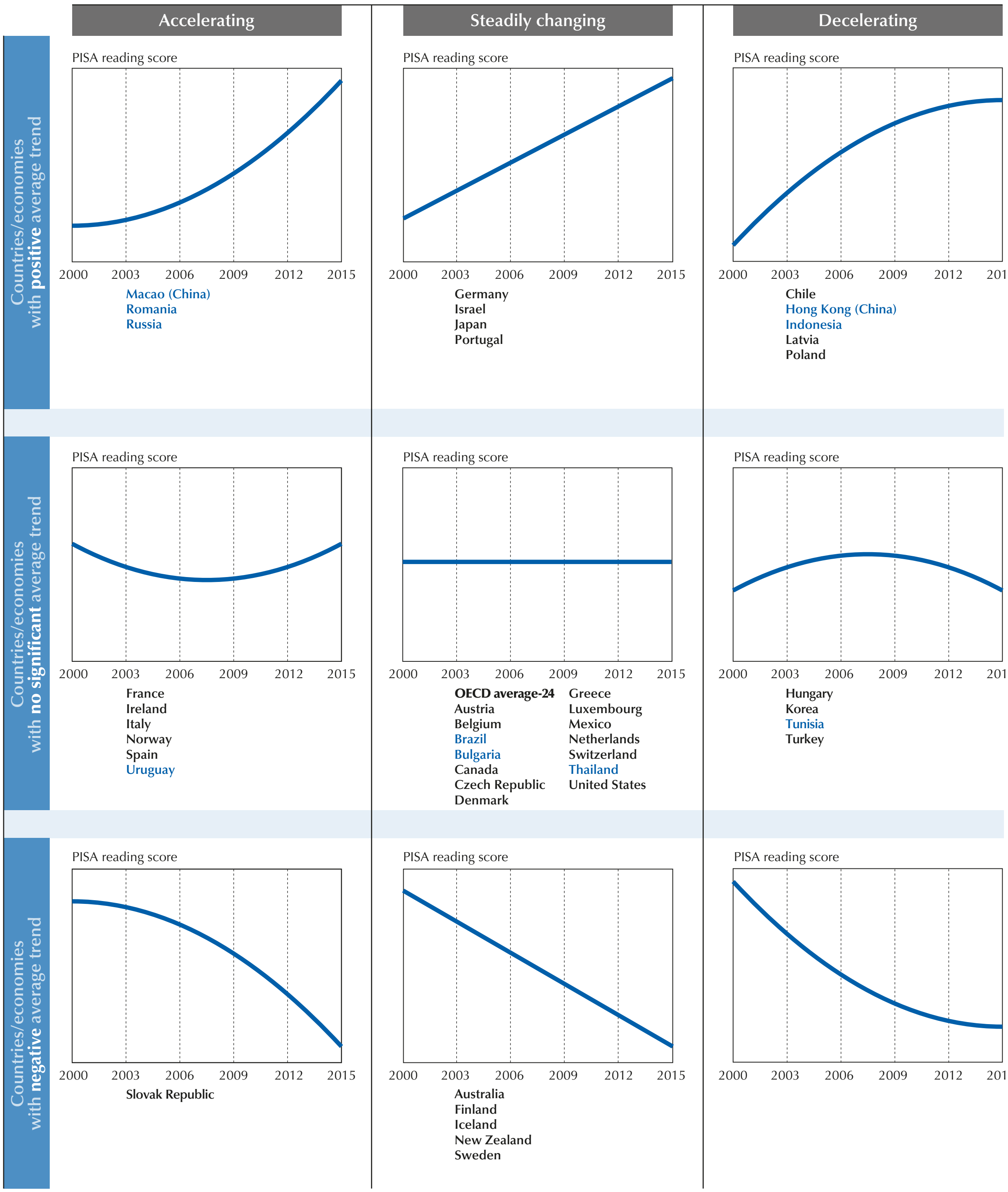
Average improvements in reading performance over successive PISA assessments, spanning at least five consecutive assessments (or 12 years), have been observed in Chile, Germany, Hong Kong (China), Indonesia, Israel, Japan, Latvia, Macao (China), Poland, Portugal, Romania and Russia. Chile, Israel and Russia saw an average improvement of between eight and ten points every three years; the remaining nine countries and economies saw improvements of between three and six points per three-year period. Twenty-four other countries saw no significant improvement or deterioration of performance, on average across successive assessments, between PISA 2000 (or 2003, for countries without data from PISA 2000) and PISA 2015. Six countries (Australia, Finland, Iceland, New Zealand, the Slovak Republic and Sweden) saw a significant negative trend, with performance deteriorating on average between three and six points every three years, between PISA 2000 (or 2003 for the Slovak Republic) and PISA 2015 (Table I.4.4a).

But over a decade and a half, not all trajectories have been linear. The average trend observed over successive PISA assessments does not capture the extent to which this trend corresponds to a steady change, or to a decelerating or accelerating improvement or deterioration in performance. Even countries with no significant average trend may have seen a temporary slump in performance followed by a recovery, or a temporary improvement, followed by a return to prior levels of performance.

Figure I.4.6 categorises countries and economies into nine groups. Countries with an average improvement across at least five PISA assessment since PISA 2000 or 2003 are in the top row; countries with no significant positive or negative trend are in the middle row; and countries with a negative trend are in the bottom row. The column indicates whether the trend observed is a steady trend (middle column), or whether it is an accelerating (left) or decelerating (right) trend. (For countries with no significant trend overall, an accelerating trend indicates that the most recent trend is positive, a decelerating trend that the most recent trend is negative.)

Figure I.4.6 ▪ **Curvilinear trajectories of average reading performance across PISA assessments**

Rate of acceleration or deceleration in performance (quadratic term)



Notes: Figures are for illustrative purposes only. Countries and economies are grouped according to the direction and significance of their average three-year trend and of their rate of acceleration (quadratic term).

Only countries and economies with data from five or six PISA assessments since PISA 2000 are included. OECD average-24 refers to the average of all OECD countries with valid data in all six assessments: Austria, Chile, Estonia, Israel, Luxembourg, the Netherlands, the Slovak republic, Slovenia, Turkey, the United Kingdom and the United States are not included in this average.

Source: OECD, PISA 2015 Database, Table I.4.4a.

StatLink http://dx.doi.org/10.1787/888933432552

Non-linear trend trajectories are estimated using a regression model, by fitting a quadratic function to the five or six mean estimates available, and taking into account the statistical uncertainty associated with each estimate as well as with comparisons across time. This is a more robust measure of a country's/economy's trajectory than the comparison of mean scores across consecutive assessments because it is less sensitive to one-time statistical fluctuations that may alter a country's/economy's mean performance estimate.

Figure I.4.6 shows that among the countries with an average improvement in performance, Macao (China), Romania and Russia show an accelerating improvement, meaning that the rate of change in performance observed over the most recent PISA assessments is faster than in the earlier assessments. In these three countries/economies, performance only really began to improve around 2006 or 2009, and improved rapidly ever since. Chile, Hong Kong (China), Indonesia, Latvia and Poland, in contrast, show decelerating improvements over the period: their gains in performance were faster over earlier assessments than in the most recent tests (in Hong Kong [China]), the most recent trajectory is significantly negative). Germany, Israel, Japan and Portugal show relatively steady improvements over the whole period. In Israel, mean performance improved from 452 score points in 2002 (when the country first participated in PISA, as part of the PISA 2000+ cohort) to 474 points in 2009 (when reading was again the major domain) and to 479 points in 2015. In Portugal, mean performance improved from 470 score points in PISA 2000, to 489 points in PISA 2009 and to 498 points in PISA 2015. Similarly, in Germany, mean performance improved from 484 score points in PISA 2000 to 497 points (or about the OECD average) in PISA 2009 and to 509 points (well above the OECD average) in PISA 2015.

Hong Kong (China) and Japan also show an average positive trend, even though the simple score difference between PISA 2000 and PISA 2015 for these countries is not significant, and close to zero. This is because the trend is estimated by taking all six available data points into account, through a linear regression model, and corresponds to the average change across successive assessments. Both Hong Kong (China) and Japan scored significantly lower in reading in PISA 2003 than in PISA 2000 (which was conducted in 2002 in Hong Kong [China]), perhaps reflecting changes in design and coverage of the reading assessment (see note 3 at the end of this chapter and Annex A5). But Japan showed relatively steady improvement ever since; and while the linear trend for Hong Kong (China) remains positive, the curvilinear trajectory indicates that the trend slowed down and reversed in recent years.

Other countries and economies show no average positive or negative trend, but this is because of a deterioration in the earlier PISA assessments followed by improvements in later assessments. This pattern is observed in France, Ireland, Italy, Norway, Spain and Uruguay. In Spain, for example, reading scores fell from 493 score points in PISA 2000 to 481 points in 2009; but this initially negative trend reversed itself in more recent years, and mean performance in 2015, at 496 points, returned again to a level close to the OECD average.

Some countries and economies do not show significant improvements or deterioration over time; their performance has remained stable over at least five PISA assessments. In Canada, in particular, reading scores have remained at least 20 points above the OECD average in all six PISA assessments – a remarkable achievement.

STUDENTS AT THE DIFFERENT LEVELS OF READING PROFICIENCY

The seven proficiency levels used in the PISA 2015 reading assessment are the same as those established for the 2009 PISA assessment, when reading was the main domain assessed: Level 1b is the lowest described level, then Level 1a, Level 2, Level 3 and so on up to Level 6. Figure I.4.7 provides details of the nature of the reading skills, knowledge and understanding required at each level of the reading scale. The required skills at each proficiency level are described according to the three processes that students use to answer the questions. These three processes are defined in the framework as "access and retrieve" (skills associated with finding, selecting and collecting information), "integrate and interpret" (processing what is read to make sense of a text), and "reflect and evaluate" (drawing on knowledge, ideas or values external to the text).

Since it is necessary to preserve the confidentiality of the test material in order to continue to monitor trends in reading beyond 2015, no question used in the PISA 2015 assessment was released after the assessment. However, because PISA 2015 used questions from previous assessments, it is possible to illustrate the proficiency levels with the test materials that were released after previous assessments. Example items to illustrate the different levels of reading proficiency can be found in the PISA 2009 and PISA 2012 initial reports (OECD, 2014; OECD, 2010c) and on line at http://www.oecd.org/pisa.

Figure I.4.8 shows the distribution of students across the seven proficiency levels in each participating country and economy. Table I.4.1a shows the percentage of students at each proficiency level on the reading scale, with standard errors.

Figure I.4.7 ■ **Summary description of the seven levels of reading proficiency in PISA 2015**

Level	Lower score limit	Characteristics of tasks
6	698	Tasks at this level typically require the reader to make multiple inferences, comparisons and contrasts that are both detailed and precise. They require demonstration of a full and detailed understanding of one or more texts and may involve integrating information from more than one text. Tasks may require the reader to deal with unfamiliar ideas in the presence of prominent competing information, and to generate abstract categories for interpretations. Reflect and evaluate tasks may require the reader to hypothesise about or critically evaluate a complex text on an unfamiliar topic, taking into account multiple criteria or perspectives, and applying sophisticated understanding from beyond the text. A salient condition for access and retrieve tasks at this level is precision of analysis and fine attention to detail that is inconspicuous in the texts.
5	626	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of deeply embedded information, inferring which information in the text is relevant. Reflective tasks require critical evaluation or hypothesis formulation, drawing on specialised knowledge. Both interpretative and reflective tasks require a full and detailed understanding of a text whose content or form is unfamiliar. For all aspects of reading, tasks at this level typically involve dealing with concepts that are contrary to expectations.
4	553	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of embedded information. Some tasks at this level require interpreting the meaning of nuances of language in a section of text by taking into account the text as a whole. Other interpretative tasks require understanding and applying categories in an unfamiliar context. Reflective tasks at this level require readers to use formal or public knowledge to hypothesise about or critically evaluate a text. Readers must demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar.
3	480	Tasks at this level require the reader to locate, and in some cases recognise the relationship between, several pieces of information that must meet multiple conditions. Interpretative tasks at this level require the reader to integrate several parts of a text in order to identify a main idea, understand a relationship or construe the meaning of a word or phrase. They need to take into account many features in comparing, contrasting or categorising. Often the required information is not prominent or there is much competing information; or there are other text obstacles, such as ideas that are contrary to expectations or negatively worded. Reflective tasks at this level may require connections, comparisons and explanations, or they may require the reader to evaluate a feature of the text. Some reflective tasks require readers to demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. Other tasks do not require detailed text comprehension but require the reader to draw on less common knowledge.
2	407	Some tasks at this level require the reader to locate one or more pieces of information, which may need to be inferred and may need to meet several conditions. Others require recognising the main idea in a text, understanding relationships, or construing meaning within a limited part of the text when the information is not prominent and the reader must make low level inferences. Tasks at this level may involve comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require readers to make a comparison or several connections between the text and outside knowledge, by drawing on personal experience and attitudes.
1a	335	Tasks at this level require the reader to locate one or more independent pieces of explicitly stated information; to recognise the main theme or author's purpose in a text about a familiar topic, or to make a simple connection between information in the text and common, everyday knowledge. Typically the required information in the text is prominent and there is little, if any, competing information. The reader is explicitly directed to consider relevant factors in the task and in the text.
1b	262	Tasks at this level require the reader to locate a single piece of explicitly stated information in a prominent position in a short, syntactically simple text with a familiar context and text type, such as a narrative or a simple list. The text typically provides support to the reader, such as repetition of information, pictures or familiar symbols. There is minimal competing information. In tasks requiring interpretation the reader may need to make simple connections between adjacent pieces of information.

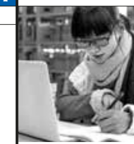
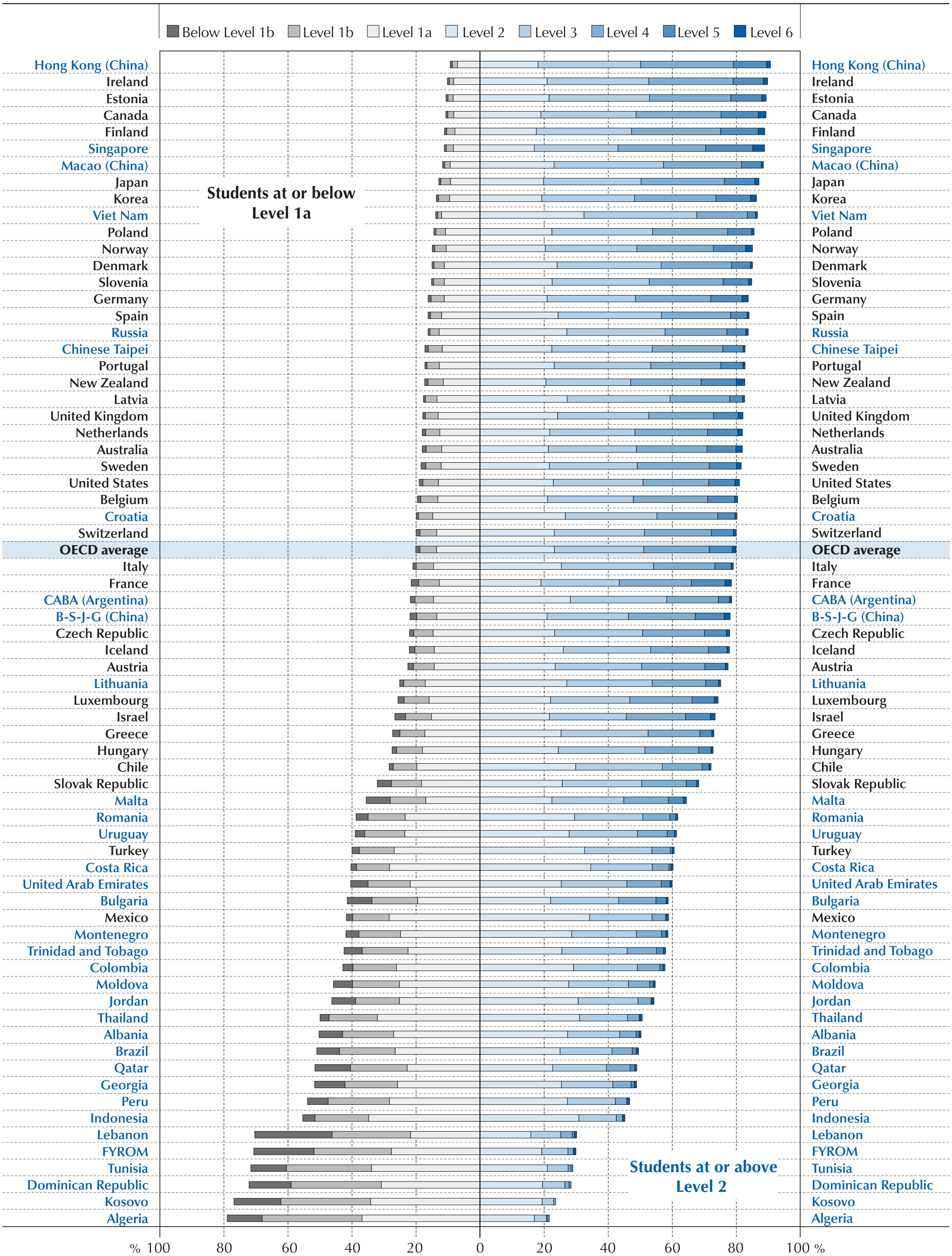


Figure I.4.8 ▪ **Students' proficiency in reading**



Countries and economies are ranked in descending order of the percentage of students who perform at or above Level 2.
Source: OECD, PISA 2015 Database, Table I.4.1a.
StatLink http://dx.doi.org/10.1787/888933432569

Proficiency above the baseline

Proficiency at Level 2 (score higher than 407 but lower than 480 points)

Level 2 can be considered a baseline level of proficiency at which students begin to demonstrate the reading skills that will enable them to participate effectively and productively in life. The 2009 Canadian Youth in Transition Survey, which followed up on students who were assessed by PISA in 2000, shows that students scoring below Level 2 in reading face a disproportionately higher risk of not participating in post-secondary education and of poor labour-market outcomes at age 19, and even more so at age 21 (OECD, 2010a).

Some tasks at Level 2 require the student to retrieve one or more pieces of information that may have to be inferred and may have to meet several conditions. Others require recognising the main idea in a text, understanding relationships, or interpreting meaning within a limited part of the text when the information is not prominent and the student must make low-level inferences. Tasks at this level may involve integrating parts of the text through comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require the student to make a comparison or several connections between the text and outside knowledge by drawing on personal experience and attitudes.

On average across OECD countries, 80% of students are proficient at Level 2 or higher. In Hong Kong (China), more than 90% of students perform at or above this threshold. In Canada, Denmark, Estonia, Finland, Ireland, Japan, Korea, Macao (China), Norway, Poland, Singapore and Viet Nam, between 85% and 90% of students achieve the baseline level of reading proficiency. In 16 participating countries/economies, between 80% and 85% of students do, and in 7 more countries, more than 75% do. In 7 OECD countries (Chile, Greece, Hungary, Israel, Luxembourg, the Slovak Republic and Turkey), between one in four (25%) and one in two (50%) students performs below Level 2. In all other OECD countries, at least three out of four students perform at Level 2 or above (Figure I.4.8 and Table I.4.1a).

In some middle- and low-income countries, fewer than one in two students reaches a baseline level in reading. In Algeria and Kosovo, fewer than one in four students scores at or above the baseline level; in the Dominican Republic, FYROM, Lebanon and Tunisia, only between 25% and 30% of students attain this level or higher, as do between 40% and 50% of students in Albania, Brazil, Georgia, Indonesia, Peru and Qatar. These countries are still far from the objective of equipping all students with the minimum level of reading skills that enables further learning and participation in knowledge-based societies.

At the same time, in many middle- and low-income countries, not all 15-year-olds are eligible to participate in PISA because these young people have dropped out of school, never attended school, or are in school, but in grade 6 or below (see Chapter 6). Assuming that these 15-year-olds would not reach Level 2 if they sat the PISA reading test, and based on the estimated total number of 15-year-olds in each country/economy, it is possible to estimate a lower bound for the proportion of all 15-year-olds who attain the baseline level of performance in reading.[4]

Table I.4.1b shows that in 23 countries and economies, including 2 OECD countries (Mexico and Turkey) and 2 countries/economies whose mean performance in reading is close to the OECD average (B-S-J-G [China] and Viet Nam), fewer than one in two 15-year-olds is in school, in grade 7 or above, and proficient in reading at Level 2 or above. In Viet Nam, 86% of students who are in the PISA target population attain Level 2, as do 78% of students in B-S-J-G (China); but the PISA target population represents less than 50% of the total population of 15-year-olds in Viet Nam, and only 64% in B-S-J-G (China). To meet the target of basic skills for all, Viet Nam and B-S-J-G (China) should expand access to secondary education to include all 15-year-olds, while keeping the quality of education high – so that those who are not currently in school can also acquire the skills and knowledge that those in school learn.

Meanwhile, in Brazil, Costa Rica, Lebanon and Mexico, fewer than two in three 15-year-olds are eligible to participate in PISA and are represented by the PISA sample; but among those who sat the PISA test in 2015, more than 40% did not reach the baseline level in reading. These countries face a double challenge to expand secondary education while also ensuring that students are at least able to read and understand texts at a level that enables them to develop their potential and participate in knowledge-based societies (Tables I.4.1a, I.4.1b and I.6.1).

Proficiency at Level 3 (score higher than 480 but lower than 553 points)

Tasks at Level 3 require the student to retrieve, and in some cases recognise the relationship among, several pieces of information that must meet multiple conditions. Interpreting tasks at this level requires the student to integrate several parts of a text in order to identify a main idea, understand a relationship or construe the meaning of a word or phrase. The student needs to take into account many features in comparing, contrasting or categorising. Often the required

information is not prominent or there is much competing information; or there are other obstacles in the text, such as ideas that are contrary to expectations or negatively worded. Reflective tasks at this level may require connections, comparisons and explanations, or they may require the student to evaluate a feature of the text. Some reflective tasks require the student to demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. Other tasks do not require detailed text comprehension but ask the student to draw on less common knowledge.

Across OECD countries, 57% of students are proficient at Level 3 or higher (that is, proficient at Level 3, 4, 5 or 6). In Canada, Finland, Hong Kong (China) and Singapore, more than 70% of students are proficient at Level 3 or higher, and at least two out of three students attain this level in Estonia, Ireland, Japan and Korea. In contrast, in 14 countries and economies (Albania, Algeria, Brazil, the Dominican Republic, FYROM, Georgia, Indonesia, Jordan, Kosovo, Lebanon, Mexico, Peru, Thailand and Tunisia), three out of four students do not attain this level (Figure I.4.8 and Table I.4.1a).

Proficiency at Level 4 (score higher than 553 but lower than 626 points)

Tasks at Level 4 that involve retrieving information require the student to locate and organise several pieces of embedded information. Some tasks at this level require interpreting the meaning of nuances of language in a section of text by taking into account the text as a whole. Other interpretative tasks require understanding and applying categories in an unfamiliar context. Reflective tasks at this level require the student to use formal or public knowledge to hypothesise about or critically evaluate a text. The student must demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar.

On average across OECD countries, 29% of students are proficient at Level 4 or higher (that is, proficient at Level 4, 5 or 6). In Canada, Finland, Hong Kong (China) and Singapore, between 40% and 46% of students attain these levels. However, in the partner countries Algeria, Kosovo and Tunisia, less than 1% of students attains at least this level (Figure I.4.8 and Table I.4.1a).

Proficiency at Level 5 (score higher than 626 but lower than 698 points)

Tasks at Level 5 that involve retrieving information require the student to locate and organise several pieces of deeply embedded information, inferring which information in the text is relevant. Reflective tasks require critical evaluation or hypotheses, drawing on specialised knowledge. Both interpreting and reflective tasks require a full and detailed understanding of a text whose content or form is unfamiliar. For all aspects of reading, tasks at this level typically involve dealing with concepts that are contrary to expectations.

Across OECD countries, 8.3% of students are top performers, meaning that they are proficient at Level 5 or 6. Singapore has the largest proportion of top performers – 18.4% – among all participating countries and economies. About 14% of students in Canada, Finland and New Zealand, and 13% in France and Korea are top performers in reading. Overall, in 15 countries and economies, more than 10% of students are top performers, in 21 countries/economies between 5% and 10% of students are top performers, in 19 countries/economies, between 1% and 5% of students attain this level of performance, and in 15 countries/economies – including OECD countries Mexico and Turkey – less than 1% of students performs at Level 5 or above (Figure I.4.8 and Table I.4.1a).

Proficiency at Level 6 (score higher than 698 points)

Tasks at Level 6 typically require the student to make multiple inferences, comparisons and contrasts that are both detailed and precise. They require demonstration of a full and detailed understanding of one or more texts and may involve integrating information from more than one text. Tasks may require the student to deal with unfamiliar ideas in the presence of prominent competing information, and generate abstract categories for interpretations. "Reflect and evaluate" tasks may require the student to hypothesise about or critically evaluate a complex text on an unfamiliar topic, taking into account multiple criteria or perspectives, and applying sophisticated understanding from beyond the text. "Access and retrieve" tasks at this level require precise analysis and fine attention to detail that is inconspicuous in the texts.

Across OECD countries, only 1.1% of students perform at Level 6 in reading, but the proportion varies somewhat across countries. More than 1 in 50 students perform at this level in Singapore (3.6%), New Zealand (2.6%), Canada (2.4%) and Norway (2.1%). In Australia, Finland and France, 2.0% of students (or about 1 in 50) attain proficiency Level 6, as do 1.9% of students in Germany and Korea and 1.8% in B-S-J-G (China). By contrast, in Algeria, the Dominican Republic, Kosovo and Tunisia, fewer than 1 in 1 000 students (0.1%) performs at Level 6 (Figure I.4.8 and Table I.4.1a).

Proficiency below the baseline

PISA distinguishes two levels of reading proficiency below Level 2. Level 1a corresponds to scores higher than 335 but lower than 407 points; and Level 1b corresponds to a range of scores below Level 1a, between 262 and 335 score points.

Proficiency at Level 1a (score higher than 335 but lower than 407 points)

Tasks at Level 1a require the student to retrieve one or more independent pieces of explicitly stated information, interpret the main theme or author's intent in a text about a familiar topic, or make a simple connection by reflecting on the relationship between information in the text and common, everyday knowledge. The required information in the text is usually prominent and there is little, if any, competing information. The student is explicitly directed to consider relevant factors in the task and in the text.

Across OECD countries, an average of 14% of students can solve tasks located at Level 1a, but cannot solve tasks located above this level. Some 6.5% of students do not even attain Level 1a. In Algeria, Brazil, the Dominican Republic, FYROM, Georgia, Indonesia, Kosovo, Peru, Qatar, Thailand and Tunisia, Level 1a is the modal proficiency level of students, meaning that a greater share of students performs at Level 1a than at any other proficiency level in PISA (Figure I.4.8 and Table I.4.1a).

Proficiency at Level 1b (score higher than 262 but lower than 335 points)

Level 1b is the lowest described level of proficiency in PISA, corresponding to some of the easiest tasks included in the assessment. Tasks at Level 1b require the student to retrieve a single piece of explicitly stated information in a prominent position in a short, syntactically simple text with a familiar context and text type, such as a narrative or a simple list. The text typically provides support to the student, such as repetition of information, pictures or familiar symbols. There is minimal competing information. In tasks requiring interpretation, the student may need to make simple connections between adjacent pieces of information. Students with scores below 262 points – that is, below Level 1b – usually do not succeed at the most basic reading tasks that PISA measures. This does not necessarily mean that they are illiterate, but that there is insufficient information on which to base a description of their reading proficiency.

Across OECD countries, 5.2% of students are only able to solve tasks at Level 1b, and 1.3% of students are not even proficient at this level. In some countries, however, very few students have such poor reading skills. In Ireland and Viet Nam, more than 98% of students perform above Level 1b (but 51% of all 15-year-olds in Viet Nam are not eligible to participate in PISA). Similarly, in Canada, Estonia, Hong Kong (China), Macao (China) and Singapore, few students (between 2% and 3%) perform at Level 1b or below.

In contrast, almost one in two students in Lebanon performs below Level 1a – and half of them (24%) score below Level 1b. More than 40% of students in Algeria, the Dominican Republic, FYROM and Kosovo, and 38% of students in Tunisia, are not able to reach Level 1a. In these countries, most of these students perform at Level 1b (Figure I.4.8 and Table I.4.1a).

Trends in the percentage of low performers and top performers in reading

PISA assesses the reading skills required for students to participate fully in a knowledge-based society. These range from the baseline skills that are considered to be the minimum required for functioning in society to the complex skills that only a few students have mastered. The proportion of students who do not meet the baseline proficiency (Level 2; low-performing students) and the proportion of students who are able to understand and communicate complex tasks (Level 5 or 6; top-performing students) are important indicators of the needs and challenges faced by each country/economy and benchmarks of the level of skills development in that country/economy.

Changes in a country's/economy's average performance can result from improvements in or the deterioration of performance at different points in the performance distribution. For example, in some countries/economies, average improvement is observed among all students, resulting in fewer students who perform below Level 2 and more students who are top performers. In other contexts, average improvement can mostly be attributed to large improvements among low-achieving students with little or no change among high-achieving students. This may result in a smaller proportion of low-performing students, but no increase among top performers. Trends in the proportion of low- and top-performing students indicate where the changes in performance have occurred, and the extent to which school systems are advancing towards providing all students with basic literacy skills and towards producing a larger proportion of students with the highest skills in reading. On average across OECD countries with comparable data, between 2009 and 2015 there was no significant change in the share of students who do not attain the baseline level of proficiency in reading, nor in the share of students who score at or above proficiency Level 5 (Figure I.4.9 and Table I.4.2a).

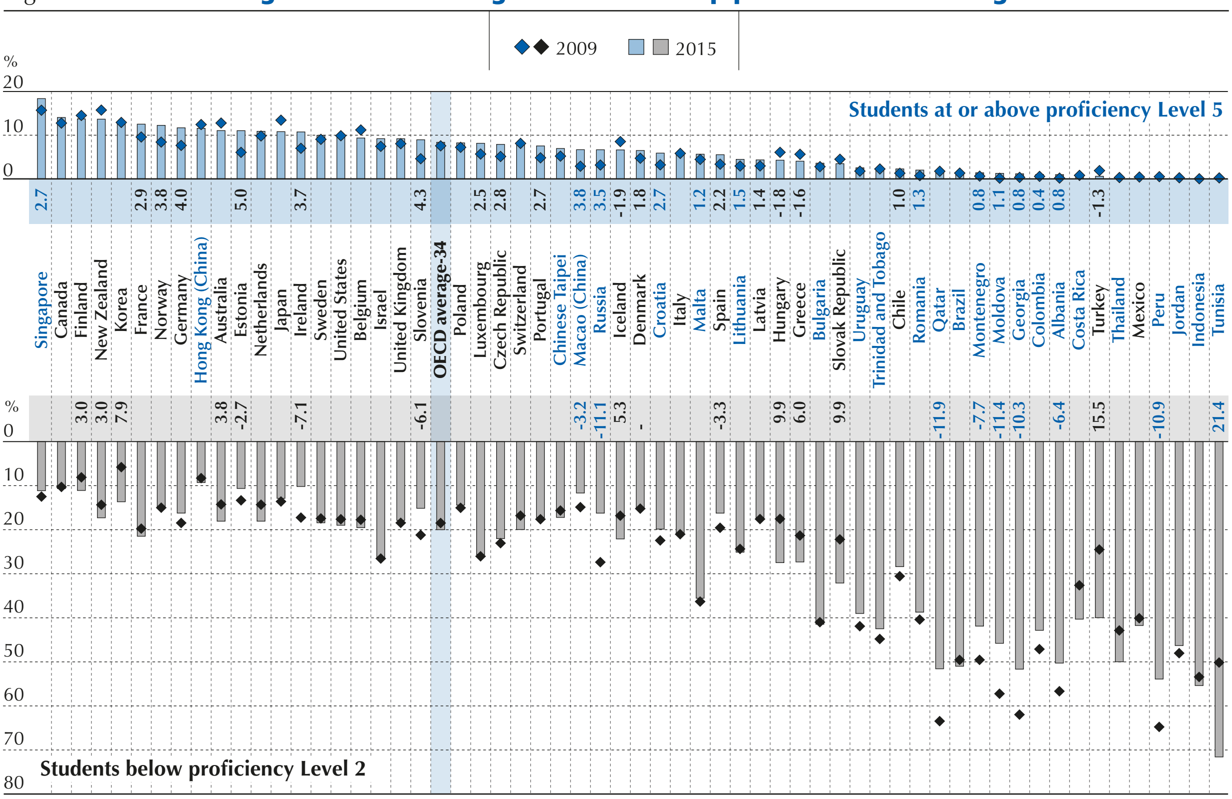
Countries and economies can be grouped into categories according to whether, between PISA 2009 and PISA 2015, they have: simultaneously reduced the share of low performers and increased the share of top performers in reading; reduced the share of low performers but not increased the share of top performers; increased the share of top performers but not reduced the share of low performers; and reduced the share of top performers or increased the share of low performers. The following section categorises countries and economies into these groups. But most countries/economies are not included in any of these groups; they had no significant change in the percentage of top performers or in the percentage of low performers.

Moving everyone up: Reduction in the share of low performers and increase in that of top performers

Between PISA 2009 and PISA 2015, Albania, Estonia, Georgia, Ireland, Macao (China), Moldova, Montenegro, Russia, Slovenia and Spain saw an increase in the share of students who attain the highest proficiency levels in PISA and a simultaneous decrease in the share of students who do not attain the baseline level of proficiency. In Slovenia, for example, the share of students performing below Level 2 shrank by six percentage points (from 21% to 15%) between 2009 and 2015, while the share of students performing at or above proficiency Level 5 grew by four percentage points (from 5% to 9%) (Figure I.4.9 and Table I.4.2a). The system-wide improvements observed in these countries and economies have lifted students out of low performance and others into top performance.

For many of these countries and economies, these changes in the share of low and top performers mirror average trends in student performance at different levels of the performance distribution since 2009. Table I.4.4b shows how, for each country and economy, the 10th, 25th, 75th and 90th percentiles of performance have evolved across different PISA cycles.

Figure I.4.9 ▪ **Percentage of low-achieving students and top performers in reading in 2009 and 2015**



Notes: Only countries/economies that participated in both 2009 and 2015 PISA assessments are shown.

The change between PISA 2009 and PISA 2015 in the share of students performing below Level 2 in reading is shown below the country/economy name. The change between PISA 2009 and PISA 2015 in the share of students performing at or above Level 5 in reading is shown above the country/economy name. Only statistically significant changes are shown (see Annex A3).

Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Countries and economies are ranked in descending order of the percentage of students performing at or above Level 5 in 2015.

Source: OECD, PISA 2015 Database, Table I.4.2a.

StatLink http://dx.doi.org/10.1787/888933432570

Consistent with trends in the share of low- and top-performing students, the table shows that in Albania, Georgia, Ireland, Macao (China), Moldova, Montenegro, Russia, Slovenia and Spain, an average improvement in performance between 2009 and 2015 can be observed at all levels of the distribution – among the lowest-achieving students (those whose performance is around the 10th and 25th percentiles of performance), among those whose score around the median, and among the highest-achieving students (those whose performance is around the 75th and 90th percentiles). Peru and Qatar also moved towards higher performance across the board during the same period. But in these countries, more than one in two students still perform below Level 2 – a clear sign that much remains to be done to equip all students with the baseline skills needed for full participation in society and the economy. By international benchmarks, these countries belong to the next category ("reducing underperformance").

Reducing underperformance: Reductions in the share of low performers but no change in that of top performers

Peru and Qatar have reduced the share of students performing below Level 2 in reading, without seeing a concurrent increase in the share of students who reach the highest levels of proficiency (Figure I.4.9 and Table I.4.4b).

Tables I.4.4b and I.4.4c show that in Peru and Qatar, the improvement in the minimum proficiency achieved by at least 90% of its students (10th percentile) was larger than the improvement at the top (90th percentile), so that the distance between the highest- and lowest-performing students narrowed significantly. The interdecile range, or the distance between the 10th and the 90th percentile of performance, also narrowed in Ireland and in Trinidad and Tobago as a result of improvements in performance among these countries' lowest-achieving students. In these two countries, there was no significant concurrent improvement among the highest-performing students (90th percentile).

Nurturing top performance: Increase in the share of top performers but no change in that of low performers

Fourteen countries and economies (Chile, Croatia, the Czech Republic, Denmark, France, Germany, Latvia, Lithuania, Luxembourg, Malta, Norway, Portugal, Romania and Singapore) saw growth in the share of top-performing students in reading since PISA 2009 with no concurrent reduction in the share of low-performing students. Germany and Norway, for example, saw increases of four percentage points in the share of students performing at or above Level 5 (from 8% to 12%), while that share increased by 3 percentage points in France (from 10% to 13%). This trend is also observed in Brazil since PISA 2012 (Figure I.4.9 and Table I.4.2a). These countries and economies have been able to increase the share of students who attain the highest scores in reading.

Table I.4.4b shows that in Chile, the Czech Republic, Estonia, France, Latvia, Lithuania, Luxembourg, Norway and Portugal, significant improvements in performance were concentrated among the highest-achieving students. These countries/economies saw the gap between the two extremes in performance widen because the minimum level achieved by the 10% highest-performing students (90th percentile) improved, while performance among the lowest achievers (10th percentile) remained stable (Table I.4.4c). The gap also widened in Macao (China) and Moldova, where there was a significant improvement at the 10th percentile, but an even larger, simultaneous improvement at the 90th percentile.

Increase in the share of low performers and/or decrease in that of top performers

By contrast, in some countries and economies, the percentage of students who do not attain the PISA baseline level of proficiency in reading increased since 2009. An increase in the share of low-achieving students is observed in Australia, Finland, Greece, Hungary, Iceland, Korea, New Zealand, the Slovak Republic, Tunisia and Turkey. In Greece, Hungary, Iceland and Turkey, the share of students who perform at the highest levels of proficiency (Level 5 and above) shrank over the same period (Figure I.4.9 and Table I.4.4b).

Table I.4.4b shows that in Costa Rica, Greece, Hungary, Iceland, the Slovak Republic, Tunisia and Turkey, performance deteriorated, on average, between PISA 2009 and PISA 2015, at all levels of the performance distribution, i.e. among these countries' highest-achieving students as well as among students who scored around the median and among the lowest-achieving students. In Hungary and the Slovak Republic, performance declined more at the bottom of the performance distribution than at the top; as a result, these countries have observed widening gaps between their highest- and lowest-achieving students.

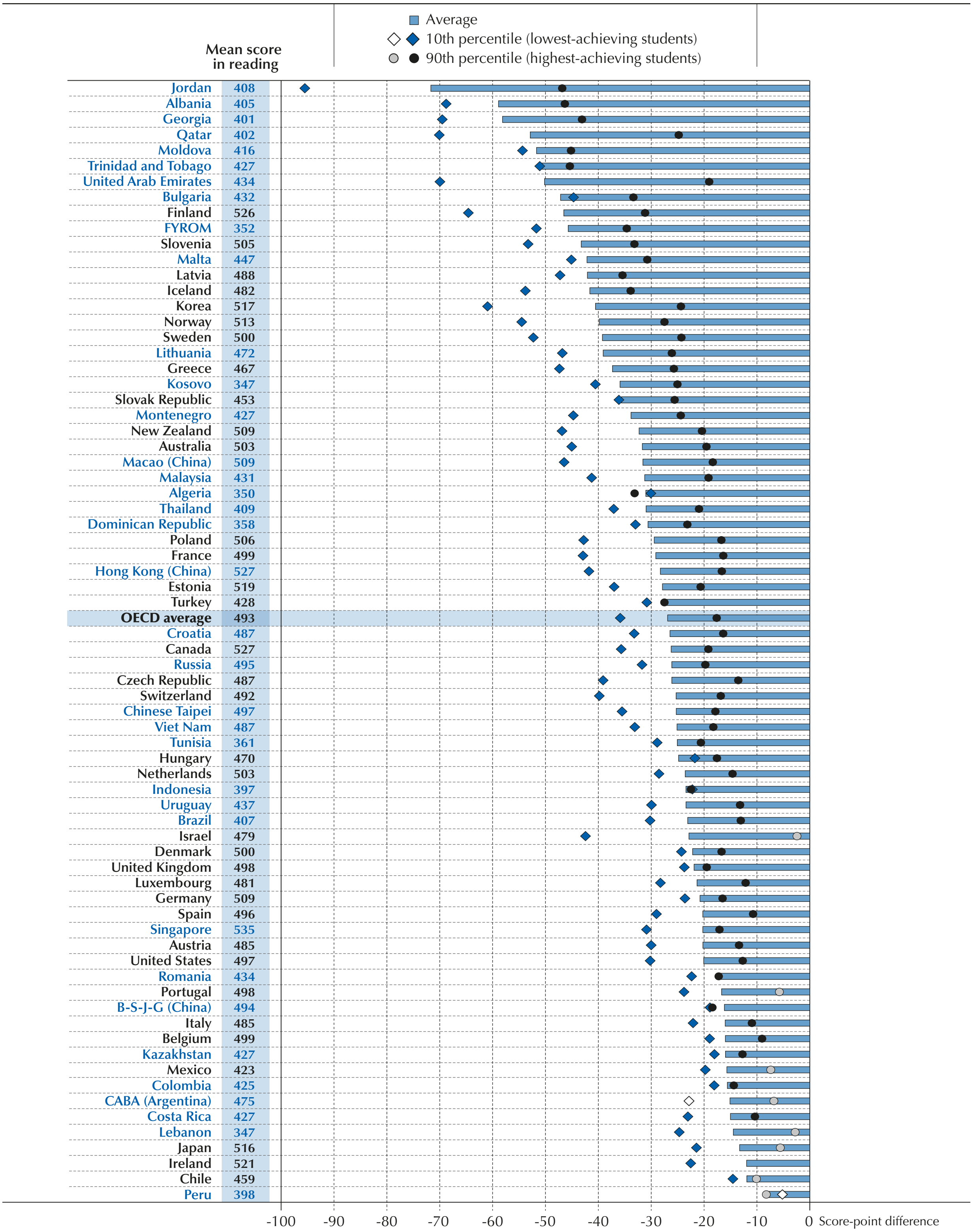
GENDER DIFFERENCES IN READING PERFORMANCE

PISA has consistently found that, across all countries and economies, girls outperform boys in reading (OECD, 2014).

In 2015, on average across OECD countries, girls outperform boys in reading by 27 score points. While girls outperform boys in reading in every participating country and economy, the gap is much wider in some countries than in others (Figure I.4.10). Using PISA 2009 data, between-country differences in gender gaps in reading have been related to gender differences in attitudes, such as whether students enjoy reading, and behaviours towards reading, such as whether students read in their free time (OECD, 2015a; OECD, 2010b).

Figure I.4.10 ■ **Gender differences in reading performance**

Score-point difference in reading (boys minus girls)



Note: All gender differences for average students are statistically significant. Statistically significant gender differences for the lowest- and highest-achieving students are marked in a darker tone (see Annex A3).

Countries and economies are ranked in descending order of the mean score-point difference in reading performance between boys and girls.

Source: OECD, PISA 2015 Database, Tables I.4.3 and I.4.7.

StatLink http://dx.doi.org/10.1787/888933432587

Among the highest-performing countries and economies, some – such as Ireland, where the difference between boys and girls is only 12 points, and Japan, where it is 13 points – have gender gaps that are smaller than the OECD average, while others – such as Finland, where the gap is 47 points – have among the largest gender gaps of all participating countries. The narrowest gender gaps (less than 15 score points in favour of girls) are observed in Chile, Ireland, Japan, Lebanon and Peru. The largest gender gaps (more than a 50 score-point difference in favour of girls) are found in Albania, Georgia, Jordan, Moldova, Qatar, Trinidad and Tobago, and the United Arab Emirates.

In 49 countries and economies out of 72, the variation in performance is larger among boys than among girls; as a result, the difference between the highest-performing boys and the lowest-performing boys is significantly larger than the equivalent difference among girls. Given girls' higher performance, but less variation in scores, gender differences at the top of the performance distribution tend to be smaller than gender differences at the bottom of the distribution, among lower-achieving students (Table I.4.7). In Israel, for example, boys scoring at the 90th percentile (or close to the highest-achieving boys) perform similarly to girls scoring at the 90th percentile. But boys performing at the 10th percentile (or close to the lowest-achieving boys) score 42 points below girls performing at the 10th percentile.

In all countries except Lebanon, Malaysia and Peru, more boys than girls do not reach a baseline level of proficiency in reading (Level 2), and in a majority of countries and economies (42), more girls than boys reach the highest levels of performance (Level 5 or 6). But in Austria, Ireland, Israel, Italy, Japan, Portugal and Spain, similar shares of boys and girls are top performers in reading; together, top-performing boys and girls represent more than 5% of all students (Tables I.4.5, I.4.6a and I.4.7).

Between PISA 2009 and PISA 2015, the gender gap in reading narrowed by 12 points on average across OECD countries: boys' performance improved somewhat (by 5 points, on average), particularly among the highest-achieving boys (+9 points at the 90th percentile), while girls' performance deteriorated (by 7 points, on average), particularly among the lowest-achieving girls (-16 points at the 10th percentile). Among all PISA participants, a significant narrowing of the gender gap in reading performance was observed in 32 countries and economies, while there was no change in the gender gap in the remaining 29 countries and economies.

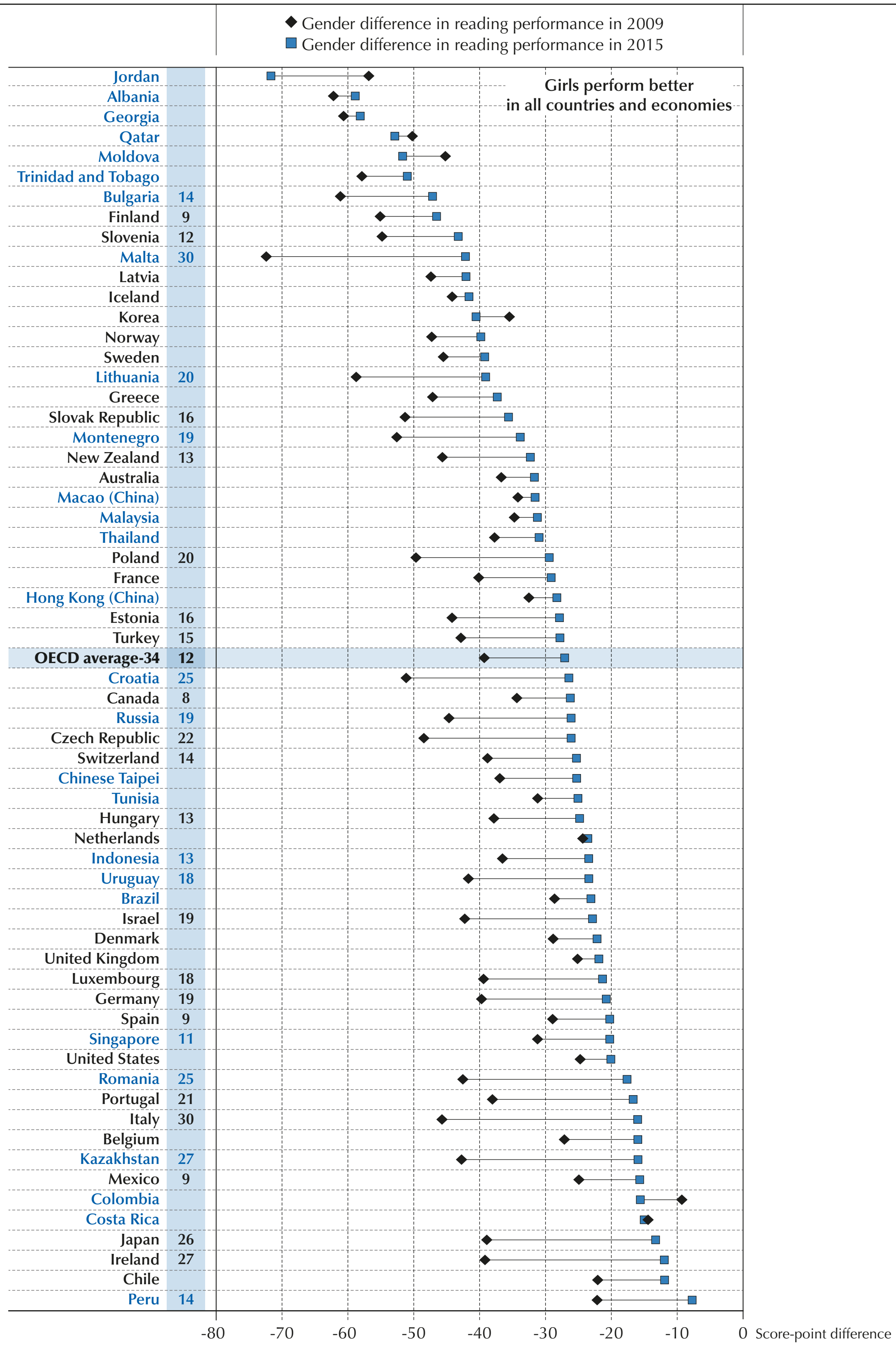
In previous PISA assessments, the gender differences in reading performance were smaller in computer-based assessments of reading (which, in 2009 and 2012, tested how well students read and navigate on line) than in paper-based assessments of reading (OECD, 2015b; OECD, 2011). Past computer-based assessments differed from paper-based assessments in at least two ways – the mode of delivery, and the content of the assessment. Both aspects could plausibly explain why gender gaps differed in the past; but each explanation has a distinct implication for gender gaps in PISA 2015, which used only questions that were originally developed for the paper-based assessments (no hypertexts were included), but delivered these questions on screen instead. If the mode of assessment makes a difference, e.g. because boys are more willing to engage with a reading test on a computer, using a keyboard or mouse, than with a reading test on paper, using a pencil or pen, gender-related differences in PISA 2015 for countries that conducted a computer-based test should be consistently smaller than gender-related differences in past PISA (paper-based) assessments of reading. If, on the other hand, the text types and questions matter more than the mode of delivery, gender-related differences in PISA 2015 should largely mirror those found in the PISA 2012 and PISA 2009 paper-based assessments of reading.[5]

Between PISA 2009 and PISA 2015, the gender gap shrank by 30 points in Malta (which delivered both PISA 2009 and PISA 2015 assessments on paper) and narrowed by between 20 and 30 points in Croatia, the Czech Republic, Ireland, Italy, Japan, Poland, Portugal and Romania (all of these countries, except Romania, delivered PISA 2015 on computer). However, in other countries that delivered the PISA 2015 test on computer – including, among OECD countries, Australia, Belgium, Chile, Denmark, France, Iceland, Korea, Latvia, the Netherlands, Norway, Sweden, the United Kingdom and the United States – the gender gap in PISA 2015 is not statistically different from the gender gap observed in PISA 2009.

In general, no clear pattern emerges when comparing gender-related performance differences in reading in PISA 2009 with differences in PISA 2015. Similar trends are found in countries that used the paper-based test as in countries that switched to the computer-based assessment: the difference between boys and girls in reading performance shrank by 10 score points, on average, in the 10 countries/economies that delivered both PISA 2009 and PISA 2015 on paper, and by 11 score points, on average, in the 53 countries/economies that changed the mode of delivery between PISA 2009 and PISA 2015 (Table I.4.8d). Moreover, the size and direction of changes in the gender gap varies across the countries that used the computer-based test. The gender gap narrowed more, on average, in the countries and economies that had the widest gaps at the beginning of the period, but the correlation between gender gaps in 2009 and subsequent changes is weak (-0.3).

Figure I.4.11 ■ **Change between 2009 and 2015 in gender differences in reading performance**

Score-point difference in reading (boys minus girls)



Notes: All gender differences in PISA 2009 and in PISA 2015 are statistically significant (see Annex A3).
Statistically significant changes between PISA 2009 and PISA 2015 are shown next to the country/economy name.
Only countries and economies with available data since 2009 are shown.
Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
Countries and economies are ranked in ascending order of gender differences in reading performance in 2015.
Source: OECD, PISA 2015 Database, Tables I.4.8a, I.4.8b and I.4.8d.

StatLink http://dx.doi.org/10.1787/888933432594

The direction in which the gender gap changed is often not consistent across subjects assessed, despite the fact that the mode of delivery of the PISA test changed similarly for all subjects. Specifically, the gender gap in mathematics performance remained broadly stable between PISA 2012 and PISA 2015, showing, if anything, a small reduction of boys' advantage in mathematics (see Chapter 5 and Table I.5.8e). While different modes of delivery may influence students' behaviour on the test, given the trends observed, the impact of the mode of delivery must either be of secondary importance, such that other concurrent changes in education systems explain the results, or it is specific to the country and the subject assessed.

Notes

1. The results of three countries, however, are not fully comparable, because of issues with sample coverage (Argentina), school response rates (Malaysia), or construct coverage (Kazakhstan); see Annex A4. As a consequence, results for these three countries are not included in most figures.

2. This worst-case scenario allows for a computation of a robust lower bound on the median and upper percentiles.

3. Changes in design and construct coverage were particularly important in the earlier PISA assessments. The change in performance observed between PISA 2000 and later assessments may thus not always reflect genuine changes in what students know and can do, but may be the result of the different assessment design used in 2000, compared to all later assessments, and of the significantly reduced coverage of the reading domain in 2003 and 2006 (see Annex A5). The uncertainty associated with comparisons involving PISA 2000, 2003 and 2006 reading results with later results is only imperfectly captured by the linking errors. Although the regression models used in this section to measure average trends are less sensitive to measurement issues affecting one assessment only, some caution is needed when interpreting reading trends before PISA 2009.

4. Similar assumptions of below-baseline skills among the population of 15-year-olds not covered by PISA are often made in related literature (Hanushek and Woessmann, 2008; Spaull and Taylor, 2015; Taylor and Spaull; 2015).

5. In the field trial for PISA 2015, no significant difference between the gender gap in the paper-based mode and the gender gap in the computer-based mode was detected, after accounting for separate mode and gender effects by domain (see Annex A6). It is important, however, to note that the identification of gender and/or mode effects in the field trial data relied on preliminary scaling results and field trial instruments that do not reflect the main survey test.

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5

Mathematics performance among 15-year-olds

This chapter compares countries' and economies' performance in mathematics in 2015 and analyses the changes in performance since 2003. Changes since the PISA 2012 assessment, when mathematics was most recently the major domain, are highlighted. The chapter also discusses differences in mathematics performance related to gender.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

The PISA assessment of mathematics focuses on measuring students' capacity to formulate, use and interpret mathematics in a variety of contexts. To succeed on the PISA test, students must be able to reason mathematically and use mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena. Competence in mathematics, as defined in PISA, assists individuals in recognising the role that mathematics plays in the world and in making the well-founded judgements and decisions needed to be constructive, engaged and reflective citizens (OECD, 2016a).

Performance in mathematics described in this way encompasses more than the ability to reproduce the knowledge of mathematics concepts and procedures acquired in school. PISA seeks to measure how well students can extrapolate from what they know and apply their knowledge of mathematics, including in new and unfamiliar situations. To this end, most PISA mathematics units make reference to real-life contexts in which mathematics abilities are required to solve a problem. The focus on real-life contexts is also reflected in the reference to the possibility of using "tools", such as a calculator, a ruler or a spreadsheet, for solving problems, just as one would do in a real-life situation, such as at work.

Mathematics was the major domain assessed in 2003, the second PISA assessment, and in 2012, the fifth PISA assessment. In this sixth PISA assessment, science is the major domain, thus less time was devoted to assessing students' mathematics skills. As a result, only an update on overall performance is possible, rather than the kind of in-depth analyses of knowledge and skills that were contained in the reports based on PISA 2003 and PISA 2012 data (OECD, 2004; OECD, 2010; OECD, 2014; OECD, 2016b).

This chapter presents the results of the assessment of mathematics in PISA 2015. Mathematics was tested using computers (as were science and reading) in 57 of the 72 participating countries and economies; the remaining 15 countries and economies, as well as Puerto Rico, an unincorporated territory of the United States, delivered the test in a pencil-and-paper format, as in previous cycles of PISA.[1] All countries/economies, regardless of the assessment mode, used the same mathematics questions, which were initially developed for the paper-based assessments used in PISA 2012 and PISA 2003. Results of the PISA test are reported on the same scale, regardless of the mode of delivery, and can be compared across all 72 participating countries and economies.[2] PISA 2015 results in mathematics can also be compared to results of the PISA 2003, 2006, 2009 and 2012 assessments (see Box I.2.3 and Annex A5).

What the data tell us

- Four countries/economies in Asia outperform all other countries/economies in mathematics: Singapore, Hong Kong (China), Macao (China) and Chinese Taipei. Japan is the strongest performer among OECD countries.
- Albania, Colombia, Montenegro, Peru, Qatar and Russia improved their students' mean performance between 2012 and 2015, contributing to an overall positive trend since these countries began participating in PISA.
- More than one in four students in Beijing-Shanghai-Jiangsu-Guangdong (China), Hong Kong (China), Singapore and Chinese Taipei are top-performing students in mathematics – meaning that they can, for instance, handle tasks that require the ability to formulate complex situations mathematically, using symbolic representations.
- On average across OECD countries, boys score 8 points higher than girls in mathematics. Boys' advantage in mathematics is most apparent among the best-performing students: the 10% highest-achieving boys score 16 points higher than the 10% highest-achieving girls.

STUDENT PROFICIENCY IN MATHEMATICS

In PISA 2003, the mean mathematics score for the 30 OECD countries at the time was set at 500 score points, with a standard deviation of 100 points (OECD, 2004). To help interpret what students' scores mean in substantive terms, the scale is divided into levels of proficiency that indicate the kinds of tasks that students at those levels are capable of completing successfully. Descriptions of the proficiency levels are revisited and updated each time a domain returns as a major domain, to reflect revisions in the framework and in the demands of the new tasks developed for the assessment. The most recent descriptions of proficiency levels are based on the PISA 2012 assessment (OECD, 2014).

Average performance in mathematics

One way to summarise student performance and to compare the relative standing of countries in mathematics is through countries' and economies' mean performance, both relative to each other and to the OECD mean. For PISA 2015, the mean performance across the 35 OECD countries is 490 score points.

Figure I.5.1 ■ Comparing countries' and economies' performance in mathematics

Statistically significantly **above** the OECD average
Not statistically significantly different from the OECD average
Statistically significantly **below** the OECD average

Mean score	Comparison country/ economy	Countries and economies whose mean score is NOT statistically significantly different from the comparison country's/economy's score
564	Singapore	
548	Hong Kong (China)	Macao (China), Chinese Taipei
544	Macao (China)	Hong Kong (China), Chinese Taipei
542	Chinese Taipei	Hong Kong (China), Macao (China), B-S-J-G (China)
532	Japan	B-S-J-G (China), Korea
531	B-S-J-G (China)	Chinese Taipei, Japan, Korea, Switzerland
524	Korea	Japan, B-S-J-G (China), Switzerland, Estonia, Canada
521	Switzerland	B-S-J-G (China), Korea, Estonia, Canada
520	Estonia	Korea, Switzerland, Canada
516	Canada	Korea, Switzerland, Estonia, Netherlands, Denmark, Finland
512	Netherlands	Canada, Denmark, Finland, Slovenia, Belgium, Germany
511	Denmark	Canada, Netherlands, Finland, Slovenia, Belgium, Germany
511	Finland	Canada, Netherlands, Denmark, Slovenia, Belgium, Germany
510	Slovenia	Netherlands, Denmark, Finland, Belgium, Germany
507	Belgium	Netherlands, Denmark, Finland, Slovenia, Germany, Poland, Ireland, Norway
506	Germany	Netherlands, Denmark, Finland, Slovenia, Belgium, Poland, Ireland, Norway
504	Poland	Belgium, Germany, Ireland, Norway
504	Ireland	Belgium, Germany, Poland, Norway, Viet Nam
502	Norway	Belgium, Germany, Poland, Ireland, Austria, Viet Nam
497	Austria	Norway, New Zealand, Viet Nam, Russia, Sweden, Australia, France, United Kingdom, Czech Republic, Portugal, Italy
495	New Zealand	Austria, Viet Nam, Russia, Sweden, Australia, France, United Kingdom, Czech Republic, Portugal, Italy
495	Viet Nam	Ireland, Norway, Austria, New Zealand, Russia, Sweden, Australia, France, United Kingdom, Czech Republic, Portugal, Italy, Iceland, Spain, Luxembourg
494	Russia	Austria, New Zealand, Viet Nam, Sweden, Australia, France, United Kingdom, Czech Republic, Portugal, Italy, Iceland
494	Sweden	Austria, New Zealand, Viet Nam, Russia, Australia, France, United Kingdom, Czech Republic, Portugal, Italy, Iceland
494	Australia	Austria, New Zealand, Viet Nam, Russia, Sweden, France, United Kingdom, Czech Republic, Portugal, Italy
493	France	Austria, New Zealand, Viet Nam, Russia, Sweden, Australia, United Kingdom, Czech Republic, Portugal, Italy, Iceland
492	United Kingdom	Austria, New Zealand, Viet Nam, Russia, Sweden, Australia, France, Czech Republic, Portugal, Italy, Iceland
492	Czech Republic	Austria, New Zealand, Viet Nam, Russia, Sweden, Australia, France, United Kingdom, Portugal, Italy, Iceland
492	Portugal	Austria, New Zealand, Viet Nam, Russia, Sweden, Australia, France, United Kingdom, Czech Republic, Italy, Iceland, Spain
490	Italy	Austria, New Zealand, Viet Nam, Russia, Sweden, Australia, France, United Kingdom, Czech Republic, Portugal, Iceland, Spain, Luxembourg
488	Iceland	Viet Nam, Russia, Sweden, France, United Kingdom, Czech Republic, Portugal, Italy, Spain, Luxembourg
486	Spain	Viet Nam, Portugal, Italy, Iceland, Luxembourg, Latvia
486	Luxembourg	Viet Nam, Italy, Iceland, Spain, Latvia
482	Latvia	Spain, Luxembourg, Malta, Lithuania, Hungary
479	Malta	Latvia, Lithuania, Hungary, Slovak Republic
478	Lithuania	Latvia, Malta, Hungary, Slovak Republic
477	Hungary	Latvia, Malta, Lithuania, Slovak Republic, Israel, United States
475	Slovak Republic	Malta, Lithuania, Hungary, Israel, United States
470	Israel	Hungary, Slovak Republic, United States, Croatia, CABA (Argentina)
470	United States	Hungary, Slovak Republic, Israel, Croatia, CABA (Argentina)
464	Croatia	Israel, United States, CABA (Argentina)
456	CABA (Argentina)	Israel, United States, Croatia, Greece, Romania, Bulgaria
454	Greece	CABA (Argentina), Romania
444	Romania	CABA (Argentina), Greece, Bulgaria, Cyprus[1]
441	Bulgaria	CABA (Argentina), Romania, Cyprus[1]
437	Cyprus[1]	Romania, Bulgaria
427	United Arab Emirates	Chile, Turkey
423	Chile	United Arab Emirates, Turkey, Moldova, Uruguay, Montenegro, Trinidad and Tobago, Thailand
420	Turkey	United Arab Emirates, Chile, Moldova, Uruguay, Montenegro, Trinidad and Tobago, Thailand, Albania
420	Moldova	Chile, Turkey, Uruguay, Montenegro, Trinidad and Tobago, Thailand, Albania
418	Uruguay	Chile, Turkey, Moldova, Montenegro, Trinidad and Tobago, Thailand, Albania
418	Montenegro	Chile, Turkey, Moldova, Uruguay, Trinidad and Tobago, Thailand, Albania
417	Trinidad and Tobago	Chile, Turkey, Moldova, Uruguay, Montenegro, Thailand, Albania
415	Thailand	Chile, Turkey, Moldova, Uruguay, Montenegro, Trinidad and Tobago, Albania
413	Albania	Turkey, Moldova, Uruguay, Montenegro, Trinidad and Tobago, Thailand, Mexico
408	Mexico	Albania, Georgia
404	Georgia	Mexico, Qatar, Costa Rica, Lebanon
402	Qatar	Georgia, Costa Rica, Lebanon
400	Costa Rica	Georgia, Qatar, Lebanon
396	Lebanon	Georgia, Qatar, Costa Rica, Colombia
390	Colombia	Lebanon, Peru, Indonesia
387	Peru	Colombia, Indonesia, Jordan
386	Indonesia	Colombia, Peru, Jordan
380	Jordan	Peru, Indonesia, Brazil
377	Brazil	Jordan, FYROM
371	FYROM	Brazil, Tunisia
367	Tunisia	FYROM, Kosovo, Algeria
362	Kosovo	Tunisia, Algeria
360	Algeria	Tunisia, Kosovo
328	Dominican Republic	

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.
Source: OECD, PISA 2015 Database, Table I.5.3.
StatLink http://dx.doi.org/10.1787/888933432605

When interpreting mean performance, only statistically significant differences among countries and economies should be taken into account (see Box I.2.2 in Chapter 2). Figure I.5.1 shows each country's/economy's mean score and also indicates for which pairs of countries/economies the differences between the means are statistically significant. For country/economy A, shown in the middle column, the mean score achieved by students is shown in the left column, and the countries/economies whose mean scores are *not* statistically significantly different are listed in the right column.[3] For all other countries/economies not listed in the right column, country/economy B scores higher than country/economy A if country/economy B is situated above country/economy A in the middle column, and scores lower if country/economy B is situated below country/economy A. For example: Singapore, whose mean score is 564 points, has a higher score than all other PISA-participating countries/economies; whereas the performance of Hong Kong (China), which appears second on the list, with a mean score of 548 points, cannot be distinguished with confidence from that of Macao (China) and Chinese Taipei, which appear third and fourth, respectively.

In Figure I.5.1, countries and economies are divided into three broad groups: those whose mean scores are statistically around the OECD mean (highlighted in dark blue), those whose mean scores are above the OECD mean (highlighted in pale blue), and those whose mean scores are below the OECD mean (highlighted in medium blue).

As shown in Figure I.5.1, four countries and economies outperform all others in mathematics in PISA 2015, with mean scores of about half a standard deviation above the OECD average or more. Singapore is the highest-performing country in mathematics, with a mean score of 564 points – more than 70 points above the OECD average. Three countries/economies – Hong Kong (China), Macao (China) and Chinese Taipei – perform below Singapore, but higher than any OECD country in PISA. Japan is the highest-performing OECD country, with a mean score of 532 points. Other countries and economies with mean performance above the average include (in descending order of mean performance) Beijing-Shanghai-Jiangsu-Guangdong (China) (hereafter "B-S-J-G [China]"), Korea, Switzerland, Estonia, Canada, the Netherlands, Denmark, Finland, Slovenia, Belgium, Germany, Poland, Ireland, Norway, Austria, New Zealand and Australia. Countries that perform around the average include Viet Nam, the Russian Federation (hereafter "Russia"), Sweden, France, the United Kingdom, the Czech Republic, Portugal, Italy and Iceland. Thirty-six participating countries and economies have a mean score that is below the OECD average.

The gap in performance between the highest- and the lowest-performing OECD countries is 124 score points. That is, while the average score of the highest-performing OECD country, Japan, is about 40 points above the OECD average, the average score of the lowest-performing OECD country, Mexico, is more than 80 points – or the equivalent of more than two years of school (see Box I.2.2 in Chapter 2) – below the OECD average. But the performance difference observed among partner countries and economies is even larger, with a 236 score-point difference between Singapore (564 points) and the Dominican Republic (328 points).

Because the figures are derived from samples, it is not possible to determine a country's or economy's precise ranking among all countries and economies. However, it is possible to determine, with confidence, a range of rankings in which the country's/economy's performance lies (Figure I.5.2). For subnational entities whose results are reported in Annex B2, a rank order was not estimated; but the mean score and its confidence interval allow for a comparison of the performance of these subnational entities with that of countries and economies. For example, the Flemish community of Belgium shows a mean score of 521 points in mathematics, below that of top performers Hong Kong (China), Japan or Singapore but close to the score achieved by students in Estonia, Korea and Switzerland on average, and clearly above the national average for Belgium (507 points).

Trends in average mathematics performance

The change in a school system's average performance over time can indicate how and to what extent the system is progressing towards achieving the goal of providing its students with the knowledge and skills needed to become full participants in a knowledge-based society. PISA 2015 mathematics results can be compared with those from PISA 2003 and from later PISA mathematics assessments. A comprehensive analysis of trends between 2003 and 2012 was included in the PISA 2012 initial report (OECD, 2014). This chapter focuses on changes in mathematics performance since PISA 2012, the most recent cycle in which mathematics was the major domain, while also reporting the average three-year trend since 2003 or a country's/economy's earliest participation in PISA. PISA 2012 and PISA 2015 results can be compared for 60 countries and economies; for 56 of these, earlier results are available too. For another four countries, PISA 2012 results are not available; only results from PISA 2009 (for Trinidad and Tobago) or from PISA 2009+ (for Georgia, Malta and Moldova) can be compared with PISA 2015 results.

Figure I.5.2 [Part 1/2] ■ **Mathematics performance among PISA 2015 participants, at national and subnational levels**

	Mathematics scale					
			Range of ranks			
			OECD countries		All countries/economies	
	Mean score	95% confidence interval	Upper rank	Lower rank	Upper rank	Lower rank
Singapore	564	561 - 567			1	1
Hong Kong (China)	548	542 - 554			2	3
Quebec (Canada)[1]	544	535 - 553				
Macao (China)	544	542 - 546			2	4
Chinese Taipei	542	536 - 548			2	4
Japan	532	527 - 538	1	1	5	6
B-S-J-G (China)	531	522 - 541			4	7
Korea	524	517 - 531	1	4	6	9
British Columbia (Canada)	522	512 - 531				
Flemish community (Belgium)	521	517 - 526				
Switzerland	521	516 - 527	2	5	7	10
Estonia	520	516 - 524	2	5	7	10
Bolzano (Italy)	518	505 - 531				
Navarre (Spain)	518	503 - 533				
Trento (Italy)	516	511 - 521				
Canada	516	511 - 520	3	7	8	12
Netherlands	512	508 - 517	5	9	10	14
Alberta (Canada)	511	502 - 521				
Denmark	511	507 - 515	5	10	10	15
Finland	511	507 - 516	5	10	10	15
Slovenia	510	507 - 512	6	10	11	15
Ontario (Canada)	509	501 - 518				
Lombardia (Italy)	508	495 - 520				
Belgium	507	502 - 512	7	13	12	18
Castile and Leon (Spain)	506	497 - 515				
Germany	506	500 - 512	8	14	12	19
La Rioja (Spain)	505	486 - 523				
Poland	504	500 - 509	10	14	14	19
Ireland	504	500 - 508	10	14	15	19
Madrid (Spain)	503	495 - 511				
German-speaking community (Belgium)	502	492 - 512				
Norway	502	497 - 506	11	15	16	20
Aragon (Spain)	500	490 - 510				
Massachusetts (United States)	500	489 - 511				
Catalonia (Spain)	500	491 - 509				
Prince Edward Island (Canada)	499	486 - 511				
Nova Scotia (Canada)	497	488 - 506				
Austria	497	491 - 502	14	21	18	27
New Zealand	495	491 - 500	15	22	20	28
Cantabria (Spain)	495	477 - 513				
Viet Nam	495	486 - 503			18	32
Russia	494	488 - 500			20	30
Sweden	494	488 - 500	15	24	20	30
Australia	494	491 - 497	15	22	21	29
Galicia (Spain)	494	486 - 502				
England (United Kingdom)	493	488 - 499				
France	493	489 - 497	15	23	21	30
Northern Ireland (United Kingdom)	493	484 - 502				
New Brunswick (Canada)	493	483 - 502				
United Kingdom	492	488 - 497	15	24	21	31
Czech Republic	492	488 - 497	16	24	21	31
Basque Country (Spain)	492	484 - 499				
Portugal	492	487 - 497	16	24	21	31
Asturias (Spain)	492	481 - 502				
Scotland (United Kingdom)	491	486 - 496				
Italy	490	484 - 495	17	26	23	33
French community (Belgium)	489	481 - 498				
Manitoba (Canada)	489	481 - 497				
Iceland	488	484 - 492	21	26	27	33
Castile-La Mancha (Spain)	486	479 - 493				
Spain	486	482 - 490	23	27	29	34
Luxembourg	486	483 - 488	24	27	31	34

* See note 1 under Figure I.5.1.
1. Results for the province of Quebec in this figure should be treated with caution due to a possible non-response bias.
2. Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
Note: OECD countries are shown in bold black. Partner countries, economies and subnational entities that are not included in national results are shown in bold blue. Regions are shown in black italics (OECD countries) or blue italics (partner countries).
Countries and economies are ranked in descending order of mean mathematics performance.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432613

Figure I.5.2 [Part 2/2] ■ **Mathematics performance among PISA 2015 participants, at national and subnational levels**

	Mathematics scale					
			Range of ranks			
			OECD countries		All countries/economies	
	Mean score	95% confidence interval	Upper rank	Lower rank	Upper rank	Lower rank
Newfoundland and Labrador (Canada)	486	479 - 492				
Comunidad Valenciana (Spain)	485	478 - 492				
Saskatchewan (Canada)	484	479 - 490				
Latvia	482	479 - 486	26	28	32	36
Malta	479	475 - 482			34	38
Lithuania	478	474 - 483			34	38
Wales (United Kingdom)	478	471 - 485				
Hungary	477	472 - 482	28	30	35	39
Balearic Islands (Spain)	476	464 - 489				
Slovak Republic	475	470 - 480	28	30	35	39
Extremadura (Spain)	473	464 - 482				
North Carolina (United States)	471	462 - 480				
Murcia (Spain)	470	457 - 484				
Israel	470	463 - 477	29	31	37	41
United States	470	463 - 476	29	31	38	41
Dubai (UAE)	467	464 - 471				
Andalusia (Spain)	466	458 - 474				
Croatia	464	459 - 469			40	42
Região Autónoma dos Açores (Portugal)	462	458 - 467				
CABA (Argentina)	456	443 - 470			40	44
Campania (Italy)	456	445 - 466				
Greece	454	446 - 461	32	32	42	43
Canary Islands (Spain)	452	443 - 461				
Romania	444	437 - 451			43	45
Bulgaria	441	433 - 449			44	46
Cyprus*	437	434 - 441			45	46
Sharjah (UAE)	429	414 - 444				
United Arab Emirates	427	423 - 432			47	48
Bogotá (Colombia)	426	417 - 435				
Chile	423	418 - 428	33	34	47	51
Turkey	420	412 - 429	33	34	47	54
Moldova	420	415 - 424			48	54
Uruguay	418	413 - 423			49	55
Montenegro	418	415 - 421			49	54
Trinidad and Tobago	417	414 - 420			50	55
Thailand	415	410 - 421			49	55
Albania	413	406 - 420			51	56
Abu Dhabi (UAE)	413	403 - 422				
Mexico	408	404 - 412	35	35	55	57
Medellín (Colombia)	408	399 - 416				
Manizales (Colombia)	407	400 - 415				
Georgia	404	398 - 409			56	59
Qatar	402	400 - 405			57	59
Ras Al Khaimah (UAE)	402	383 - 420				
Costa Rica	400	395 - 405			57	60
Lebanon	396	389 - 403			58	61
Cali (Colombia)	394	385 - 402				
Fujairah (UAE)	393	382 - 404				
Colombia	390	385 - 394			60	63
Ajman (UAE)	387	374 - 400				
Peru	387	381 - 392			61	64
Indonesia	386	380 - 392			61	64
Umm Al Quwain (UAE)	384	375 - 394				
Jordan	380	375 - 385			63	65
Puerto Rico[2]	378	367 - 389				
Brazil	377	371 - 383			64	65
FYROM	371	369 - 374			66	67
Tunisia	367	361 - 373			66	68
Kosovo	362	358 - 365			67	69
Algeria	360	354 - 365			68	69
Dominican Republic	328	322 - 333			70	70

* See note 1 under Figure I.5.1.
1. Results for the province of Quebec in this figure should be treated with caution due to a possible non-response bias.
2. Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.

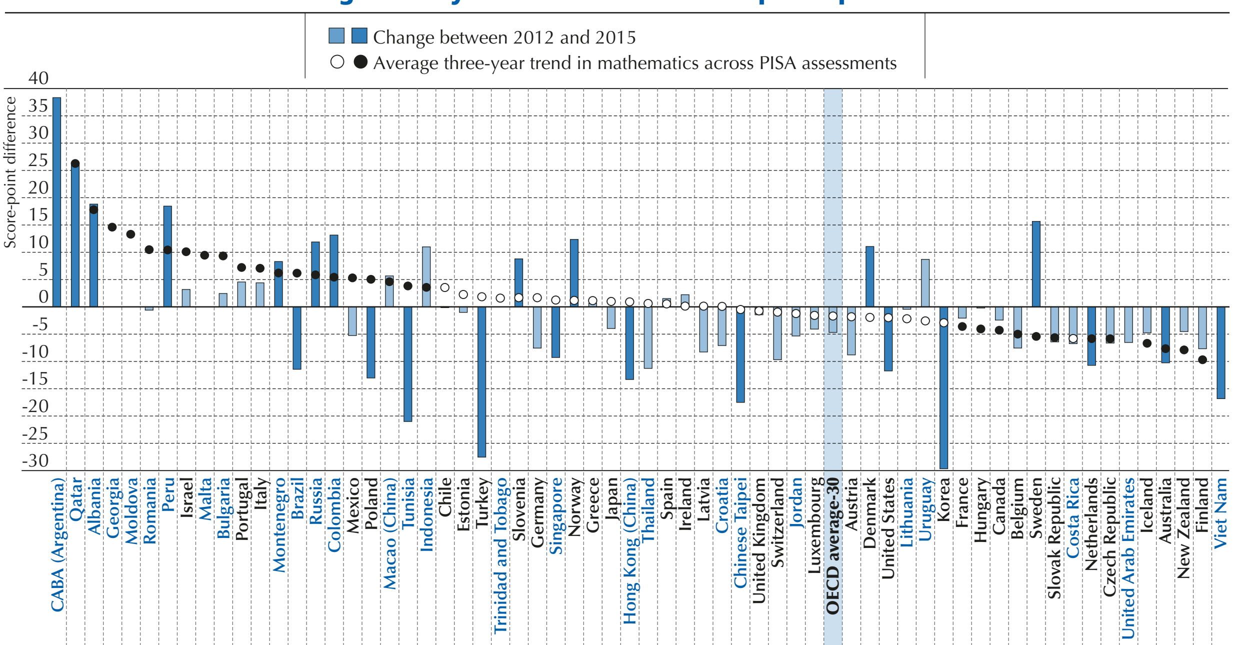
Note: OECD countries are shown in bold black. Partner countries, economies and subnational entities that are not included in national results are shown in bold blue. Regions are shown in black italics (OECD countries) or blue italics (partner countries).
Countries and economies are ranked in descending order of mean mathematics performance.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432613

On average across OECD countries, mathematics performance remained broadly stable between 2012 and 2015; the average score-point difference between PISA 2012 and PISA 2015, for the 35 OECD countries, is -4 points, a non-significant difference given the uncertainty about the link between the PISA 2015 and the PISA 2012 scales (see Box I.2.3 in Chapter 2 and Annex A5). Longer trends also show overall stability of average results. For OECD countries with valid data for PISA 2003, mathematics results declined, on average, by 1.7 score points every three years between 2003 and 2015 – a non-significant trend.

Among all PISA participants, 11 countries/economies – including four OECD countries – saw significant improvements since 2012. Performance improved by 38 score points in Ciudad Autónoma de Buenos Aires (Argentina) (hereafter "CABA [Argentina]") and by 26 score points in Qatar. Performance improved by between 15 and 20 score points in Albania, Peru and Sweden and by between 10 and 15 score points in Colombia, Denmark, Norway and Russia. Significant improvements since 2012 are also observed in Montenegro and Slovenia, but mean scores improved by less than 10 points in these countries. Performance also improved by more than 15 score points in Georgia, Malta and Moldova since they first participated in PISA in 2010, as part of the PISA 2009+ programme (Figure I.5.3 and Table I.5.4a).

Meanwhile, 12 countries and economies saw deteriorating performance between 2012 and 2015 (Figure I.5.3 and Table I.5.4a). In most countries and economies, however, performance remained stable between 2012 and 2015 – as can be expected, given the short period of time between the two assessments.

Figure I.5.3 ■ **Change between 2012 and 2015 in mathematics performance and average three-year trend since earliest participation in PISA**



Notes: Statistically significant differences are shown in a darker tone (see Annex A3).

The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. This model takes into account that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+. For countries/economies with comparable data for PISA 2012 and PISA 2015 only, the average three-year trend coincides with the change between 2012 and 2015.

Only countries/economies with valid results for PISA 2015 and at least one prior assessment are shown.

Countries and economies are ranked in descending order of the average three-year trend in mathematics performance since the earliest participation in PISA.

Source: OECD, PISA 2015 Database, Table I.5.4a.

StatLink http://dx.doi.org/10.1787/888933432623

Figure I.5.3 shows that the positive changes in performance observed in recent years in Albania, Colombia, Montenegro, Peru, Qatar and Russia are consistent with longer-term trends seen since these countries/economies first participated in PISA. By contrast, the recent improvements observed in Denmark, Norway, Slovenia and Sweden reverse an earlier drop in PISA scores (which was not always significant). The overall trajectory for these countries since their earliest participation

in PISA, indicated by the dots in Figure I.5.3 representing the average three-year trend, corresponds to a non-significant improvement in Norway and Slovenia, a non-significant decline in Denmark, and a decline, by 5.4 points every three years, in Sweden. Between 2003 and 2012, Sweden saw one of the steepest declines in mean mathematics performance (more than 30 score points); but the most recent change between 2012 and 2015, when mathematics scores in Sweden improved by 16 points, slowed, and perhaps reversed, this trend.

Among the countries and economies that saw a deterioration in performance between 2012 and 2015, the overall trajectory across PISA assessments is nevertheless positive in Brazil (which gained 6.2 points in every PISA round, on average, since 2003), in Poland (+5.0 points every three years) and in Tunisia (+3.8 points every three years). In Hong Kong (China), Korea, Singapore, Chinese Taipei, Turkey and the United States, there was no significant improvement or deterioration in performance over the longer time period; in Australia and the Netherlands, the change between 2012 and 2015 is the most recent part of a deteriorating trend in performance over a longer period of time.

At any given point in time, some countries and economies perform similarly. But as time passes and school systems evolve, certain countries and economies improve their performance, pull ahead of the group of countries with which they shared similar performance levels, and catch up to another group of countries. Other countries and economies see a decline in their performance, and fall behind in rankings relative to other countries. Figure I.5.4 shows, for each country and economy, those other countries and economies with comparable results in mathematics in 2012, but whose performance differed in 2015, reflecting a faster, or slower, improvement or deterioration over time.

Figure I.5.5 shows the relationship between each country's and economy's average mathematics performance in PISA 2012 and their score difference between 2012 and 2015. Countries and economies whose performance declined during this period are found both among countries that performed above the OECD average in 2012, such as Korea, and among countries that had comparatively low performance in PISA 2012, such as Tunisia. Improvements are found among both low-performing countries (such as Peru) and among countries performing close to the OECD average (such as Denmark). The correlation between a country's/economy's mathematics score in PISA 2015 and its change in mathematics performance since 2012 is -0.4 – indicating a moderate, negative association.

Annex A5 discusses the extent to which changes in the scaling procedures, introduced for the first time in PISA 2015, influence the results of reported changes between PISA 2012 and PISA 2015. It shows that the negative changes between PISA 2012 and PISA 2015 reported for Chinese Taipei (-18 score points) and Viet Nam (-17 score points) are, to a large extent, due to the use of a different scaling approach in 2015; and that the reported change between PISA 2012 and PISA 2015 for Turkey (-28 score points) would have been -18 score points had all results been generated under a consistent scaling approach. Annex A5 also shows that the improvement between PISA 2012 and PISA 2015 in Albania's mean score in mathematics (+19 score points) would have been smaller and most likely be reported as not significant (+7 points) had all results been generated under a consistent scaling approach. All other differences between reported changes and those based on applying the PISA 2015 approach to scaling to previous PISA assessments are well within the confidence interval indicated for the reported changes.

But the question remains: to what extent do changes in the way the test is delivered (the test mode) influence the ability to monitor trends in mathematics? Great care was taken to ensure that trends would not be significantly affected by the shift from a paper- to a computer-based test. For instance, when developing a fully equivalent computer version for a paper-based task proved challenging because of interface issues, such as students' unfamiliarity with equation editors or drawing tools on computers, these tasks were treated as distinct in paper and computer modes, with mode-specific difficulty parameters. In this way, only tasks that proved fully equivalent across the two modes and on aggregate across countries (51 items in mathematics) were used to indicate improving or deteriorating performance over time (see Box I.2.3 in Chapter 2 and Annex A5 for further details on how the computer- and paper-based versions of the test are linked for the purpose of scaling results).

The estimation of mode-specific difficulty parameters for the remaining 30 items was based on strong evidence of mode differences at the international level. It did not take into account country-specific factors that may have affected the equivalence of computer- and paper-based tasks.[4] Box I.5.1 explores the extent to which changes in PISA performance between 2012 and 2015 are related to differences in familiarity with ICT tools across countries. It shows that the between-country variation in exposure to computers can account for only a limited fraction of the observed variation in trends.

Figure I.5.4 [Part 1/4] ■ **Multiple comparisons of mathematics performance between 2012 and 2015**

Comparison country/economy	Mathematics performance in 2012	Mathematics performance in 2015	Countries/economies with… ... similar performance in 2012 and in 2015	... similar performance in 2012, but higher performance in 2015	... similar performance in 2012, but lower performance in 2015
Singapore	573	564			
Hong Kong (China)	561	548	Chinese Taipei		Korea
Macao (China)	538	544			Japan
Chinese Taipei	560	542	Hong Kong (China)		Korea
Japan	536	532		Macao (China)	Switzerland
Korea	554	524		Hong Kong (China), Chinese Taipei	
Switzerland	531	521		Japan	Netherlands
Estonia	521	520	Canada		Netherlands, Finland, Poland, Viet Nam
Canada	518	516	Estonia, Netherlands, Finland		Belgium, Germany, Poland, Viet Nam
Netherlands	523	512	Canada, Finland	Switzerland, Estonia	Poland, Viet Nam
Denmark	500	511	Slovenia		Ireland, Austria, New Zealand, Australia, France, United Kingdom, Czech Republic
Finland	519	511	Canada, Netherlands, Belgium, Germany	Estonia	Poland, Viet Nam
Slovenia	501	510	Denmark		Ireland, Austria, New Zealand, Australia, Czech Republic
Belgium	515	507	Finland, Germany, Poland	Canada	Viet Nam
Germany	514	506	Finland, Belgium, Poland	Canada	Viet Nam
Poland	518	504	Belgium, Germany	Estonia, Canada, Netherlands, Finland	Viet Nam
Ireland	501	504	Viet Nam	Denmark, Slovenia	Austria, New Zealand, Australia, France, United Kingdom, Czech Republic
Norway	489	502			Russia, France, United Kingdom, Portugal, Italy, Iceland, Spain, Luxembourg, Latvia, Slovak Republic, United States
Austria	506	497	New Zealand, Viet Nam, Australia, Czech Republic	Denmark, Slovenia, Ireland	
New Zealand	500	495	Austria, Australia, France, United Kingdom, Czech Republic	Denmark, Slovenia, Ireland	
Viet Nam	511	495	Ireland, Austria, Australia	Estonia, Canada, Netherlands, Finland, Belgium, Germany, Poland	
Russia	482	494	Sweden, Portugal, Italy	Norway	Spain, Lithuania, Hungary, Slovak Republic, United States
Sweden	478	494	Russia		Lithuania, Hungary, Slovak Republic, United States, Croatia
Australia	504	494	Austria, New Zealand, Viet Nam, Czech Republic	Denmark, Slovenia, Ireland	
France	495	493	New Zealand, United Kingdom, Czech Republic, Portugal, Iceland	Denmark, Ireland, Norway	Luxembourg, Latvia
United Kingdom	494	492	New Zealand, France, Czech Republic, Portugal, Iceland	Denmark, Ireland, Norway	Luxembourg, Latvia
Czech Republic	499	492	Austria, New Zealand, Australia, France, United Kingdom, Iceland	Denmark, Slovenia, Ireland	

* See note 1 under Figure I.5.1.
Note: Only countries and economies with valid results for the PISA 2012 and PISA 2015 assessments are shown.
Countries and economies are ranked in descending order of mean mathematics performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432638

Figure I.5.4 [Part 2/4] ▪ Multiple comparisons of mathematics performance between 2012 and 2015

Comparison country/economy	Mathematics performance in 2012	Mathematics performance in 2015	Countries/economies with… ... higher performance in 2012, but similar performance in 2015	... higher performance in 2012, but lower performance in 2015	... lower performance in 2012, but similar performance in 2015	... lower performance in 2012, but higher performance in 2015
Singapore	573	564				
Hong Kong (China)	561	548			Macao (China)	
Macao (China)	538	544	Hong Kong (China), Chinese Taipei	Korea		
Chinese Taipei	560	542			Macao (China)	
Japan	536	532	Korea			
Korea	554	524			Japan, Switzerland, Estonia, Canada	Macao (China)
Switzerland	531	521	Korea		Estonia, Canada	
Estonia	521	520	Korea, Switzerland			
Canada	518	516	Korea, Switzerland		Denmark	
Netherlands	523	512			Denmark, Slovenia, Belgium, Germany	
Denmark	500	511	Canada, Netherlands, Finland, Belgium, Germany	Poland, Viet Nam		
Finland	519	511			Denmark, Slovenia	
Slovenia	501	510	Netherlands, Finland, Belgium, Germany	Poland, Viet Nam		
Belgium	515	507	Netherlands		Denmark, Slovenia, Ireland, Norway	
Germany	514	506	Netherlands		Denmark, Slovenia, Ireland, Norway	
Poland	518	504			Ireland, Norway	Denmark, Slovenia
Ireland	501	504	Belgium, Germany, Poland		Norway	
Norway	489	502	Belgium, Germany, Poland, Ireland, Austria, Viet Nam	New Zealand, Australia, Czech Republic		
Austria	506	497			Norway, Russia, Sweden, France, United Kingdom, Portugal, Italy	
New Zealand	500	495	Viet Nam		Russia, Sweden, Portugal, Italy	Norway
Viet Nam	511	495			Norway, New Zealand, Russia, Sweden, France, United Kingdom, Czech Republic, Portugal, Italy, Iceland, Spain, Luxembourg	Denmark, Slovenia
Russia	482	494	Austria, New Zealand, Viet Nam, Australia, France, United Kingdom, Czech Republic, Iceland	Luxembourg, Latvia		
Sweden	478	494	Austria, New Zealand, Viet Nam, Australia, France, United Kingdom, Czech Republic, Portugal, Italy, Iceland	Spain, Luxembourg, Latvia		
Australia	504	494			Russia, Sweden, France, United Kingdom, Portugal, Italy	Norway
France	495	493	Austria, Viet Nam, Australia		Russia, Sweden, Italy	
United Kingdom	494	492	Austria, Viet Nam, Australia		Russia, Sweden, Italy	
Czech Republic	499	492	Viet Nam		Russia, Sweden, Portugal, Italy	Norway

* See note 1 under Figure I.5.1.
Note: Only countries and economies with valid results for the PISA 2012 and PISA 2015 assessments are shown.
Countries and economies are ranked in descending order of mean mathematics performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432638

Figure I.5.4 [Part 3/4] ■ **Multiple comparisons of mathematics performance between 2012 and 2015**

Comparison country/economy	Mathematics performance in 2012	Mathematics performance in 2015	Countries/economies with… ... similar performance in 2012 and in 2015	... similar performance in 2012, but higher performance in 2015	... similar performance in 2012, but lower performance in 2015
Portugal	487	492	Russia, France, United Kingdom, Italy, Iceland, Spain	Norway	Luxembourg, Latvia, Lithuania, Slovak Republic, United States
Italy	485	490	Russia, Portugal, Spain	Norway	Latvia, Lithuania, Slovak Republic, United States
Iceland	493	488	France, United Kingdom, Czech Republic, Portugal, Luxembourg	Norway	Latvia
Spain	484	486	Portugal, Italy, Latvia	Norway, Russia	Lithuania, Hungary, Slovak Republic, United States
Luxembourg	490	486	Iceland, Latvia	Norway, France, United Kingdom, Portugal	
Latvia	491	482	Spain, Luxembourg	Norway, France, United Kingdom, Portugal, Italy, Iceland	
Lithuania	479	478	Hungary, Slovak Republic	Russia, Sweden, Portugal, Italy, Spain	United States, Croatia
Hungary	477	477	Lithuania, Slovak Republic, Israel, United States	Russia, Sweden, Spain	Croatia
Slovak Republic	482	475	Lithuania, Hungary, United States	Norway, Russia, Sweden, Portugal, Italy, Spain	
Israel	466	470	Hungary, Croatia		
United States	481	470	Hungary, Slovak Republic	Norway, Russia, Sweden, Portugal, Italy, Spain, Lithuania	
Croatia	471	464	Israel	Sweden, Lithuania, Hungary	
CABA (Argentina)	418	456			Chile, Uruguay, Montenegro, Thailand, Mexico, Costa Rica
Greece	453	454	Romania		Turkey
Romania	445	444	Greece, Bulgaria, Cyprus*		Turkey
Bulgaria	439	441	Romania, Cyprus*		United Arab Emirates, Turkey
Cyprus*	440	437	Romania, Bulgaria		Turkey
United Arab Emirates	434	427		Bulgaria	Thailand
Chile	423	423	Thailand	CABA (Argentina)	
Turkey	448	420		Greece, Romania, Bulgaria, Cyprus*	
Uruguay	409	418	Montenegro	CABA (Argentina)	Mexico, Costa Rica
Montenegro	410	418	Uruguay	CABA (Argentina)	Costa Rica
Thailand	427	415	Chile	CABA (Argentina), United Arab Emirates	
Albania	394	413			Tunisia
Mexico	413	408		CABA (Argentina), Uruguay	Costa Rica
Qatar	376	402			Colombia, Indonesia
Costa Rica	407	400		CABA (Argentina), Uruguay, Montenegro, Mexico	
Colombia	376	390	Peru, Indonesia	Qatar	
Peru	368	387	Colombia, Indonesia		
Indonesia	375	386	Colombia, Peru	Qatar	
Jordan	386	380	Brazil		Tunisia
Brazil	389	377	Jordan		Tunisia
Tunisia	388	367		Albania, Jordan, Brazil	

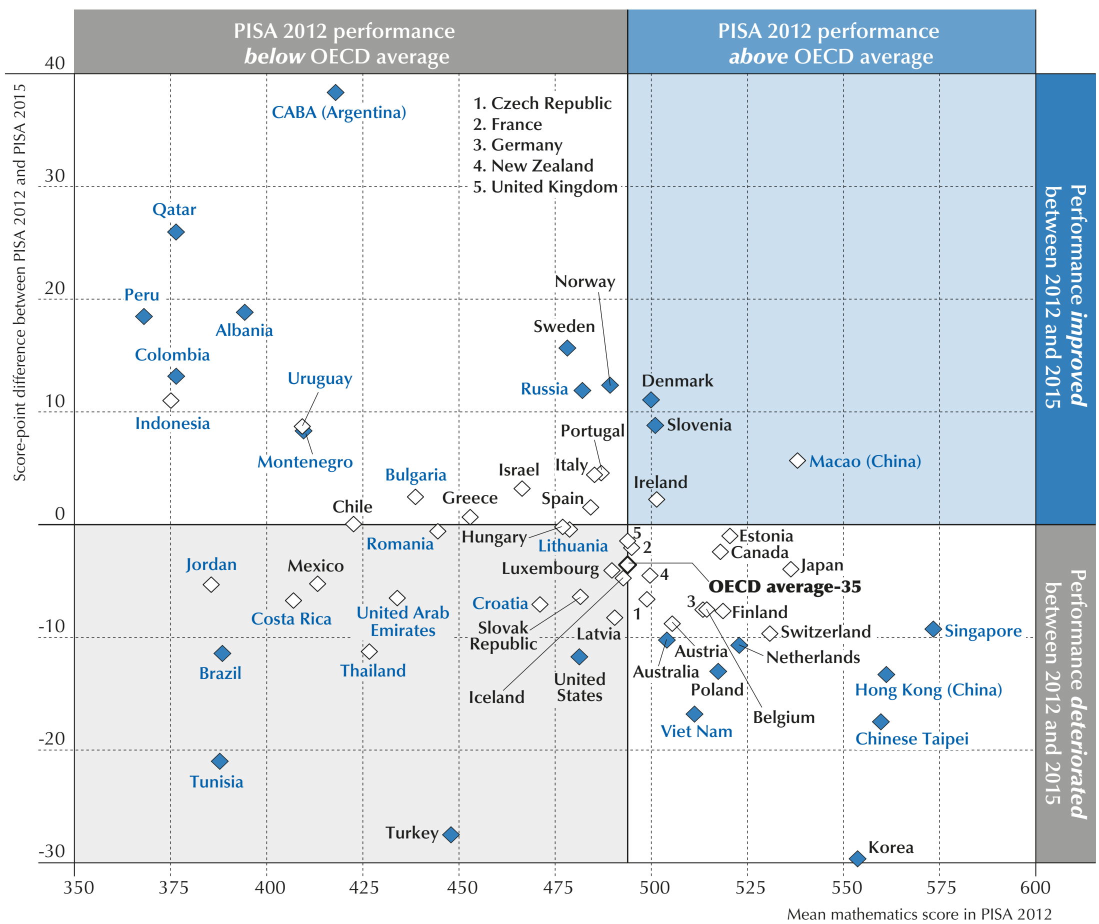
* See note 1 under Figure I.5.1.
Note: Only countries and economies with valid results for the PISA 2012 and PISA 2015 assessments are shown.
Countries and economies are ranked in descending order of mean mathematics performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432638

Figure I.5.4 [Part 4/4] ■ **Multiple comparisons of mathematics performance between 2012 and 2015**

Comparison country/economy	Mathematics performance in 2012	Mathematics performance in 2015	Countries/economies with… ... higher performance in 2012, but similar performance in 2015	... higher performance in 2012, but lower performance in 2015	... lower performance in 2012, but similar performance in 2015	... lower performance in 2012, but higher performance in 2015
Portugal	487	492	Austria, New Zealand, Viet Nam, Australia, Czech Republic		Sweden	
Italy	485	490	Austria, New Zealand, Viet Nam, Australia, France, United Kingdom, Czech Republic, Iceland, Luxembourg		Sweden	
Iceland	493	488	Viet Nam		Russia, Sweden, Italy, Spain	
Spain	484	486	Viet Nam, Iceland, Luxembourg			Sweden
Luxembourg	490	486	Viet Nam		Italy, Spain	Russia, Sweden
Latvia	491	482			Lithuania, Hungary	Russia, Sweden
Lithuania	479	478	Latvia			
Hungary	477	477	Latvia			
Slovak Republic	482	475			Israel	
Israel	466	470	Slovak Republic, United States		CABA (Argentina)	
United States	481	470			Israel, Croatia, CABA (Argentina)	
Croatia	471	464	United States		CABA (Argentina)	
CABA (Argentina)	418	456	Israel, United States, Croatia, Greece, Romania, Bulgaria	Cyprus*, United Arab Emirates, Turkey		
Greece	453	454			CABA (Argentina)	
Romania	445	444			CABA (Argentina)	
Bulgaria	439	441			CABA (Argentina)	
Cyprus*	440	437				CABA (Argentina)
United Arab Emirates	434	427	Turkey		Chile	CABA (Argentina)
Chile	423	423	United Arab Emirates, Turkey		Uruguay, Montenegro	
Turkey	448	420			United Arab Emirates, Chile, Uruguay, Montenegro, Thailand, Albania	CABA (Argentina)
Uruguay	409	418	Chile, Turkey, Thailand		Albania	
Montenegro	410	418	Chile, Turkey, Thailand	Mexico	Albania	
Thailand	427	415	Turkey		Uruguay, Montenegro, Albania	
Albania	394	413	Turkey, Uruguay, Montenegro, Thailand, Mexico	Costa Rica		
Mexico	413	408			Albania	Montenegro
Qatar	376	402	Costa Rica	Jordan, Brazil, Tunisia		
Costa Rica	407	400			Qatar	Albania
Colombia	376	390		Jordan, Brazil, Tunisia		
Peru	368	387	Jordan	Brazil, Tunisia		
Indonesia	375	386	Jordan	Brazil, Tunisia		
Jordan	386	380			Peru, Indonesia	Qatar, Colombia
Brazil	389	377				Qatar, Colombia, Peru, Indonesia
Tunisia	388	367				Qatar, Colombia, Peru, Indonesia

* See note 1 under Figure I.5.1.
Note: Only countries and economies with valid results for the PISA 2012 and PISA 2015 assessments are shown.
Countries and economies are ranked in descending order of mean mathematics performance in 2015.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432638

Figure I.5.5 ■ **Relationship between change in mathematics performance and average PISA 2012 mathematics scores**



Notes: Score-point difference in mathematics between PISA 2012 and PISA 2015 that are statistically significant are indicated in a darker tone (see Annex A3).
The correlation between a country's/economy's mean score in 2012 and its change is -0.4.
Only countries and economies with valid results for the PISA 2012 and PISA 2015 assessments are shown.
Source: OECD, PISA 2015 Database, Table I.5.4a.
StatLink http://dx.doi.org/10.1787/888933432646

Box I.5.1 **Between-country differences in students' exposure to computers and changes in mean performance between 2012 and 2015**

Despite the attention given to ensuring comparability of test results across modes, it was not possible – nor desired – to adjust the scaling of results to take country differences in familiarity with computer tools, or in student motivation to take the PISA test on computer, into account. Indeed, PISA aims to measure student performance in different countries against a common, but evolving, benchmark – one that includes the ability to use today's tools for solving problems in the different subjects assessed.

But is there any evidence that changes in a country's/economy's mean score reflect differences across countries/economies in students' familiarity with ICT?

The field trial for PISA 2015 provides a partial, negative answer to this question: in no country/economy that participated in the mode-effect study did the difference between students' results on the computer- and paper-based tests deviate significantly from the average between-country difference, which was set to zero in the scaled results (see Annex A6).

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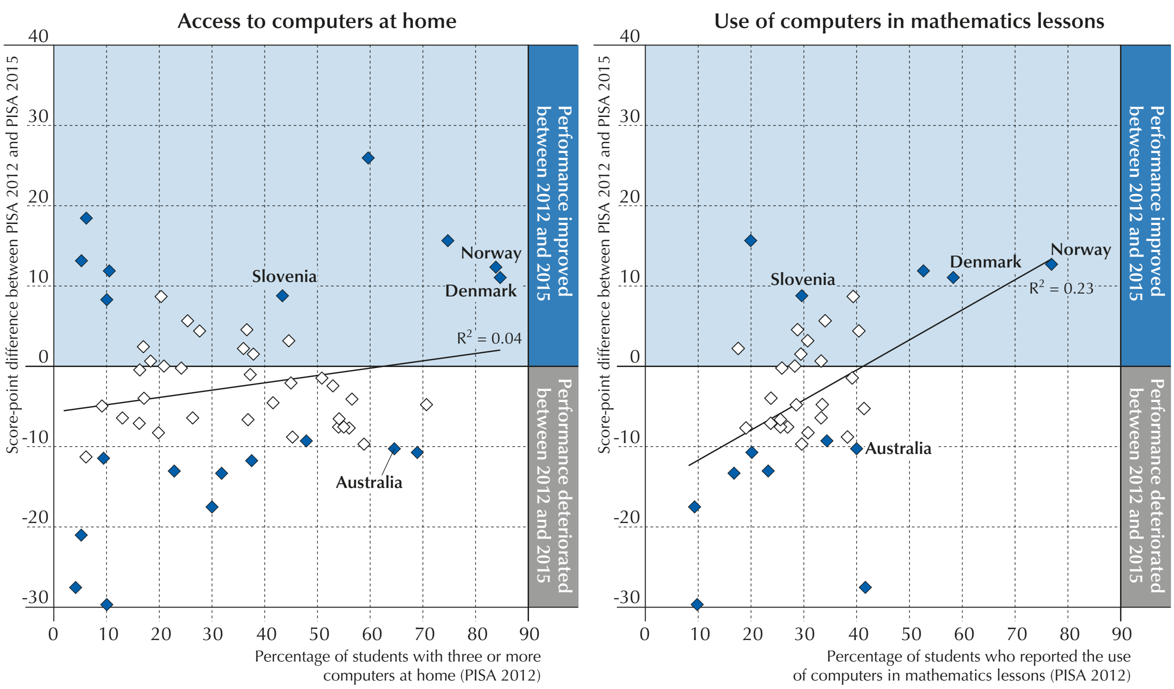
However, because the national field-trial samples were small, only large differences in performance between students who were given the computer-based version of the test and an equivalent group of students, selected through random assignment, who were given the paper-based version of the test could be detected. It was not possible to rule out small and moderate effects of the mode of delivery on the mean performance of countries/economies.

Correlational analyses corroborate the conclusion that changes in the mode of delivery are, at best, only a partial explanation for changes in performance between PISA 2012 and PISA 2015 that are observed in countries that conducted the 2012 test on paper and the 2015 test on computer. Figure I.5.6 shows shows the relationship between a simple indicator of familiarity with ICT that is available for all countries participating in PISA 2012 (the share of students who reported, in PISA 2012, having "three or more" computers in their homes; on average across OECD countries, 43% of students so reported) and the difference in mathematics performance between the PISA 2012 and the PISA 2015 assessments, for countries that conducted PISA 2015 on computer. Across all countries and economies, greater exposure to ICT devices in the home explains, at best, only 4% of the variation in the difference between PISA 2012 and 2015 scores (correlation: 0.21).[1] After excluding two countries that show both greater exposure and significant and positive trends (Denmark and Norway), the correlation between these two measures is only 0.10 across the remaining countries/economies. This means that in Denmark and Norway, students' greater familiarity with ICT (or, perhaps, greater motivation to take a test delivered on computer rather than one delivered on paper) could be part of the observed improvement in performance.

Figure I.5.6 ▪ **Relationship between change in mathematics performance and students' exposure to computers in 2012**



Notes: Score-point differences in mathematics between PISA 2012 and PISA 2015 that are statistically significant are indicated in a darker tone (see Annex A3).

Only countries and economies with available data since 2012 and who conducted the PISA 2015 test on computer are shown.

Sources: OECD, PISA 2012 Database, Tables 1.1 and 2.5 from OECD (2015), *Students, Computers and Learning: Making the Connection,* PISA, OECD Publishing.

OECD, PISA 2015 Database, Table I.5.4.

StatLink http://dx.doi.org/10.1787/888933432654

...

But in general, countries where students have greater familiarity with ICT tools are almost equally likely to observe positive and negative trends, as are countries where students have less familiarity with ICT.

For 38 countries and economies, a more specific indicator of familiarity with ICT tools for mathematics is also available, through the optional ICT questionnaire for students that was distributed in PISA 2012. Students were asked to report whether they use computers during mathematics lessons for specific tasks, such as drawing the graph of a function or calculating with numbers. The share of students who reported doing at least one of these tasks on computer during mathematics lessons in the month prior to the PISA 2012 test correlates positively with the difference in mathematics performance between PISA 2012 and PISA 2015 in these 38 countries and economies (correlation 0.48). But clearly, not all changes in performance can be explained by the use of ICT tools in mathematics lessons. An improvement in mathematics performance was observed in Slovenia, for instance, despite the fact that students reported only average levels of familiarity with ICT in the PISA 2012 survey. In Australia, a negative trend in performance between PISA 2012 and PISA 2015 was observed despite the fact that students in 2012 reported frequent use of ICT tools in mathematics lessons.

Another 30 countries and economies can also compare changes in performance between 2012 and 2015 with the difference in mean performance between the main, paper-based assessment of mathematics conducted in 2012, and an optional, computer-based assessment of mathematics. This second test was conducted among some of the same students who also sat the paper-based PISA test, often in the afternoon of the main testing day. Results were reported on the same mathematics scale as the results of the paper-based test (OECD, 2015b). The PISA 2015 mathematics test (both in its computer-based and in its paper-based versions) used only items that were developed originally for the paper-based test; it is therefore closer, in terms of the questions asked and in timing (as part of the main, two-hour test session) to the PISA 2012 paper-based test, even though it was conducted on computer.

The correlation of changes in mean mathematics performance between 2012 and 2015 with differences between the computer-based and the paper-based mathematics performance in 2012 is only 0.18 – signalling a weak association. This may imply that the aspects that are unique to the PISA 2012 computer-based assessment (the inclusion of items that explicitly measure students' ability to use ICT tools for solving mathematics problems, and when the test was conducted) explain a bigger part of the performance differences in 2012 than how the test was delivered. It may also imply that changes in performance between 2012 and 2015 largely reflect other factors than the mode of delivery, such as changes in student proficiency, or the sampling variability and scaling changes that contribute to the uncertainty associated with trend estimates (the sampling error and link error; see Annex A5).

1. Changes in mean mathematics performance are even less correlated with other indicators of access to computers at home. The correlation is only 0.17 with the share of students in 2012 who reported having "two or more computers" at home, and close to 0 (0.05) with the share of students in 2012 who reported having "one or more computer" at home.

Changes in mathematics performance between 2012 and 2015, after accounting for changes in enrolment rates and demographic factors

Changes in performance over a short period of time may also be due to rapid demographic changes that shift the profile of the country's/economy's population. For example, because of trends in enrolment rates or migration, the characteristics of the PISA reference population – 15-year-olds enrolled in school – may have changed between PISA 2012 and PISA 2015. Adjusted changes shed light on differences in mathematics performance that are not due to alterations in the demographic characteristics of the student population or the sample. Annex A5 provides details on how these figures are estimated.

Table I.5.4d presents the change in mathematics performance between PISA 2012 and PISA 2015 at the median and at the top of the performance distribution among all 15-year-olds – assuming that 15-year-olds who are not represented in the PISA sample would have performed among the weakest 50%, had they been assessed. The difference between observed and adjusted trends, in these cases, reflects changes in the percentage of 15-year-olds that the PISA sample represents.

Among the countries and economies where the PISA sample covers less than 80% of the population of 15-year-olds (Coverage index 3; see Chapter 6 for a detailed discussion), and that have comparable data for PISA 2012 and PISA 2015, the coverage of the PISA sample grew by more than 10 percentage points in Costa Rica and Colombia, and by about 5 percentage points in Indonesia (see Table I.6.1 and the related discussion in Chapter 6). Table I.5.4d shows that in Colombia, the level at which at least 50% of all 15-year-olds perform (adjusted median) improved by more than 20 score points over the reported improvement in mean performance.

Significant improvements in the scores corresponding to the (adjusted) 75th and 90th percentiles, but not at the median, were also observed in Indonesia. The mathematics score attained by at least a quarter of the country's 15-year-olds increased by about 20 points, while coverage increased by about 5 percentage points between 2012 and 2015. In Costa Rica, average performance declined (not significantly) in 2015, but the PISA 2015 sample covered a larger proportion of the 15-year-old population than the PISA 2012 sample did. It is not possible to estimate whether the median score for 15-year-olds improved, because less than 50% of 15-year-olds were covered in 2012. But the adjusted change observed at the 75th percentile indicates that the mathematics score attained by at least one in four 15-year-olds rose by about 14 points during the period (Table I.2.4d).

Table I.5.4e presents an estimate of the change in mean performance between PISA 2015 and prior assessments that would have been observed had the proportion of immigrants, the share of girls, and the age distribution of students in the PISA sample stayed constant across assessments. In some countries, the demographics of the student population have changed considerably in recent years. In these countries, the adjusted changes and trends may differ from the observed changes and trends reported in previous sections. If countries and economies observe a more negative change than the adjusted change reported here, that means that concurrent shifts in the student population have had adverse effects on performance. Conversely, if a country's observed change is more positive than the adjusted change reported here, it means that concurrent shifts in the student population contributed to improvements in the mean level of performance. While the observed levels of performance measure the overall quality of education in a school system, the comparison of the observed trends with the hypothetical, adjusted trends can highlight the challenges that countries and economies face in improving students' and schools' performance in mathematics.

Over the most recent period covered by PISA (2012 to 2015), few countries saw large demographic shifts in the population of 15-year-olds; as a result, for most countries/economies, adjusted changes in mean scores for this period closely track observed changes. The largest differences between adjusted and observed changes are found in Switzerland[5] and Qatar. In Switzerland, the reported change is negative, although not significant (-10 points); but had there been no demographic shifts in the PISA sample, the change would have been closer to zero (-5 points). The reverse is found for Qatar, where the observed change is larger (a 26-point increase) than the adjusted change (21 points), indicating that changes in the student population in Qatar contributed to improvements in the mean level of performance.

STUDENTS AT THE DIFFERENT LEVELS OF MATHEMATICS PROFICIENCY

The six proficiency levels used in the PISA 2015 mathematics assessment are the same as those established for the PISA 2003 and 2012 assessments, when mathematics was the major area of assessment. The process used to produce proficiency levels in mathematics is similar to that used to produce proficiency levels in science, as described in Chapter 2. Figure I.5.7 presents a description of the mathematical skills, knowledge and understanding that are required at each level of the mathematics scale.

Since it is necessary to preserve the confidentiality of the test material in order to continue to monitor trends in mathematics beyond 2015, no question used in the PISA 2015 assessment of mathematics was released after the assessment. However, because PISA 2015 used questions from previous mathematics assessments, it is possible to illustrate the proficiency levels with test materials that were released after previous assessments. Sample items that illustrate the different levels of mathematics proficiency can be found in the PISA 2012 initial report (OECD, 2014) and on line at www.oecd.org/pisa.

Figure I.5.8 shows the distribution of students across the six proficiency levels in each participating country and economy. Table I.5.1a shows the percentage of students at each proficiency level on the mathematics scale, with standard errors.

Figure I.5.7 ■ **Summary description of the six levels of mathematics proficiency in PISA 2015**

Level	Lower score limit	Characteristics of tasks
6	669	At Level 6, students can conceptualise, generalise and utilise information based on their investigations and modelling of complex problem situations, and can use their knowledge in relatively non-standard contexts. They can link different information sources and representations and flexibly translate among them. Students at this level are capable of advanced mathematical thinking and reasoning. These students can apply this insight and understanding, along with a mastery of symbolic and formal mathematical operations and relationships, to develop new approaches and strategies for attacking novel situations. Students at this level can reflect on their actions, and can formulate and precisely communicate their actions and reflections regarding their findings, interpretations, arguments, and the appropriateness of these to the original situation.
5	607	At Level 5, students can develop and work with models for complex situations, identifying constraints and specifying assumptions. They can select, compare and evaluate appropriate problem-solving strategies for dealing with complex problems related to these models. Students at this level can work strategically using broad, well-developed thinking and reasoning skills, appropriate linked representations, symbolic and formal characterisations, and insight pertaining to these situations. They begin to reflect on their work and can formulate and communicate their interpretations and reasoning.
4	545	At Level 4, students can work effectively with explicit models for complex, concrete situations that may involve constraints or call for making assumptions. They can select and integrate different representations, including symbolic, linking them directly to aspects of real-world situations. Students at this level can utilise their limited range of skills and can reason with some insight, in straightforward contexts. They can construct and communicate explanations and arguments based on their interpretations, arguments and actions.
3	482	At Level 3, students can execute clearly described procedures, including those that require sequential decisions. Their interpretations are sufficiently sound to be a base for building a simple model or for selecting and applying simple problem-solving strategies. Students at this level can interpret and use representations based on different information sources and reason directly from them. They typically show some ability to handle percentages, fractions and decimal numbers, and to work with proportional relationships. Their solutions reflect that they have engaged in basic interpretation and reasoning.
2	420	At Level 2, students can interpret and recognise situations in contexts that require no more than direct inference. They can extract relevant information from a single source and make use of a single representational mode. Students at this level can employ basic algorithms, formulae, procedures or conventions to solve problems involving whole numbers. They are capable of making literal interpretations of the results.
1	358	At Level 1, students can answer questions involving familiar contexts where all relevant information is present and the questions are clearly defined. They are able to identify information and to carry out routine procedures according to direct instructions in explicit situations. They can perform actions that are almost always obvious and follow immediately from the given stimuli.

Proficiency above the baseline

Proficiency at Level 2 (score higher than 420 but lower than 482 points)

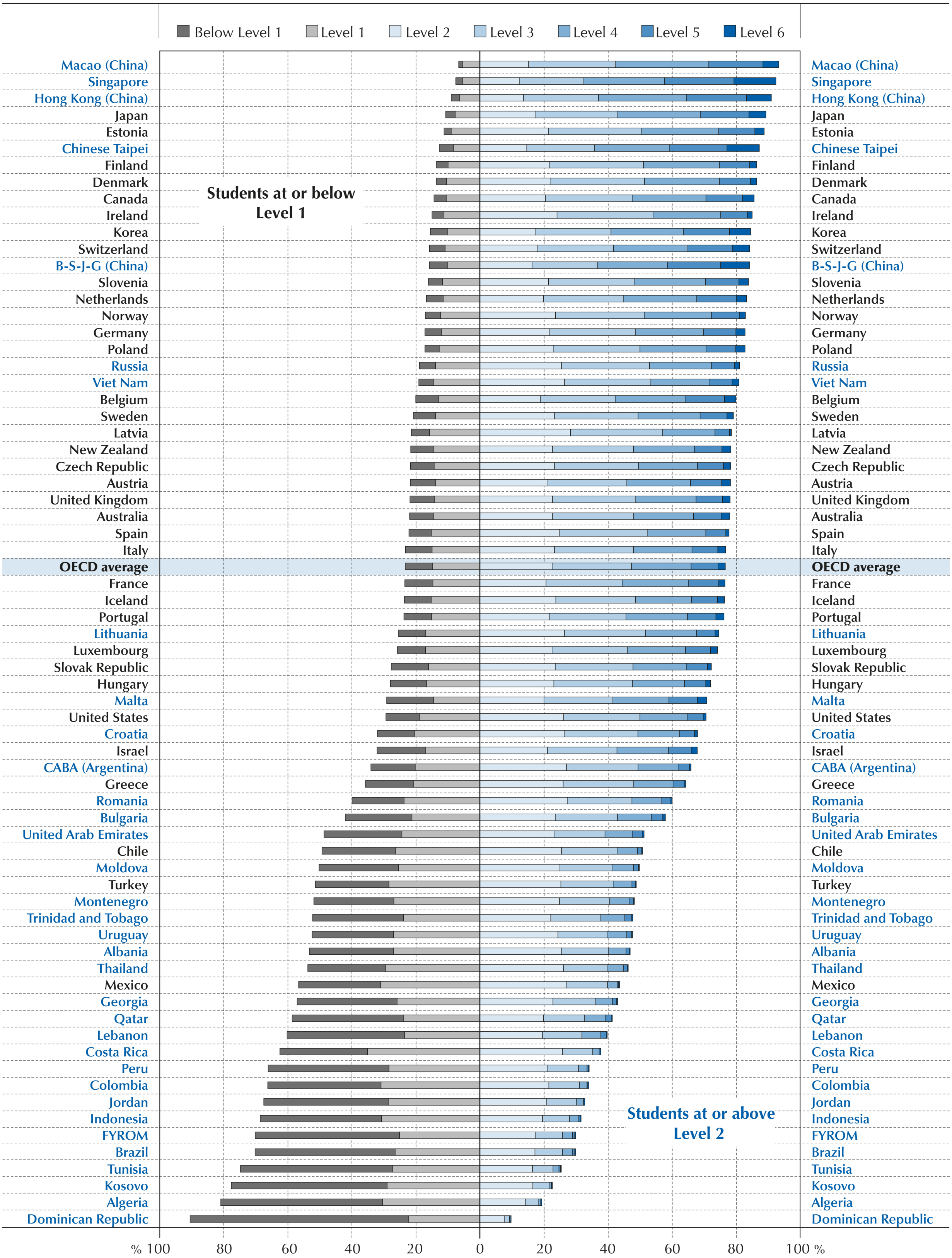
At Level 2, students can use basic algorithms, formulae, procedures or conventions to solve problems involving whole numbers – e.g. to compute the approximate price of an object in a different currency or to compare the total distance across two alternative routes. They can interpret and recognise situations in contexts that require no more than direct inference, extract relevant information from a single source and make use of a single representational mode. Students at this level are capable of making literal interpretations of the results.

Level 2 can be considered a baseline level of proficiency that is required to participate fully in modern society. More than 90% of students in Hong Kong (China), Macao (China) and Singapore meet this benchmark. On average across OECD countries, 77% of students attain Level 2 or higher. More than one in two students perform at these levels in all OECD countries except Turkey (48.6%) and Mexico (43.4%) (Figure I.5.8 and Table I.5.1a). Meanwhile, fewer than one in ten students in the Dominican Republic (9.5%), and only 19.0% of students in Algeria attain this baseline level of mathematics proficiency.

Proficiency at Level 3 (score higher than 482 but lower than 545 points)

At Level 3, students can execute clearly described procedures, including those that require sequential decisions. They typically show some ability to handle percentages, fractions and decimal numbers, and to work with proportional relationships. Their interpretations are sufficiently sound to be the basis for building a simple model or for selecting and applying simple problem-solving strategies. Students at this level can interpret and use representations based on different information sources and reason directly from them. Their solutions reflect that they have engaged in basic interpretation and reasoning.

Figure I.5.8 ■ **Student proficiency in mathematics**



Countries and economies are ranked in descending order of the percentage of students who perform at or above Level 2.
Source: OECD, PISA 2015 Database, Table I.5.1a.
StatLink http://dx.doi.org/10.1787/888933432665

Across OECD countries, 54% of students are proficient at Level 3 or higher (that is, proficient at Level 3, 4, 5 or 6). In Hong Kong (China), Japan, Macao (China), Singapore and Chinese Taipei, more than 70% of students are proficient at Level 3 or higher, and at least two out of three students in B-S-J-G (China), Estonia and Korea attain this level. In contrast, in 21 countries and economies with comparable data, three out of four students do not attain this level; and in Algeria, the Dominican Republic, Kosovo and Tunisia, more than 90% of students do not attain Level 3 (Figure I.5.8 and Table I.5.1a).

Proficiency at Level 4 (score higher than 545 but lower than 607 points)

At Level 4, students can work effectively with explicit models on complex, concrete situations that may involve constraints or call for making assumptions. They can select and integrate different representations, including symbolic representations, linking them directly to aspects of real-world situations. Students at this level can reason with some insight, in straightforward contexts. They can construct and communicate explanations and arguments based on their interpretations, reasoning and actions.

Across OECD countries, 29.3% of students perform at proficiency Level 4, 5 or 6. More than one in two students in Hong Kong (China), Macao (China), Singapore and Chinese Taipei perform at one of these levels. Between 40% and 50% of students perform at or above Level 4 in B-S-J-G (China) (47.4%), Japan (46.3%), Korea (43.6%) and Switzerland (42.5%). By contrast, in 22 participating countries and economies with comparable data, fewer than one in ten students attains this levels – including OECD countries Chile (7.8%), Turkey (7.0%) and Mexico (3.5%) (Figure I.5.8 and Table I.5.1a).

Proficiency at Level 5 (score higher than 607 but lower than 669 points)

At Level 5, students can develop and work with models for complex situations, identifying constraints and specifying assumptions. They can select, compare and evaluate appropriate problem-solving strategies for dealing with complex problems related to these models. Students at this level can work strategically using broad, well-developed thinking and reasoning skills, appropriate linked representations, symbolic and formal characterisations, and insights pertaining to these situations. They have begun to develop the ability to reflect on their work and to communicate conclusions and interpretations in written form.

Across OECD countries, 10.7% of students are top performers, meaning that they are proficient at Level 5 or 6. Among all countries and economies that participated in PISA 2015, the partner country Singapore has the largest proportion of top performers (34.8%), followed by Chinese Taipei (28.1%), Hong Kong (China) (26.5%) and B-S-J-G (China) (25.6%). Overall, in 29 countries and economies, more than 10% of students are top performers, in 12 countries/economies, between 5% and 10% of students are top performers, in 17 countries/economies, between 1% and 5% of students perform at these levels, and in 12 countries/economies – including OECD country Mexico – less than 1% of students performs at Level 5 or above.

Countries with similar mean performance may have significantly different shares of students who are able to perform at the highest levels in PISA. This is true, for example, in Switzerland (mean performance: 521 points; 19.2% of students are top performers) and Estonia (mean performance: 520 points; 14.2% of students are top performers); in Latvia (mean performance: 482 points; 5.2% of students are top performers) and Malta (mean performance: 479 score points; 11.8% of students are top performers); and in the United States (mean performance: 470 points; 5.9% top performers) and Israel (mean performance: 470 points; 8.9% of students are top performers) (Figure I.5.8 and Table I.5.1a).

Proficiency at Level 6 (score higher than 669 points)

Students at Level 6 on the PISA mathematics scale can successfully complete the most difficult PISA items. At Level 6, students can conceptualise, generalise and use information based on their investigations and modelling of complex problem situations, and can use their knowledge in relatively non-standard contexts. They can link different information sources and representations and move flexibly among them. Students at this level are capable of advanced mathematical thinking and reasoning. These students can apply this insight and understanding, along with a mastery of symbolic and formal mathematical operations and relationships, to develop new approaches and strategies for addressing novel situations. Students at this level can reflect on their actions, can formulate and precisely communicate their actions and reflections regarding their findings, interpretations and arguments, and can explain why they were applied to the original situation.

On average across OECD countries, only 2.3% of students attain Level 6. More than one in ten students perform at this level in Singapore (13.1%) and Chinese Taipei (10.1%). In B-S-J-G (China), Hong Kong (China), Japan Korea and Switzerland, between 5% and 10% of students attain proficiency Level 6. In 30 participating countries and economies,

between 1% and 5% of students perform at this level, in 21 countries/economies, between 0.1% and 1% of students performs at Level 6, and in 12 other countries/economies, fewer than one in one thousand students (0.1%) performs at Level 6 (Figure I.5.8 and Table I.5.1a).

Proficiency below the baseline

Proficiency at Level 1 (score higher than 358 but lower than 420 points) or below

At Level 1 students can answer mathematics questions involving familiar contexts where all relevant information is present and the questions are clearly defined. They are able to identify information and carry out routine procedures according to direct instructions in explicit situations. They can perform actions that are almost always obvious and follow immediately from the given stimuli.

Students below Level 1 may be able to perform direct and straightforward mathematical tasks, such as reading a single value from a well-labelled chart or table where the labels on the chart match the words in the stimulus and question, so that the selection criteria are clear and the relationship between the chart and the aspects of the context depicted are evident. They can perform, at best, only simple arithmetic calculations with whole numbers by following clear and well-defined instructions.

On average across OECD countries, 23.4% of students are proficient only at or below Level 1. In Macao (China) (6.6%), Singapore (7.6%) and Hong Kong (China) (9.0%), less than 10% of students perform at or below Level 1 (Figure I.5.8 and Table I.5.1a). By contrast, in the Dominican Republic (68.3%) and Algeria (50.6%), more than one in two students score below Level 1, the lowest level of proficiency in PISA. In 17 participating countries and economies, between 25% and 50% of students do not reach Level 1 on the mathematics scale.

All PISA-participating countries and economies have students who score at or below Level 1; but the largest proportions of students who score at these levels are found in the lowest-performing countries. In some cases, countries with similar mean performance may have significantly different shares of students who score below the baseline level in mathematics. For example, in B-S-J-G (China), whose mean performance is 531 score points, 15.8% of students score at these levels, while in Japan, whose mean performance is 532 points, 10.7% of students perform at these levels. And while mean performance in Chinese Taipei (542 points) is similar to that of Macao (China) (544 points), the percentage of low achievers in Chinese Taipei (12.7%) is about twice that of Macao (China) (6.6%).

Trends in the percentage of low performers and top performers in mathematics

PISA’s mathematics assessments gauge the extent to which students towards the end of compulsory schooling have acquired the mathematical skills and knowledge that enable them to engage with problems and situations encountered in daily life, including in professional contexts that require some level of understanding of mathematics, mathematical reasoning and mathematical tools. These range from basic notions of mathematics and the straightforward application of familiar procedures (related to proficiency Level 2) to complex skills that only a few students have mastered, such as the ability to formulate complex situations mathematically, using symbolic representations (proficiency Level 5 and above).

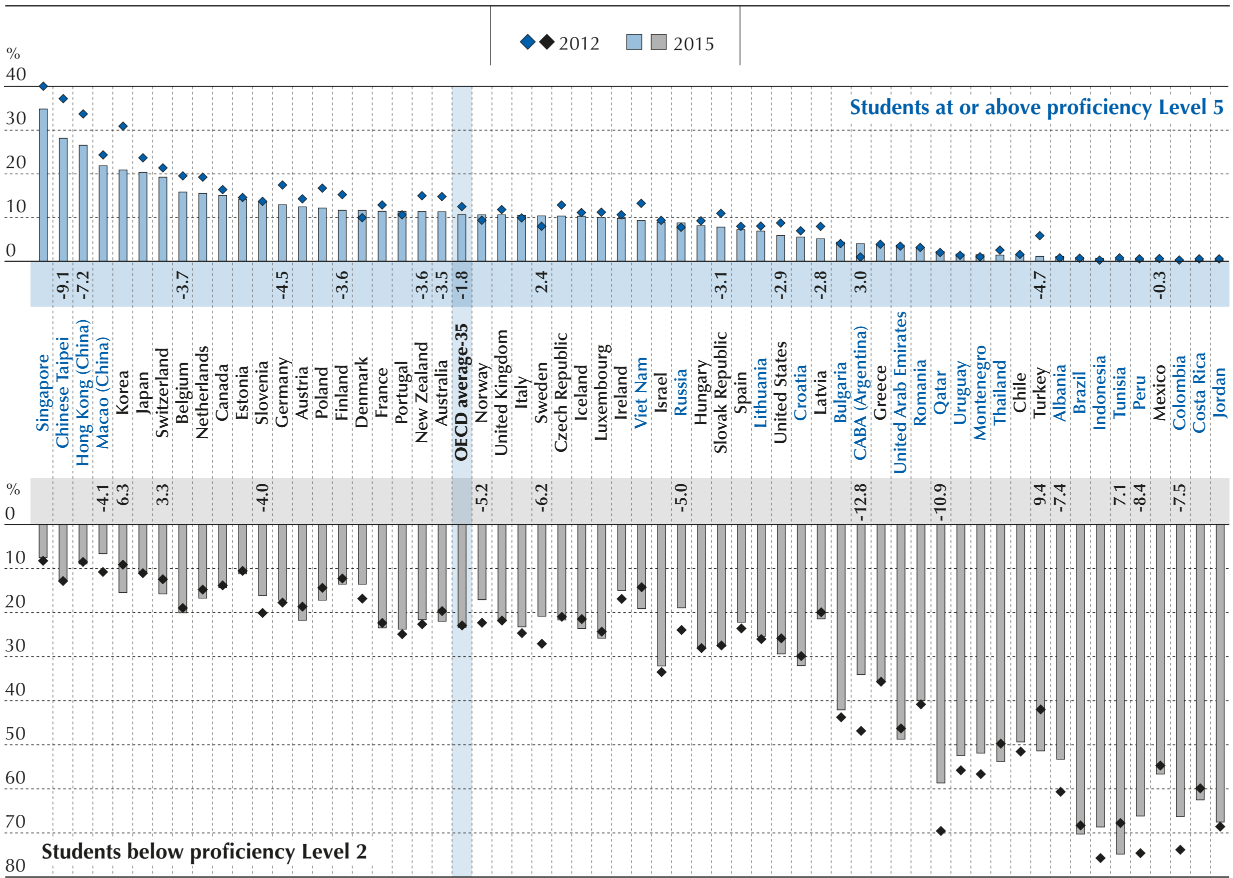
Changes in a country’s or economy’s average performance can result from changes at different levels of the performance distribution. For example, for some countries and economies, average improvement stems from improvements among low-achieving students, where the share of students scoring below Level 2 is reduced. In other countries and economies, average improvement mostly reflects changes among high-achieving students, where the share of students who perform at or above Level 5 grows. On average across OECD countries with comparable data, between 2012 and 2015 there was no significant change in the share of students who do not attain the baseline level of proficiency in mathematics, but the share of students who score at or above proficiency Level 5 shrank by 1.8 percentage points (Figure I.5.9 and Table I.5.2a).

Countries and economies can be grouped into categories according to whether, between PISA 2012 and PISA 2015, they have: simultaneously reduced the share of low performers and increased the share of top performers in mathematics; reduced the share of low performers but not increased the share of top performers; increased the share of top performers but not reduced the share of low performers; and reduced the share of top performers or increased the share of low performers. The following section categorises countries and economies into these groups.[6] But most countries/economies are not included in any of these groups: they had no significant change in the percentage of top performers or in the percentage of low performers.

Moving everyone up: Reduction in the share of low performers and increase in that of top performers

Between the PISA 2012 and PISA 2015 assessments, CABA (Argentina) and Sweden saw an increase in the share of students who attain the highest levels of proficiency in PISA and a simultaneous decrease in the share of students who do not attain the baseline level of proficiency. In Sweden, for example, the share of students performing below Level 2 shrank by six percentage points (from 27% to 21%) between 2012 and 2015, while the share of students performing at or above proficiency Level 5 grew by more than two percentage points (from 8.0% to 10.4%) (Figure I.5.9 and Table I.5.2a). The system-wide improvements observed in these countries and economies have lifted students out of low performance and others into top performance.

Figure I.5.9 ▪ **Percentage of low-achieving students and top performers in mathematics in 2012 and 2015**



Notes: Only countries/economies that participated in both PISA 2012 and 2015 are shown.

The change between PISA 2012 and PISA 2015 in the share of students performing below Level 2 in mathematics is shown below the country/economy name. The change between PISA 2012 and PISA 2015 in the share of students performing at or above Level 5 in mathematics is shown above the country/economy name.

Only statistically significant changes are shown (see Annex A3).

Countries and economies are ranked in descending order of the percentage of students performing at or above Level 5 in 2015.

Source: OECD, PISA 2015 Database, Table I.5.2a.

StatLink http://dx.doi.org/10.1787/888933432672

Another way to assess countries' and economies' success in "moving everyone up" is to compare the change in performance at different percentiles of the performance distribution (Table I.5.4b). Five countries and economies show positive and significant changes in performance at the 10th percentile, i.e. the minimum level achieved by at least 90% of their students, at the median (the minimum level achieved by at least 50% of their students) and at the 90th percentile. Table I.5.4b shows that, consistent with trends in the share of low- and top-performing students, in Sweden and CABA (Argentina), an average improvement in performance between 2012 and 2015 can be observed at all levels of the distribution – among the lowest-achieving students (those whose performance is around the 10th percentile of

performance), among the students who perform around the median, and among the highest-achieving students (those who score around the 90th percentile). Albania, Qatar and Peru also moved towards higher performance across the board during the same period. But in these countries, more than one in two students still perform below Level 2 – a clear sign that much remains to be done to equip all students with the baseline skills needed for full participation in society and the economy. By international benchmarks, these countries belong to the next category ("reducing underperformance").

Reducing underperformance: Reduction in the share of low performers but no change in that of top performers

In Albania, Colombia, Macao (China), Norway, Peru, Qatar, Russia and Slovenia, the change in mathematics performance between 2012 and 2015 was largest among the students who did not attain the baseline level of proficiency. These countries/economies have been successful in reducing underperformance among their students, but without seeing a concurrent increase in the share of students who reach the highest levels of proficiency (Figure I.5.9).

Tables I.5.4b and I.5.4c show that Norway not only saw an improvement in the minimum proficiency achieved by at least 90% of its students (10th percentile), but also significantly reduced the distance between its highest- and lowest-performing students (the interdecile range, or the distance between the 10th and the 90th percentile). Macao (China) also narrowed the gap between the highest and lowest achievers in mathematics, but in this case, the significant improvement in performance at the bottom of the distribution was accompanied by a significant decline among students at the 90th percentile.

Nurturing top performance: Increase in the share of top performers but no change in that of low performers

No country/economy saw growth in the share of its top-performing students in mathematics since PISA 2012 without a concurrent reduction in the share of low-performing students (Figure I.5.9 and Table I.5.2a). When considering changes in percentiles, Table I.5.4b shows that in Indonesia and Montenegro, significant improvements in performance were concentrated among the highest-achieving students. Both countries saw the gap between the two extremes in performance widen because students at the 90th percentile of the performance distribution improved more than students at the 10th percentile did (Table I.5.4c). In these two countries, students at the 90th percentile remain relatively low achieving, by international standards. In Montenegro, the 90th percentile of performance is within the range of Level 3, and in Indonesia, it is even lower, and less than 10% of students perform at Level 3 or above.

Increase in the share of low performers and/or decrease in that of top performers

By contrast, in 16 countries and economies, the percentage of students who do not attain the baseline level of proficiency in mathematics increased since 2012, or the share of students who perform at the highest levels of proficiency shrank (Figure I.5.9 and Table I.5.2a). Both trends are observed in Korea and Turkey.

Korea and Turkey, together with Australia, are also the only three countries in which performance deteriorated significantly between 2012 and 2015, among both the lowest- and highest-achieving students. In Australia and Korea, the magnitude of the change at the top and at the bottom was similar, and the gap between the two extremes did not widen or narrow significantly. By contrast, in Turkey, the decline in performance was larger at the top (90th percentile) than at the bottom (10th percentile) (Table I.5.4c).

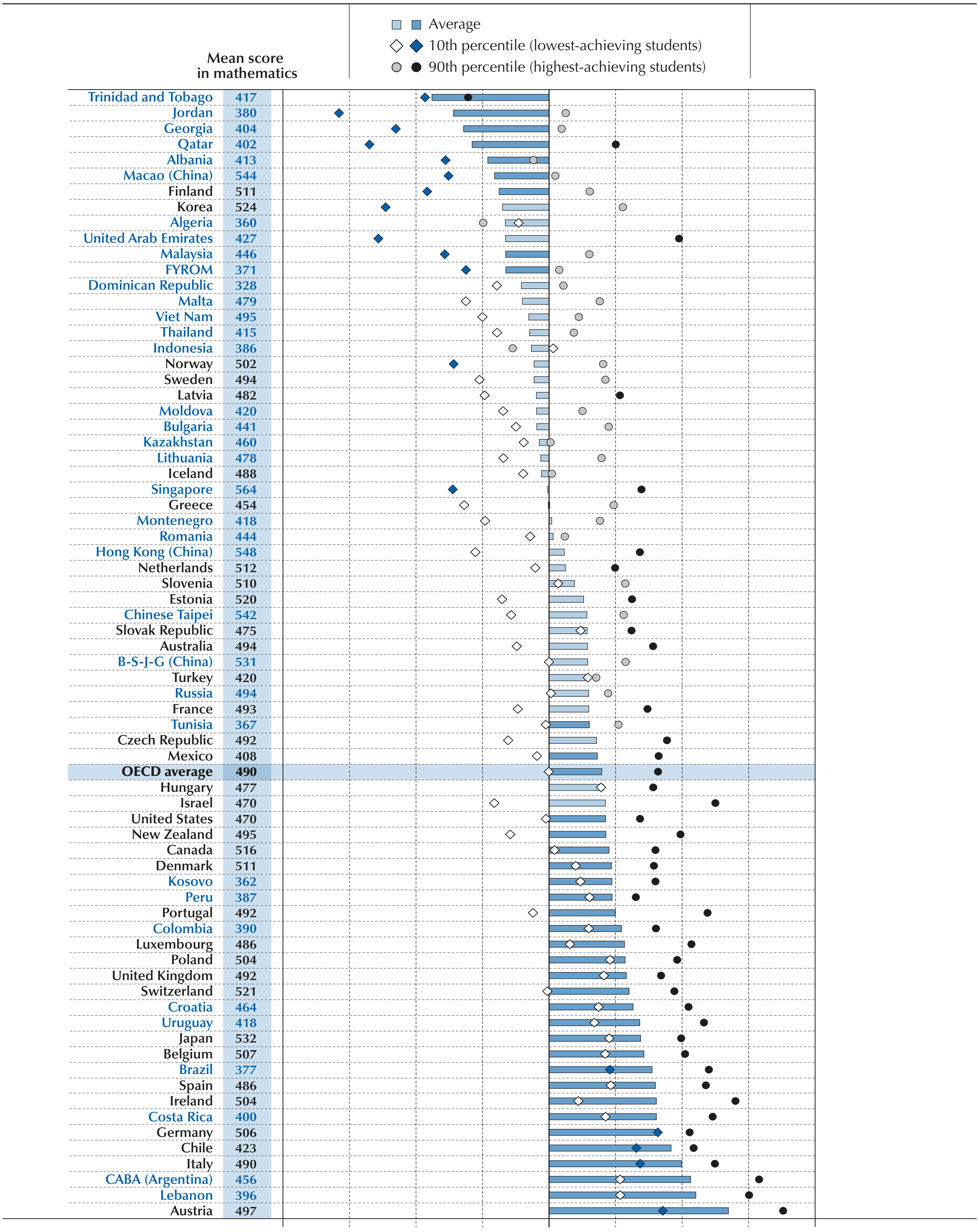
Gender differences in mathematics performance

Figure I.5.10 presents a summary of boys' and girls' performance in the PISA mathematics assessment (Table I.5.7). On average across OECD countries, boys outperform girls in mathematics by eight score points. Boys' advantage at the mean is statistically significant in 28 countries and economies, and is largest in Austria, Brazil, CABA (Argentina), Chile, Costa Rica, Germany, Ireland, Italy, Lebanon and Spain, where boys' average score exceeds girls' by more than 15 points. It is noteworthy that none of the high-performing Asian countries and economies is among this group. In fact, in nine countries and economies, including top performers Finland and Macao (China), as well as Albania, the Former Yugoslav Republic of Macedonia (hereafter "FYROM"), Georgia, Jordan, Malaysia, Qatar and Trinidad and Tobago, girls score higher than boys in mathematics, on average.

PISA has consistently found that boys perform better than girls in mathematics among the highest-achieving students and, as a result, there are more boys than girls who perform at Level 5 or above on the mathematics scale (OECD, 2015a). As noted above, in PISA 2015, boys outperform girls in mathematics by an average of 8 score points (across OECD countries); but the highest-scoring 10% of boys score 16 points higher than the best-performing 10% of girls.

Figure I.5.10 ■ **Gender differences in mathematics performance**

Score-point difference in mathematics (boys minus girls)



Note: Statistically significant differences are marked in a darker tone (see Annex A3).

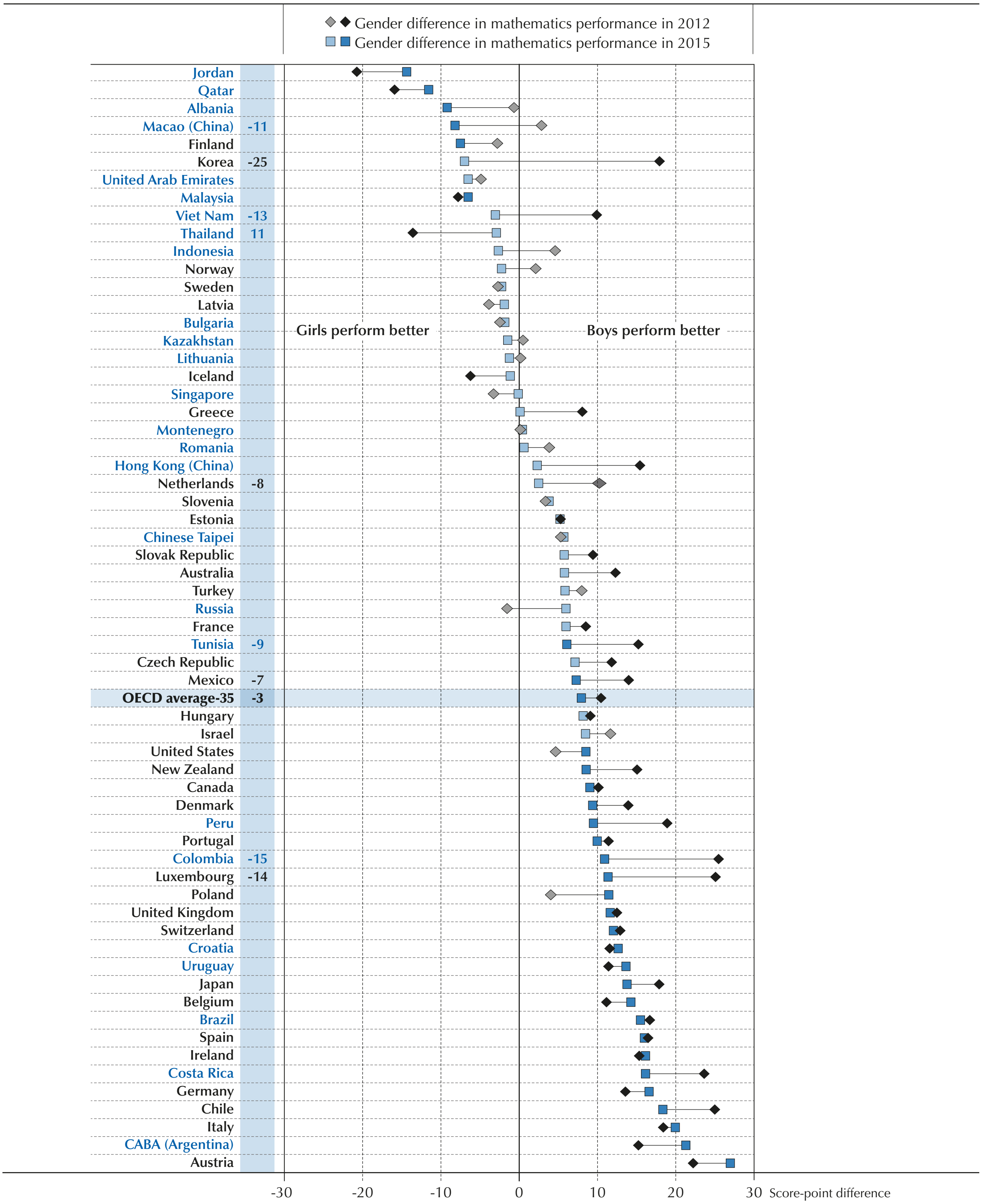
Countries and economies are ranked in ascending order of the mean score-point difference in mathematics between boys and girls.

Source: OECD, PISA 2015 Database, Tables I.5.3 and I.5.7.

StatLink http://dx.doi.org/10.1787/888933432684

Figure I.5.11 ▪ **Change between 2012 and 2015 in gender differences in mathematics performance**

Score-point difference in mathematics (boys minus girls)



Notes: Gender differences in PISA 2012 and in PISA 2015 that are statistically significant are marked in a darker tone (see Annex A3).
Statistically significant changes between PISA 2012 and PISA 2015 are shown next to the country/economy name.
Only countries and economies that participated in both PISA 2012 and 2015 are shown.
Countries and economies are ranked in ascending order of gender differences in 2015.
Source: OECD, PISA 2015 Database, Tables I.5.8a, I.5.8c and I.5.8e.
StatLink http://dx.doi.org/10.1787/888933432693

Meanwhile, there is no gender gap, on average, at the 10th percentile of performance (the minimum level achieved by at least 90% of boys and girls). The gender gap at the top of the performance distribution (90th percentile) is significant in a majority of countries and economies, and exceeds 15 points in 30 of them. Only in Trinidad and Tobago do high-achieving girls perform better than high-achieving boys; and in no PISA-participating country or economy do more girls than boys perform at Level 5 or above in mathematics (Tables I.5.6a and I.5.7).

Between the PISA 2012 and PISA 2015 assessments, the gender gap did not change significantly in a vast majority of countries. The gender gap in mathematics shrank by three points across OECD countries, on average, but this reduction mainly reflects the change in one country (Korea). In Korea, mathematics scores dropped more steeply among boys than among girls between 2012 and 2015. As a result, while Korea had one of the largest gender gaps in favour of boys in 2012, in 2015, girls outperformed boys, although the difference is not statistically significant. Tunisia also saw a significant deterioration in performance among both boys and girls, although boys' scores in mathematics dropped more dramatically. As a result, the gender gap in favour of boys narrowed by nine points. The gender gap narrowed significantly in Colombia as well, where boys' performance remained stable between 2012 and 2015, but girls' performance improved by 20 points, on average, and by 28 points among the highest-achieving girls. Colombia had the largest gender gap in favour of boys of all PISA-participating countries/economies in 2012, and was able to reduce this gap significantly – including among the country's highest-achieving students. In Luxembourg, Mexico, the Netherlands and Viet Nam, boys' advantage shrank because performance deteriorated among boys, but not among girls. In Macao (China), there was no gender gap in 2012; but by 2015, girls had improved their performance, while boys' performance remained stable. The opposite trend is observed in Thailand, where girls scored higher than boys in 2012, but as a result of deteriorating performance among girls, the gap closed between 2012 and 2015 (Figure I.5.11 and Tables I.5.8a, I.5.8d and I.5.8e).

Notes

1. The countries/economies that administered the paper-based test in 2015 are: Albania, Algeria, Argentina, the Former Yugoslav Republic of Macedonia, Georgia, Indonesia, Jordan, Kazakhstan, Kosovo, Lebanon, Malta, Moldova, Romania, Trinidad and Tobago, and Viet Nam.

2. The results of three countries, however, are not fully comparable, because of issues with sample coverage (Argentina), school response rates (Malaysia), or construct coverage (Kazakhstan); see Annex A4. As a consequence, results for these three countries are not included in most figures.

3. Due to rounding, two or more countries can be listed with the same mean score. The order in which countries appear is based on the unrounded results.

4. National differences in mode effects for single items are neutralised by the treatment of differential item functioning in the scaling model. But an overall mode effect related to students' familiarity with ICT devices or to their motivation to take the test in one mode or another, would still affect country mean performance. See Annex A5 and the *PISA 2015 Technical Report* (OECD, forthcoming) for details on the scaling model used in PISA 2015.

5. Note by Switzerland: In Switzerland, the increase in the weighted share of students between previous rounds of PISA and PISA 2015 samples is larger than the corresponding shift in the target population according to official statistics.

6. High- and low-achieving students can be defined using either common, international benchmarks for performance (the PISA proficiency levels) or national benchmarks corresponding to performance quantiles (e.g. the performance achieved by at least 90% of students, or the performance achieved by the top 10%). Because of this, occasionally one country/economy can be listed under two different headings.

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6

Socio-economic status, student performance and students' attitudes towards science

This chapter defines the dimensions of equity in education: inclusiveness and fairness. It first discusses 15-year-olds' access to schooling in PISA-participating countries and economies, and then describes how the socio-economic status of students and schools is related to student performance and students' attitudes towards science.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Equity in education is a central and long-standing focus of PISA and a major preoccupation for countries around the world. Education systems share the goal of equipping students, irrespective of their social background, with the skills necessary to achieve their full potential in social and economic life.

However, PISA shows that in many countries, even those that perform well in PISA, students' backgrounds continue to influence their opportunities to benefit from education and develop their skills. That is why equity in education – ensuring that education outcomes are the result of students' abilities, will and effort, rather than their personal circumstances – lies at the heart of advancing social justice and inclusion. Ensuring that the most talented, rather than the wealthiest, students obtain access to the best education opportunities is also a way to use resources effectively and raise education and social outcomes in general.

This chapter presents the main PISA 2015 indicators of equity in education. Equity is a complex concept, and the chapter concentrates on two related goals: inclusion and fairness. Inclusion refers to the objective of ensuring that all students, particularly those from disadvantaged backgrounds or traditionally marginalised groups, have access to high-quality education and reach a baseline level of skills. Fairness refers to the goal of removing obstacles to the full development of talent that stem from economic and social circumstances over which individual students have no control, such as unequal access to educational resources in their family and school environments.

What the data tell us

- Canada, Denmark, Estonia, Hong Kong (China) and Macao (China) achieve high levels of performance and equity in education outcomes.
- Access to schooling is nearly universal in most OECD countries and more than 80% of 15-year-olds in 33 countries are represented by PISA samples. But a smaller proportion of 15-year-olds are enrolled in school in grade 7 or above in the OECD countries Turkey (70%) and Mexico (62%), and in partner countries and economies such as Beijing-Shanghai-Jiangsu-Guangdong (China) (hereafter "B-S-J-G [China]") (64%), Costa Rica (63%) and Viet Nam (49%).
- On average across OECD countries, students' socio-economic status explains 13% of the variation in student performance in science.
- Socio-economically disadvantaged students across OECD countries are almost three times more likely than more advantaged students not to attain the baseline level of proficiency in science. However, about 29% of disadvantaged students are considered resilient – meaning that they beat the odds and perform among the top quarter of students in all participating countries. In Macao (China) and Viet Nam, students facing the greatest disadvantage on an international scale outperform the most advantaged students in about 20 other PISA-participating countries and economies.
- While between 2006 and 2015 no country or economy improved its performance in science and its equity levels simultaneously, in nine countries where mean achievement remained stable, socio-economic status became a weaker predictor of student performance. Over this period, the United States is the country where the impact of socio-economic status on performance weakened the most and where the percentage of resilient students grew by the largest margin.

While inclusion and fairness can be examined across a wide range of dimensions, this chapter highlights differences in performance and access to resources related to students' socio-economic status. The chapter investigates results in science, reading and mathematics.

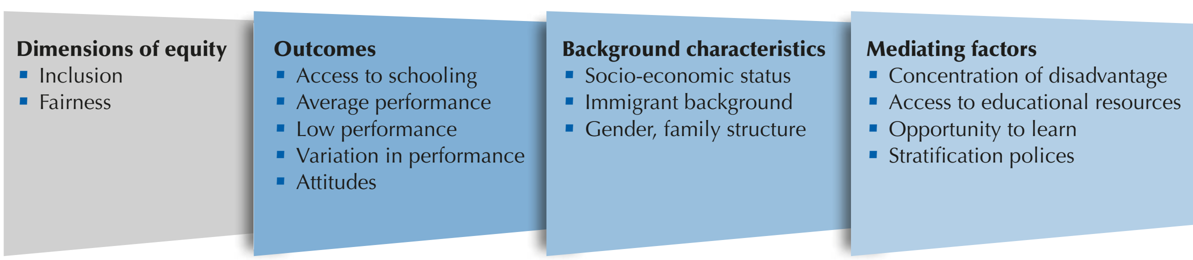
HOW PISA EXAMINES INCLUSION AND FAIRNESS IN EDUCATION

PISA defines equity in education as providing all students, regardless of gender, family background or socio-economic status, with high-quality opportunities to benefit from education. Defined in this way, equity implies neither that everyone should achieve the same results, nor that every student should be exposed to identical, "one-size-fits-all" approaches to teaching and learning. Rather, it refers to creating the conditions for minimising any adverse impact of students' socio-economic status or immigrant background on their performance.

This understanding of equity in education enjoys wide support across countries and is aligned with the Sustainable Development Goals (SDG), adopted by the United Nations in September 2015. In particular, Goal 4 encourages countries to ensure "inclusive and equitable quality education and promote lifelong learning opportunities for all". Two important features distinguish this goal from the preceding Millennium Development Goals (MDG). First, it puts the quality of education and learning outcomes front and centre, whereas the MDG agenda remained focused on access and enrolment. Second, the goal has a truly global reach, as no country, rich or poor, can yet claim to have attained it. By providing extensive and internationally comparable information on students' skills and their family and community backgrounds, PISA offers a unique measure to assess progress towards the SDGs and to analyse inclusion and fairness in education from an international perspective.

Figure I.6.1 summarises the conceptual framework underlying the analyses in this chapter.

Figure I.6.1 ▪ **A conceptual framework for examining equity in education in PISA 2015**



Defining inclusion and fairness

PISA defines inclusion in education as ensuring that all students attain essential foundation skills. In this light, education systems where a large proportion of 15-year-olds has not learned the basic skills needed to fully participate in society are not considered as sufficiently inclusive.

A second dimension of equity, fairness, is defined in relation to contemporary debates about equality of opportunity in a public policy context (e.g. Kanbur and Wagstaff, 2014; Roemer and Trannoy, 2015). Education systems are fairer if students' achievements are more likely to result from their abilities and factors that students themselves can influence, such as their will or effort, and less fair the more they are conditioned by contextual characteristics or "circumstances" that students cannot influence, including their gender, race or ethnicity, socio-economic status, immigrant background, family structure or place of residence.[1]

In PISA, fairness relates to the distribution of opportunities to acquire a quality education and, more specifically, to the degree to which background circumstances influence students' education outcomes.[2] According to this view, fair education systems provide all students, regardless of their background, with similar opportunities to succeed academically.[3]

Performance outcomes examined

Across these two dimensions, equity in education can be examined by looking at a range of student outcomes. First, access to schooling can be seen as a precondition for children to benefit from education. Access is chiefly reflected in school enrolment rates; more equitable and inclusive systems succeed in minimising the share of school-age youth who are not enrolled or are significantly delayed in their progression through school.

Ensuring universal access to schooling at the current quality of education would yield significant social and economic gains, particularly in lower-income countries. But improving both access to and the quality of schools, so that every student acquires basic skills (the ability to read and understand simple texts, and master basic mathematical and scientific concepts and procedures; defined as performing at or above Level 2 on the PISA scale) would have a much larger impact on social and economic outcomes than extending access to schooling alone.

The estimated gains of achieving full participation in secondary school and ensuring that every student scores at or above the baseline level of proficiency on the PISA scale would average 13 times the current GDP of lower-middle income countries and at least twice the current GDP across most high-income countries (OECD, Hanushek and Woessmann, 2015).

The experience of several countries in PISA also shows that improving basic and higher-order skills can be done simultaneously, thus meeting the need for both types of skills in knowledge-based economies. Using the innovations developed by the most skilled workers requires a workforce that has acquired at least basic skills.

The Survey of Adult Skills, a product of the OECD Programme for the International Assessment of Adult Competencies (PIAAC), shows that poor skills severely limit people's access to better-paying and more-rewarding jobs (OECD, 2016a). It works the same way for nations: the distribution of skills has significant implications for how the benefits of economic growth are shared within societies. Put simply, where large shares of adults have poor skills, it becomes difficult to introduce productivity-enhancing technologies and new ways of working, which can then stall improvements in living standards.

Skills affect more than earnings and employment. In all countries with comparable data from the Survey of Adult Skills, adults with lower skills in literacy are far more likely than those with better skills to report poor health, to perceive themselves as objects rather than actors in political processes, and to have less trust in others. In short, without the right skills, people will languish on the margins of society, technological progress will not translate into economic growth, and countries will not be able to compete in the global economy. It is simply not possible to develop inclusive policies and engage with all citizens if a lack of proficiency in basic skills prevents people from fully participating in society.

The main outcome analysed in this chapter in relation to equity is student performance in the core PISA domains. Students' mean scores on the PISA assessment are key indicators of students' knowledge and skills, including the mastery of processes, conceptual understanding, and the ability to extrapolate and apply knowledge in a variety of situations. For countries, average performance indicates the extent to which students near the end of compulsory education have acquired key knowledge and skills that are essential for full participation in modern societies.[4]

Another outcome of critical relevance for equity in education is basic achievement, which refers to students attaining at least proficiency Level 2 on the PISA assessment.[5] As explained in Chapter 2, proficiency Level 2 is considered a baseline that all students should be expected to reach by the time they leave compulsory education; not attaining this level is likely to lead to considerable disadvantage later in life (OECD, 2010). Level 2 represents the critical benchmark at which students begin to demonstrate the science competencies that will enable them to participate effectively and productively in life situations related to science and technology, and to engage with science-related issues as informed citizens. Students with proficiency at or above Level 2 are, at the very least, able to apply some limited knowledge of science in familiar contexts only and to demonstrate a minimum level of autonomous reasoning and understanding of the basic features of science. For countries around the world, reducing the number of low-performing students is a central avenue towards improving equity in their education systems, given the fact that low-performing students come disproportionately from socio-economically disadvantaged and immigrant backgrounds.

Equity can also be examined by looking at variation in performance within a country or economy. How skills are distributed across the student population complements the information provided by country averages, which can vary as a result of changes at different levels of the performance distribution. Chapter 2 describes trends in science performance between 2006 and 2015 among low- and high-achieving students, looking both at low and top performers (performance below Level 2, and at or above Level 5, respectively) and at differences between students at the 10th and 90th percentiles of the performance distribution within each country and economy. In this chapter, variation in performance is mainly examined as variation between and within schools.

In line with the definition of science literacy in PISA 2015, the equity framework also recognises the affective dimensions of learning science as important student outcomes. These relate to students' attitudes towards and beliefs about science, which can play a significant role in their interest, engagement and response to science-related issues and, in turn, in building strong foundation skills in science. From an equity perspective, the concern is that disparities in science performance related to students' socio-economic and demographic backgrounds might extend to students' attitudes towards science, including their expectations – or lack thereof – of a career in science or their appreciation of scientific approaches to enquiry. Students' attitudes towards science and their self-beliefs about learning science are discussed in greater detail in Chapters 2 and 3.

Socio-economic status and other background characteristics

The chapter examines equity in education by focusing on students' socio-economic status. In PISA, a student's socio-economic background is estimated by the PISA index of economic, social and cultural status (ESCS), which is based on information about the students' home and background (Box I.6.1).

Box I.6.1. **Definition of socio-economic status in PISA**

Socio-economic status is a broad concept that summarises many different aspects of a student, school or school system. In PISA, a student's socio-economic status is estimated by the PISA index of economic, social and cultural status (ESCS), which is derived from several variables related to students' family background: parents' education, parents' occupations, a number of home possessions that can be taken as proxies for material wealth, and the number of books and other educational resources available in the home. The PISA index of economic, social and cultural status is a composite score derived from these indicators via Principal Component Analysis (PCA). It is constructed to be internationally comparable. For the first time, in PISA 2015, the PCA was run across equally weighted countries, including OECD and partner countries/economies. Thus, all countries and economies contribute equally to ESCS scores. However, for the purpose of reporting, the values of the ESCS scale are standardised to have a mean of zero and a standard deviation of one for the population of students in OECD countries, with each country given equal weight. In order to allow for trend analyses, in PISA 2015, the ESCS was computed for the current cycle and also recomputed for the earlier cycles using a similar methodology (see *PISA 2015 Technical Report* [OECD, forthcoming]).

The ESCS index makes it possible to draw comparisons between students and schools with different socio-economic profiles. In this report, students are considered **socio-economically advantaged** if they are among the 25% of students with the highest values on the ESCS index in their country or economy; students are classified as **socio-economically disadvantaged** if their values on the ESCS index are among the bottom 25% within their country or economy. Students whose values on the ESCS index are in the middle 50% within their country or economy are classified as having an average socio-economic status. Following the same logic, schools are classified as socio-economically advantaged, disadvantaged or average within each country or economy based on their students' mean values on the ESCS index.

On average across OECD countries, parents of socio-economically advantaged students are highly educated: a large majority has attained tertiary education (97%) and works in a skilled, white-collar occupation (94%). By contrast, the parents of socio-economically disadvantaged students have much lower educational attainment. Across OECD countries, 55% of parents of disadvantaged students attained some post-secondary non-tertiary education as their highest level of formal schooling, 33% attained lower secondary education or less, and only 12% attained tertiary education. Few disadvantaged students have a parent working in a skilled occupation (8%); many parents of these students work in semi-skilled, white-collar occupations (43%), and the majority (49%) work in elementary occupations or semi-skilled, blue-collar occupations (Table II.6.2b).

One of the home possessions that most clearly distinguishes students of different socio-economic profiles is the quantity of books at home. While 47% of advantaged students reported having more than 200 books at home, on average, this is the case for only 7% of disadvantaged peers. Advantaged students also reported a greater availability of other educational resources, such as educational software. On average across OECD countries, however, more than 80% of students, regardless of their socio-economic status, reported having a quiet place to study at home and a computer that they can use for schoolwork (Table II.6.2b).

At the individual level, analyses in this chapter consider the relationship between each student's socio-economic status and his or her science performance and attitudes towards science as assessed in PISA 2015, with an occasional focus on other domains as well. At the school level, the analyses consider the relationship between the average socio--economic status of 15-year-old students in the school and the scores of the 15-year-olds attending that school. At the country level, the socio-economic status of students, both on average and its distribution within the country, can be related to average performance at the school-system level.

A consistent finding throughout PISA assessments is that socio-economic status is related to performance at the system, school and student levels. These associations partly reflect the advantages in resources that relatively high socio-economic status confers. However, they also result from other characteristics that are associated with socio-economic status but that have not been measured by the ESCS index. For example, at the system level, high socio-economic status is often related to greater wealth and higher spending on education. At the school level, socio-economic status tends to be positively correlated with a range of community characteristics that can boost student performance, such as a safe environment or the availability of public libraries and museums. At the individual level, socio-economic status can be related to parents' attitudes towards education, in general, and to their involvement in their child's education, in particular.

The effects of socio-economic status on student achievement have been widely documented, and research has shed light on specific mechanisms linking economic, social and cultural assets in the family context to students' education outcomes (e.g. Bianchi et al., 2004; Feinstein, Duchworth and Sabates, 2008; Jæger and Breen, 2016). For example, students whose parents have higher levels of education and more prestigious and better-paid jobs typically benefit from a wider range of financial (e.g. private tutoring, computers, books), cultural (e.g. extended vocabulary, time in active parenting) and social (e.g. role models and networks) resources that make it easier for students to succeed in school, compared with peers who come from families with lower levels of education or that are affected by chronic unemployment, low-paid jobs or poverty.

Performance differences between socio-economically advantaged and disadvantaged students are not the only indication of the degree to which an education system is equitable. Other student background characteristics and the environment in which students learn are also related to performance. Chapter 7 examines equity through the lens of differences between students with and without an immigrant background. Other essential factors not covered in this chapter include students' gender and family structure. Differences in science literacy and attitudes towards science between boys and girls are analysed in Chapters 2 and 3. The relationship between family structure and performance in PISA was examined in the volume devoted to equity in PISA 2012.

Mediating factors

The impact of personal background circumstances on student performance is partly mediated by other factors. The equity framework in PISA 2015 focuses on the concentration of disadvantage and its association with students' access to educational resources, on differences in opportunity to learn, and on grade repetition and tracking. This chapter looks at how these mediating factors interact with students' socio-economic status; Chapter 7 examines how they affect students with and without an immigrant background.

How educational resources are distributed among students of different backgrounds can be an important determinant of equity in education opportunities. Education systems that are successful, both in quality and equity, attract the highest-quality resources to where these resources can make the most difference. Chapters in this volume provide a glimpse of how resource allocation is related to students' backgrounds by using information collected from school principals about the quality of school infrastructure and the availability of qualified teachers.

Differences in student performance can also be influenced by inequalities in opportunity to learn, that is, the relative exposure that students of different backgrounds may have to specific content in the classroom. This is mainly reflected in the instructional time school systems and teachers allocate to learning a particular subject or content. Time spent on content and the way in which time is organised are primary factors influencing student achievement (OECD, 2016b). Research using PISA data suggests that up to one third of the relationship between socio-economic status and student performance can be accounted for by measures of opportunity to learn (Schmidt et al., 2015).

Another potential channel for the association between students' socio-economic background and achievement are stratification policies used by schools and education systems to organise instruction for students of varying ability and interests. Two widely used forms of stratification are grade repetition and early tracking. While the decision to retain a student at a given grade or to place a student in a less academically-oriented programme is made primarily on the basis of performance, research suggests that students' background characteristics can also play a role in the likelihood that students are sorted into different grades and programmes (Agasisti and Cordero, forthcoming; van de Werfhorst and Mijs, 2010). Volume II provides a more in-depth examination of the association between student performance and school-level resources, learning environments and stratification policies and practices, and of how they reflect the level of equity in a system.

SUCCESSFUL PERFORMANCE AND EQUITY IN EDUCATION

PISA consistently finds that high performance and greater equity in education opportunities and outcomes are not mutually exclusive. In this light, success in education can be defined as a combination of high levels of achievement and high levels of equity. Looking at performance and equity simultaneously also helps avoid the risk of misinterpreting low variability in student achievement as a synonym of equity. Instead, equity is about success for students from all social backgrounds. Widespread low achievement should never be taken as a desirable outcome.

Indeed, the sources of variability in performance include not only students' background circumstances but also differences in their interests, aspirations and effort. Arguably, an education system where both levels of achievement and variability are high, and where such variation is only weakly related to social background, does better than a system where most students do poorly and variability is low. Equitable education systems are those where inclusion and fairness in education and high levels of performance do not come at the expense of one another.

Figure I.6.2 ■ **Countries' and economies' performance in science and major indicators of equity in education**

(blue)	**Higher** quality or equity than the OECD average
(white)	Not statistically different from the OECD average
(grey)	**Lower** quality or equity than the OECD average

		Equity in education					
		Inclusion		Fairness			
	Mean performance in science	Coverage of the national 15-year-old population (PISA Coverage index 3)	Percentage of students performing below Level 2 in science	Percentage of variation in science performance explained by students' socio-economic status	Score-point difference in science associated with a one-unit increase in the ESCS[1]	Percentage of resilient students[2]	Percentage of the between-school variation in science performance explained by students' and schools' ESCS
	Mean score	Index	%	%	Score dif.	%	%
OECD average	493	0.89	21	13	38	29	62.9
Singapore	556	0.96	10	17	47	49	64.9
Japan	538	0.95	10	10	42	49	63.0
Estonia	534	0.93	9	8	32	48	48.2
Chinese Taipei	532	0.85	12	14	45	46	72.3
Finland	531	0.97	11	10	40	43	46.1
Macao (China)	529	0.88	8	2	12	65	7.3
Canada	528	0.84	11	9	34	39	53.7
Viet Nam	525	0.49	6	11	23	76	45.8
Hong Kong (China)	523	0.89	9	5	19	62	40.9
B-S-J-G (China)	518	0.64	16	18	40	45	65.0
Korea	516	0.92	14	10	44	40	63.7
New Zealand	513	0.90	17	14	49	30	73.0
Slovenia	513	0.93	15	13	43	35	74.0
Australia	510	0.91	18	12	44	33	63.0
United Kingdom	509	0.84	17	11	37	35	69.2
Germany	509	0.96	17	16	42	34	74.6
Netherlands	509	0.95	19	13	47	31	64.5
Switzerland	506	0.96	18	16	43	29	55.4
Ireland	503	0.96	15	13	38	30	61.5
Belgium	502	0.93	20	19	48	27	78.7
Denmark	502	0.89	16	10	34	28	50.7
Poland	501	0.91	16	13	40	35	63.5
Portugal	501	0.88	17	15	31	38	65.2
Norway	498	0.91	19	8	37	26	34.0
United States	496	0.84	20	11	33	32	54.0
Austria	495	0.83	21	16	45	26	68.8
France	495	0.91	22	20	57	27	w
Sweden	493	0.94	22	12	44	25	65.0
Czech Republic	493	0.94	21	19	52	25	75.4
Spain	493	0.91	18	13	27	39	61.9
Latvia	490	0.89	17	9	26	35	58.7
Russia	487	0.95	18	7	29	26	43.5
Luxembourg	483	0.88	26	21	41	21	90.3
Italy	481	0.80	23	10	30	27	52.5
Hungary	477	0.90	26	21	47	19	80.1
Lithuania	475	0.90	25	12	36	23	59.6
Croatia	475	0.91	25	12	38	24	65.7
CABA (Argentina)	475	1.04	23	26	37	15	83.7
Iceland	473	0.93	25	5	28	17	49.7
Israel	467	0.94	31	11	42	16	59.7
Malta	465	0.98	33	14	47	22	69.2
Slovak Republic	461	0.89	31	16	41	18	70.4
Greece	455	0.91	33	13	34	18	60.1
Chile	447	0.80	35	17	32	15	66.5
Bulgaria	446	0.81	38	16	41	14	74.6
United Arab Emirates	437	0.91	42	5	30	8	34.0
Uruguay	435	0.72	41	16	32	14	68.8
Romania	435	0.93	39	14	34	11	60.4
Cyprus[3]	433	0.95	42	9	31	10	62.2
Moldova	428	0.93	42	12	33	13	55.7
Turkey	425	0.70	44	9	20	22	49.2
Trinidad and Tobago	425	0.76	46	10	31	13	70.1
Thailand	421	0.71	47	9	22	18	55.0
Costa Rica	420	0.63	46	16	24	9	70.0
Qatar	418	0.93	50	4	27	6	34.3
Colombia	416	0.75	49	14	27	11	64.4
Mexico	416	0.62	48	11	19	13	54.5
Montenegro	411	0.90	51	5	23	9	69.8
Georgia	411	0.79	51	11	34	8	53.0
Jordan	409	0.86	50	9	25	8	33.7
Indonesia	403	0.68	56	13	22	11	55.7
Brazil	401	0.71	57	12	27	9	58.0
Peru	397	0.74	58	22	30	3	79.3
Lebanon	386	0.66	63	10	26	6	39.9
Tunisia	386	0.93	66	9	17	5	52.3
FYROM	384	0.95	63	7	25	4	54.5
Kosovo	378	0.71	68	5	18	3	48.3
Algeria	376	0.79	71	1	8	7	30.8
Dominican Republic	332	0.68	86	13	25	0	66.4

1. ESCS refers to the PISA index of economic, social and cultural status.
2. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and performs in the top quarter of students among all countries/economies, after accounting for socio-economic status.
3. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.
Countries and economies are ranked in descending order of the mean score in science.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432706

Figure I.6.2 presents countries' and economies' mean performance in science in PISA 2015 alongside a selection of indicators that map the dimensions of equity examined in this chapter. While these indicators do not capture all of the inequities that may exist within countries, they provide a reliable indication of levels of inclusion and fairness, particularly from an international perspective.

Two major indicators of inclusion are access to schooling and the percentage of students performing at or above the baseline level of skills. In 22 of the 24 countries/economies that perform above the OECD average in science, PISA samples cover more than 80% of the national population of 15-year-olds, implying that more than 8 in 10 young people in this age group are enrolled in grade 7 or above in school; the only exceptions to this pattern are B-S-J-G (China), where 64% are, and Viet Nam, where only 49% are. In addition, in all high-performing countries but Belgium, the proportion of students performing below proficiency Level 2 in science is below the OECD average. This means that the large majority of high-performing systems also achieve high levels of inclusion: they succeed in ensuring high levels of participation in education among 15-year-olds and in reducing the number of students who perform poorly.

Indicators of fairness in education opportunities confirm that high levels of equity and achievement need not be mutually exclusive. In 10 of the 24 high-performing systems in PISA 2015, the strength of the relationship between performance and socio-economic status is weaker than the OECD average, and in another 9 systems it is not significantly different from the average. Thus, among the most successful countries and economies in mean achievement, socio-economic disadvantage tends to play a relatively minor role in explaining variation in student performance. Similarly, in 15 of these 24 high-performing education systems, the difference in student performance associated with a one-unit increase on the PISA index of economic, social and cultural status is either below or similar to the OECD average. Only in three high-performing systems – Belgium, Singapore and Switzerland – are these two indicators of the relationship between student performance and socio-economic status stronger than average (Figure I.6.2).

Another indication that high equity and high performance can be achieved simultaneously is that, in 17 of these high-performing systems, the proportion of disadvantaged students who manage to perform better than predicted by their socio-economic status and at high international standards is above the OECD average (see the discussion on "resilient" students below).

The degree to which the variation in performance between schools can be attributed to students' and schools' socio-economic status can also be taken as an indicator of fairness. In countries where school performance varies considerably and where a high level of variation is accounted for by the average socio-economic status of the students in the schools, students are more likely to have different resources and opportunities depending on the school they attend, following the broader pattern of socio-economic segregation. In 20 of these 24 high-performing countries and economies, this indicator remains below or around the OECD average (below or within 10 percentage points, respectively).

The education systems that have been able to secure strong and equitable learning outcomes show others what is possible to achieve. Considering collectively the selected indicators presented in Figure I.6.2, Canada, Denmark, Estonia, Hong Kong (China) and Macao (China) stand out by achieving both high performance and high equity in education opportunities.

National income, spending on education and socio-economic heterogeneity

The countries and economies participating in PISA demonstrate that excellence and equity are attainable under a wide variety of conditions.

High national income is neither a prerequisite for nor a guarantee of high performance. As shown in Chapter 2, countries with higher national incomes are at a relative advantage in performance comparisons. However, the relationship between national income and mean performance is not deterministic, and countries and economies of similar wealth show very different mean performance in PISA 2015. Moreover, while there is also a positive relationship between spending per student and mean science performance, yet again, comparable mean science scores in PISA 2015 are achieved by countries and economies with very different levels of expenditure on education (Table I.2.13).

Socio-economic diversity can also coexist with high levels of achievement. In PISA, the level of socio-economic heterogeneity within each country and economy is best captured by the range between the 5th and 95th percentiles of the distribution on the PISA index of economic, social and cultural status.[6] Among the 24 high-performing education systems in the PISA 2015 science assessments, B-S-J-G (China), Portugal and Viet Nam show greater socio-economic diversity than the OECD average. By contrast, in Finland, Japan, Korea and the Netherlands, differences between students at the two extremes of the socio-economic distribution are smaller than the OECD average (Table I.6.2a).

Figure I.6.3 ▪ **Socio-economic contextual factors and indicators of equity in education**

System-level correlations

	Equity indicators				
	Coverage of the national 15-year-old population (PISA Coverage index 3)	Percentage of variation in science performance explained by students' socio-economic status	Score-point difference in science associated with a one-unit increase in the ESCS[1]	Percentage of resilient students[2]	Percentage of between-school variation in science performance explained by students' and schools' socio-economic status
OECD					
Per capita GDP	0.30	0.16	0.29	0.01	0.12
Expenditure in education ages 6-15	**0.39**	0.11	0.32	0.13	0.08
Socio-economic heterogeneity	**-0.69**	0.24	**-0.59**	**-0.37**	0.12
Partners					
Per capita GDP	**0.41**	-0.13	0.17	**0.33**	**-0.26**
Expenditure in education ages 6-15	**0.57**	0.10	**0.50**	**0.50**	0.00
Socio-economic heterogeneity	**-0.72**	0.23	**-0.52**	**-0.24**	0.07

1. ESCS refers to the PISA index of economic, social and cultural status.
2. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and performs in the top quarter of students among all countries/economies, after accounting for socio-economic status.

Note: Correlation coefficients that are statistically significant at the 5% level are indicated in bold.

Source: OECD, PISA 2015 Database, Tables I.2.11, I.6.1, I.6.2a I.6.3a, I.6.7 and I.6.12a.

StatLink http://dx.doi.org/10.1787/888933432713

Figure I.6.3 shows correlations between these contextual factors and the indicators of equity in education presented above.

As expected, wealthier countries and economies, and those spending more on their education systems, tend to provide better access to schooling – a key indicator of inclusion – as measured by the PISA coverage of the national population of 15-year-olds. Inversely, greater levels of socio-economic heterogeneity appear negatively correlated with the capacity of countries/economies to ensure that all youth have equal opportunities to benefit from education. Still, some countries with socio-economic disparities greater than the OECD average, such as Luxembourg, Portugal and Tunisia, also manage to achieve high levels of coverage.

Socio-economic heterogeneity appears to be positively correlated with the percentage of variation in performance explained by socio-economic status. This means that, in more socio-economically diverse countries/economies, it is somewhat easier to predict students' performance based on their socio-economic status. Inversely, heterogeneity is negatively and more strongly correlated with performance differences between students from different socio-economic groups.[7] These correlations may reflect a certain technical constraint in measuring the impact of socio-economic status: in countries with greater socio-economic diversity, the impact associated with one standard deviation on the ESCS index does not fully capture differences between students at the extremes of the distribution, as they tend to be more than two standard deviations apart.

Overall, moderate correlation coefficients (i.e. with values $r<.5$) indicate that differences between countries' socio-economic conditions play a relatively minor role in explaining levels of equity in education. In other words, countries with similar levels of economic development, investment in education and socio-economic diversity can be home to both more and less equitable school systems.

ACCESS TO EDUCATION AMONG 15-YEAR-OLDS

Access to schooling is a prerequisite for achieving inclusion and equity in education. While having all eligible 15-year-olds enrolled in school does not guarantee that every student will acquire the skills needed to thrive in an increasingly knowledge-intensive economy, it is the first step towards building an inclusive and fair education system. Regardless of its average level of performance, any education system where a large proportion of 15-year-olds does not attend school cannot be considered an equitable system.

Globally, enrolment in secondary education has expanded dramatically over the past decades (Barro and Lee, 2013). Yet in many countries, the goal of universal enrolment in lower and upper secondary education is far from becoming a reality. According to UNESCO,[8] in 2014, 16.0% of the world's youth of lower secondary school age were out of school.

However, this rate varies greatly across world regions. For example, in sub-Saharan Africa, 34.0% of youth in this age group were not enrolled; 19.6% of youth in South and West Asia were not enrolled; nor were 7.6% of youth in Latin America and the Caribbean and 1.6% of adolescents of this age group in developed countries.

Household survey data from low- and middle-income countries consistently show that children from poor households, ethnic minorities or rural areas are significantly less likely to make the transition from primary to lower secondary school and from lower to upper secondary school, and are more likely to be delayed in their progression through the grade levels (UNESCO, 2015). In many regions, therefore, opportunities to participate in education remain unequally distributed, depending on students' socio-economic and immigrant backgrounds.

PISA's population coverage as a measure of inclusion in education

Among PISA-participating countries and economies, the majority of OECD countries achieved near-universal access to schooling at both primary and lower secondary levels well before PISA started measuring students' skills in 2000. Some countries that joined the OECD more recently, and some partner countries and economies, are further from securing universal enrolment for their 15-year-olds but have been gradually advancing towards this goal over the past decades.

Between 2003 and 2015, Mexico added more than 300 000 students and Turkey added more than 375 000 students to the total population of 15-year-olds enrolled in grade 7 or above, an increase of 24% and 52%, respectively. Among partner countries, over the same period, Brazil added more than 493 000 students eligible to participate in PISA, and between 2006 and 2015, Colombia added more than 130 000 students, representing increases in enrolment of 21% and 24%, respectively. In Mexico, the number of enrolled students grew at a faster rate than did the overall population of 15-year-olds, while in Brazil, Colombia and Turkey, enrolment grew in spite of a shrinking population of 15-year-olds (Table I.6.1). This means that, in all of these countries, the increase in enrolment rates resulted from an improved capacity to retain students as they progress through higher grades.

Beyond changes in absolute numbers, enrolment is a major indicator of the degree of inclusion in an education system. While PISA is not designed to estimate enrolment rates per se, it provides a range of indices that measure its coverage of the population of 15-year-olds enrolled in grade 7 or above in each country and economy (also known as the "target population"). PISA relies on an age-based definition of its target population to overcome comparability problems that arise from differences in the structures of national education systems. To be eligible to participate in PISA, students must be between 15 years and 3 months and 16 years and 2 months of age at the beginning of the assessment period, and enrolled in an educational institution in grade 7 or higher.

The best proxy for enrolment available in PISA is Coverage index 3 (CI3), which reflects the proportion of the national population of 15-year-olds (enrolled and not enrolled) who are represented by the PISA sample.[9] Values of CI3 can be taken to reflect the percentage of 15-year-olds excluded/not excluded from the school system. Low values of CI3 can therefore be interpreted as lower levels of access to schooling among 15-year-olds, and less inclusion in an education system.

In PISA 2015, among OECD countries, enrolment, as measured by CI3, was over 90% in 21 countries and between 80% and 90% in another 12 countries, implying that more than 9 in 10 15-year-olds in the first group and more than 8 in 10 in the second group are represented in PISA samples. Lower coverage rates are found only in Mexico (62%) and Turkey (70%). Among partner countries and economies that participated in PISA 2015, coverage differs more widely. Enrolment was above 90% in 14 out of these 37 education systems, between 80% and 90% in another 6 systems, between 70% and 80% in 9 systems, and below 70% in the remaining 8 systems, including a coverage rate of 49% in Viet Nam (Table I.6.1).

Overall, there are 20 countries in PISA 2015 where less than 80% of 15-year-olds are enrolled in school and eligible to participate in PISA. This implies that PISA results for these countries are not fully representative of their populations of 15-year-olds. It also signals that these school systems face serious challenges in becoming more inclusive and equitable.

Looking at the evolution of coverage over time, and taking as a benchmark the UNESCO global out-of-school rate for youth of lower secondary school age in 2014 (16%), average coverage across PISA assessments has been higher than 84% in all OECD countries except Chile (82%), Mexico (58%) and Turkey (56%). A comparison of coverage relative to 2003 (or the earliest year available for countries that joined PISA after 2003) also shows that, in the majority of OECD countries, coverage has remained stable or increased over time, and that changes in the national populations of 15-year-olds enrolled in grade 7 or above have typically mirrored the magnitude of changes in the total population of 15-year-olds (Table I.6.1).

Trends in access to schooling in selected countries with low coverage

Figure I.6.4 describes trends in access to schooling for a number of countries where coverage has consistently remained below the 84% threshold across PISA assessments, and where, therefore, access to schooling arguably remains a major challenge for achieving equity in education. For these countries, Figure I.6.4 also shows trends in the weighted number of students participating in PISA (i.e. the numerator for calculating the coverage index) and in the total population of 15-year-olds (i.e. the denominator for the coverage index). Changes in the former can be seen as indicative of true change in coverage, while changes in the latter reflect demographic changes.[10] The relative magnitude of the changes in these two variables indicates the main source of changes in coverage.

Figure I.6.4 ■ **Change between 2003 and 2015 in the coverage of 15-year-olds in grade 7 and higher**

Selected PISA-participating countries

		Coverage of the national 15-year-old population (PISA coverage index 3)					Change between 2015 and 2003 or earliest available year (PISA 2015 – PISA 2003)				
		PISA 2003	PISA 2006	PISA 2009	PISA 2012	PISA 2015	Coverage index 3	Total population of 15-year-olds		Weighted number of participating students	
		Index	Index	Index	Index	Index	% dif.	Absolute dif.	% dif.	Absolute dif.	% dif.
OECD	Mexico	0.49	0.54	0.61	0.63	0.62	13	64 947	3	321 345	30
	Turkey	0.36	0.47	0.57	0.68	0.70	34	-27 403	-2	444 086	92
Partners	Brazil	0.56	0.54	0.61	0.72	0.71	15	-47 673	-1	473 708	24
	Colombia	m	0.60	0.58	0.63	0.75	15	-136 558	-15	30 586	6
	Costa Rica	m	m	0.53	0.50	0.63	10	1 250	2	8 943	21
	Indonesia	0.46	0.53	0.53	0.63	0.68	22	252 321	6	1121 296	57
	Malaysia	m	m	0.78	0.79	0.76	-2	705	0	-8 924	-2
	Peru	m	m	0.73	0.72	0.74	1	-5 196	-1	4 131	1
	Thailand	0.69	0.72	0.73	0.72	0.71	2	-31 557	-3	-2 281	0
	Uruguay	0.63	0.69	0.63	0.73	0.72	9	-415	-1	4 511	13
	Viet Nam	m	m	m	0.56	0.49	-7	85 556	5	-81 658	-9

Note: Coverage index 3 is the percentage of the national population of 15-year-olds who are represented in the PISA sample (see *PISA 2015 Technical Report* [OECD, forthcoming]).

Source: OECD, PISA 2003, PISA 2006, PISA 2009, PISA 2012 and PISA 2015 Databases, Table I.6.1.

StatLink http://dx.doi.org/10.1787/888933432727

Results indicate that in Brazil, Costa Rica, Indonesia, Mexico, Turkey and Uruguay, coverage expanded greatly, and that changes in the percentage of the population of 15-year-olds enrolled in grade 7 or higher largely outweigh changes in the overall population of this age group. The decomposition of the CI3 trend suggests that, in these countries, changes in CI3 reflect real improvements in coverage. In Colombia, CI3 increased by 15 percentage points over time, but the change appears to be primarily the result of a decline in the total population of 15-year-olds. In Malaysia, Peru and Thailand, CI3 remained stable, suggesting no significant improvements in coverage over time. By contrast, in Viet Nam, coverage shrank by 7 percentage points between 2012 and 2015 as enrolment decreased while the total population of 15-year-olds increased.

How low coverage may affect the interpretation of PISA results

In countries and economies with low values on the coverage index, a significant proportion of eligible 15-year-olds does not sit the PISA assessment. While PISA results are representative of the target population in all adjudicated countries/economies, they cannot be readily generalised to the entire population of 15-year-olds in countries where a large percentage of 15-year-olds are not enrolled in grade 7 or above. A source of concern is that young people not covered by PISA differ from peers who do participate in the test in one or several characteristics that are associated with the outcomes assessed in PISA. The results thus need to be carefully interpreted when considering those countries where many youth are excluded from the target population.

First, caution is needed when making performance comparisons between countries with very different coverage rates. Assuming that students omitted from the PISA samples are likely to perform at lower levels than students represented in the samples, comparisons will likely be biased in favour of countries with lower coverage rates. For example, B-S-J-G (China),

Hong Kong (China), Korea and Viet Nam are all high performers in PISA, with average scores ranging from 515 to 525 points in science; but while coverage rates stand around 90% in both Hong Kong (China) and Korea, they are only 64% in B-S-J-G (China) and 49% in Viet Nam (Table I.6.1).

Moreover, when comparing the performance of education systems over time, it is important to consider that low coverage can also lead to an underestimation of the real improvements achieved by education systems that expanded access to schooling and/or improved performance over time. Typically, as previously omitted student populations gain access to schooling, a larger proportion of low-performing students will be included in PISA samples. In countries or economies that expanded access to education, adjustments for changes in the coverage and composition of target populations can shed light on the real, and potentially larger, magnitude of improvements. Taking into account changes in population coverage over time also serves to assess the extent to which a deterioration in mean performance results from a lower quality of education or from the improved capacity of an education system to include students who, in the past, would not have been enrolled, or who would still have been in lower grades than their 15-year-old peers.

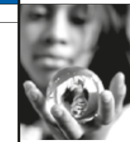
There is a range of analytical strategies to estimate the impact that using proxy results for out-of-school 15-year-olds can have on an education system's mean performance in PISA. The simplest of these strategies is to assume that, if students currently not enrolled in school and/or in eligible grades sat the PISA test, they would all score at a similar level of performance on the PISA scale. Then, these hypothetical results are factored in, weighted by the proportion of out-of-school students in the population of 15-year-olds. Using this strategy, Chapter 2 presents average three-year trends for the median and top quartile of science performance of 15-year-olds, after adjusting for changes in coverage over time.

Low coverage can also have an impact on the analysis of equity outcomes within or between countries and economies. As noted above, at different stages of childhood and adolescence, disadvantaged youth are more often out of school or below the modal grade that corresponds to their age, and as a result they are less likely to meet the criteria for eligibility in the PISA target populations. This means that inequalities related to students' socio-economic and immigrant backgrounds are likely to be underestimated when coverage is low due to a sample selection process that makes disadvantaged students more likely to be excluded from the sample.

The relationship between student performance and socio-economic status can appear similar among countries and economies with large gaps in coverage; but extending coverage in countries with lower levels of inclusion may reveal a different picture. For instance, in Belgium, B-S-J-G (China) and the Czech Republic, students' socio-economic status explains a similar percentage, about 19%, of the variation in student performance, while coverage is about 30 percentage points lower in B-S-J-G (China) than in the Czech Republic and Belgium (Figure I.6.2). If, in B-S-J-G (China), socio-economic status were a stronger predictor of performance among the third of 15-year-olds who are not represented in the PISA sample than among those who are (a hypothesis that cannot be tested with PISA data), then the strength of the socio-economic gradient in B-S-J-G (China) would likely differ from that observed in the other two countries.

Similarly, for Costa Rica, Indonesia, Lebanon, Montenegro, Thailand, Turkey and Viet Nam, the slope of the socio-economic gradient is significantly below the OECD average. In these countries and economies, a one-unit change on the PISA index of economic, social and cultural status is associated with a difference of between 20 and 25 score points in science. Among this group, the coverage rate in Montenegro is at least 20 percentage points higher than in the rest of the countries (Figure I.6.2). Thus, the slope of the socio-economic gradient can be taken as more representative of the influence that socio-economic status has on the skills of the overall population of 15-year-olds in Montenegro. Performance differences between students at the upper and lower ends of the distribution of socio-economic status would also likely increase if coverage were extended in countries with a large share of out-of-school youth.

In order to gain further insight into the impact of non-enrolment or delayed progression on performance and equity, it is important to distinguish among the various reasons why some young people have not been included in PISA samples in their respective countries and economies, and to estimate the relative incidence of these potential causes for omission. Some youth may have never enrolled in formal schooling, whereas others may have dropped out after a period of enrolment; yet others may still be in the school system but have not reached grade 7.[11] As this information cannot be derived from the PISA coverage index, complementary sources of data need to be used. For instance, by combining information from administrative and household survey data, it is often possible to make more fine-grained assumptions about the likely performance and socio-economic profile of youth who are out of school or severely delayed in their progression through school (Box I.6.2). This represents another avenue for estimating countries' average performance in PISA and levels of equity in education.



Box I.6.2. **Combining household surveys and PISA data to better estimate the quality and equity of education systems with low coverage**

There are a variety of strategies to estimate the scores that students who are not covered by PISA would have attained had they sat the PISA test, and to measure education systems' levels of fairness (i.e. equality of opportunity) once access to education (i.e. enrolment) has been taken into account. These strategies vary according to the different assumptions they make about the reasons why students are not enrolled in school or are at a lower grade than expected, and about what their actual but unmeasured level of skills would be.

A common feature of these approaches is their reliance on national government data and household surveys, which can also be part of internationally co-ordinated data collection. These sources cover populations in and out of school, and provide detailed information on non-enrolment, grade progression and dropout in relation to students' socio-economic and demographic characteristics. PISA, which provides a reliable assessment of learning outcomes, cannot, by design, provide this type of information as it takes schools, rather than households, as its sampling unit. Combining data from PISA (or other international assessments of learning outcomes) and national surveys is a way to blend the benefits of both data sources and address issues related to sample coverage. For instance, Ferreira and Gignoux (2014) used household surveys to assess the sensitivity of inequality measures to sample selection in four countries with low coverage rates in PISA 2006: Brazil, Indonesia, Mexico and Turkey. Relying on information about the characteristics of 15-year-olds in these ancillary datasets and sample re-weighting methods, their results suggest that equity indicators in these four countries are robust to selection on three observed variables (gender, mother's education and father's occupation). However, sample selection on unobserved student characteristics would result in large increases in both the variance of student scores and the percentage of variance in performance explained by pre-determined circumstances. In the same vein, Spaull and Taylor (2015) combine household surveys with information on grade completion and surveys providing data on cognitive outcomes for 11 sub-Saharan African countries to construct composite measures of education quantity and quality. These measures, which distinguish between children who never enrol in school or drop out at an early age, and children who complete target grades but remain illiterate and innumerate, suggest that learning deficits outweigh access deficits in all these countries.

As a general rule, the more information that is known about out-of-school adolescents, the fewer the assumptions needed for the predictions of models examining both performance and equity, and the better these assumptions can be grounded empirically. In countries and economies with low access to schooling, combining responses to the following questions about out-of-school students is of particular relevance:

- How many adolescents are out of the school system or enrolled substantially below their expected grade?
- How early did out-of-school adolescents leave the school system?
- What are the characteristics of students outside the school system and/or significantly delayed in their grade progression, and how do they compare with students covered by the PISA assessment?
- Is low performance the main reason why students leave the education system or are delayed in their grade progression?

The more out-of-school adolescents there are, the poorer they are and the earlier they left the school system, the larger the impact that sample omission will likely have on average PISA scores and on estimates of levels of equity in these school systems.

Ultimately, the best solution is to directly measure the knowledge and skills of out-of-school adolescents, particularly in education systems where they represent a large proportion of 15-year-olds. This is the case in the countries that participate in PISA for Development – a PISA assessment tool tailored for emerging and developing economies – where the skills of students in and outside of the school system are evaluated (Box I.6.3).

Box I.6.3. **Assessing the skills of non-enrolled students in PISA for Development**

The PISA for Development (PISA-D) initiative launched by the OECD and its partners aims to make PISA more accessible and relevant to low- and middle-income countries. PISA-D is enabling a wider range of countries to use PISA assessments for monitoring progress towards nationally set targets for improvement, for analysing the factors associated with student learning, particularly among poor and marginalised populations, for building the capacity of national institutions, and for tracking international education targets set out in the Sustainable Development Goals adopted by the United Nations General Assembly in 2015. As of July 2016, eight countries are participating in the PISA-D initiative: Cambodia, Ecuador, Guatemala, Honduras, Panama, Paraguay, Senegal and Zambia.

In particular, PISA-D responds to the needs of low- and middle-income countries where a sizeable proportion of 15-year-olds is not enrolled in school. The project includes three technical strands that enhance the PISA framework. The first focuses the PISA test instruments on the lower levels of performance. The second enhances contextual questionnaires and data-collection instruments to capture the diverse situations of students in low- and middle-income countries. The third strand develops methods and approaches to incorporate out-of-school 15-year-olds in the assessment, because countries are interested in learning about the skills acquired by all children, not just those who attend school.

Including out-of-school youth in the survey makes PISA-D unique in the landscape of large-scale international assessments. The project explores methodologies and data-collection tools for out-of-school youth both to assess their skills, competencies and non-cognitive attributes, and to obtain better actionable data on the characteristics of these children, the reasons why they are not in school, and on the magnitude and forms of exclusion and disparities.

If successful, this third strand of PISA-D will inform strategies, in future rounds of PISA, to measure the competencies of out-of-school 15-year-olds, providing a context for interpreting the in-school results for PISA-participating countries that have sizeable proportions of out-of-school 15-year-olds. With this enhancement, PISA would be able to offer countries an important indicator of human capital in the population as a whole, not just among those who have attained grade 7 and above by the time they are 15 years old. The enhancement would also help monitor progress towards the education Sustainable Development Goal 4, which emphasises ensuring that all children and young people achieve at least minimum levels of proficiency in reading and mathematics.

Source: www.oecd.org/pisa/aboutpisa/pisafordevelopment.htm; Carr-Hill (2015).

DISPARITIES IN PERFORMANCE, BY SOCIO-ECONOMIC STATUS

Home background influences success in education, and schooling can either reinforce or mitigate that influence. Although poor performance in school does not automatically stem from socio-economic disadvantage, the socio-economic status of students and schools can have a powerful influence on learning outcomes. Because advantaged families are better able to enhance the effect of schooling, because students from advantaged families attend higher-quality schools, or because schools are simply better-equipped to nurture and develop young people from advantaged backgrounds, schools may sometimes reproduce existing patterns of socio-economic advantage. However, because schools are also environments that harmonise children's learning experiences, and because they can serve to channel resources towards disadvantaged children, schools can also help create a more equitable distribution of learning opportunities and outcomes (Downey and Condron, 2016). The degree to which reinforcing or compensatory mechanisms prevail depends both on the level of socio-economic inequality in a country/economy and on the characteristics of its school system.

How performance differences relate to socio-economic disparities among students

Examining the strength and slope of the socio-economic gradient

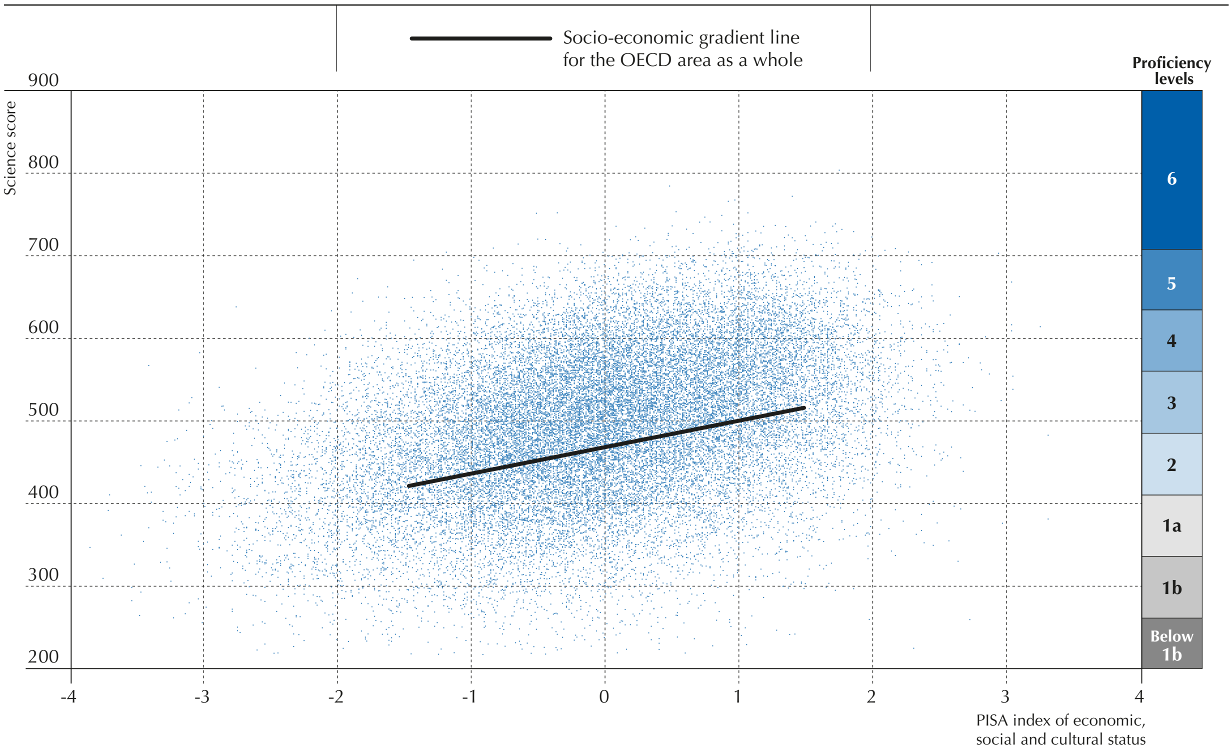
While many disadvantaged students succeed at school, including those who achieve at high levels internationally, socio-economic status is associated with significant differences in performance in most countries and economies that participate in PISA. Advantaged students tend to outscore their disadvantaged peers by large margins; and those differences in performance may also be compounded by other factors.

Figure I.6.5 shows the overall relationship between students' socio-economic status and performance across all countries and economies that participated in PISA 2015, as depicted by the socio-economic gradient. The gradient line describes the typical performance of a student given his or her socio-economic status. The dispersion of dots around the gradient line in Figure I.6.5 indicates that the relationship between student performance and socio-economic status is far from deterministic: many disadvantaged students score well above what is predicted by the gradient line, while a sizeable proportion of students from privileged families perform worse than expected, given their background. In fact, for any group of students with similar backgrounds, the range in performance is considerable.

The socio-economic gradient summarises many of the aspects of equity in education that can be analysed through PISA. Two major aspects of this relationship are the strength and the slope of the socio-economic gradient.

The strength of the socio-economic gradient refers to how well socio-economic status predicts performance. When a student's actual performance is not the same as would be expected given his or her socio-economic status (as when the dots in Figure I.6.5 are far from the dark line), the socio-economic gradient is considered to be weak. When socio-economic status becomes a good predictor of performance (and the dots in the figure are close to the dark line), then the gradient is considered strong.

Figure I.6.5 ■ **Students' socio-economic status and average performance across OECD countries**



Note: Each dot represents an OECD student picked at random out of ten OECD students.
Source: OECD, PISA 2015 Database.
StatLink http://dx.doi.org/10.1787/888933432735

The strength of the gradient provides an indication of the extent to which education policies should target socio-economically disadvantaged students specifically, or low-performing students in general. If the relationship between social background and performance is weak, then other factors are likely to have greater bearing on student achievement, and focusing on students with low socio-economic status might not be so effective. By contrast, when the relationship is strong, then effective policies would be those that eliminate barriers to high-performance linked to socio-economic disadvantage (Box I.6.4). The strength of the socio-economic gradient is measured by the proportion of the variation in performance that is explained by differences in socio-economic status.

On average across OECD countries, students' socio-economic status explains a significant share of the variation in their performance in the core subjects assessed in PISA 2015. For science, 12.9% of the variation in student performance within each country is associated with socio-economic status. In 15 countries and economies, the strength of the socio-economic gradient is above average and students' socio-economic status explains more than 15% of the variation in performance; in Ciudad Autónoma de Buenos Aires (Argentina) (hereafter "CABA [Argentina]"), France, Hungary, Luxembourg and Peru, it accounts for more than 20% of this variability.

By contrast, in 26 countries the strength of the gradient remains below the OECD average; in OECD countries Canada, Estonia, Iceland, Italy, Latvia, Norway and Turkey, students' socio-economic status explains less than 10% of the variation in their performance in science (Table I.6.3a). Similar results are observed for other domains of assessment where, on average across OECD countries, socio-economic status accounts for 11.9% of the variation in reading performance and 13.0% of the variation in mathematics performance (Tables I.6.3b and I.6.3c).

The slope of the socio-economic gradient refers to the impact of socio-economic status on performance, or the average difference in performance between two students whose socio-economic status differs by one unit on the PISA index of economic, social and cultural status. That is, the slope shows the magnitude of the impact on performance that socio-economically targeted policies could potentially have (Box I.6.4). As such, it is a summary measure of the differences in performance observed across socio-economic groups. A flat line in Figure I.6.5, parallel to the horizontal axis, would imply that there are only small differences in performance related to socio-economic status; in other words, advantaged and disadvantaged students would perform equally well. A steep line, however, would signal large performance differences related to socio-economic status.

The upward slope of the line in Figure I.6.5 indicates that advantaged students generally perform better than disadvantaged students. On average across OECD countries, a one-unit increase on the PISA index of economic, social and cultural status is associated with an increase of 38 score points in the science assessment. In the Czech Republic and France, the impact of socio-economic status on performance is largest: a one-unit increase in ESCS is associated with an improvement of more than 50 score points in science; in Austria, Belgium, Hungary, Malta, the Netherlands, New Zealand and Singapore, the increase is associated with an improvement of between 45 and 50 score points.

By contrast, in 13 countries and economies, the associated change in performance is less than 25 score points; this group includes OECD countries Mexico and Turkey (Table I.6.3a). In both reading and mathematics, the average slope across OECD countries is only one score point below that in science, and values of the slope across domains of assessment show very high correlations (r=>.94) across countries (Tables I.6.3b and I.6.3c).

Relationship between socio-economic status and performance

Another way to examine the impact of socio-economic status on performance is by looking at differences in performance across students from various socio-economic groups. For instance, on average across OECD countries, advantaged students – those in the top quarter of the distribution on the PISA index of economic, social and cultural status within their countries/economies – score 88 points higher in science than disadvantaged students – those in the bottom quarter of the distribution. In B-S-J-G (China), France, Hungary and Luxembourg, the gap between the two groups of students is largest: 115 score points or more. Among OECD countries, this difference is smallest in Estonia, Iceland, Latvia, Mexico and Turkey, where it ranges between 50 and 70 score points (Table I.6.3a).

In PISA 2015, across countries and economies, the strength and the slope of the socio-economic gradient in science performance show a positive, medium-to-high correlation (r=.63). This means that education systems with greater fairness in education outcomes, as measured by the percentage of the variation in student performance explained by socio-economic status, tend to show smaller performance differences between students from different socio-economic groups, as measured by the average change in performance scores associated with a one-unit change on the PISA index of economic, social and cultural status. That is, most countries show either steep, strong socio-economic gradients or flat, weak gradients.

But there are exceptions to this pattern. Korea is the only country where performance differences related to socio-economic status are relatively large (above the OECD average), but the relationship between performance and socio-economic status is relatively weak (below the OECD average). Inversely, Chile, Peru and Uruguay are the only countries where the relationship between performance and socio-economic status is strong, but performance differences related to socio-economic status are small; thus these countries show flat, strong socio-economic gradients (Figure I.6.2).

Box I.6.4. **A framework for policies to improve performance and equity in education**

Building on the policy framework of previous PISA reports (Willms, 2006; OECD, 2013a), this chapter identifies two main measures of equity in education outcomes: the strength of the relationship between performance and socio-economic status (the strength of the socio-economic gradient) and the size of performance differences across socio-economic groups (the slope of the socio-economic gradient).

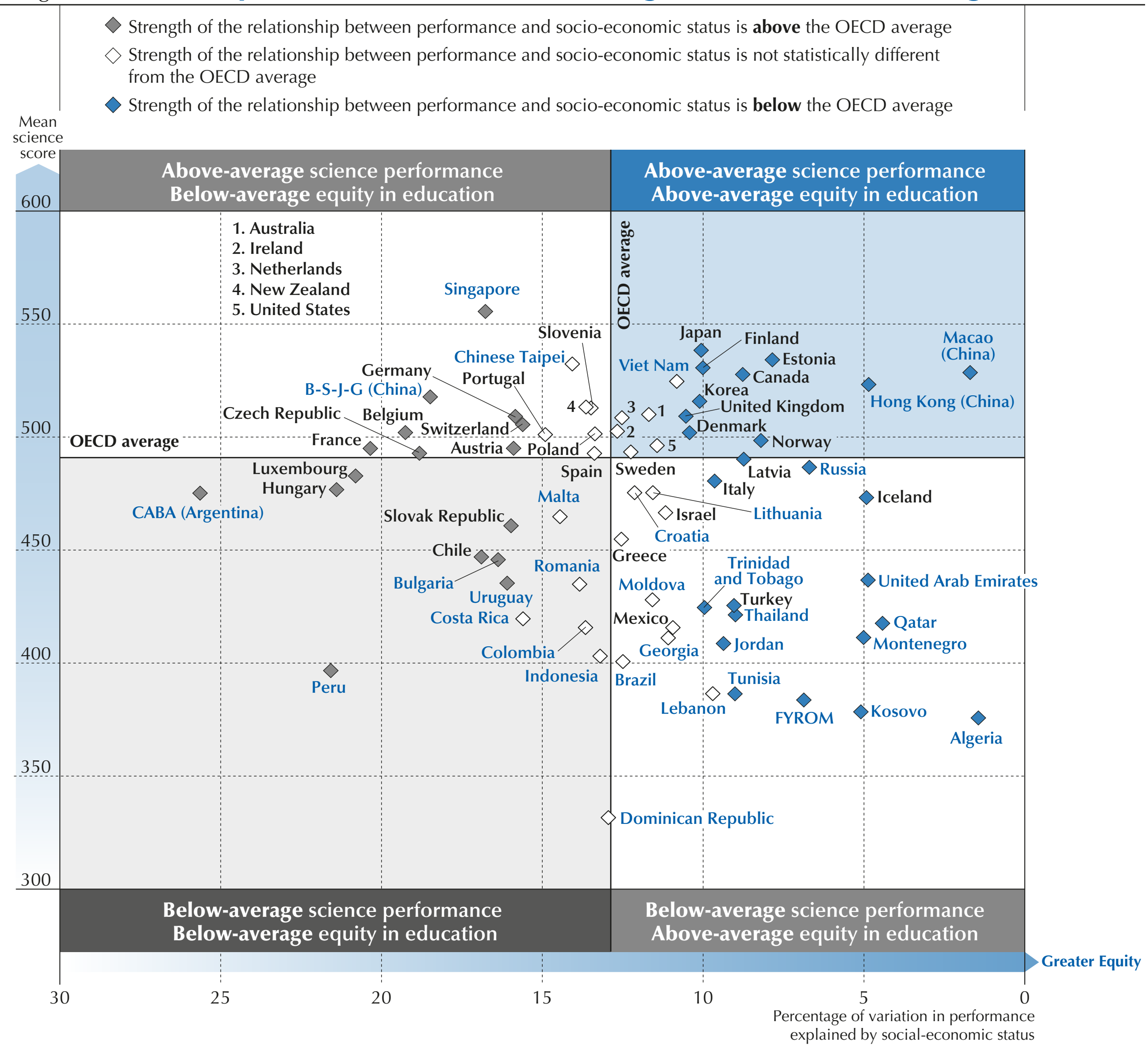
While these two measures are positively correlated, they capture different aspects of the relationship between students' performance and socio-economic status, with potentially different policy implications. Considering these two dimensions of equity in education can help policy makers map a way forward to raise quality and improve equity:

- When performance differences across the socio-economic spectrum are small (i.e. slope is flat) and students often perform better (or worse) than expected given their socio-economic status (i.e. strength is low), a common policy goal is to improve performance across the board. In these cases, universal policies tend to be most effective. These types of policies include changing curricula or instructional systems and/or improving the quality of the teaching staff.
- When performance differences across the socio-economic spectrum are large (i.e. slope is steep) and students often perform better (or worse) than expected given their socio-economic status (i.e. strength is low), improving performance among the lowest performers is typically a major priority, regardless of their socio-economic status. In these cases, targeting disadvantaged students only would provide extra support to some students who are already performing relatively well, while it would leave out some students who are not necessarily disadvantaged but who perform poorly. Policies can be targeted to low-performing students if these students can be easily identified, or to low-performing schools, particularly if low performance is concentrated in particular schools. Examples of such policies involve evaluation, feedback and appraisals for students, teachers and schools, or establishing early-warning mechanisms and providing a modified curriculum or additional instructional support for struggling students.
- When performance differences across the socio-economic spectrum are small (i.e. slope is flat) but students perform as expected given their socio-economic status (i.e. strength is high), policy can focus on dismantling barriers to high performance associated with socio-economic disadvantage. In these cases, effective compensatory policies should target disadvantaged students or schools, providing them with additional support, resources or assistance. Free lunch programmes or free textbooks for disadvantaged families are examples of these policies.
- When performance differences across the socio-economic spectrum are large (i.e. slope is steep) and students perform as would be expected given their socio-economic status (i.e. strength is high), reducing performance differences and improving performance, particularly among disadvantaged students, are combined policy goals. A mix of policies targeting low performance and socio-economic disadvantage can be most effective in these cases, since universal policies may be less effective in improving both equity and performance simultaneously.

While a single measure cannot capture the many complexities of equity in education, the strength of the socio-economic gradient provides a useful benchmark to compare school systems, particularly in relation to their average levels of achievement. As noted above, PISA consistently finds that high performance and greater fairness in education opportunities and outcomes are not mutually exclusive. In 10 of the 24 countries and economies that scored above the OECD average in science in PISA 2015, the strength of the relationship between student performance and socio-economic status is below the OECD average (Figure I.6.6). School systems in Canada, Denmark, Estonia, Finland, Hong Kong (China), Japan, Korea, Macao (China), Norway and the United Kingdom achieve high performance in science, and in Latvia average performance, while the relationship between student performance and socio-economic status is significantly weaker than average. By this measure, school systems in Australia, Ireland, the Netherlands, New Zealand, Poland, Portugal, Slovenia and Chinese Taipei achieve high science performance with a level of fairness similar to the OECD average.[12]

While socio-economic status remains a strong predictor of performance in many countries, another consistent finding from PISA is that poverty is not destiny. Many disadvantaged students succeed in attaining high levels of performance, not only within their own countries and economies, but also when considered globally.

Figure I.6.6 ■ **Mean performance in science and strength of the socio-economic gradient**



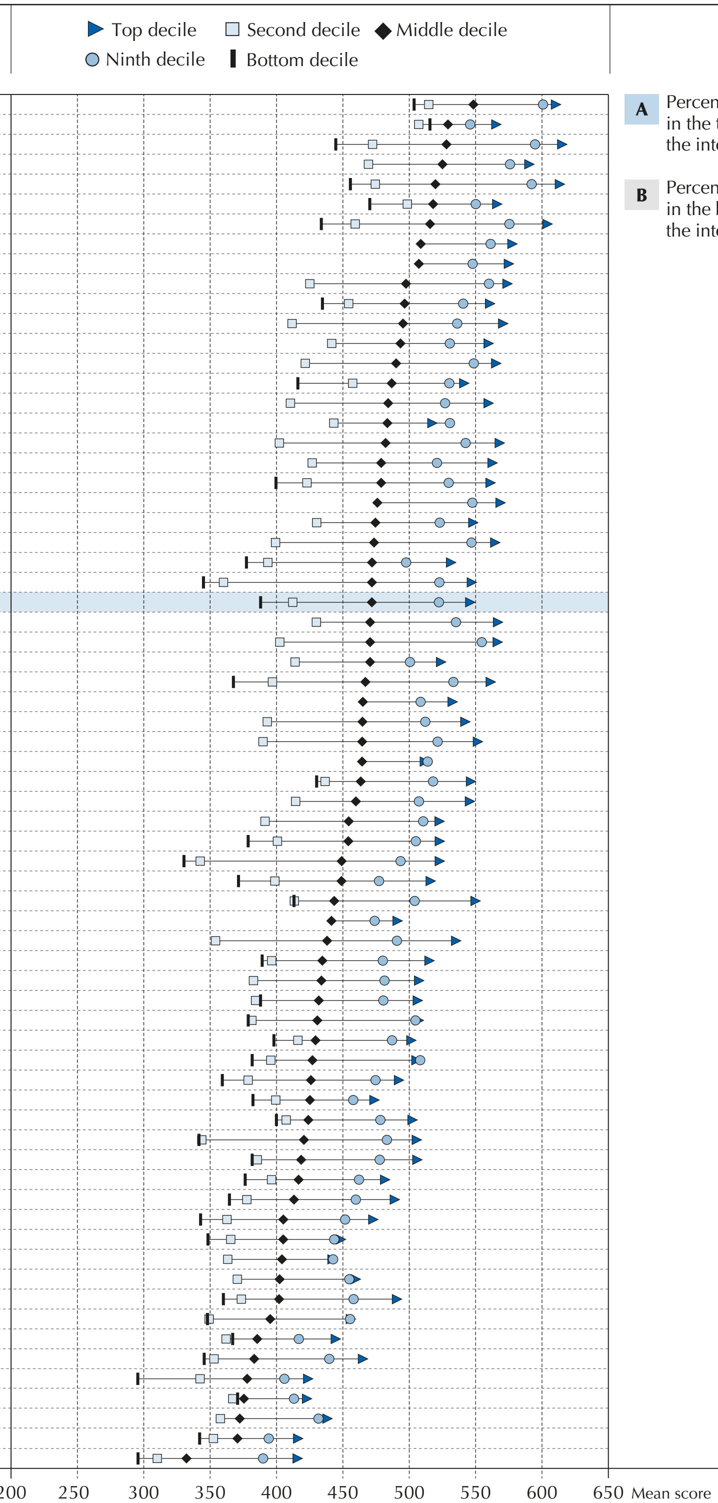
Notes: The correlation between a country's/economy's mean science score and the strength of the socio-economic gradient is 0.17.
Only countries and economies with available data are shown.
Source: OECD, PISA 2015 Database, Table I.6.3a.
StatLink http://dx.doi.org/10.1787/888933432747

Figure I.6.7 shows performance differences by international deciles of the PISA index of social, economic and cultural status – that is, by placing students on the same scale and allowing a comparison of the performance of student groups from similar socio-economic contexts across countries and economies. This analysis reveals, for instance, that, in Macao (China) and Viet Nam, students facing the greatest disadvantage (i.e. those in the bottom decile of the distribution of the ESCS index internationally) have average scores over 500 points in the science assessment, significantly above the OECD mean score of 493 points, which reflects the performance of students from all socio-economic backgrounds. Such a high level of achievement also means that these disadvantaged students in Macao (China) and Viet Nam outperform the most advantaged students (i.e. those in the top decile of the distribution of the ESCS index internationally) in about 20 other PISA-participating countries and economies.

These results are testimony to how widely the performance of students of similar socio-economic status can vary across school systems. Of course, when comparing countries and economies that differ substantially in their national wealth and socio-economic heterogeneity, the proportion of 15-year-old students at each decile on the international scale will vary considerably. However, large differences in performance can also be observed between countries where similar percentages of students have similar socio-economic status. For instance, in Hong Kong (China), about 26% of students are in the bottom two deciles of the PISA index of economic, social and cultural status internationally, and their average science score is above 485 points.

A corrigendum has been issued for this page. See: http://www.oecd.org/about/publishing/Corrigenda-PISA2015-VolumeI.pdf

Figure I.6.7 ▪ **Mean performance in science, by international decile on the PISA index of economic, social and cultural status**



	A	B
Viet Nam	2	76
Macao (China)	9	22
B-S-J-G (China)	8	52
Japan	11	8
Singapore	27	11
Hong Kong (China)	12	26
Chinese Taipei	14	12
Estonia	23	5
Finland	33	2
Korea	9	6
Portugal	24	28
Germany	39	7
Canada	48	2
Poland	13	16
Spain	20	31
United Kingdom	35	5
Latvia	11	25
Slovenia	25	5
Switzerland	31	8
Australia	35	4
New Zealand	29	5
Ireland	31	5
Czech Republic	16	9
Denmark	53	3
Hungary	22	16
OECD average	27	12
Netherlands	28	4
France	18	9
Italy	24	15
Belgium	34	7
Norway	45	1
Sweden	39	3
Austria	26	5
Russia	24	5
United States	32	11
Croatia	17	10
Lithuania	24	12
CABA (Argentina)	39	18
Slovak Republic	22	8
Chile	18	27
Luxembourg	34	14
Iceland	57	1
Malta	26	13
Uruguay	13	39
Greece	26	13
Romania	9	20
Israel	29	6
Turkey	4	59
Indonesia	1	74
Moldova	7	28
Mexico	8	53
Thailand	8	55
Bulgaria	28	13
Colombia	8	43
Costa Rica	14	38
Trinidad and Tobago	18	14
Peru	9	50
Jordan	13	21
Montenegro	17	11
United Arab Emirates	42	3
Brazil	14	43
Georgia	12	19
Tunisia	15	39
Lebanon	10	27
FYROM	18	13
Algeria	4	52
Qatar	48	3
Kosovo	19	10
Dominican Republic	7	40

A Percentage of students in the **top** decile of the international ESCS[1] index

B Percentage of students in the **bottom** decile of the international ESCS index

1. ESCS refers to the PISA index of economic, social and cultural status.

Notes: International deciles refer to the distribution of the PISA index of economic, social and cultural status across all countries and economies.

Only countries and economies with available data are shown.

Countries and economies are ranked in descending order of the mean science performance of students in the middle decile of the PISA index of economic, social and cultural status.

Source: OECD, PISA 2015 Database, Table I.6.4a.

StatLink http://dx.doi.org/10.1787/888933432757

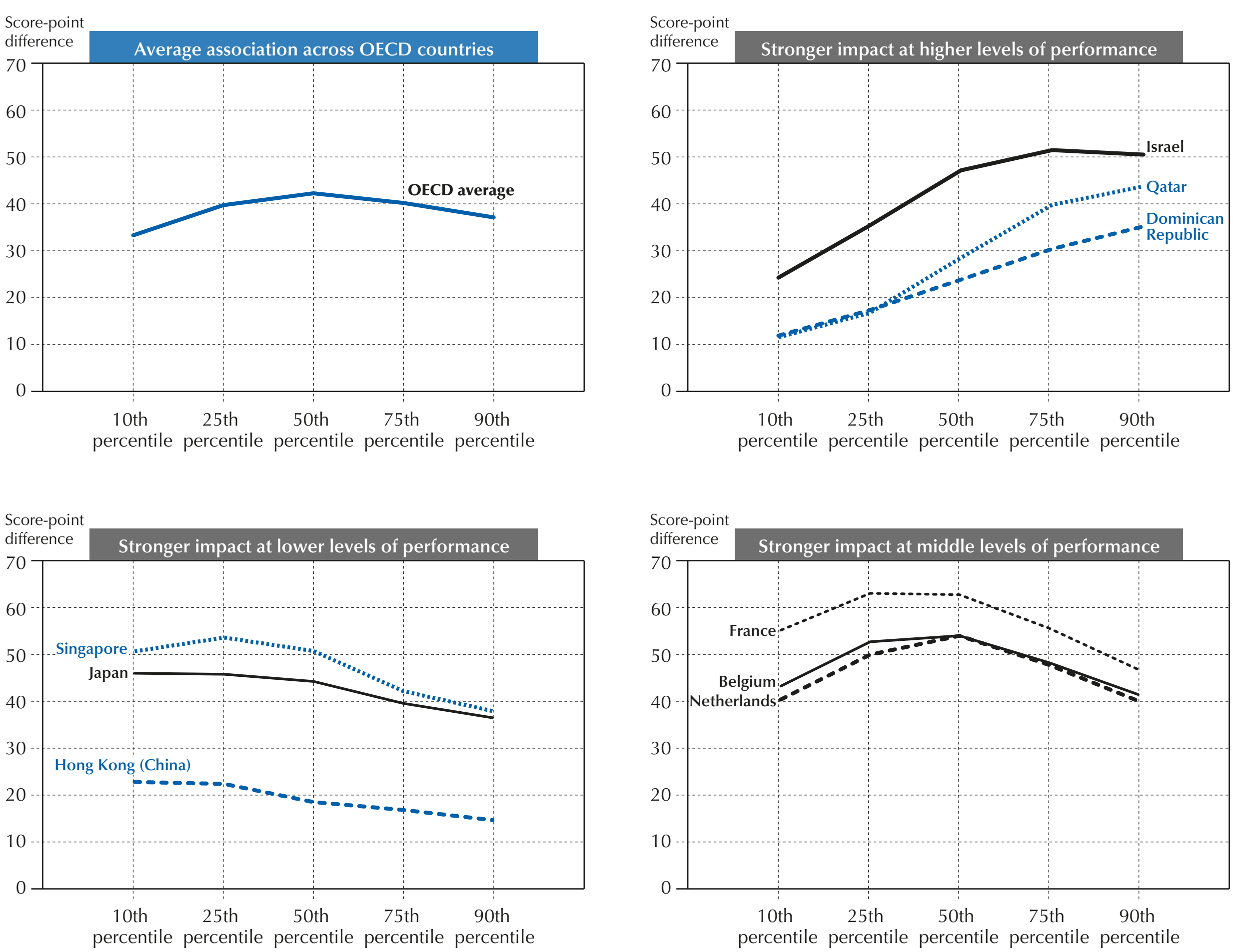
In Chile and Moldova, a similar percentage of students are in this category, while their average scores in science are about 100 score points lower. Likewise, there are large performance differences between countries with comparable percentages of advantaged students. For example, in both Korea and Peru, only 9% of students are in the top two deciles of the ESCS index internationally, but in Korea these students' average performance is above 560 points, whereas in Peru it is around 460 score points.

Socio-economic status as a predictor of low and high performance

When assessing fairness in education systems, it is also informative to examine the influence that socio-economic status has on low- and high-achieving students – that is, whether and how much its impact varies at low and high levels of performance.

Figure I.6.8 describes the relationship between socio-economic status and five different levels of student performance in science.[13] While the results reported above indicate that socio-economic status is strongly and positively associated with changes in average scores, this analysis addresses the question of whether the pattern of association varies depending on students' level of performance. If there were no variation in this relationship for low- and high-performing students, then the lines of the socio-economic gradient depicted in Figure I.6.8 would be flat. By contrast, a changing pattern of association would result in a curved line – implying a greater or lesser impact of socio-economic status, depending on the level of performance.

Figure I.6.8 ▪ **How high and low performance are related to socio-economic status**



Note: Score-point differences are quantile regression estimates of science performance on the PISA index of economic, social and cultural status (ESCS).
Source: OECD, PISA 2015 Database, Table I.6.5.
StatLink http://dx.doi.org/10.1787/888933432762

The upper-left panel of Figure I.6.8 shows that, on average across OECD countries, the impact of socio-economic status on performance is slightly weaker among both low- and high-performing students (a one unit-change in ESCS is associated with a performance difference of 33 score points among students in the 10th percentile of the performance distribution, and with a difference of 37 score points among students in the 90th percentile), and stronger for students who perform around the median (for whom a one-unit change in ESCS is associated with a performance difference of 42 score points).

By comparison, the average slope of the socio-economic gradient, associated with a performance difference of 38 score points, applies to all students, regardless of their level of performance. Although differences are small, they suggest that an increase in socio-economic status may translate into improvements in performance of varying magnitudes across the spectrum of performance. In some countries, for example, higher socio-economic status may be more important for avoiding low performance, whereas in others it may be of greater help for achieving high performance.

Indeed, the average impact masks significant differences in the pattern of association across countries and economies. The upper-right panel of Figure I.6.8 shows how, in the Dominican Republic, Israel and Qatar, the impact of socio-economic status is more pronounced among higher-performing students (those at the 75th and 90th percentiles of the performance distribution) than among lower-performing students (those at the 25th and 10th percentiles). This suggests that, in these countries, coming from an advantaged background is more of a prerequisite for being a high performer.

The bottom-left panel of Figure I.6.8 shows that, in Hong Kong (China), Japan and Singapore, the opposite pattern holds: the impact of socio-economic status is stronger among low performers than among high performers. This indicates that, in these school systems, socio-economic advantage acts more as a protection against low performance than as a springboard to high achievement.

The bottom-right panel shows how, in another group of countries including Belgium, France and the Netherlands, the association between students' performance and socio-economic status mirrors the average pattern in OECD countries but in a more pronounced way. In these countries, socio-economic status matters mostly for students who score around average in science. This may be related to the fact that, in these systems, socio-economic status influences the decisions to sort students who perform at average levels into different tracks, helping to secure better opportunities for middling students with higher status, and potentially interfering to a greater extent with performance-based sorting mechanisms.

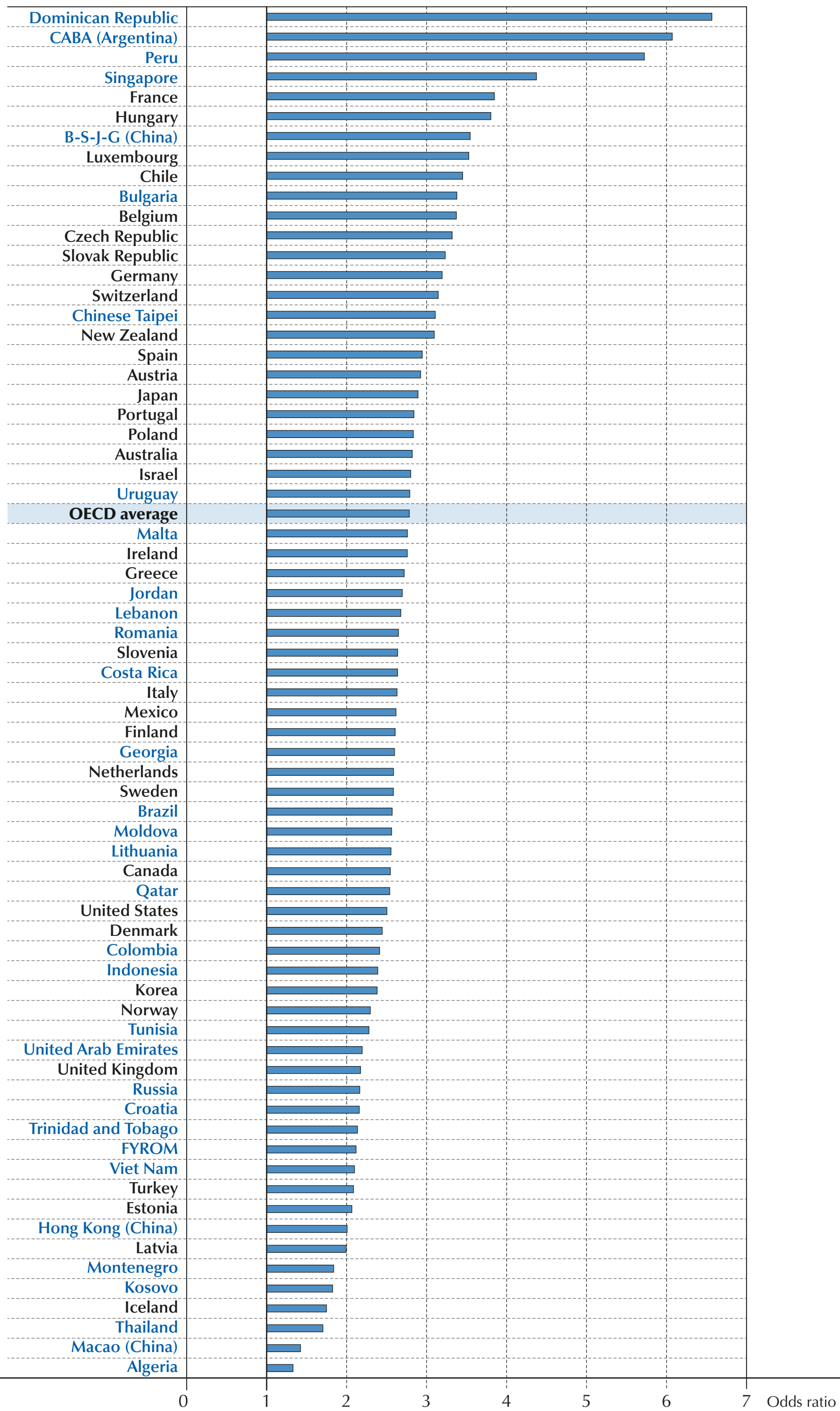
While the examples highlighted in Figure I.6.8 illustrate the largest differences in how socio-economic status is related to performance at various levels, non-linear patterns of association are observed elsewhere too. Indeed, in 53 out of the 72 countries and economies that participated in PISA 2015, there are significant differences between the impact that changes in socio-economic status have for science scores at the 10th and 50th percentiles of the performance distribution. In most cases, the impact is stronger on students whose performance is around the median or not significantly different between the two. In 34 countries and economies, the association between performance and socio-economic status differs between low- and high-performing students, while in 27 countries and economies it differs between top- and average-performing students (Table I.6.5). However, this association can be mediated by other factors; socio-economic status is not the only reason for low or high performance.

When considering inclusion, it is also important to learn more about the relationship between disadvantage and low performance. On average across OECD countries, 21.2% of 15-year-olds score below proficiency Level 2 in science. However, 34.0% of students in the bottom quarter of the PISA index of economic, social and cultural status score at that level, while only 9.3% of students in the top quarter of the index do (Table I.6.6a). Figure I.6.9 shows the likelihood that disadvantaged students within their respective countries/economies score below proficiency Level 2 in science, compared to their peers with average or high socio-economic status.

On average across OECD countries, disadvantaged students are 2.8 times more likely than more advantaged students not to attain the baseline level of proficiency in science. While there is significant variation in the magnitude of this risk, the association between socio-economic disadvantage and low performance is statistically significant in all PISA-participating countries and economies. This shows the pervasiveness of the impact of socio-economic "circumstances" on student achievement, no matter the level at which school systems perform as a whole.

Countries where the likelihood that disadvantaged students perform below proficiency Level 2 in science is greatest, relative to more advantaged students, are remarkably diverse. In CABA (Argentina), the Dominican Republic, Peru and Singapore, these students are between 4 and 7 times more likely to be low performers, while in another 13 countries/economies they are between 3 and 4 times more likely to be low performers. This group of countries/economies where students with low socio-economic status are at greater risk of not attaining the baseline level of skills in science includes high-performing countries such as Belgium, Germany, New Zealand, Singapore, Switzerland and Chinese Taipei, as well as countries/economies with average or low mean performance.

Figure I.6.9 ■ **Likelihood of low performance among disadvantaged students, relative to non-disadvantaged students[1]**



1. A socio-economically disadvantaged student is a student in the bottom quarter of the distribution of the PISA index of economic, social and cultural status (ESCS) within his or her country/economy.

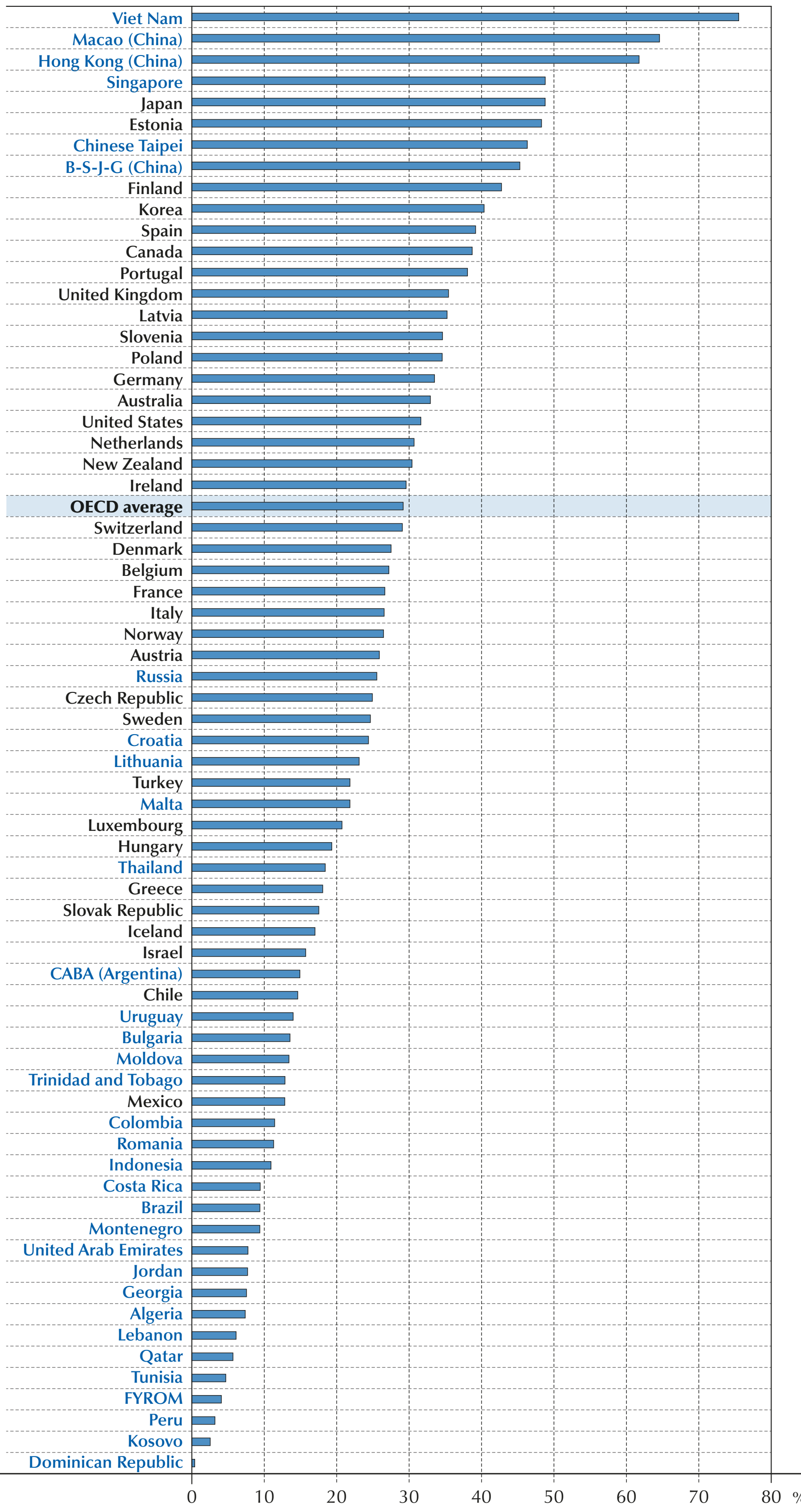
Note: All coefficients are statistically significant (see Annex A3).

Countries and economies are ranked in descending order of the likelihood that students in the bottom quarter of ESCS score below Level 2 in science, relative to non-disadvantaged students.

Source: OECD, PISA 2015 Database, Table I.6.6a.

StatLink http://dx.doi.org/10.1787/888933432777

Figure I.6.10 ■ **Percentage of resilient students[1]**



1. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and performs in the top quarter of students among all countries/economies, after accounting for socio-economic status.

Countries and economies are ranked in descending order of the percentage of resilient students.

Source: OECD, PISA 2015 Database, Table I.6.7.

StatLink http://dx.doi.org/10.1787/888933432786

By contrast, in Algeria, Iceland, Kosovo, Macao (China), Montenegro, Qatar and Thailand, socio-economically disadvantaged students are no more than twice as likely as more advantaged students to score below proficiency Level 2 in science. Among these countries/economies, Macao (China) is also a high performer in science.

Results for reading and mathematics are broadly comparable to those observed in science, although the likelihood of low performance among disadvantaged students is slightly lower in reading, when compared to all non-disadvantaged students and to advantaged students in the top quarter of the PISA index of economic, social and cultural status (Tables I.6.6b and I.6.6c).

Resilient students

Further evidence that higher levels of equity and performance need not be at odds with each other comes from the finding that many disadvantaged students, schools and school systems achieve better performance in PISA than predicted by their socio-economic status. As such, they are considered to be "resilient". In PISA, a student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status in the country/economy of assessment and yet performs in the top quarter of students among all countries, after taking their socio-economic status into account.[14]

Figure I.6.10 shows that, on average across OECD countries, 29.2% of disadvantaged students in PISA 2015 beat the odds against them and score among the top quarter of students in all participating countries, after accounting for socio-economic status. In B-S-J-G (China), Estonia, Finland, Hong Kong (China), Japan, Korea, Macao (China), Singapore, Chinese Taipei and Viet Nam, more than four in ten disadvantaged students are considered to be resilient, although low coverage rates in B-S-J-G (China) and Viet Nam likely mean that the most disadvantaged 15-year-olds in these countries are not represented in these results. By contrast, fewer than one in ten disadvantaged students in Algeria, Brazil, Costa Rica, the Dominican Republic, the Former Yugoslav Republic of Macedonia (hereafter "FYROM"), Georgia, Jordan, Kosovo, Lebanon, Montenegro, Peru, Qatar, Tunisia and the United Arab Emirates is a top performer in science after taking socio-economic status into account (Table I.6.7).

DIFFERENCES IN STUDENTS' SCIENCE-RELATED CAREER EXPECTATIONS AND BELIEFS RELATED TO SOCIO-ECONOMIC BACKGROUND

As discussed in Chapter 3, a shared goal in countries and economies across the world is to promote students' interest in science and technology careers. This has led educators to pay greater attention to the affective dimensions of learning science. Equity in access to these occupations is a related concern, as disadvantaged students are often under-represented in scientific fields of study. This is partly due to their lower average performance relative to students from more privileged backgrounds, but also to differences in their attitudes towards learning science.

PISA 2015 asked students about the occupation they expect to be working in when they are 30 years old. Their responses were grouped into major categories of science-related and non-science-related careers. On average across OECD countries, a smaller percentage of disadvantaged students (18.9%) than of advantaged students (31.5%) expect to work in an occupation that requires further science training beyond compulsory education – a pattern that holds in all countries and economies that participated in PISA 2015. In general, science-related careers prove more popular among students with lower socio-economic status in countries where more advantaged students are also attracted to these occupations (Table I.6.8).

But students' career expectations can, of course, be strongly linked to their academic performance. Indeed, after accounting for students' performance in science, in 25 countries and economies, students from less privileged backgrounds are neither more nor less likely than their advantaged peers to expect to work in a science- or technology-related occupation by age 30. However, in another 46 countries/economies, students from less privileged backgrounds are significantly less likely to expect to work in a science-related career. On average across OECD countries, and after discounting the association with performance, students in the bottom quarter of the PISA index of economic, social and cultural status are 25% less likely than their peers in the top quarter of the index to see themselves pursuing a career in science, and in Finland, Jordan, Moldova, Poland and Romania this likelihood is 50% or less (Table I.6.8). Results in Chapter 3 show that, in a large number of countries, students' expectations of pursuing a career in science are related not only to their performance and socio-economic status, but also to their gender and enjoyment of science (Table I.3.13b).

PISA 2015 also asked students about their views about the nature of scientific knowledge and the validity of scientific methods of enquiry as a source of knowing – their epistemic beliefs. Students whose epistemic beliefs are in agreement with current views about the nature of science can be said to value scientific approaches to enquiry. As reported in Chapter 2, PISA 2015 shows broad support for scientific approaches to enquiry among 15-year-olds and small gender disparities in these beliefs, on average across OECD countries. When comparing students with different socio-economic status, however, in virtually all PISA-participating countries and economies, advantaged students tend to hold beliefs in greater agreement with scientific approaches to enquiry than disadvantaged students. These differences are largest in Austria, Luxembourg, Sweden and Switzerland (Table I.6.8). Overall, results show that the positive association between socio-economic status and performance is mirrored in students' attitudes towards science, suggesting that differences between students of different backgrounds on these two dimensions might reinforce each other over time.

HOW PERFORMANCE IS RELATED TO SOCIO-ECONOMIC STATUS BETWEEN AND WITHIN SCHOOLS

Ensuring consistently high standards across schools is a formidable challenge for any school system. Some performance differences between schools may be related to the socio-economic composition of the school's student population or other characteristics of the student body. For instance, in some countries and economies, residential segregation, based on income or on cultural or ethnic background, often translates into disparities in the quantity and quality of resources (Reardon and Owens, 2014). Performance differences among schools can also be related to the design of school systems and system-level education policies, such as differences in the degree of autonomy granted to schools, and to policies emphasising greater competition for students among schools and greater school choice (Hsieh and Urquiola, 2006; Söderström and Uusitalo, 2010).

Disadvantaged students have generally been shown to benefit from sharing school and classrooms with more privileged peers, whereas implications for the latter group remain an open debate. Research using PISA data from 2009 has found that a small number of countries host effective, socio-economically integrated schools – those achieving gains for disadvantaged students without lowering the outcomes of advantaged students – and that integration tends to be more effective in larger schools (Montt, 2016).

Systems with small between-school variations in performance tend to be those that are comprehensive, meaning that they do not sort students by programme or school based on ability. Systems trying to meet different needs of students by creating different tracks or pathways through education and inviting students to choose among them at an earlier or later age tend to show larger between-school variations and a greater impact of social background on learning outcomes. Volume II examines how system- and school-level policies vary and are related to performance differences between students and schools.

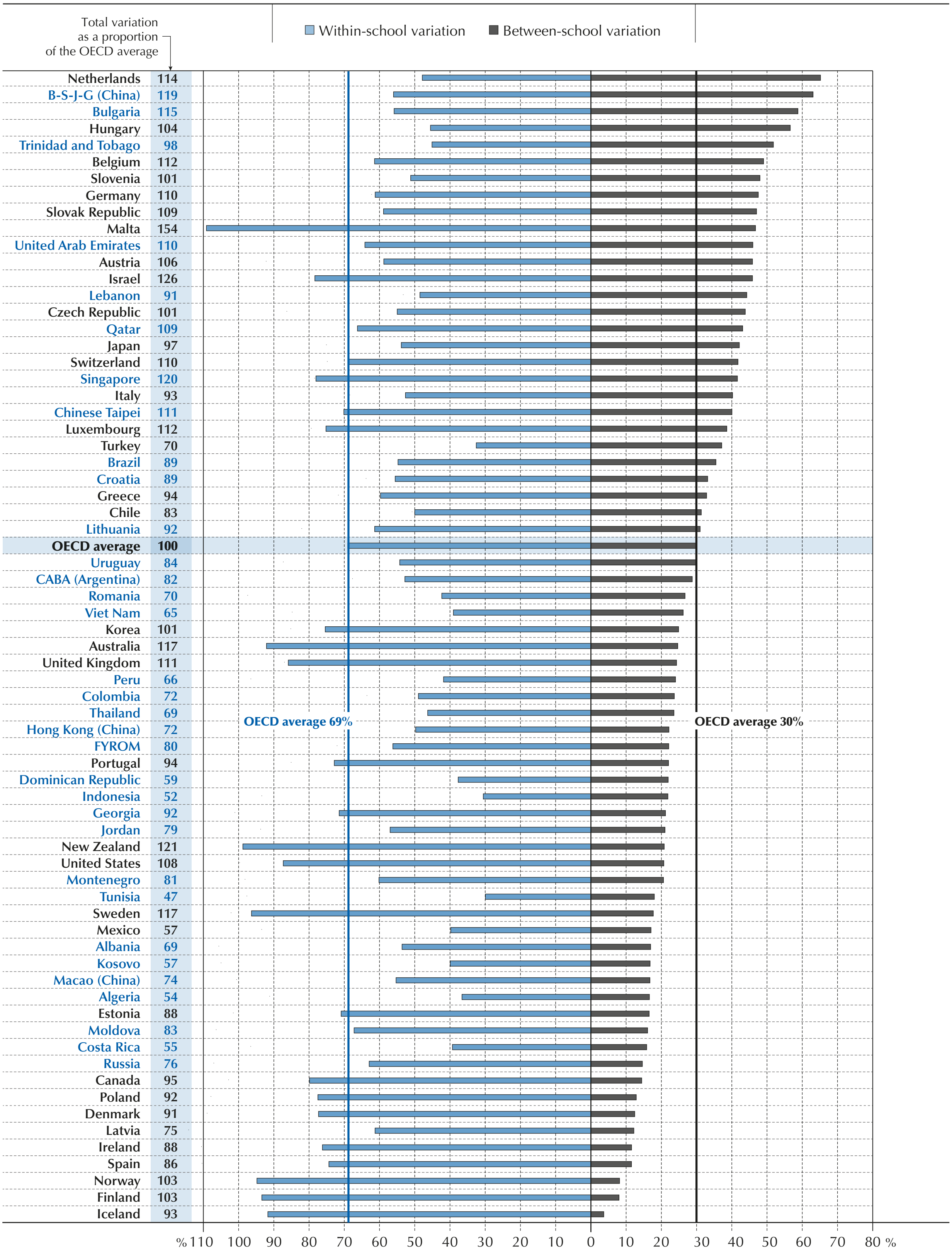
Figure I.6.11 shows the variation in student performance in science between and within schools in countries and economies participating in PISA 2015. The overall length of the bar represents the total variation in that country as a proportion of the OECD average level of variation in performance. The dark part of the bar represents the proportion of those differences that is observed between schools, and the light part of the bar represents the proportion observed within schools.

Across OECD countries, 30.1% of performance differences are observed between schools and the remaining part is observed within schools.[15,16] The extent of between-school differences in performance varies widely across school systems. For example, in Finland, Iceland and Norway, between-school differences account for less than 10% of total variation in performance, and in Canada, Denmark, Ireland, Latvia, Poland and Spain, they account for between 10% and 15% of the variance. In these countries, overall variation in performance also tends to be low; but in Finland and Norway, relatively small differences across students in different schools coexist with an overall level of variation slightly above the OECD average (Table I.6.9). Because Canada, Denmark, Finland, Ireland, Norway and Poland also manage to achieve higher-than-average mean performance in science, in these countries families can expect that, no matter which school their children attend, they are likely to achieve at high levels.

By contrast, in B-S-J-G (China), Bulgaria, Hungary, the Netherlands, and Trinidad and Tobago, differences between schools account for more than 50% of the total variation in the country's/economy's performance. In these countries the overall level of variation is similar or higher than the OECD average (Table I.6.9).

How the variation in performance is distributed between and within schools is often related to the degree of socio-economic diversity across schools. On average across OECD countries, 76.5% of variation in the PISA index of economic, social and cultural status observed within schools, as indicated by the value of the index of social inclusion, while the remaining 23.5% of the variation in students' socio-economic status is found between schools. This implies that, on average, there tends to be more socio-economic diversity among students attending the same schools than between students attending different schools. In B-S-J-G (China), CABA (Argentina), Chile, Colombia, Indonesia and Peru, more than 40% of the variation in students' socio-economic status lies between schools, whereas in Albania, Finland, Iceland, Kosovo, Montenegro, Norway and Sweden, less than 15% of the variation lies between schools (Table I.6.10).

Figure I.6.11 ■ **Variation in science performance between and within schools**



Countries and economies are ranked in descending order of the between-school variation in science performance, as a percentage of the total variation in performance across OECD countries.

Source: OECD, PISA 2015 Database, Table I.6.9.

StatLink http://dx.doi.org/10.1787/888933432794

Figure I.6.12 shows the mean performance of students attending schools with varying socio-economic profiles across countries. Socio-economically disadvantaged schools are defined as schools in the bottom quarter of the distribution of the school-level PISA index of economic, social and cultural status within each country/economy; advantaged schools are defined as those in the top quarter of the distribution of the index. On average across OECD countries, students attending advantaged schools have a mean performance of 546 points in science, while students in disadvantaged schools have a mean performance of 442 points. This implies an average difference across OECD countries of 104 score points in science between students attending the two types of school. This difference is larger than 160 score points in Bulgaria, Hungary and the Netherlands, and ranges between 140 and 160 score points in Belgium, B-S-J-G (China), Germany, Malta, the Slovak Republic, Slovenia, and Trinidad and Tobago. In all of these countries/economies, students attending advantaged schools score well above the OECD average in science, but the mean performance of 15-years-olds attending disadvantaged schools is at least 50 points lower than the OECD average (Table I.6.11).

By contrast, in 18 countries and economies, less than 70 score points separate the mean performance of students attending advantaged and disadvantaged schools. And in some of these countries and economies, students in disadvantaged schools score high by international standards. For instance, in Macao (China), these students score 512 points in science, on average, while their peers in advantaged schools score 25 points higher. In Finland, students in disadvantaged schools score 511 points in science, on average, while their peers in advantaged schools score 45 points higher; in Estonia, disadvantaged students score 509 points in science, 64 points below their peers in advantaged schools (Table I.6.11). This shows that some high-performing schools systems also achieve a high level of fairness as measured by a weak relationship between the concentration of socio-economic disadvantage in schools and poor performance.

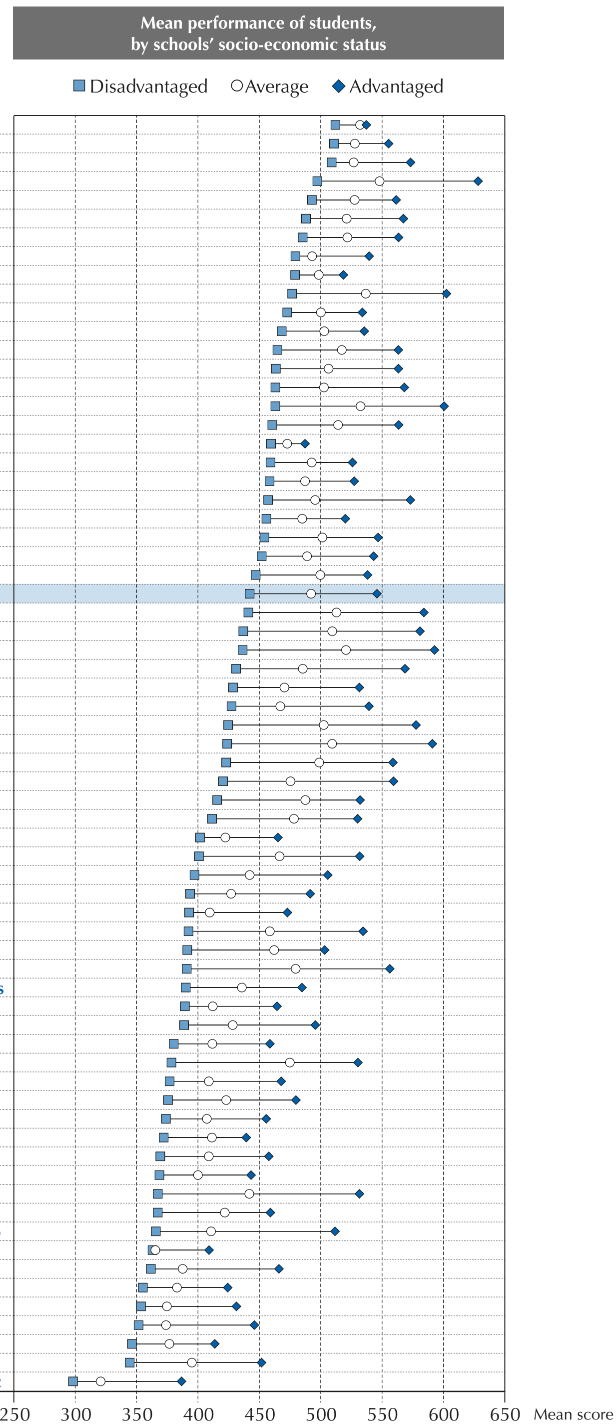
That some school systems are better than others at weakening the relationship between disparities in performance and the socio-economic composition of schools is also illustrated by Figure I.6.13, which shows the overall levels of variation in performance found between and within schools and the proportion of these differences that is explained by students' and schools' socio-economic profile. On average across OECD countries, 62.6% of the performance differences observed across students in different schools can be accounted for by the socio-economic status of students and schools, whereas only 3.8% of the performance differences among students attending the same school is associated with their socio-economic status (Table I.6.12a). In reading and mathematics, the socio-economic profile of students and schools explains a similar share of the differences in performance found between and within schools (Tables I.6.12b and I.6.12c). While socio-economic status explains a larger share of the performance differences between schools, it is important to note that these differences represent, on average, slightly less than a third (30.1%) of the overall level of variation in performance in science across OECD countries (Table I.6.9).

Socio-economic equity between schools is greater in countries with greater equity in outcomes, in general, as measured by the strength of the relationship between performance and socio-economic status and the proportion of variation in performance observed between rather than within schools. This is the case of school systems with high average science performance, such as Estonia, Finland, Macao (China), Norway and Viet Nam. In all of these countries/economies, less than 50% of between-school differences in performance – which in turn are below the OECD average as a share of the overall level of variation – is explained by socio-economic disparities among students and schools. By contrast, socio-economic disparities are closely associated with performance differences in CABA (Argentina), Belgium, the Czech Republic, Hungary, Luxembourg and Peru, where more than 75% of the between-school variation in performance – which in turn is above the OECD average as a share of the overall level of variation, except in Peru – is explained by the socio-economic profile of students and schools.

Generally, the higher the level of variation in performance, either between or within schools, the higher the percentage of that variation that is accounted for by socio-economic status. However, countries and economies with similar levels of variation in performance between schools can differ notably in this respect. For instance, in both Italy and Chinese Taipei, between-school variation in performance is about 10 percentage points higher than the OECD average, but the share of that variation that is explained by socio-economic status is 20 percentage points lower in Italy than in Chinese Taipei. Similarly, socio-economic status is a weaker predictor of between-school performance differences in the United States than in New Zealand, two countries with a between-school level of variation that is about 10 percentage points lower than the OECD average (Tables I.6.9 and I.6.12a). From an equity point of view, both the overall level of variation in performance and the proportion of variance explained by socio-economic status are important. These indicators can provide guidance to policy makers about whether to focus efforts on reducing overall variation or weakening the impact of socio-economic disparities.

Figure I.6.12 ▪ Science performance of students in socio-economically advantaged, average and disadvantaged schools

	Average socio-economic status of students attending a…		
	Disadvantaged school[1]	Average school[2]	Advantaged school[3]
Macao (China)	-1.06	-0.65	0.18
Finland	-0.11	0.23	0.66
Estonia	-0.44	0.04	0.56
Singapore	-0.51	-0.04	0.72
Canada	0.05	0.54	0.99
Viet Nam	-2.63	-1.95	-0.94
Hong Kong (China)	-1.05	-0.63	0.16
Poland	-0.85	-0.41	0.11
Norway	0.14	0.48	0.83
Japan	-0.63	-0.19	0.27
Denmark	0.09	0.60	1.08
Ireland	-0.29	0.13	0.66
Korea	-0.59	-0.22	0.25
Australia	-0.30	0.28	0.80
United Kingdom	-0.31	0.18	0.77
Chinese Taipei	-0.72	-0.23	0.33
New Zealand	-0.28	0.15	0.62
Iceland	0.35	0.75	1.07
Spain	-1.32	-0.60	0.47
Latvia	-1.04	-0.45	0.20
Switzerland	-0.36	0.09	0.75
Russia	-0.48	0.08	0.49
Portugal	-1.15	-0.43	0.44
Sweden	-0.09	0.31	0.78
United States	-0.61	0.12	0.77
OECD average	-0.62	-0.05	0.57
Slovenia	-0.52	0.00	0.64
Germany	-0.52	0.08	0.75
B-S-J-G (China)	-1.89	-1.19	-0.04
Czech Republic	-0.73	-0.26	0.41
Lithuania	-0.67	-0.05	0.52
Croatia	-0.70	-0.30	0.32
Belgium	-0.49	0.18	0.79
Netherlands	-0.31	0.15	0.64
Austria	-0.48	0.07	0.71
Luxembourg	-0.58	0.00	0.92
Italy	-0.69	-0.08	0.58
CABA (Argentina)	-1.17	0.09	1.01
Moldova	-1.29	-0.72	-0.03
Israel	-0.38	0.18	0.66
Chile	-1.36	-0.55	0.51
Romania	-1.17	-0.64	0.13
Thailand	-1.99	-1.33	-0.25
Slovak Republic	-0.82	-0.08	0.55
Greece	-0.72	-0.07	0.56
Hungary	-1.03	-0.23	0.58
United Arab Emirates	0.03	0.50	0.96
Costa Rica	-1.62	-0.90	0.22
Uruguay	-1.46	-0.92	0.19
Mexico	-2.22	-1.24	-0.18
Malta	-0.61	-0.10	0.61
Colombia	-1.82	-1.08	0.04
Turkey	-2.23	-1.44	-0.61
Georgia	-0.96	-0.35	0.33
Jordan	-1.06	-0.45	0.26
Montenegro	-0.61	-0.19	0.30
Indonesia	-2.72	-1.97	-0.80
Bulgaria	-0.86	-0.07	0.65
Qatar	0.09	0.63	1.00
Trinidad and Tobago	-0.73	-0.28	0.34
Algeria	-1.81	-1.35	-0.61
Brazil	-1.76	-1.04	-0.01
Tunisia	-1.63	-0.88	0.06
FYROM	-0.71	-0.26	0.30
Lebanon	-1.48	-0.60	0.27
Kosovo	-0.60	-0.15	0.32
Peru	-2.19	-1.10	0.07
Dominican Republic	-1.57	-1.00	-0.06



1. A socio-economically disadvantaged school is a school in the bottom quarter of the distribution of the school-level PISA index of economic, social and cultural status (ESCS) within each country/economy.
2. A socio-economically average school is a school in the second and third quarters of the distribution of the school-level PISA ESCS index within each country/economy.
3. A socio-economically advantaged school is a school in the top quarter of the distribution of the school-level PISA ESCS index within each country/economy.

Note: Only countries with available data are shown.

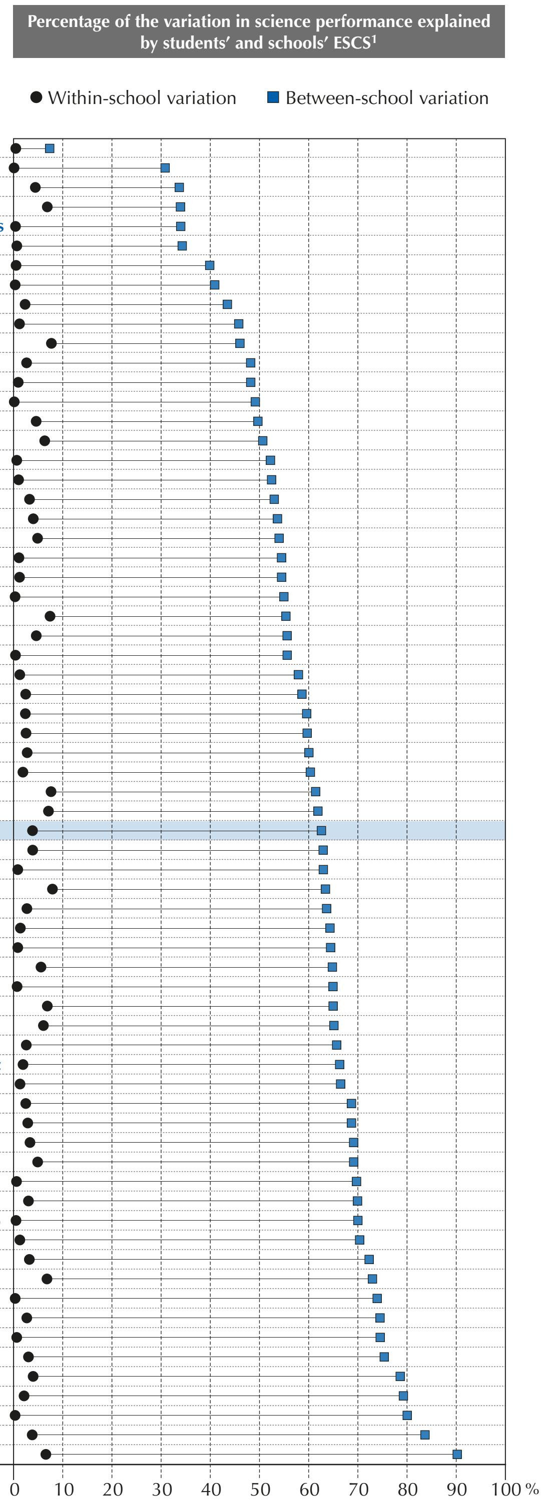
Countries and economies are ranked in descending order of the mean performance in science of students attending disadvantaged schools.

Source: OECD, PISA 2015 Database, Table I.6.11.

StatLink http://dx.doi.org/10.1787/888933432803

Figure I.6.13 ■ Performance differences between and within schools explained by students' and schools' socio-economic profile

Within-school variation as a percentage of the average total variation in science performance across OECD countries	Between-school variation as a percentage of the average total variation in science performance across OECD countries	
55	17	Macao (China)
37	17	Algeria
57	21	Jordan
95	8	Norway
64	46	United Arab Emirates
66	43	Qatar
49	44	Lebanon
50	22	Hong Kong (China)
63	15	Russia
39	26	Viet Nam
93	8	Finland
71	17	Estonia
40	17	Kosovo
33	37	Turkey
92	4	Iceland
77	12	Denmark
30	18	Tunisia
53	40	Italy
71	21	Georgia
80	14	Canada
87	21	United States
56	22	FYROM
40	17	Mexico
46	24	Thailand
69	42	Switzerland
67	16	Moldova
31	22	Indonesia
55	36	Brazil
61	12	Latvia
61	31	Lithuania
78	46	Israel
60	33	Greece
42	27	Romania
76	12	Ireland
74	12	Spain
69	**30**	**OECD average**
92	25	Australia
54	42	Japan
77	13	Poland
75	25	Korea
49	24	Colombia
48	65	Netherlands
78	42	Singapore
56	63	B-S-J-G (China)
96	18	Sweden
73	22	Portugal
56	33	Croatia
38	22	Dominican Republic
50	31	Chile
59	46	Austria
54	30	Uruguay
86	24	United Kingdom
109	47	Malta
60	21	Montenegro
39	16	Costa Rica
45	52	Trinidad and Tobago
59	47	Slovak Republic
70	40	Chinese Taipei
99	21	New Zealand
51	48	Slovenia
61	48	Germany
56	59	Bulgaria
55	44	Czech Republic
61	49	Belgium
42	24	Peru
46	57	Hungary
53	29	CABA (Argentina)
75	39	Luxembourg



1. ESCS refers to the PISA index of economic, social and cultural status.

Countries are ranked in ascending order of the percentage of between-school variation in science performance explained by the PISA index of economic, social and cultural status.

Source: OECD, PISA 2015 Database, Tables I.6.9 and I.6.12a.

StatLink http://dx.doi.org/10.1787/888933432819

Differences in access to educational resources, grade repetition and enrolment in vocational tracks related to socio-economic status

A potential source of inequity in learning opportunities and outcomes lies in the distribution of resources across students and schools. A positive relationship between the socio-economic profile of schools and the quantity or quality of resources means that advantaged schools benefit from more or better resources; a negative relationship implies that more or better resources are devoted to disadvantaged schools. No relationship between the two implies that schools attended by disadvantaged students are as likely to have access to better or more resources as schools attended by advantaged students.

PISA 2015 provides two summary measures of the availability of educational resources at the school level: the index of shortage of educational material and the index of shortage of educational staff. Both indices combine school principals' responses to questions about whether their school's capacity to provide instruction is hindered by a shortage or inadequacy of either material resources (e.g. textbooks, IT equipment, laboratory material or physical infrastructure) or human resources (including both teaching and assisting staff).[17]

Figure I.6.14 shows differences in the mean values of the indices of shortage of educational material and educational staff between socio-economically advantaged and disadvantaged schools across countries and economies participating in PISA 2015. Negative differences imply that principals in disadvantaged schools perceive the amount and/or quality of resources in their schools as an obstacle to providing instruction to a greater extent than principals in advantaged schools; positive differences mean that the perception of having inadequate resources is more common among principals of schools with a more privileged socio-economic intake.

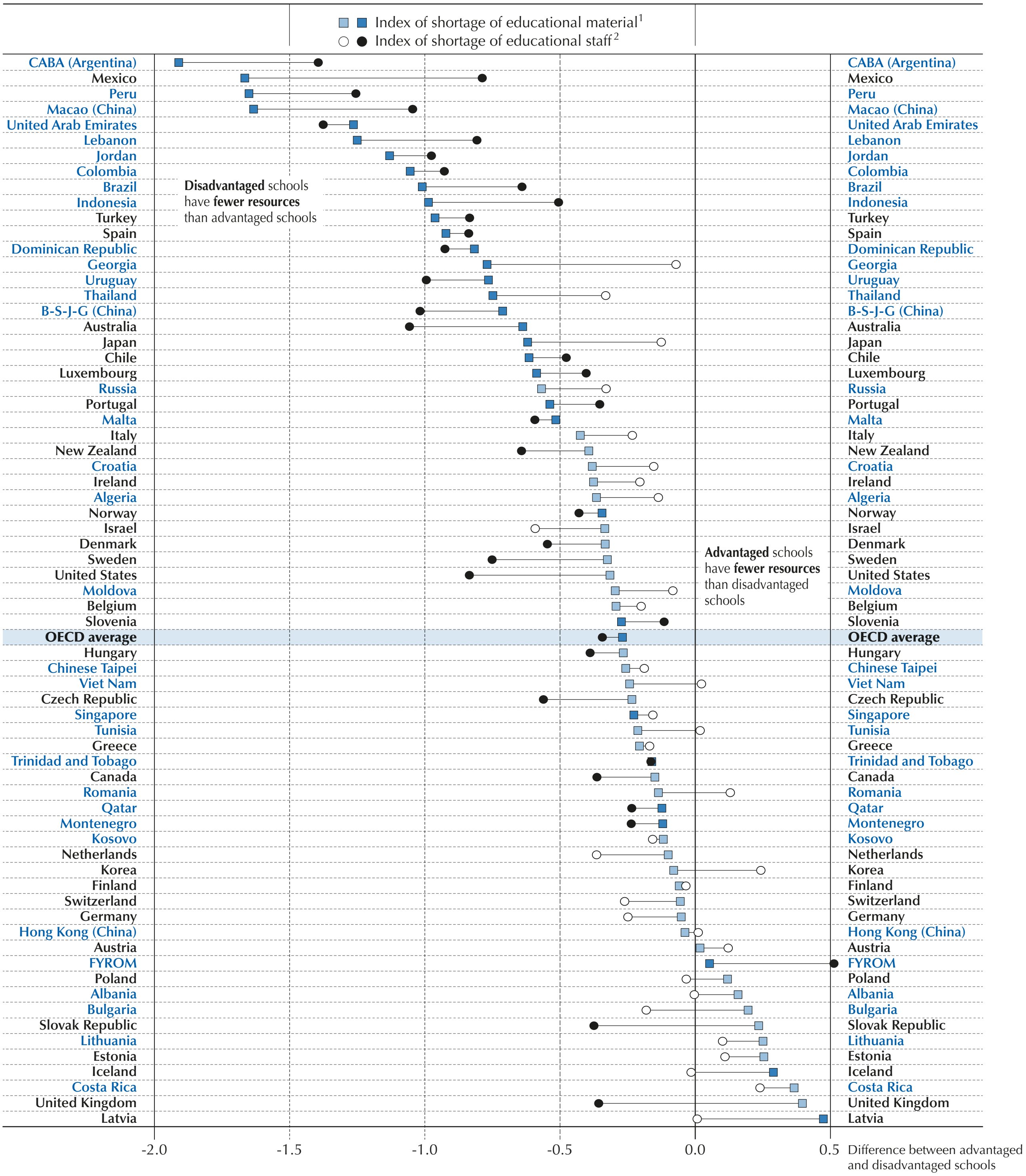
Results suggest that, in a large number of countries, access to educational resources at the school level is unequally distributed between students with the highest and lowest socio-economic status within each country and economy. According to school principals' reports, in 31 countries/economies, students in advantaged schools have access to better educational material resources than their peers in disadvantaged schools; in 36 countries and economies, students in advantaged schools have greater access to education staff than do disadvantaged students. The largest disparities in the perceived quality of material resources between schools with different socio-economic profiles are observed in CABA (Argentina), Lebanon, Macao (China), Mexico, Peru and the United Arab Emirates. By contrast, in FYROM, Iceland and Latvia, 15-year-olds attending disadvantaged schools enjoy greater access to educational resources than their peers in advantaged schools. And in about half of the countries and economies that participated in PISA 2015, students in disadvantaged schools appear no more likely than students in advantaged schools to have access to better or more resources (Table I.6.13). The relationship between access to educational resources and student performance is analysed in Chapter 6 of Volume II.

Equity in education opportunities for students of different socio-economic backgrounds can also be related to the policies adopted by school systems to sort and select students. One of these policies is grade repetition, the practice of requiring students to remain in the same grade for an additional school year, generally with the objective to give struggling students more time to master grade-appropriate content before they move on to more advanced coursework. However, research consistently finds that grade repetition is ineffective in equalising student performance because students who are retained tend to experience achievement losses relative to those not being retained (Jimerson, 2001; Choi et al., 2016; Fruehwirth, Navarro and Takahashi, 2016). While students are mainly retained in their grade progression on the basis of performance, students' backgrounds can also be related to the likelihood of repeating a grade.

Indeed, based on students' self-reports about grade repetition, Figure I.6.15 shows that, across OECD countries, disadvantaged students are about 80% more likely to have repeated a grade either in primary or secondary school than advantaged students, even after accounting for their performance in two assessment domains.

The increased likelihood of grade repetition among disadvantaged students compared with their advantaged peers, and after taking performance into account, is observed in 33 out of the 72 countries and economies that participated in PISA 2015. Differences in this likelihood are largest in CABA (Argentina), Portugal, the Slovak Republic, Spain, Uruguay and Viet Nam – where 15-year-olds in the bottom quarter of the PISA index of economic, social and cultural status are at least three-and-a-half times more likely than 15-year-olds in the top quarter of the index to have repeated a grade. The opposite pattern, a higher likelihood of grade repetition among advantaged students, is observed in only three countries: Korea, Malta and Singapore. Overall, the relative likelihood of having repeated a grade based on socio-economic status is only weakly correlated (r=.29) with the overall incidence of grade repetition in each school system (Table I.6.14).

Figure I.6.14 ■ **Differences in educational resources between advantaged and disadvantaged schools**



1. The index of shortage of educational material is measured by an index summarising school principals' agreement with four statements about whether the school's capacity to provide instruction is hindered by a lack of and/or inadequate educational materials, including physical infrastructure.

2. The index of shortage of educational staff is measured by an index summarising school principals' agreement with four statements about whether the school's capacity to provide instruction is hindered by a lack and/or inadequate qualifications of the school staff.

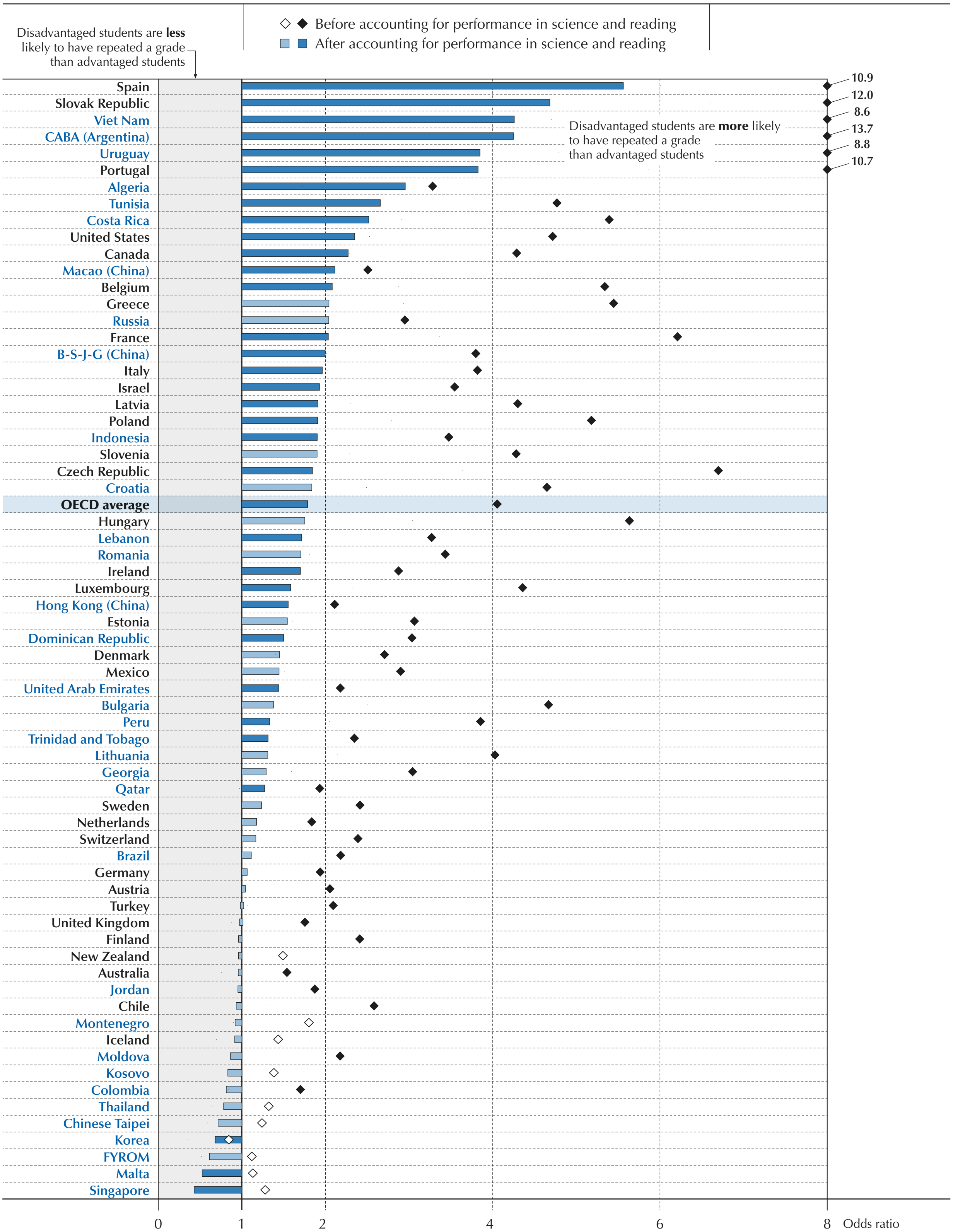
Note: Statistically significant differences between advantaged and disadvantaged schools are marked in a darker tone (see Annex A3).

Countries and economies are ranked in ascending order of the difference in index of shortage of educational material between advantaged and disadvantaged schools.

Source: OECD, PISA 2015 Database, Table I.6.13.

StatLink http://dx.doi.org/10.1787/888933432823

Figure I.6.15 ■ **Increased likelihood of grade repetition, by students' socio-economic status**



Note: Statistically significant values are marked in a darker tone (see Annex A3).
Countries and economies are ranked in descending order of the likelihood for disadvantaged students to have repeated a grade, relative to advantaged students, after accounting for socio-economic status.
Source: OECD, PISA 2015 Database, Table I.6.14.
StatLink http://dx.doi.org/10.1787/888933432839

Differences in student performance in science related to socio-economic status can also be rooted in disparities in the amount of time devoted to learning science in school, as learning time is a major component of opportunity to learn (OECD, 2016b). PISA 2015 asked students how many regular science lessons they are required to attend per week and how much time they spend in science lessons per week. On average across OECD countries, the percentage of advantaged students who attend at least one science lesson per week is 3.4 percentage points higher than that among disadvantaged students, even if more than nine in ten students in both groups take science courses every week. However, in Austria, Belgium, Croatia and FYROM, the difference ranges between 10 and 20 percentage points, and in another 15 countries and economies, it ranges between 5 and 10 percentage points (Table I.6.15). In addition, advantaged students tend to spend about 35 more minutes every week in regular school science lessons, on average across OECD countries (Table I.6.15). Given an average school year of 37 weeks across OECD countries (OECD, 2016c, Table D1.2), the average cumulative additional exposure to science lessons for advantaged students, compared to disadvantaged students, would amount to more than 20 hours per school year.

Arguably, differences in instruction time in science can translate into significant differences in performance on the PISA science assessment and in science-related attitudes. As shown in Chapter 2 of Volume II, students who are not required to attend science lessons score 25 points lower in science than students who are required to attend at least one science lesson per week, on average across OECD countries, and after accounting for the socio-economic status of students and schools. Likewise, the likelihood of expecting to work in a science-related occupation by age 30 is almost two-and-a-half times higher for students who are required to attend at least one science course per week than for those who are not, also after accounting for their socio-economic status (Table II.2.3). These results suggest that differences in opportunity to learn contribute to the performance differences between students from different socio-economic backgrounds.

Socio-economic differences in students' opportunity to learn can be related to stratification policies. A case in point is tracking, the practice of sorting students into academic or vocational study programmes. While tracking allows for a better match between students' interests and abilities, and the subjects they study, it can also widen differences in students' exposure to subject-specific content, as subjects might be excluded from or covered in less depth in certain tracks, and receive greater attention in others.

On average across OECD countries, 14.3% of 15-year-old students are enrolled in a vocational track. Among them, 72.5% participate in at least one science lesson per week at school, compared to 95.8% of students enrolled in academic tracks. This means that 15-year-olds enrolled in vocational programmes receive, on average, around 80 minutes less per week of regular science instruction than their peers in academic tracks (Tables I.6.15 and I.6.16). The overall potential impact of these differences in exposure to science courses is limited because of the small proportion of students who are enrolled in vocational tracks, on average across OECD countries. But disadvantaged students are more likely than advantaged students to be affected by this policy. PISA 2015 results find that the likelihood that disadvantaged students are enrolled in a vocational programme, after taking students' science performance into account, is almost three times higher than the likelihood for advantaged students, on average across OECD countries where different study programmes are offered to 15-year-olds (Table I.6.16). Chapter 6 of Volume II examines in greater detail the associations between stratification policies and student performance.

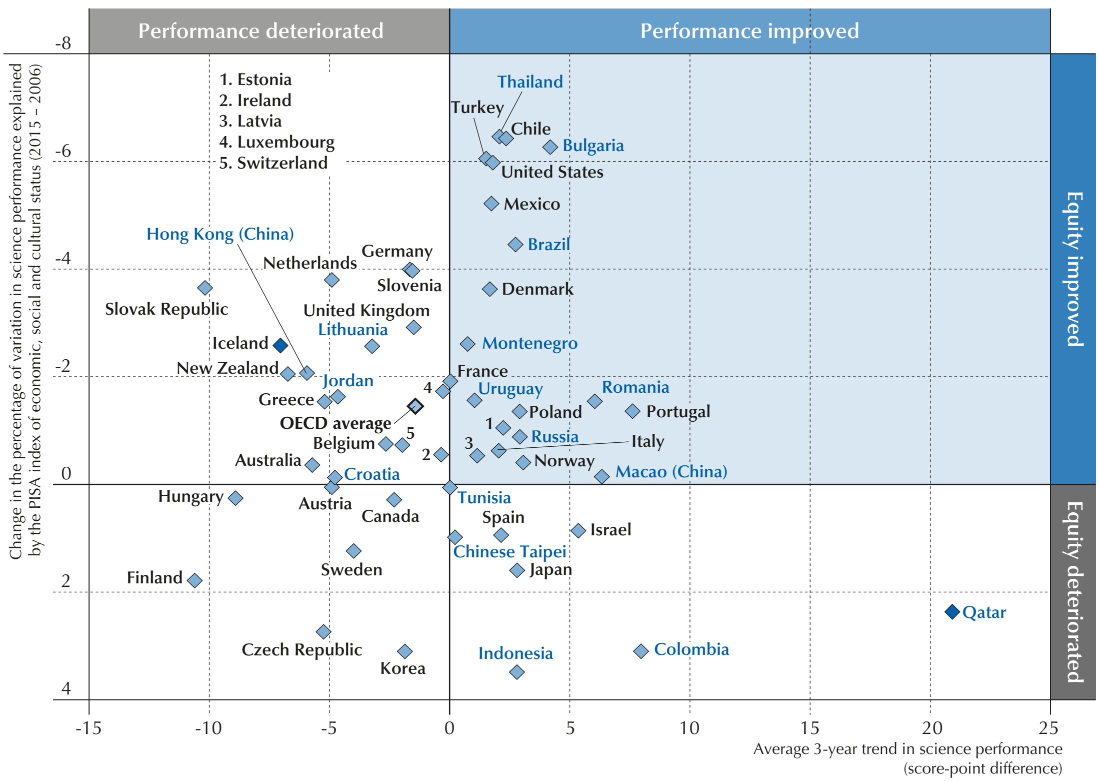
TRENDS IN EQUITY IN EDUCATION

By analysing data across different PISA assessments, it is possible to identify those school systems that have become more or less equitable over time, and whether trends in equity are commensurate with trends in performance. In this chapter, trends in equity are analysed by comparing the evolution of some key equity indicators between PISA 2006 and PISA 2015, two rounds of PISA when science was the major domain of assessment.

In 2006, on average across OECD countries, 14.4% of the variation in students' science performance could be explained by students' socio-economic status (the strength of the socio-economic gradient). A one-unit change in the PISA index of economic, social and cultural status – which corresponds to the difference between students with average socio-economic status and disadvantaged students – was associated with a difference in science performance of 39 score points (the slope of the socio-economic gradient). By 2015, the degree to which students' socio-economic status predicted performance in science decreased to 12.9% – a drop of 1.4 percentage points – while the difference in performance between students who were one unit apart on the ESCS index decreased to 38 score points – a minimal drop of 1 point (Table I.6.16).

Figure I.6.16 presents changes in the strength of the socio-economic gradient against average three-year trends in science performance between 2006 and 2015. Over this period, the strength of the gradient decreased by more than three percentage points in eight countries that also managed to maintain their average performance: Brazil, Bulgaria, Chile, Denmark, Germany, Slovenia, Thailand and the United States. In these countries, students' socio-economic status became a less reliable predictor of achievement as there was no significant change in performance.

Figure I.6.16 ■ **Change between 2006 and 2015 in the strength of the socio-economic gradient and average 3-year trend in science performance**



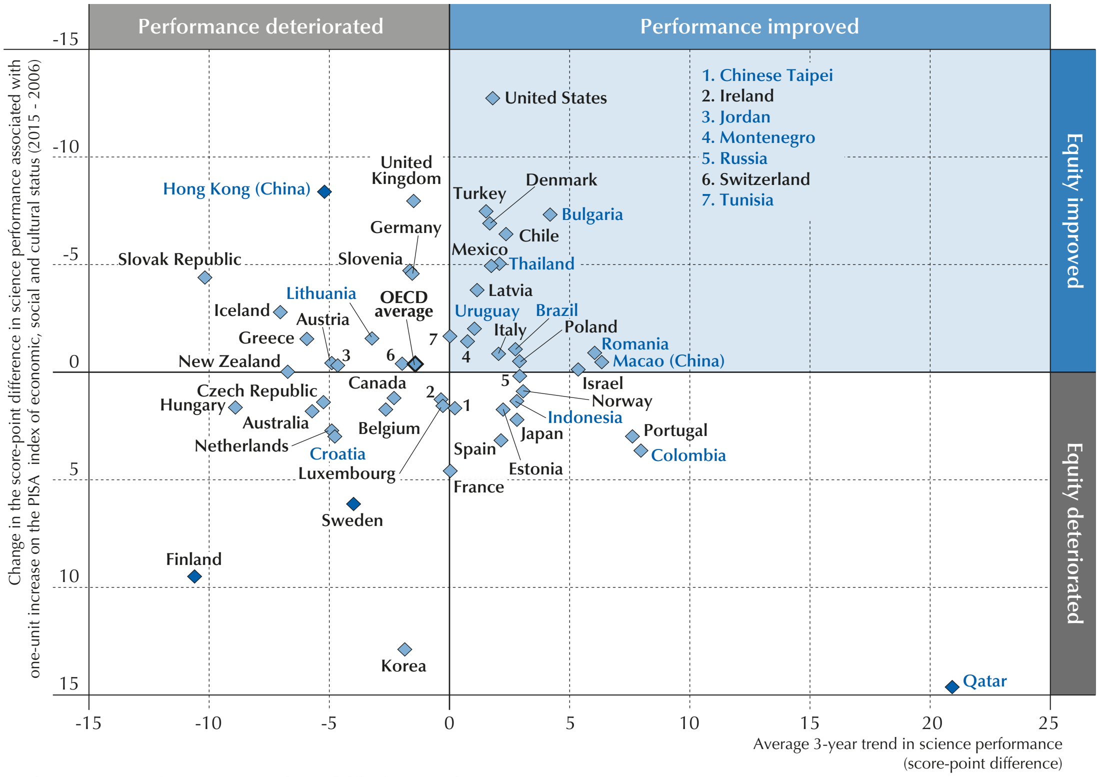
Notes: Only countries and economies with available data are shown.
Changes in both equity and performance between 2006 and 2015 that are statistically significant are indicated in a darker tone (see Annex A3).
The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. This model takes into account that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
Source: OECD, PISA 2015 Database, Table I.6.17.
StatLink http://dx.doi.org/10.1787/888933432843

Figure I.6.17 shows changes in the slope of the socio-economic gradient alongside average three-year trends in science performance. Between PISA 2006 and PISA 2015, in Chile, Denmark, Mexico, Slovenia, Turkey, the United Kingdom and the United States, the average impact of students' socio-economic status on performance weakened by more than four score points while mean science achievement did not decline. In these countries, average differences in performance between students with different socio-economic status shrank even as overall performance remained stable.

Chile, Denmark, Mexico, Slovenia and the United States appear in the upper-right quadrants of both figures; these are countries that achieved improvements in equity between 2006 and 2015, as measured by both the strength and the slope of the socio-economic gradient, without compromising their average performance in science.

The largest reduction in the average impact of socio-economic status on science performance – by 13 score points – is observed in the United States, where the percentage of variation explained by students' socio-economic status also decreased by 6 percentage points. In addition, between 2006 and 2015, the percentage of resilient students grew from 25.0% to 31.6%. Trends in science literacy and equity in the United States are examined in greater detail in a special report that draws comparisons with other countries/economies with above-average performance and equity in PISA 2015 (OECD, 2016d).

Figure I.6.17 ■ **Change between 2006 and 2015 in the slope of the socio-economic gradient and average 3-year trend in science performance**



Notes: Only countries and economies with available data are shown.
Changes in both equity and performance between 2006 and 2015 that are statistically significant are indicated in a darker tone (see Annex A3).
The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. This model takes into account that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
Source: OECD, PISA 2015 Database, Table I.6.17.

StatLink http://dx.doi.org/10.1787/888933432855

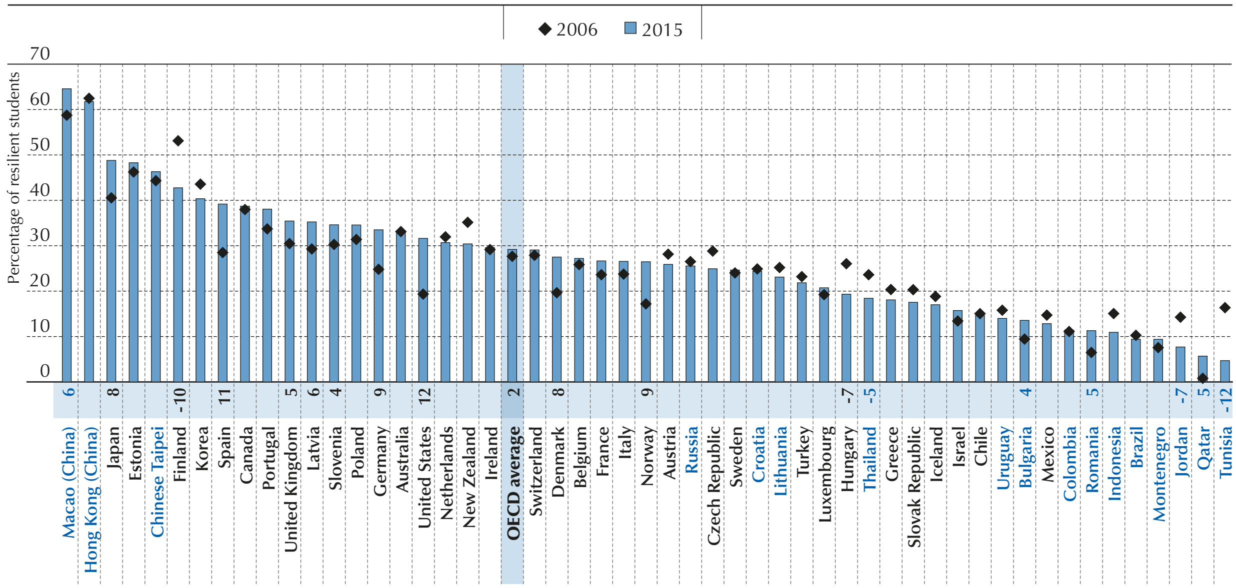
Colombia, Israel, Macao (China), Portugal and Romania managed to improve their average science performance while maintaining equity levels.

Overall, trend analyses looking at the evolution of science performance and the socio-economic gradient in PISA-participating countries and economies show that school systems succeeded in improving performance while maintaining equity levels, or vice versa. However, between PISA 2006 and PISA 2015, no country or economy improved its performance in science while simultaneously weakening the socio-economic gradient.

A different indicator of whether countries and economies are moving towards more equitable school systems are trends in student resiliency. Resilient students are disadvantaged students within their countries and economies who beat the socio-economic odds against them and perform in the top quarter of students across all participating countries and economies after taking socio-economic status into account. Countries and economies in which the proportion of students who are resilient is growing are those that are improving the chances for disadvantaged students to become high achievers.

Figure I.6.18 shows that, on average across OECD countries, the percentage of resilient students increased from 27.7% in 2006 to 29.0% in 2015 (Table I.6.7). A negative trend in student resiliency is observed in 5 of the 53 countries and economies for which data are available, with reductions of more than 10 percentage points in Finland and Tunisia, and between 5 and 10 percentage points in Hungary, Jordan and Thailand. Over this period, some of these countries also saw increases in the percentage of low performers, negative or stable trends in the strength and slope of the socio-economic gradient, and a decline in mean science performance (Table I.6.16).

Figure I.6.18 ▪ **Change between 2006 and 2015 in student resiliency[1]**



1. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and performs in the top quarter of students among all countries/economies, after accounting for socio-economic status.

Notes: Only countries/economies with available data are shown. The percentage-point difference between 2006 and 2015 in the share of resilient students is shown next to the country/economy name. Only statistically significant differences are shown (see Annex A3).

Countries and economies are ranked in descending order of the percentage of resilient students in 2015.

Source: OECD, PISA 2015 Database, Table I.6.7.

StatLink http://dx.doi.org/10.1787/888933432860

By contrast, some countries with large improvements in student resiliency – Macao (China), Qatar and Romania – also managed to reduce the percentage of students performing below Level 2 and maintain or improve their average performance. Trends in resiliency are correlated with trends in the proportion of low performers – who, as discussed in previous sections, tend to come from disadvantaged backgrounds. This suggests that policies aimed at helping disadvantaged students thrive academically need not be at odds with policies that target low performance, regardless of students' socio-economic status.

Notes

1. Applications of equality of opportunity or fairness that rely on the distinction between "circumstances" and "effort" assume that the influence of these two sets of factors can be disentangled. However, the approach adopted here acknowledges that societies and cultures differ in where they draw the line between effort and circumstances, and that such a distinction is a social and cultural decision, rather than an ontological one. Views of equality of opportunity typically differ with respect to the point after which they hold individuals accountable for their economic and social achievements. A pragmatic view of equality of opportunity accepts that each society may determine the precise indicators that reflect circumstances and effort in its own way.

2. Defined in this way, fairness differs from equality of opportunity understood as equal treatment or lack of discrimination in the competition for valued resources or positions (e.g. admission to university, jobs) among people with the same relevant skills/abilities. While the latter remains a basis for non-discriminatory policies, it does not account for the fact that the process of skill development and the distribution of skills across the population (e.g. at age 15) can be themselves socially conditioned and subject to the influence of "circumstances". Therefore, considerations of fairness do not only concern situations where individuals have similar skills, but also, and in the first place, differential opportunities for acquiring skills.

3. This may involve compensatory mechanisms in the allocation of resources, so that education systems reduce pre-existing inequalities among students from different backgrounds in their chances to succeed academically. It also follows that inequalities in outcomes (e.g. performance) among students of different backgrounds can only be seen as acceptable or fair if they are driven by factors under students' control, such as effort.

4. Science was the major domain of PISA 2015. As explained in Chapter 2, the definition of science literacy in PISA 2015 reflects its intention to assess not only what students know in science, but also what they can do with what they know, and how they can creatively apply scientific knowledge to real-life situations. PISA 2015 provides an overall science scale, which draws on all of the science questions in the assessment, as well as scales for three science competencies, three content areas and three knowledge categories. The metric for the overall science scale is based on a mean for OECD countries of 500 points and a standard deviation of 100 points that were set in PISA 2006 when the science scale was first developed.

5. The PISA performance scale is divided into proficiency levels to help users interpret what student scores mean in substantive terms. For PISA 2015, the range of difficulty of the tasks is represented by seven levels of science proficiency. At Level 2, which corresponds with performance between 410 and 483.9 score points in science, students are able to draw on everyday content knowledge and basic procedural knowledge to identify an appropriate scientific explanation, interpret data, and identify the question being addressed in a simple experimental design. They can use basic or everyday scientific knowledge to identify a valid conclusion from a simple data set. Students at Level 2 also demonstrate basic epistemic knowledge by being able to identify questions that could be investigated scientifically. Proficiency above Level 2 implies a greater mastery of these competencies and types of knowledge.

6. However, this measure does not capture differences between countries in the average socio-economic status of 15-year-olds. As such, it does not reflect how students from different countries and economies differ from each other in terms of their average socio-economic backgrounds.

7. This corresponds to the slope of the socio-economic gradient, which, for science in PISA 2015, varies from 8 to 15 score points. The negative relationship does not mean that more socio-economically diverse countries and economies have a negative slope.

8. See UNESCO Institute of Statistics database at http://data.uis.unesco.org/ (accessed 3 October 2016).

9. Coverage index 3 (CI3) is one of the indices intended to measure PISA population coverage (alongside Coverage index 1 and Coverage index 2). Specifically, CI3 represents the coverage of the national 15-year-old population. It is calculated by P/ST7a_1, where the value ST7a_1 is the entire population of 15-year-olds in each country (enrolled and not enrolled), based on national statistics; and where the value P is the weighted estimate of PISA-eligible non-excluded 15-year-old students from the student sample. Thus P/ST7a_1 indicates the proportion of the national population of 15-year-olds covered by the non-excluded portion of the student sample (see *PISA 2015 Technical Report,* OECD [forthcoming]). Low values of CI3 tend to be mirrored by low values of Coverage index 4 (CI4), which indicates the coverage of the estimated school population, and which takes into account a weighted estimate of PISA-eligible 15-year-old students excluded within schools in each country, and an estimate of the number of 15-year-old students enrolled in each school in the sample, prior to contacting the school to conduct the assessment. Values of CI4 are presented in the *PISA 2015 Technical Report* (OECD, forthcoming).

10. There is a degree of uncertainty surrounding point estimates for CI3. This arises mainly from the fact that its denominator (i.e. the total number of 15-year-olds in the country or economy) is a population estimate typically derived from administrative data sources, therefore subject to non-sampling error and sometimes also to changes in methodology and sources over time. By contrast, the numerator in the calculation of CI3 is a weighted estimate from the PISA sample, subject to sampling error and for which confidence intervals can be computed. For these reasons, it can be difficult to assess whether changes in CI3 over time are statistically significant.

11. The PISA sampling frame allows an overall exclusion rate within a country (i.e. school-level and within-school exclusions combined) of up to 5% below the PISA desired target population (see *PISA 2015 Technical Report,* OECD [forthcoming]).

12. Viet Nam has similar achievements but cannot be characterised as an equitable school system since only 49% of its national population of 15-year-olds is represented by the PISA sample.

13. These results are obtained through quantile regressions of the 10th, 25th, 50th, 75th and 90th percentiles of the distribution of student performance in science on students' socio-economic status; on the method, see Koenker and Hallock (2001).

14. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and performs in the top quarter of residual scores among students from all countries/economies, after accounting for socio-economic status. The procedure for identifying resilient students is as follows: in a first step, a measure of performance adjusted for differences in ESCS across countries is computed through a linear regression of performance on ESCS and a squared transformation of ESCS. International top performers are then defined as those students who are in the top quarter of this adjusted measure among students in all PISA participating countries and economies. In a second step, the disadvantaged students in each country/economy are defined as those students whose ESCS is in the bottom quarter among students in their country/economy. Resilient students are those students who are socio-economically disadvantaged (their socio-economic status is low relative to other students in their own country) and international top performers (their performance is high with respect to all other students in PISA, after accounting for differences in socio-economic status across countries). Therefore, one characteristic of resilient students is that they achieve better performance in PISA than predicted by their socio-economic status.

15. Note that these results also depend on how schools are defined and organised within countries and on the units chosen for sampling purposes. For example, in some countries, some of the schools in the PISA sample were defined as administrative units (even if they spanned several geographically separate institutions, as in Italy; in others they were defined as those parts of larger educational institutions that serve 15-year-olds; in others they were defined as physical school buildings; and in others they were defined from a management perspective). The *PISA 2015 Technical Report* (OECD, forthcoming) provides an overview of how schools were defined in each country and economy. Note also that, because of the manner in which students were sampled, the within-school variation includes variation in performance between classes and grade levels as well as between students in similar classes and grades.

16. In the multilevel analyses carried out to estimate the overall level of variation in performance and its decomposition between and within schools, student final weights were used for Level 1 and school weights were used for Level 2.

17. The indices are constructed to have a mean of zero and a standard deviation of one across OECD countries. Positive values on the indices mean that principals view the amount and/or quality of resources in their schools as an obstacle to provide instruction for their students to a greater extent than the OECD average; inversely, negative values reflect that school principals perceive the lack or inadequacy of resources as an obstacle to instruction to a lesser extent than the OECD average (for more details, see Chapter 6 in Volume II).

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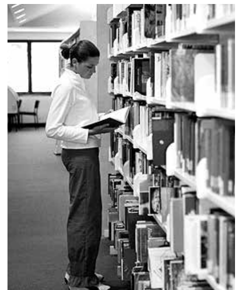


7

Immigrant background, student performance and students' attitudes towards science

This chapter examines differences in performance and attitudes towards science in PISA 2015 by students' immigrant background. It discusses recent trends in immigration in PISA-participating countries and economies, and highlights factors associated with low performance among immigrant students, including the concentration of disadvantage in the schools that many of these students attend.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

How school systems respond to migration can have an enormous impact on the economic and social well-being of all members of the communities they serve, whether they have an immigrant background or not.

The analysis of immigrant students' outcomes in PISA 2015 builds on the equity framework presented in Chapter 6. A first dimension of equity, inclusion, refers to the objective of ensuring that all students, particularly those from disadvantaged or traditionally marginalised groups, reach a baseline level of skills. A second dimension, fairness, relates to removing obstacles to student achievement that are rooted in circumstances over which students have no control – including an immigrant background. Minimising any potentially adverse impact of students' immigrant background on their outcomes at school is not only an imperative for achieving equity in education but also a way of enhancing social cohesion and economic outcomes in host communities. For the children of immigrants, education is a main route towards integration.

What the data tell us

- On average across OECD countries, 12.5% of students in 2015 have an immigrant background, up from 9.4% in 2006. Some 57% of immigrant students who recently arrived in their host communities have at least one parent as educated as the average parent in the host country, but 45% of second-generation and 67% of first-generation immigrant students do not speak the language of the PISA test at home.
- The average difference in science performance between immigrant and non-immigrant students with a similar socio-economic profile is 31 score points. The average difference shrinks to 19 score points after taking into account the language spoken at home.
- On average across OECD countries, and after taking their socio-economic status into account, immigrant students are more than twice as likely as their non-immigrant peers to perform below proficiency Level 2 in science. Yet 24% of socio-economically disadvantaged immigrant students are considered resilient – meaning that they manage to score among the top quarter of all students in PISA.
- On average across countries with relatively large immigrant student populations, attending a school with a high concentration of immigrant students is not associated with lower student performance after accounting for the school's socio-economic intake.
- The average difference in science performance between immigrant and non-immigrant students with similar socio-economic status and familiarity with the test language narrowed by 6 score points between 2006 and 2015.

However, in many countries and economies, no matter their level of achievement as an education system, students with an immigrant background continue to have poorer outcomes in schools than students without an immigrant background (see Box I.7.1 for the definition of immigrant background in PISA). PISA shows that, in most school systems, first-generation immigrant students who have spent more time in the country of destination tend to perform better than those who have spent less time in the country; that second-generation immigrant students tend to perform better than first-generation immigrant students but still worse than their non-immigrant peers; and that the most vulnerable immigrant students tend to be those who arrive at a late age, who have limited mastery of the language of assessment in the host country, and who come from a country where education standards are weaker (OECD, 2015a; OECD, 2013; OECD, 2012). Yet these relationships differ widely across countries.

INCLUSIVE AND FAIR EDUCATION FOR IMMIGRANT STUDENTS

Since PISA 2012, many OECD countries, especially in Europe, have seen a sharp increase in the number of immigrants entering their territories – including unprecedented numbers of asylum-seekers and children. An estimated 5 million permanent migrants arrived to OECD countries in 2015, an increase of about 20% relative to 2014, with family reunification and free movement accounting each for about a third of these permanent entries (OECD, 2016; OECD, 2015b). The recent wave of migration has reinforced a long and steady upward trend in the share of the immigrant population in OECD countries, which has grown by more than 30% and has become increasingly diverse since 2000 (OECD/EU, 2015). Over this period, many former OECD emigration countries, such as Ireland, Italy and Spain, became destination countries; before the global economic crisis, immigration rates in these countries were sometimes as large as those of traditional OECD immigration countries (OECD, 2015b).

Box I.7.1. **Definition of immigrant students in PISA**

PISA classifies students into several categories according to their immigrant background and that of their parents:

Non-immigrant students are students whose mother or father (or both) was/were born in the country or economy where they sat the PISA test, regardless of whether the student himself or herself was born in that country or economy. In this chapter, these students are also referred to as "**students without an immigrant background**".

Immigrant students are students whose mother and father were both born in a country/economy other than that where the student sat the PISA test. In this chapter, they are also referred to as "**students with an immigrant background**". Among immigrant students, a distinction is made between those born in the country/economy of assessment and those born abroad:

- **First-generation immigrant students** are foreign-born students whose parents are also both foreign-born.
- **Second-generation immigrant students** are students born in the country/economy where they sat the PISA test and whose parents are both foreign-born.

In some analyses, these two groups of immigrant students are, for the purpose of comparison, considered along with non-immigrant students. In other cases, the outcomes of first- and second-generation immigrant students are examined separately. PISA also provides information on other factors related to students' immigrant background, including the main language spoken at home (i.e. whether students usually speak, at home, the language in which they were assessed in PISA or another language, which could also be an official language of the host country/economy) or, for first-generation immigrant students, the number of years since the student arrived in the country where he or she sat the PISA test.

Migration puts enormous strains on both host communities and immigrants themselves; but it can also provide new opportunities for countries that face ageing native-born populations and the threat of labour and skill shortages. A lesson from the history of many OECD countries is that successful integration can promote social cohesion and economic and social development in host countries. How education systems respond to immigration has a major impact both on the opportunities offered to immigrants and on immigrants' ability to participate in the labour markets of host countries and to feel part of their communities. In other words, countries' success in integrating immigrant children into society bears a strong connection with the efficacy of social policy in general and education policy in particular. This chapter sheds light on the success of school systems in addressing the challenges of diversity and helping students with an immigrant background develop their skills.

When looking at the outcomes of immigrant students, it is important to highlight that, both within and across countries, immigrant students are a much more diverse than homogeneous population. Students with an immigrant background can differ widely in their country of origin, cultural and language traditions, socio-economic status and the length of time spent in the host country. They also bring a wide range of skills, knowledge and motivations to their schools. While in most OECD countries students with an immigrant background tend to perform worse in PISA than non-immigrant students, in a number of countries the opposite is true. Cross-country variations in the performance of immigrant students, which persists even after accounting for students' socio-economic status, clearly suggests that policy has an important role to play in narrowing those differences.

Research indicates that the education outcomes of immigrant students are shaped by different resources and circumstances associated with both the families and immigrant communities they come from, and the social and education policies, and attitudes towards immigrants, in the countries of destination. In this light, any (dis)advantage that accrues to immigrant students is best understood when compared with the outcomes of non-immigrant youth of similar socio-economic status. In addition, immigrant students' education outcomes are affected by institutional features of the host-country education systems, including early stratification practices (Buchman and Parrado, 2006; Heath and Brinbaum, 2014). More generally, performance differences among immigrant students across countries need to be seen in light of the selectivity of host-country immigration policies and the relative cultural and linguistic similarity between countries of origin and destination. Immigration policies vary widely across PISA-participating countries/economies, contributing to the highly diverse profiles of immigrant student populations and their families (Box I.7.2).

Immigrant students often face the double disadvantage of coming from immigrant and disadvantaged backgrounds. That is, in many cases immigrant students have to overcome cultural and social barriers that compound the effects of socio-economic deprivation, including attending schools with fewer resources and higher concentrations of other disadvantaged students. In addition, immigrant students are, in general, more likely than their non-immigrant peers to be delayed in their progression through school grades and to be enrolled in vocational programmes, which, in turn, can lead to less exposure to some academic content (OECD, 2015a). Looking at how multiple forms of disadvantage influence student performance is also a way of highlighting the resilience of immigrant students and how, despite poverty and unfamiliarity with the prevailing culture, many immigrant 15-year-olds still manage to perform above expectations – and thus boost their potential to make exceptional contributions to their host countries.

Box I.7.2. **The impact of immigration policies on the immigrant student population**

In most PISA-participating countries/economies, immigrant students perform below their non-immigrant peers. However, these performance differences must be interpreted in the context of the profile of the immigrant student population, which is shaped by the immigration policies in each country/economy. For example, immigration is a relatively new phenomenon in some countries, while it has been a feature of other countries for decades. In these latter countries, many immigrant students may be second- or third-generation immigrants, and there may be more mechanisms in place to integrate immigrants than found in countries that have only recently started receiving immigrants.

The criteria used for admitting immigrants into countries vary considerably. Some countries give preferential admission to the highly educated, while others accept a greater share of low-skilled immigrants or humanitarian migrants, refugees and asylum-seekers. Parents who are more educated might value education more for their own children and may be better placed to assist with homework or navigate the host country's education system, facilitating their children's academic success. In addition, countries/economies differ markedly in the composition of their immigrant populations. Migrants often choose destinations that have colonial, linguistic or cultural links with their home country or where there is a large community of their compatriots; some may choose to move to countries closer to home.

Across most countries and economies, immigrant populations are far from homogeneous. The diversity of immigrants' geographic and cultural origins is usually mirrored in linguistic diversity: large numbers of immigrant students speak at home a language different from the language of instruction in the host community's schools. OECD countries (and several partner countries and economies) can be grouped into a few categories according to the characteristics of their immigrant populations. Among countries with large immigrant populations, five such groups can be identified:

1. **Settlement countries** where immigration has contributed to the country's development and is considered to be part of its heritage and history. Approximately one in two people is either foreign-born or has at least one foreign-born parent, and there are large proportions of highly educated immigrants. These countries include Australia, Canada, Israel and New Zealand.

2. **Long-standing destination countries with many recent and highly educated immigrants**. These countries include Luxembourg, Switzerland and the United Kingdom, where many recent immigrants arrived through free movement in the EU/EFTA for labour purposes. The United States can also be included in this group of countries, although its more recent arrivals include large numbers of low-educated immigrants from Latin America.

3. **Long-standing destination countries with many settled, low-educated migrants**. Guest workers came to these countries after World War II for what were often supposed to be temporary stays; but many settled permanently. There are many second- and third-generation immigrant children and relatively fewer numbers of new immigrants. Immigrant adults have relatively poor employment rates and are socially disadvantaged compared to the native population. This group of countries includes Austria, Belgium, France, Germany and the Netherlands.

...

4. **Countries with large populations of recent and humanitarian immigrants**. Much of the immigrant population arrived after 2000 and the vast majority did not speak the language of the destination country upon arrival. Immigrants in these countries tend to be disadvantaged compared to the non-immigrant population; but these host countries have strong integration policies. These countries include Denmark, Finland, Norway and Sweden.
5. **New destination countries with large populations of low-educated immigrants**. These migrants came to fill low-skilled, manual labour jobs and arrived in significant numbers in the early 2000s. Most of them are either young and childless or have left their children in their home countries. The immigrant children who have grown up in these destination countries tend to have poorer outcomes than their native-born peers. Greece, Italy, Portugal and Spain are included in this group.

Among countries with smaller numbers of immigrants, relative to the native-born population, another three groups can be distinguished:

6. **New destination countries with many recent, highly educated immigrants**. These countries have received increasing numbers of labour migrants, especially in the past decade, many of whom are highly skilled and come from high-income countries. Overall integration outcomes tend to be good relative to other new destination countries, although many highly educated immigrants are considered to be overqualified in the labour market. These countries include Iceland, Ireland and Malta.
7. **Countries with an immigrant population shaped by border changes and/or by national minorities**, where the majority of the foreign-born population came to be considered so as a result of border changes or nation-building in the late 20th century, mainly in Central and Eastern Europe. This immigrant population is an ageing group with social and economic outcomes that are often similar to, if not better than, those of their native-born peers. Countries in this group include Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic and Slovenia.
8. **Emerging destination countries with small immigrant populations.** This group of countries is made up of OECD countries where less than 2% of the population is foreign-born, but where the share of foreign-born residents has more than doubled since 2000 and where integration outcomes vary widely. Countries in this group include Bulgaria, Chile, Japan, Korea, Mexico, Romania and Turkey.

Even within groups of countries in similar circumstances, there are wide disparities in integration outcomes. This suggests that policies have a key role to play. Integration policies, and extra support targeted towards immigrant families and children, can make a significant difference in how immigrant students fare in their host communities.

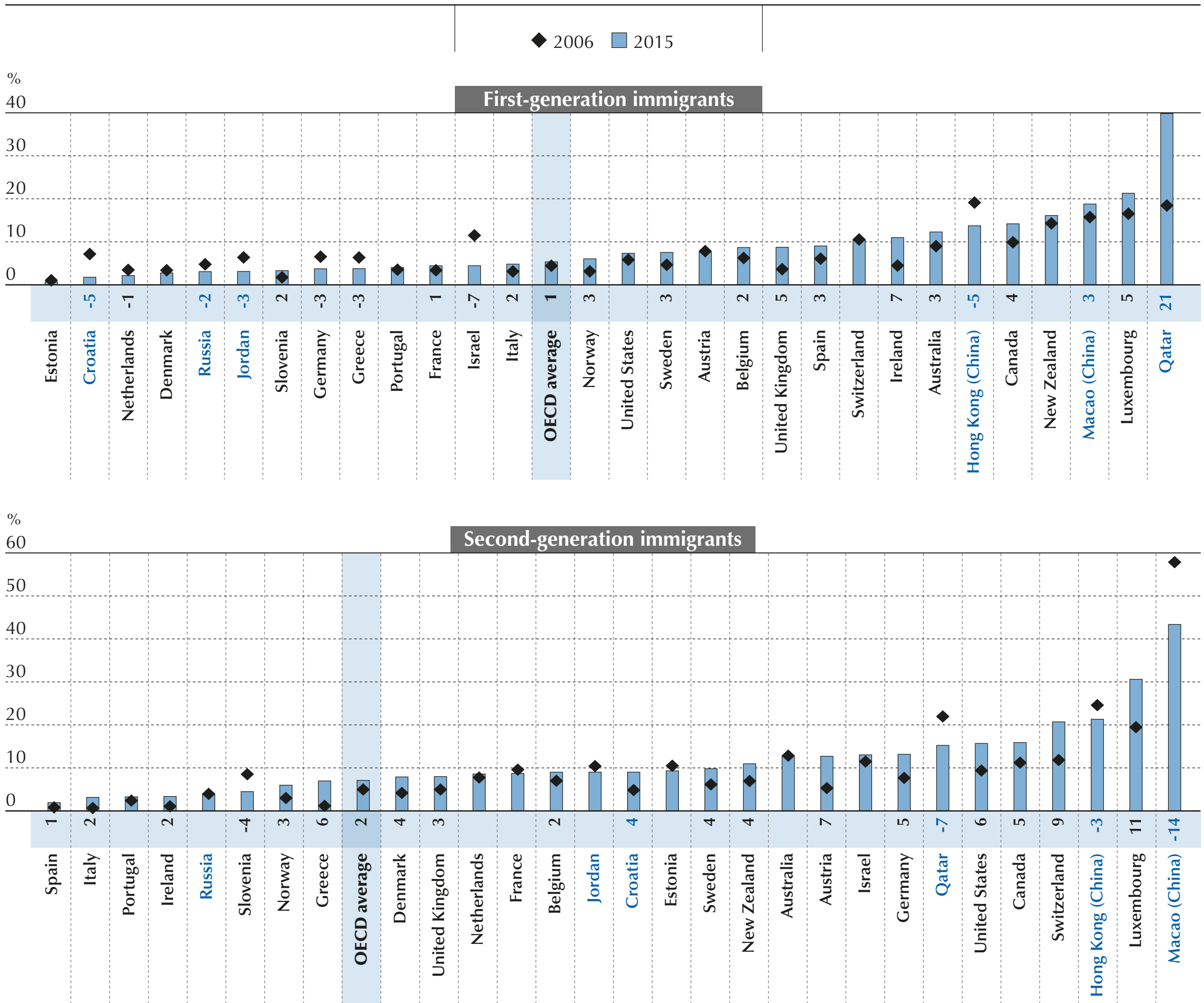
Sources: OECD/European Union (2015).

A PROFILE OF IMMIGRANT STUDENTS IN PISA 2015

Global migration flows are profoundly changing the typical classroom in many PISA-participating countries and economies. But immigration is not affecting all countries the same way, neither in its overall magnitude nor in the share of first- and second-generation immigrant students.[1] Figure I.7.1 shows that the percentage of 15-year-olds students with an immigrant background grew from 9.4% to 12.5% between 2006 and 2015, on average across OECD countries. About two-thirds of this growth comes from the increase in the percentage of second-generation immigrant students, from 5.0% to 7.1%, while the share of first-generation immigrant students grew more modestly from 4.5% to 5.4% of the total number of students in OECD countries. This represents a continuation of the upward trend in the number of immigrant students observed in previous PISA assessments.

However, the overall percentage of immigrant students and its growth between 2006 and 2015 vary considerably across countries and economies, as does the composition of immigrant populations. In PISA 2015, more than one in two students in Luxembourg, Macao (China), Qatar and the United Arab Emirates had an immigrant background, as did close to one in three students in Canada, Hong Kong (China) and Switzerland. By contrast, in 38 countries and economies that participated in PISA 2015, the proportion of immigrant students remains below 6.25%, or less than half of the average percentage in OECD countries (12.5%) (Table I.7.1). In the remainder of the chapter, this threshold is used to identify countries with greater challenges and opportunities associated with the presence of immigrant students in their school systems.

Figure I.7.1 ■ **Change between 2006 and 2015 in the percentage of second- and first-generation immigrant students**



Notes: Only countries where the percentage of immigrant students is higher than 6.25% in 2015 are shown.
Results for Germany should be interpreted with caution due to missing rates on the student immigrant background and language spoken at home variables (see Tables A1.3 and A5.10).
The percentage-point difference between 2006 and 2015 in the share of students with an immigrant background is shown next to the country/economy name. Only statistically significant differences are shown (see Annex A3).
For each figure, countries and economies are ranked in ascending order of the percentage of students in 2015.
Source: OECD, PISA 2015 Database, Table I.7.1.
StatLink http://dx.doi.org/10.1787/888933432876

Hereafter, countries where more than 6.25% of 15-year-old students have an immigrant background are referred to as "countries with relatively large immigrant student populations". Most of the analyses presented in this chapter are related to these countries and economies.

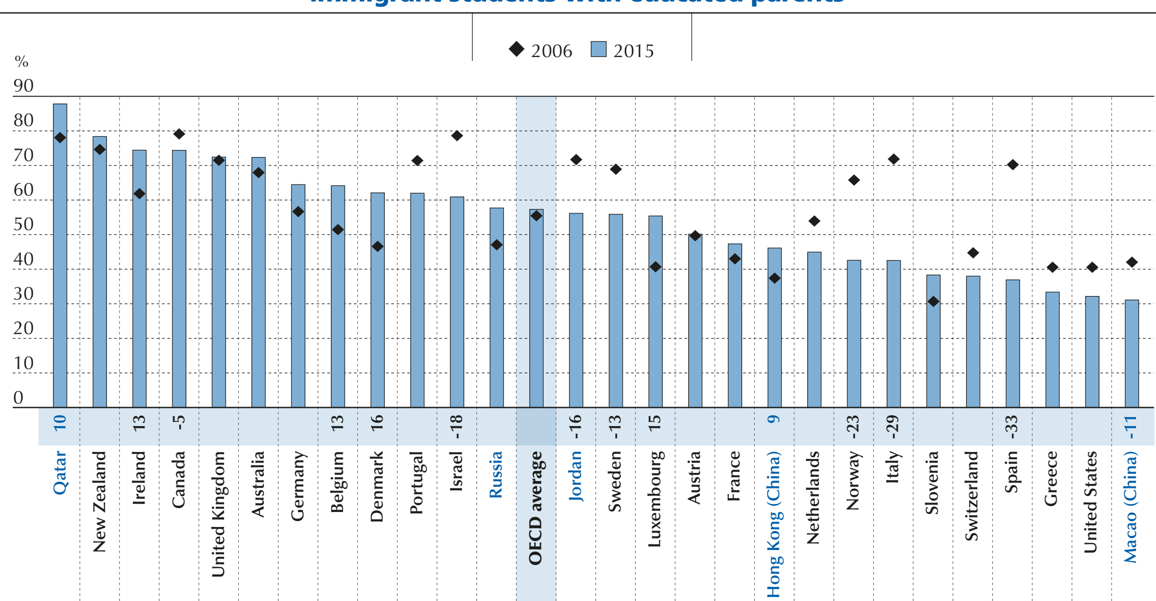
Between 2006 and 2015, the percentage of immigrant students increased by more than 10 percentage points in Luxembourg and Qatar, and by between 5 and 10 percentage points in Austria, Canada, Ireland, New Zealand, Norway, Sweden, Switzerland,[2] United Kingdom and the United States. Over the same period, the proportion of immigrant students decreased in 12 countries, including by more than 5 percentage points in high-immigration countries/economies Hong Kong (China), Israel and Macao (China) (Table I.7.1).

When examining the association between immigration and academic performance at either the system or student level, it is important to do so in the context of the changing composition of student populations over time. This allows for an assessment of how variation in performance is related to differences in the socio-economic status of immigrant students across countries, and to differences in the ways that education systems cater to the needs of immigrant students.

Migrants' decision to relocate to another country is commonly associated with a desire to improve their living standards. But as a result of displacement and during adjustment periods in their host countries, immigrants often endure economic hardship and precarious living conditions. This helps explain why, on average across OECD countries, students with an immigrant background tend to be more disadvantaged than non-immigrant students, as reflected in the lower values on the PISA index of economic, social and cultural status (ESCS) of both second- and first-generation immigrant students, on average across OECD countries, and in most partner countries and economies (Table I.7.2). Nonetheless, the mobility of high-skilled workers and their families also plays an important role in international migration, and in a small number of PISA-participating countries, immigrant students tend to have similar or higher socio-economic status than their non-immigrant peers. In PISA 2015, this is the case in Estonia, Ireland, Latvia, Malta, Montenegro, Singapore and the United Arab Emirates.

Despite being more disadvantaged than non-immigrants, on average, many immigrants bring valuable skills to their host countries. Figure I.7.2 reveals a positive trend in the education backgrounds of recent entrants into OECD countries, as reflected in the educational attainment of the parents of first-generation immigrant students who sat the PISA test in 2006 and 2015. On average across OECD countries, 57.3% of first-generation immigrant students in 2015 have at least one parent who attended school for as many years as the average parent in the host country, an increase of 1.4 percentage points from 2006 for countries with available data. Among countries with relatively large immigrant student populations, this increase is most apparent in Belgium, Croatia, Denmark, Ireland and Luxembourg, where the percentage of first-generation immigrant students with educated parents increased by 10 percentage points or more over this period. By contrast, in Israel, Italy, Jordan, Macao (China), Norway, Sweden and Spain, the share of first-generation immigrant students sitting the PISA test and having highly educated parents shrank by more than 10 percentage points between 2006 and 2015 (Table I.7.2).

Figure I.7.2 ▪ **Change between 2006 and 2015 in the percentage of first-generation immigrant students with educated parents**[1]



1. "Educated parents" are those who are as educated as the average parent in the host country.

Notes: Only countries where the percentage of immigrant students is higher than 6.25% are shown.

The percentage-point difference between 2006 and 2015 in the share of first-generation immigrant students with educated parents is shown next to the country/economy name. Only statistically significant differences are shown (see Annex A3).

Countries and economies are ranked in descending order of the percentage of first-generation immigrant students with educated parents in 2015.

Source: OECD, PISA 2015 Database, Table I.7.2.

StatLink http://dx.doi.org/10.1787/888933432881

While trends in the percentage of immigrant students with educated parents reflect improvements in the education outcomes in many countries of origin, growing migration flows are also translating into greater linguistic diversity in receiving countries. On average across OECD countries, the percentage of 15-year-olds who do not speak the language of the PISA assessment at home increased by four percentage points among both first- and second-generation immigrant students between 2006 and 2015 in countries with available data. This means that, in PISA 2015, two in three first-generation immigrant students and almost one in two second-generation immigrant students were assessed in a language different from the one they normally use at home. In Belgium, Germany,[3] Greece, Ireland, Qatar and Slovenia, the share of immigrant students born abroad who mainly speak a language different from that of the PISA test increased by between 10 and 35 percentage points (Table I.7.2). In Israel, Italy and Qatar, the growth in the percentage of second-generation students speaking mainly another language at home was between 10 and 20 percentage points (Table I.7.2). These two trends – a growing number of recent migrants from linguistically distant countries, and a greater use of heritage languages within immigrant families whose offspring were born in host countries – indicate that students with an immigrant background were, on average, less familiar with the language of assessment in PISA 2015 than in PISA 2006. This suggests that many school systems are facing greater challenges to integrate linguistically heterogeneous student populations.

IMMIGRATION AND PERFORMANCE IN HOST COUNTRIES

Despite the growing numbers and greater linguistic diversity of immigrant students in PISA-participating countries, results from PISA 2015 provide no basis for the claim that larger proportions of students with an immigrant background are related to poorer education standards in host communities. Figure I.7.3 shows that there is no significant association between the share of immigrant students and the performance of a school system, as measured by the mean score on the PISA science assessment. In fact, the percentage of students with an immigrant background and a school system's mean performance are positively but weakly correlated, as indicated by the upward slope of the line in the upper panel of the figure.

Obviously, the composition of immigrant populations can vary greatly across countries, and this can have a significant impact on the average achievement of immigrant students. However, the conclusion that the share of students with an immigrant background is not necessarily related to mean science performance at the country/economy level holds even after accounting for the socio-economic status of immigrant 15-year-olds. This is reflected in the lower panel of Figure I.7.3, which shows a weak correlation between a school system's mean performance and the percentage of immigrant students who are socio-economically disadvantaged, expressed as a part of the total student population within each country.

Differences between immigrant and non-immigrant students in science performance and science-related attitudes

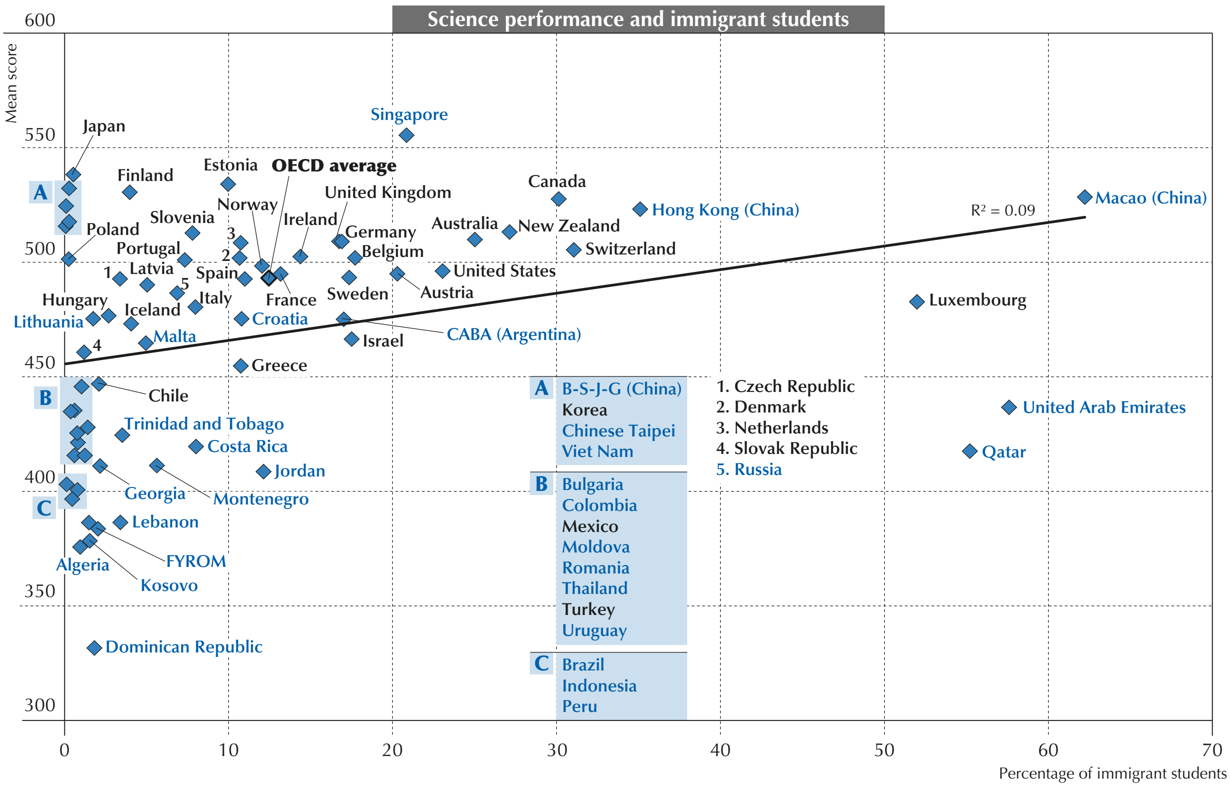
Figure I.7.4 compares the science performance of immigrant and non-immigrant students across the school systems that participated in PISA 2015. Results show how, in most countries, both first- and second-generation immigrant students tend to perform worse than students without an immigrant background. The average science performance of foreign-born students whose parents were also born outside the host country is 447 score points, about half a standard deviation below the mean performance of non-immigrant students (500 score points), on average across OECD countries. Second-generation immigrant students perform between the two, with an average science score of 469 points.

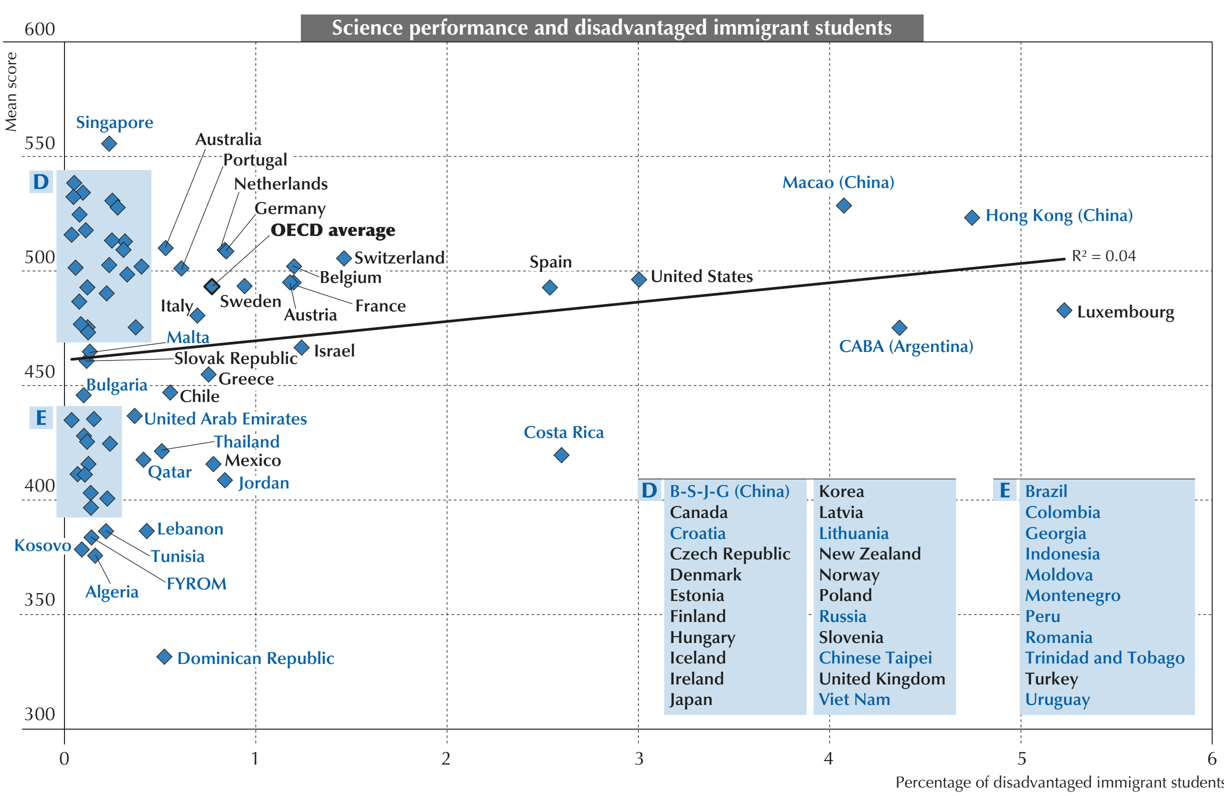
Figure I.7.4 also shows that, although many immigrants have poorer relative performance when compared to their non-immigrant peers in their country/economy, they can perform at very high levels by international standards. Among countries with relatively large immigrant student populations, Macao (China) and Singapore are high-performing school systems where the average science scores of both first- and second-generation immigrant students are higher than those of non-immigrant students, which implies that the performance of these immigrant students contributes to raise the mean scores of these countries. Immigrant students in Australia, Canada, Estonia, Hong Kong (China), Ireland and New Zealand also score similarly to or higher than the OECD average in science (Table I.7.4a).

Figure I.7.5 shows that, on average across OECD countries, the average difference in science performance between immigrant and non-immigrant students — 43 score points — is reduced to 31 score points after taking students' socio-economic status into account. But these performance gaps, and the extent to which socio-economic status accounts for them, vary widely across countries and economies. Among countries with relatively large immigrant student populations, the gaps are largest in Austria, Belgium, Denmark, Germany, Slovenia, Sweden and Switzerland: more than 60 score points before accounting for socio-economic status, and between 40 and 55 score points after accounting for socio-economic status (Table I.7.4a).

By contrast, in a smaller number of these countries, immigrant students outperform their non-immigrant peers. This is the case in Macao (China), where immigrants score 22 points higher after accounting for their socio-economic status, and in Qatar and the United Arab Emirates, where they outperform their non-immigrant peers by more than 80 score points. In Australia, Canada, Ireland, Jordan, New Zealand and the Russian Federation (hereafter "Russia"), the performance differences between the two groups are negligible in the first place (Table I.7.4a).

Figure I.7.3 ▪ **Percentage of immigrant students and education systems' average performance in science**

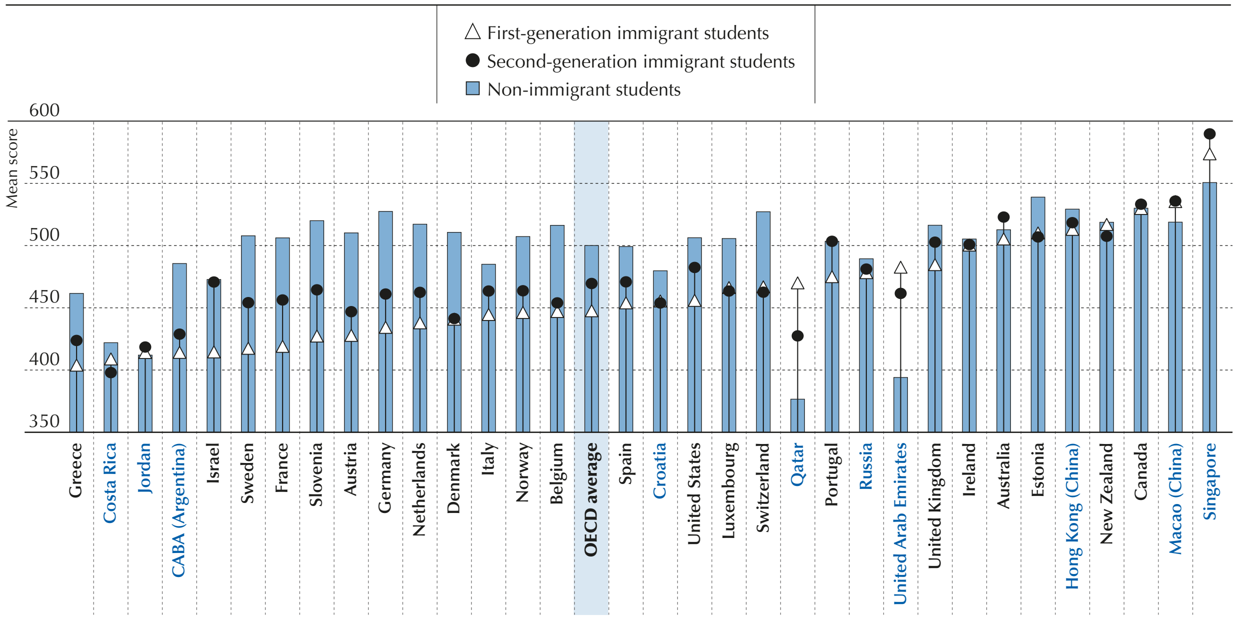




Source: OECD, PISA 2015 Database, Table I.7.3.

StatLink http://dx.doi.org/10.1787/888933432897

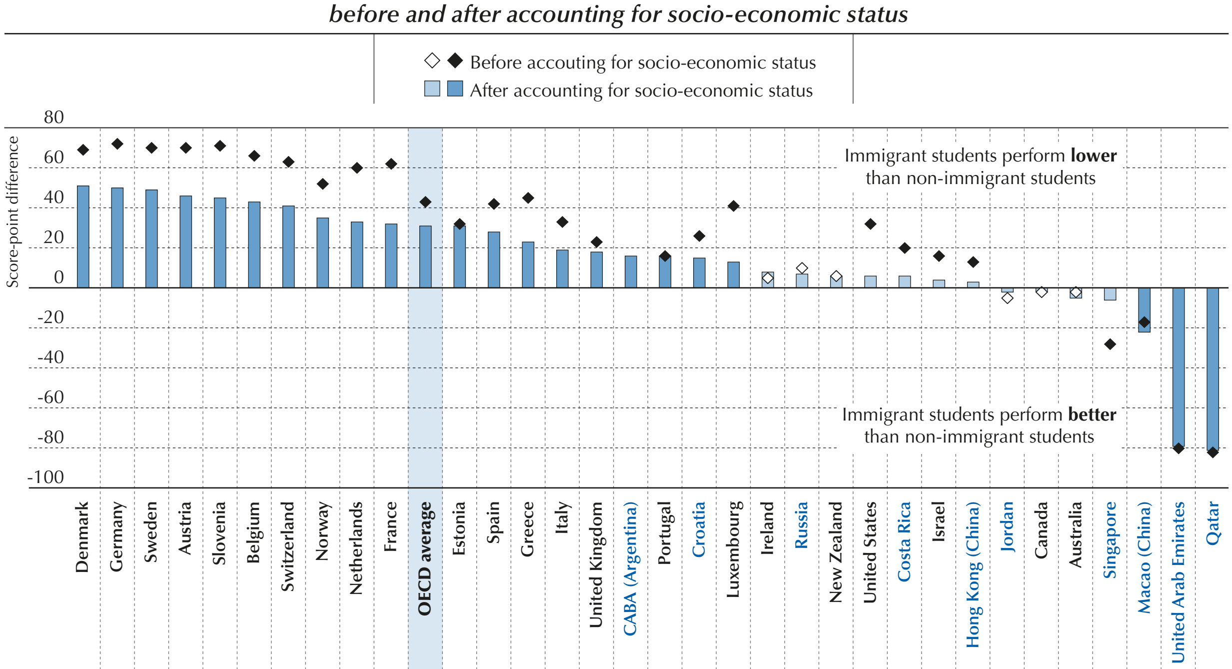
Figure I.7.4 ▪ **Student performance in science, by immigrant background**



Note: Only countries where the percentage of immigrant students is higher than 6.25% are shown.
Countries and economies are ranked in ascending order of the mean science score of first-generation immigrant students.
Source: OECD, PISA 2015 Databases, Table I.7.4a.
StatLink http://dx.doi.org/10.1787/888933432903

Figure I.7.5 ▪ **Differences in science performance, by immigrant background**

Score-point difference in science between immigrant and non-immigrant students, before and after accounting for socio-economic status



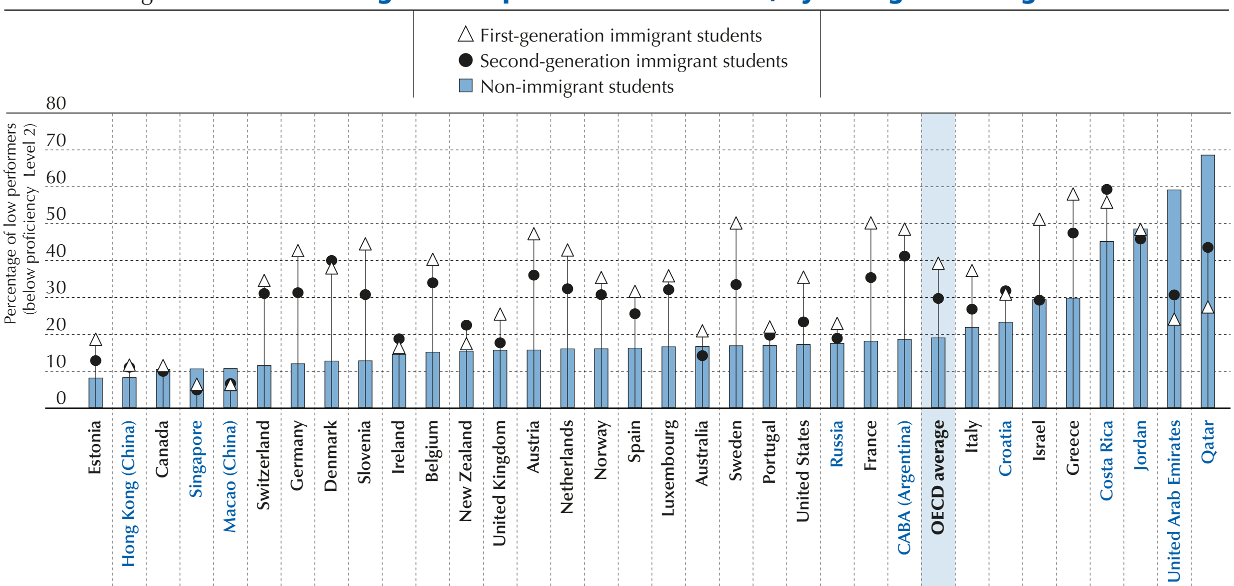
Notes: Only countries where the percentage of immigrant students is higher than 6.25% and with available PISA index of economic, social and cultural status (ESCS) data are shown.
Statistically significant differences are marked in a darker tone (see Annex A3).
Countries and economies are ranked in descending order of the gap in science performance related to immigrant background after accounting for students' socio-economic status.
Source: OECD, PISA 2015 Databases, Table I.7.4a.
StatLink http://dx.doi.org/10.1787/888933432915

In 22 out of the 33 countries where the overall proportion of immigrant students is larger than 6.25%, or half the OECD average proportion, performance differences between immigrant and non-immigrant students remain significant after accounting for socio-economic status. Only in five of these countries/economies – Costa Rica, Hong Kong (China), Israel, Singapore and the United States – do these differences disappear after accounting for socio-economic status. This indicates that, in most cases, socio-economic disadvantage cannot fully account for immigrant students' poorer performance.

A similar pattern of results is observed in other assessment domains. On average across OECD countries, immigrant students score 40 points lower in reading and 37 points lower in mathematics than their non-immigrant peers. When comparing students with similar socio-economic status, these differences are reduced to 29 and 26 score points, respectively (Table I.7.4b, Table I.7.4c).

Beyond differences in mean performance, a major concern for countries and economies around the world is that immigrant students are more likely than their non-immigrant peers to leave the school system without having attained a baseline level of skills – an indicator of the inclusiveness of these systems. Figure I.7.6 shows that, on average across OECD countries, as many as 39.1% of first-generation immigrant students and 29.5% of second-generation immigrant students perform below proficiency Level 2 in the PISA 2015 science assessment. By comparison, only 18.9% of students without an immigrant background are low performers in science.

Figure I.7.6 ▪ **Percentage of low performers in science, by immigrant background**



Note: Only countries where the percentage of immigrant students is higher than 6.25% are shown.
Countries and economies are ranked in ascending order of the percentage of non-immigrant students scoring below Level 2.
Source: OECD, PISA 2015 Database, Table I.7.5a.
StatLink http://dx.doi.org/10.1787/888933432926

Among countries with relatively large immigrant student populations, in Canada, Estonia, Hong Kong (China), Ireland, Macao (China) and Singapore, less than 20% of both first- and second-generation immigrant students perform below Level 2 in science. These are all countries and economies with a mean performance above the OECD average, and where high performance standards are achieved across the board, regardless of immigrant background. By contrast, in Ciudad Autónoma de Buenos Aires (Argentina) (hereafter "CABA [Argentina]"), Costa Rica, Greece, Jordan and Qatar, more than four in ten immigrant students, both first- and second-generation, perform below proficiency Level 2 (Table I.7.5a). These are countries and economies with mean performance in science below the OECD average.

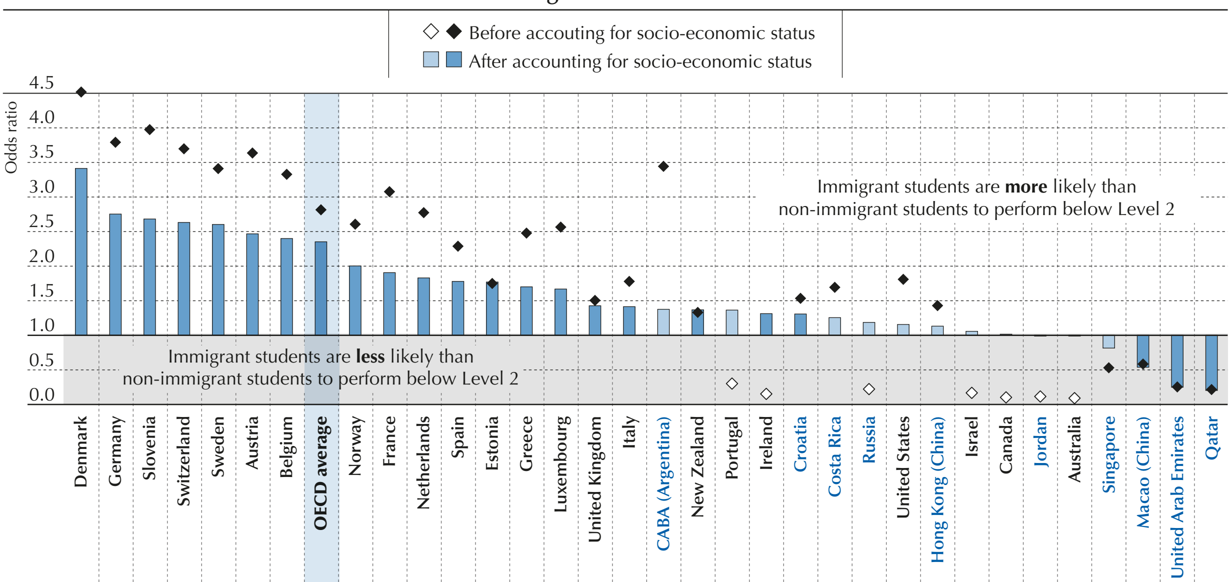
In other assessment domains, the percentage of low performers is also higher among immigrant students. Results for mathematics closely mirror those of science: on average across OECD countries, 39.7% of first-generation immigrant students and 30.5% of second-generation immigrant students score below proficiency Level 2, whereas 21.2% of their non-immigrant peers perform at that level (Table I.7.5c). In reading, the difference in the percentage of low performers is smaller between second-generation immigrant students and non-immigrant students (Table I.7.5b).

The greater likelihood that immigrant students perform below the baseline level of proficiency in science, reading and mathematics, compared with their non-immigrant peers is partly explained by differences in their socio-economic profile. Figure I.7.7 shows the change in the likelihood that immigrant students are low performers in science, before and after accounting for their socio-economic status.

On average across OECD countries, and before taking their socio-economic status into consideration, immigrant students are almost three times more likely than their non-immigrant peers to perform below proficiency Level 2 in science. After this factor is accounted for, the probability that immigrant students do not attain Level 2 is still more than twice that of non-immigrant students. In 19 of the 33 countries with relatively large immigrant student populations, immigrant students are more likely than non-immigrant students to be low performers in science; and in 11 of these countries, they are as likely as non-immigrant students to be low performers. But in Macao (China), Qatar and the United Arab Emirates, immigrant students are more likely than their non-immigrant peers to score at or above Level 2 in science.

Figure I.7.7 ■ **Likelihood of low performance in science, by immigrant background**

Likelihood that immigrant students perform below proficiency Level 2 in science, relative to non-immigrant students, after accounting for socio-economic status



Notes: Only countries where the percentage of immigrant students is higher than 6.25% and with available PISA index of economic, social and cultural status (ESCS) data are shown.

Statistically significant values are marked in a darker tone (see Annex A3).

Countries and economies are ranked in descending order of the likelihood of immigrant students to perform below Level 2 in science, after accounting for socio-economic status.

Source: OECD, PISA 2015 Database, Table I.7.5a.

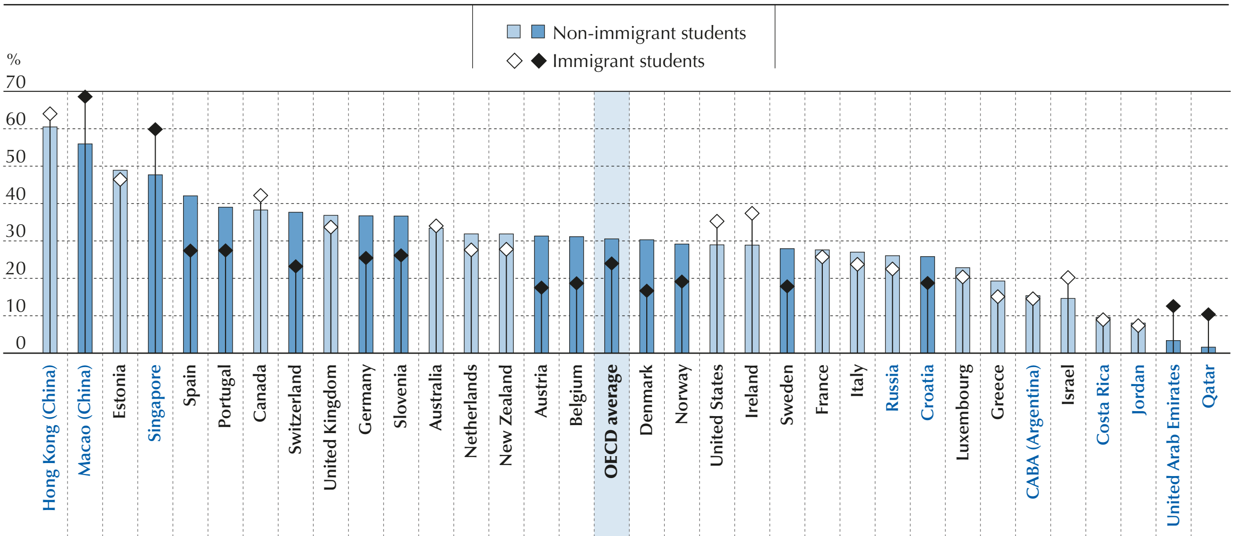
StatLink http://dx.doi.org/10.1787/888933432936

Results from PISA 2015 thus indicate that differences in socio-economic status can only partly explain why many immigrant students perform worse than non-immigrant students. This suggests that strong and responsive welfare systems can only go so far in helping immigrant children succeed in school; education policies that focus specifically on immigrant students are needed to provide these students with fair opportunities to develop their skills.

Resilient immigrant students

As discussed above, immigrant students are often socio-economically disadvantaged when compared to students without an immigrant background. While the association between socio-economic status and performance is strong, PISA results provide evidence that the link is far from unbreakable. Figure I.7.8 compares the percentage of students with and without an immigrant background who, while coming from disadvantaged families, beat the odds and score among the top quarter of students in all participating countries, after accounting for socio-economic status – that is, students who are classified as "resilient".[4] On average across OECD countries, 24.0% of immigrant students are considered to be resilient, compared to 30.5% of non-immigrant students.

Figure I.7.8 ▪ **Resilient students, by immigrant background**



Notes: Only countries where the percentage of immigrant students is higher than 6.25% and with available PISA index of economic, social and cultural status (ESCS) data are shown.

Statistically significant differences between non-immigrant and immigrant students are marked in a darker tone (see Annex A3).

A student is classified as resilient if he or she is in the bottom quarter of the ESCS in the country/economy of assessment and performs in the top quarter of students from all countries/economies.

Countries and economies are ranked in descending order of the percentage of resilient students without an immigrant background.

Source: OECD, PISA 2015 Database, Table I.7.6.

StatLink http://dx.doi.org/10.1787/888933432947

Among high-performing countries/economies with relatively large immigrant student populations, more than half of all disadvantaged immigrant students in Hong Kong (China), Macao (China) and Singapore are resilient, and more than one in three in Australia, Canada, Estonia, Ireland, the United Kingdom and the United States are. In both Hong Kong (China) and Singapore, the percentage of resilient students is higher among immigrant 15-year-olds than among their non-immigrant peers (Table I.7.6).

However, resilience among students with an immigrant background can vary markedly across countries with similar mean scores in science. For instance, 27.6% of disadvantaged immigrant students in the Netherlands are resilient while only 16.7% in Denmark are. These are both high-performing countries with comparable mean scores in science and a similar overall percentage of 15-year-old students with an immigrant background. Similarly, the percentage of resilient immigrant students in the United States (35.2%) is twice as large as that in Austria (17.5%) – two countries with a mean science performance around the OECD average and similar proportions of immigrant students (Table I.7.6).

These results can be read as a sign that, in some countries, large proportions of students manage to overcome the "double disadvantage" of low socio-economic status and an immigrant background. At the same time, variations across PISA-participating countries and economies in the relative success of immigrant students, whether disadvantaged or not, imply that education systems play a significant role in helping immigrant students fully develop their potential (Box I.7.3).

Box I.7.3. **Does the performance of immigrant students from the same country of origin vary across host countries?**

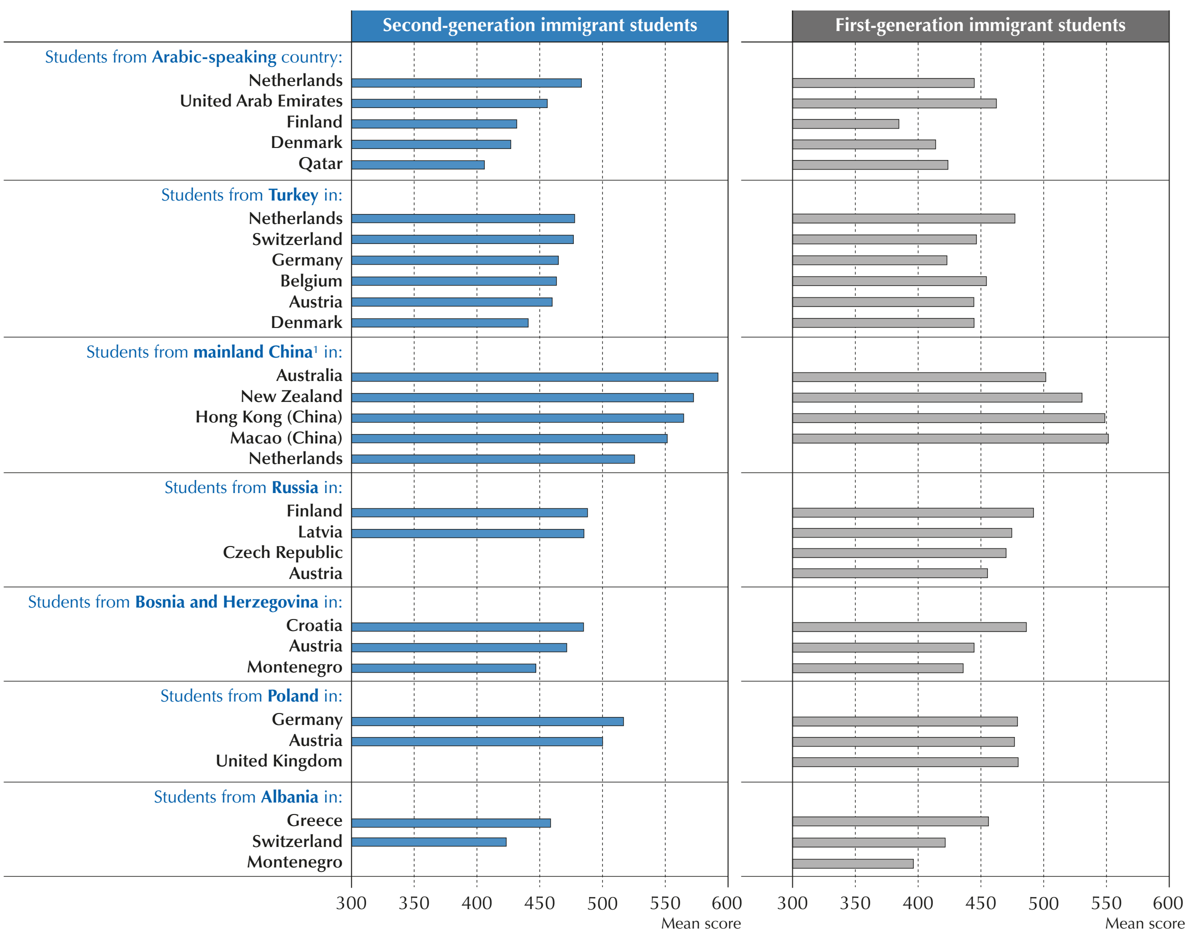
PISA 2015 shows that, although immigrant students tend to score lower than non-immigrant students, many perform at high levels by international standards, especially those in countries with selective immigration policies, such as Australia, Canada and New Zealand (Table I.7.4a). While this may seem to support the view that differences in the achievement of immigrant students can be explained mainly by variations in the backgrounds of immigrants across countries and economies, PISA results show that the performance of immigrant students is also strongly related to the characteristics of education systems in host countries.

...

Figure I.7.9 below illustrates this point by pooling PISA data from 2006, 2009, 2012 and 2015. The figure shows, for a selected group of countries with available information, how second- and first-generation immigrant students from the same country of origin and similar socio-economic status perform in science across various destination countries, after also accounting for the socio-economic composition of the host communities.

Results indicate that the performance of immigrant students of similar cultural and socio-economic backgrounds can vary markedly across host-country school systems. For instance, second-generation immigrant students from Arabic-speaking countries living in the Netherlands, traditionally a high-performing country in PISA, score 77 points higher in science, on average, than those who settled in Qatar – a country with a significantly lower mean performance in science – but also between 50 and 60 points higher than those who settled in Finland and Denmark – two countries that tend to have a mean performance at or above the OECD average. In addition, both second- and first-generation Albanian immigrant students attending schools in Greece tend to score about 35 points higher in science than compatriot peers attending schools in Switzerland – despite the higher mean performance of the latter country across PISA assessments.

Figure I.7.9 ▪ **Immigrant students' performance in science, by country of origin and destination**



1. Mainland China excludes Hong Kong (China), Macao (China) and Chinese Taipei.

Notes: Data from multiple PISA assessments are pooled to reach the minimum number of observations required for the estimation. Results are only shown for pairs of origin and destination countries/economies with data for 30 or more first- or second-generation immigrant students. Results correspond to predicted performance if all the immigrant students from a given country of origin and all the non-immigrant students across all the destination countries/economies for immigrants of that origin had the same socio-economic status as the average student across these destination countries/economies.

Countries and economies are ranked in descending order of second-generation immigrant students' performance score in science, by country of origin.

Source: OECD, PISA 2006, 2009, 2012 and 2015 Databases.

StatLink http://dx.doi.org/10.1787/888933432957

The figure also shows how the performance of students from the same country of origin can vary, in a given host country, between first- and second-generation immigrants. For example, while students born in mainland China score above the OECD average across several destination countries, they generally perform better in Hong Kong (China) and Macao (China), where they score above 550 points in science, than in Australia, where their average science score is 502 points. However, among second-generation Chinese immigrant students, this pattern is reversed, as students born to Chinese parents who settled in Australia score 592 points in science, on average, outperforming second-generation Chinese immigrant students in both Hong Kong (China) and Macao (China).

These results align with previous analyses in showing that it is not only socio-economic status and the mean performance of host countries that contribute to differences in the performance of immigrant students who come from the same country of origin but who settle in different destination countries. The findings suggest that these differences are also related to the capacity of school systems in host countries to nurture the talents of students with different cultural backgrounds. Other factors not included in this analysis might also contribute to the differences in the performance of immigrant students from the same national or cultural origin across host countries. These include students' own motivation or the support they receive from their parents, and also factors not linked to socio-economic status that can play a role in immigrant families' decision to settle in a given country, such as personal networks, historical links or parents' professional aspirations. PISA questionnaires can yield further insights into the differences in the outcomes of immigrant students across destination countries, including their sense of belonging and well-being in school.

DIFFERENCES BETWEEN IMMIGRANT AND NON-IMMIGRANT STUDENTS IN SCIENCE-RELATED CAREER EXPECTATIONS

As discussed in Chapter 3, many education systems are emphasising the affective dimensions of science learning in an effort to encourage more students to pursue careers in science and technology. Equity in access to these occupations is an additional concern for educators and policy makers, given that disadvantaged students are often under-represented in scientific fields of study. This negative selection can be related to lower average performance relative to more advantaged students, but also to differences in their attitudes towards learning science. PISA 2015 can be used to analyse whether disparities in science-related attitudes are also observed between immigrant and non-immigrant students.

PISA 2015 asked students about the occupation they expect to be working in when they are 30 years old. Their responses were grouped into major categories of science-related and non-science-related careers. On average across OECD countries, the proportion of students who expect to work in an occupation that requires further science training beyond compulsory education is slightly larger among immigrant students (27.3%) than among non-immigrant students (24.4%). Among countries with relatively large immigrant student populations, in Canada, Jordan, Qatar, the United Arab Emirates, the United Kingdom and the United States, more than four in ten immigrant students expect to pursue a science-related career (Table I.7.7).

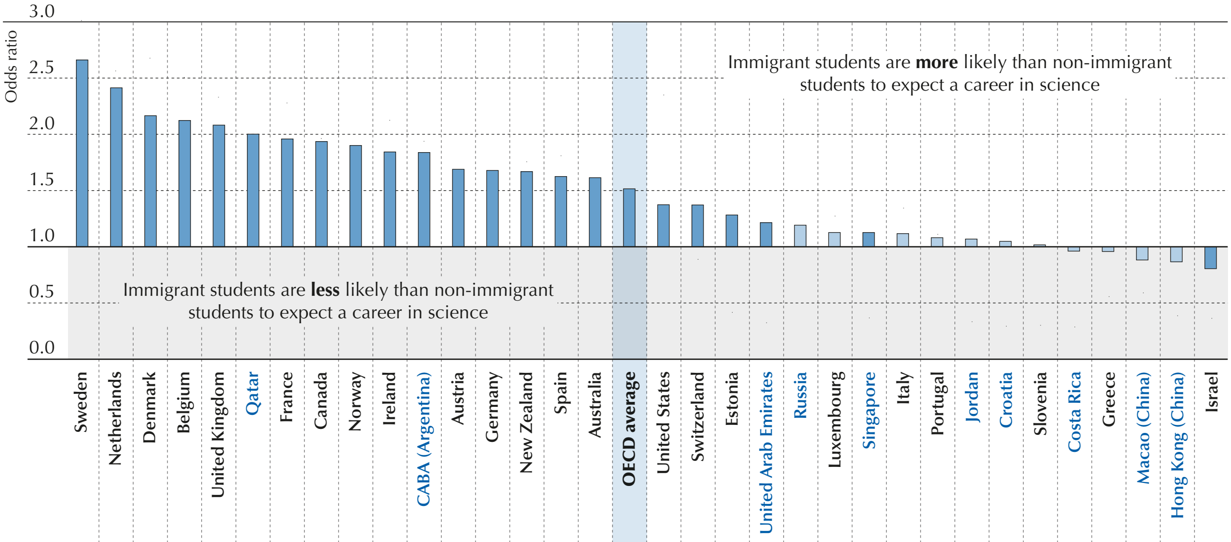
A student's expectation to work in a science- or technology-related profession can, of course, be heavily influenced by how the student performs in science. Figure I.7.10 shows that the greater likelihood that immigrant students expect a career in science, compared with non-immigrant students, holds even after taking into account student performance in science and its potential impact in shaping this expectation. On average across OECD countries, immigrant students are 50% more likely than their non-immigrant peers who score similarly in science to expect to work in a science-related career; in Denmark, the Netherlands, Sweden and the United Kingdom, they are more than twice as likely to expect such a career. This relationship remains positive and significant in 21 out of 33 countries and economies where more than 6.25% of students have an immigrant background (Table I.7.7).

OTHER FACTORS LINKED TO LOW PERFORMANCE AMONG IMMIGRANT STUDENTS

Past PISA results have shown that, beyond its association with socio-economic status, the lower average performance of immigrant students compared with that of non-immigrant students is associated, individually or in concert, with other factors, including language barriers, the concentration of disadvantage in the schools in which many immigrant students are enrolled, and stratification policies that result in different opportunities for learning (OECD, 2015a).

Figure I.7.10 ■ **Students' expectations of pursuing a career in science, by immigrant background**

Likelihood that immigrant students expect a career in science, relative to non-immigrant students, after accounting for science performance



Notes: Only countries where the percentage of immigrant students is higher than 6.25% are shown.
Statistically significant values are shown in a darker tone (see Annex A3).
Countries and economies are ranked in descending order of the likelihood of immigrant students to expect a career in science, after accounting for science performance.
Source: OECD, PISA 2015 Database, Table I.7.7.
StatLink http://dx.doi.org/10.1787/888933432964

Language spoken at home

In PISA 2015, on average across OECD countries, for 44.7% of second-generation and 67.0% first-generation immigrant students, the main language spoken at home is different from the language of assessment in their host country (Table I.7.2). Among countries with relatively large immigrant student populations, in Austria and Luxembourg, more than seven in ten second-generation immigrant students are in this situation; in Slovenia, Sweden and the United States, this is the case for more than eight in ten first-generation immigrant students. On average across OECD countries, immigrant students who speak the language of assessment at home score 31 points lower in science that non-immigrant students who speak the language of assessment at home; but immigrant students who mainly speak another language in the family context score 54 points lower than these non-immigrant students – that is, more than 20 points lower than immigrant students who have greater familiarity with the test language (Table I.7.8a).

This "language penalty" for immigrant students in the science assessment – understood as the difference in performance between students with an immigrant background who speak the language of assessment as their main language at home and those who do not – is largest in Hong Kong (China) and Luxembourg (between 90 and 100 score points), and in Austria, Belgium, Jordan, Macao (China), Russia and Switzerland (between 40 and 55 score points) (Table I.7.8a). Across school subjects, there is a broad similarity in the pattern of association between language spoken at home and performance in science and reading, whereas, in mathematics, immigrant students who are less familiar with the test language suffer a smaller penalty (15 score points), on average across OECD countries (Tables I.7.8b and Table I.7.8c).

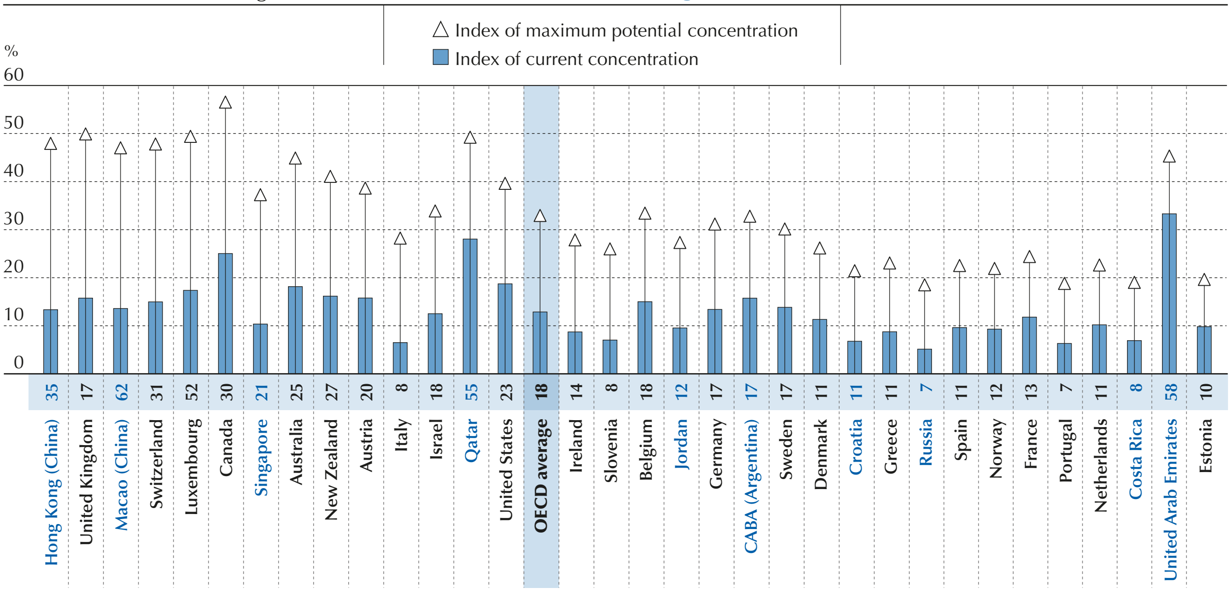
Concentration of immigrant students in schools

Low performance among immigrant students can also be partly linked to the fact that these students are often concentrated in disadvantaged schools. Immigrant students tend to be over-represented in certain schools, sometimes because they live in the same neighbourhoods, but in other cases also because school systems group them together regardless of their place of residence. The concentration of immigrant students in schools does not automatically have adverse effects on student performance or social integration. However, negative outcomes will likely follow if ethnic agglomerations become enclaves whose residents have little possibility of outward and upward mobility.

Therefore, a critical link between the concentration of immigrant students in a school and low performance is the socio-economic intake of the schools where immigrants tend to be enrolled. Immigrant students' learning will be hindered if these are disadvantaged schools that suffer from a shortage or inadequacy of educational resources, including teacher preparedness, or where the concentration of disadvantaged students results in a poorer disciplinary climate.

Measuring the concentration of immigrant students in schools in a reliable and internationally comparable way is challenging in many respects, mainly because of the variation in the percentage of immigrant students across countries, but also because of other differences across schools.[5] PISA 2015 relies on two indices to measure the concentration of students with an immigrant background in schools. The first is the index of current concentration, which represents the percentage of students, both immigrant and non-immigrant, that would have to be relocated from one school to another so that all schools would have an identical percentage of immigrant students and, consequently, an identical percentage of non-immigrant students.[6] The second measure is the index of maximum potential concentration, which represents the minimum proportion of students that would have to be moved across schools if all immigrant students were allocated to the largest schools.[7] By defining country-specific thresholds for the school-level concentration of immigrant students, these indices address some of the shortcomings of other concentration measures and provide a benchmark that reflects more accurately the relative similarity between the composition of schools and their social context.

Figure I.7.11 ■ **Concentration of immigrant students in schools**



Notes: Only countries where the percentage of immigrant students is higher than 6.25% are shown.
The percentage of immigrant students is shown next to the country/economy name.
Countries and economies are ranked in descending order of the distance between current and maximum potential of concentration.
Source: OECD, PISA 2015 Database, Table I.7.9.
StatLink http://dx.doi.org/10.1787/888933432974

The difference between the two indices indicates the distance between the current mix of immigrant and non-immigrant students in schools and the highest possible degree of segregation of immigrant students in a country/economy, given the overall percentage of immigrant students and the size of the country/economy's schools.[8] The maximum potential concentration is a hypothetical scenario where all immigrant students attend the largest schools in the country, and hence where the largest number of them can be found in the same schools and classrooms. Given this scenario, countries where the difference between the two indices is larger can be seen as having greater success in avoiding the segregation of immigrant students into particular schools. Figure I.7.11 shows how countries and economies with relatively large populations of immigrant students rank on this measure.

Current and potentially maximum levels of concentration of immigrant students differ most – by 30 percentage points or more – in Canada, Hong Kong (China), Luxembourg, Macao (China), Switzerland and the United Kingdom. In all of these countries and economies, immigrant students represent a large share of the student population, ranging from 16.7% in the United Kingdom to 62.2% in Macao (China); but the current distribution of immigrant students across

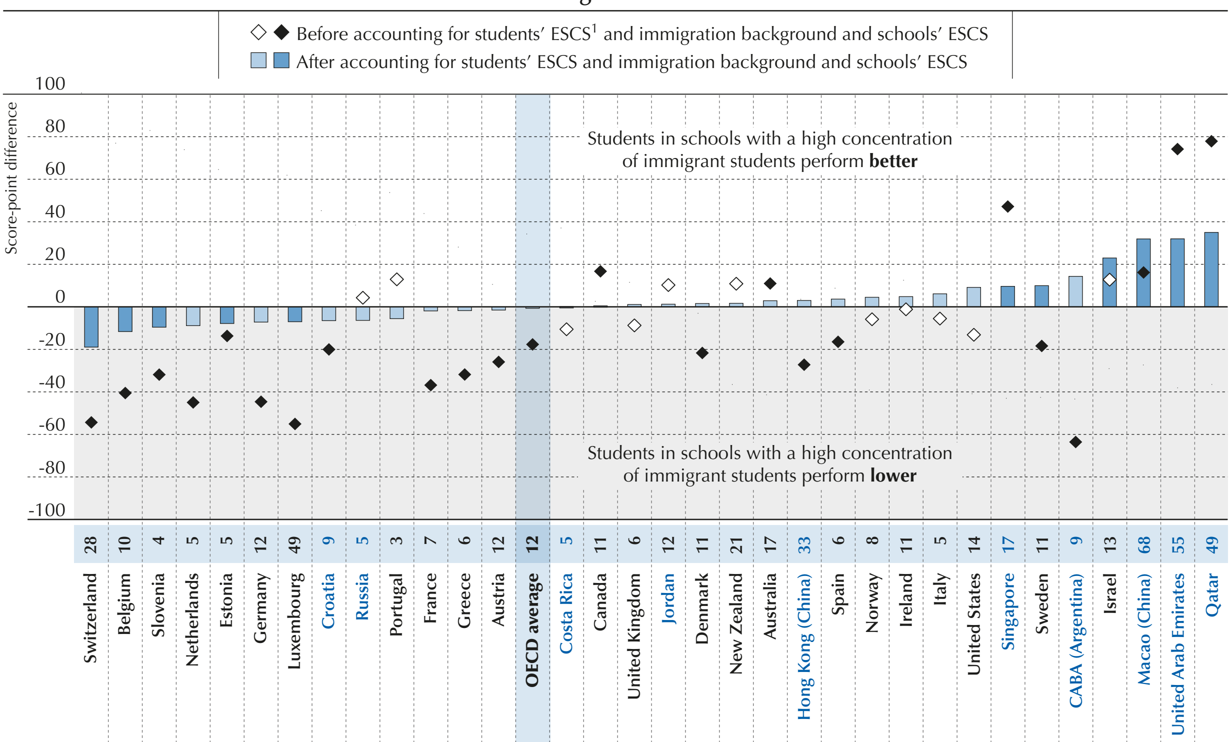
schools is far below the highest possible level of concentration. By contrast, in Costa Rica, Croatia, Denmark, Estonia, France, Greece, the Netherlands, Norway, Portugal, Russia, Spain and the United Arab Emirates, the two indices differ by less than 15 percentage points, which implies that in these countries and economies, current levels of concentration are somewhat closer to their potential ceiling (Table I.7.9).

Further comparisons can be drawn between countries with similar overall percentages of immigrant students and maximum potential levels of concentration, which indicate comparable circumstances in terms of school size, but with different levels of current concentration. For example, in Luxembourg and Qatar, more than five in ten students have an immigrant background and almost half of the student population would have to move schools if the concentration of immigrant students were to reach its maximum level. Yet, in Luxembourg immigrant students are currently less concentrated in the same schools than in Qatar, where the percentage of students who would have to move schools to reach an even distribution is ten percentage points higher. Similarly, Singapore has a current level of concentration that is eight percentage points lower than that of the United States, a country with a similar overall percentage of immigrant students and a similar maximum concentration index (Table I.7.9).

The main concern behind the concentration of immigrant students in certain schools is its potential association with poorer student outcomes. Figure I.7.12 compares the performance of students, both immigrant and non-immigrant, attending schools with different levels of concentration of immigrant students in their respective countries. In this analysis, schools are classified as being either in the bottom or the top half of the concentration distribution in their respective countries.

Figure I.7.12 ▪ **Student performance in science and concentration of immigrant students in schools**

Score-point difference in science between students attending schools with low and high concentrations of immigrant students



1. ESCS refers to the PISA index of economic, social and cultural status.

Notes: Only countries where the percentage of immigrant students is higher than 6.25% and with available index of economic, social and cultural status (ESCS) data are shown.

Statistically significant score-point differences are marked in a darker tone (see Annex A3).

The thresholds for defining schools with low and high concentrations of immigrant students are country-specific and shown next to country names. The threshold is the percentage of immigrant students in the school that divides the 50% of the students attending schools with the smallest percentage of immigrants, and the 50% of the students attending schools with the largest percentage of immigrants, within each country/economy.

Countries and economies are ranked in ascending order of the score-point difference between students attending schools in the top half of the concentration distribution and students attending schools in the bottom half of the distribution, after accounting for students' ESCS, immigration background and schools' ESCS.

Source: OECD, PISA 2015 Database, Table I.7.10.

StatLink http://dx.doi.org/10.1787/888933432986

Therefore, high and low concentration thresholds are defined as country-specific rather than identical for all countries and economies. For example, in Switzerland, about one in two students attends schools where less than 28.5% of their peers are immigrants, while the other half attends schools with a larger share of immigrant students. In Germany, one in two students attends a school where less than 12.0% of his or her peers have an immigrant background, and the other half attends schools with a higher percentage of immigrant students (Table I.7.10).

The bars in Figure I.7.12 show, for each country and economy, the association between attending a school with a high concentration of immigrant students and student performance. Before taking into account students' socio-economic status and immigrant background, as well as the socio-economic intake of their school, a higher concentration of immigrant students in schools is associated with a 18-point lower score in science, on average across OECD countries. However, once background factors are accounted for, this negative association with performance disappears entirely.

In 24 out of the 34 countries/economies for which results can be computed, the score-point difference is no longer significant when high- and low-concentration schools with similar socio-economic intakes are compared. Among the five countries where a negative association persists, the size of the difference tends to be substantially reduced. For example, in Luxembourg, the difference shrinks from 55 score points to 7 score points; in Belgium, it drops from 41 score points to 12 score points. In addition, in a number of countries/economies – Israel, Macao (China), Qatar, Singapore, Sweden and the United Arab Emirates – attending a school with a high concentration of immigrant students is positively associated with student performance, after taking into account students' own socio-economic status and immigrant background, and the average socio-economic status of the school's intake. Overall, PISA results mirror previous evidence that suggests that it is the concentration of disadvantage, and not the concentration of immigrants per se, that has detrimental effects on learning (Table I.7.10).

Differences in access to educational resources, stratification practices and opportunity to learn related to immigrant background

Disparities in learning outcomes between students of different backgrounds might be related to a number of factors. These include the distribution of educational resources across schools, and stratification policies and practices that may result in differences in opportunity to learn. Chapter 6 shows that many of these factors affect advantaged and disadvantaged students differently; whether differences are observed when comparing students with and without an immigrant background can also provide important pointers for educators and policy makers.

PISA 2015 provides two summary measures of the adequacy of educational resources at the school level: the index of shortage of educational material and the index of shortage of education staff. These indices are derived from school principals' responses to questions about whether a shortage or inadequacy of resources hinders their school's capacity to provide instruction.[9] On average across OECD countries, no relationship is observed between the adequacy of the material and human resources at the school level – as measured by these indices – and the level of concentration of immigrant students in schools – as measured by country-specific concentration thresholds (Table I.7.11). Differences in resources between schools with low and high percentages of immigrant students are only found in about a third of the countries and economies with relatively large immigrant student populations; but the associations are not necessarily consistent. In CABA (Argentina), Germany, Macao (China) and Spain, principals in schools with a high concentration of immigrant students tend to perceive that their schools are less well-resourced, both in terms of equipment and staff, than principals in schools with a low concentration of 15-year-olds with an immigrant background (Table I.7.11). The opposite is true in Estonia and the United Arab Emirates, two countries where few immigrant students come from disadvantaged backgrounds.

If an immigrant background were related to the likelihood that students are sorted into different programmes or schools, education opportunities would likely differ for immigrant and non-immigrant students. A common stratification policy is grade repetition, the practice of retaining struggling students at a given grade with the aim of giving them more time to master the curriculum. On average across OECD countries, 19.9% of immigrant students had repeated a grade by the time they sat the PISA 2015 test, compared to 10.9% of their non-immigrant peers. Among countries with relatively large populations of immigrant students, a slightly smaller difference in the incidence of grade repetition between these two groups of students is observed: 19.3% of immigrant students and 12.8% of non-immigrant students had repeated a grade in these countries (Table I.7.12).

While the decision to have a student repeat a grade is usually based on his or her performance, in 2015, immigrant students were about 70% more likely than their non-immigrant peers to have repeated a grade, after accounting for students' socio-economic status and their performance in the science and reading assessments. Among countries and economies where immigrant students represent more than 6.25% of the student population, a higher likelihood of grade repetition among immigrant students, relative to non-immigrant students, is observed in 18 countries and economies, even when comparing students with similar socio-economic status and performance in science and reading considered together. After accounting for these factors, immigrant students in Singapore and Sweden are around four times more likely, and students in Greece, Slovenia and the United Kingdom are about two-and-a-half times more likely than non-immigrant students to have repeated a grade (Table I.7.12).

By contrast, after accounting for students' socio-economic status and performance in science, there are no significant differences, on average across OECD countries, between immigrant and non-immigrant students in the likelihood of being enrolled in vocational rather than academic programmes, another common form of sorting students in secondary education (Table I.7.13). Indeed, in up to 13 countries and economies with relatively large populations of immigrant students, these students are less likely to be enrolled in a vocational track, after socio-economic status and performance in science have been taken into account (Table I.7.13).

Similarly, PISA results suggest that there are no significant differences, on average across OECD countries, in the amount of science instruction to which immigrant and non-immigrant students are exposed at school. This is measured by the percentage of students taking at least one science lesson per week at school and by the average time spent per week in regular science lessons (Table I.7.14).

Overall, and in light of the results presented in Chapter 6, it appears that disparities in educational resources and opportunity to learn are less pronounced between immigrant and non-immigrant students than between students of different socio-economic status. These results are encouraging, in that they suggest a relatively minor impact of immigrant background on students' opportunity to learn, once students' academic performance and socio-economic status have been taken into account. Volume II examines in greater detail the association between student performance and school-level resources, learning environments and stratification policies and practices, and how they reflect the level of equity in a system.

TRENDS IN PERFORMANCE DIFFERENCES BETWEEN IMMIGRANT AND NON-IMMIGRANT STUDENTS

Figure I.7.13 shows changes between 2006 and 2015 in the differences in science performance between immigrant and non-immigrant students. In 2006, 9.4% of students across OECD countries had an immigrant background. They scored, on average, 50 points lower in science than their non-immigrant peers. When students with similar socio-economic status and familiarity with the language of assessment were compared, the performance gap between immigrant and non-immigrant students was cut by more than half, to 23 score points, a smaller but still significant margin.

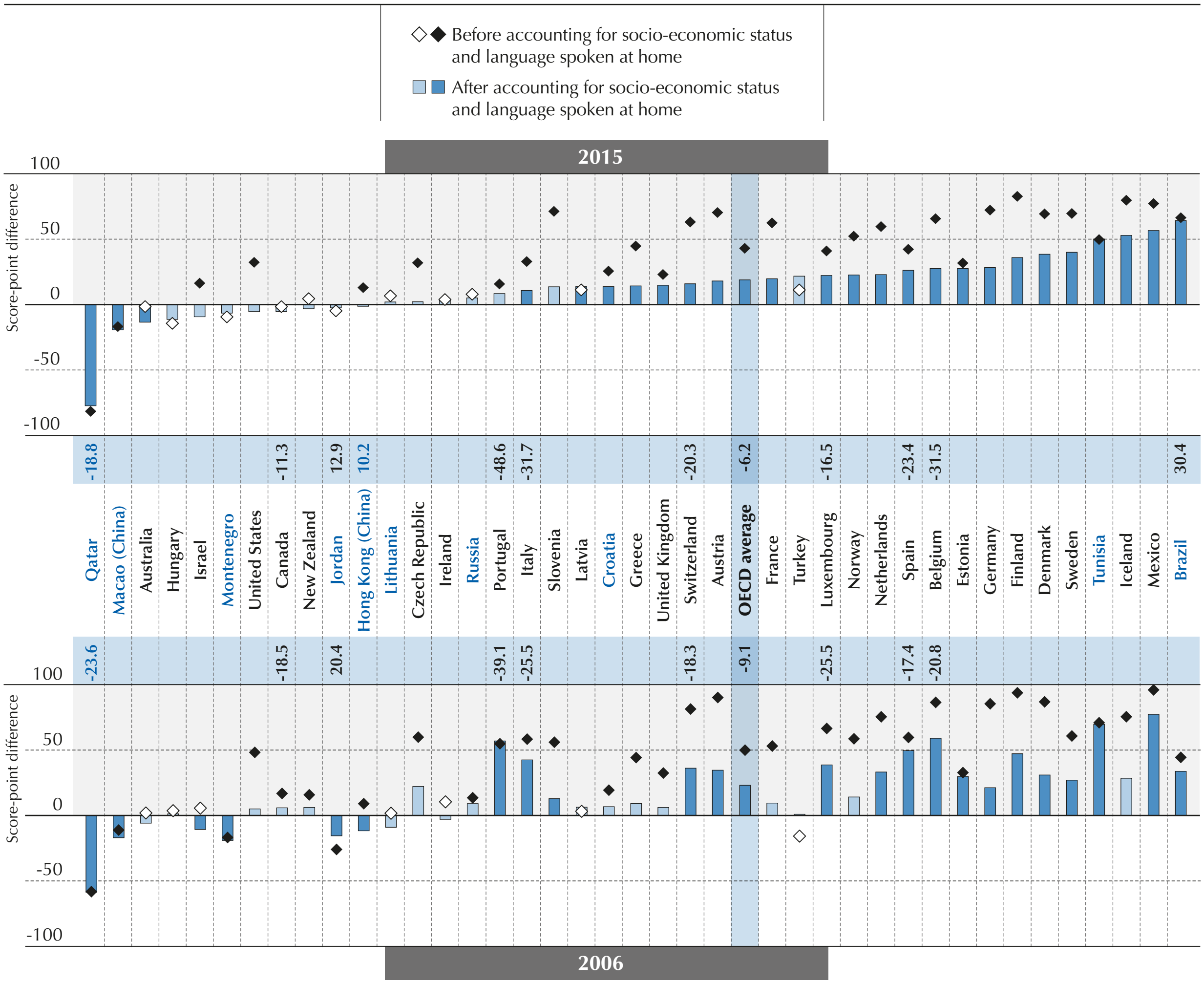
By 2015, the share of immigrant students across OECD countries had increased to 12.5%. In turn, the average difference in science performance in favour of non-immigrant students is 43 score points, before accounting for students' socio-economic status and language spoken at home, while the gap after accounting for these background factors is 19 score points, again a smaller but significant difference. As a result, in 2015, on average across OECD countries, immigrant students continue to perform worse in science than their non-immigrant peers, even after accounting for socio-economic status and language spoken at home, although the performance difference narrowed slightly since 2006.

However, in a number of countries, notably OECD countries Belgium, Italy, Portugal, Spain and Switzerland, the differences in performance between immigrant and non-immigrant students shrank by 20 score points or more over the period, after accounting for socio-economic status and familiarity with the language of assessment; in Canada and Luxembourg, these differences narrowed by between 10 and 20 score points. In some of these countries, the difference shrank mainly because of improvements in immigrant students' performance rather than because of poorer performance among their non-immigrant peers. For instance, between 2006 and 2015, immigrant students in Portugal improved their science performance by 64 score points while non-immigrant students improved by 25 points. During the same period, immigrant students in Italy improved their scores in science by 31 points and immigrant students in Spain improved by 23 points, while in both countries the performance of students without an immigrant background remained stable (Table I.7.15a). In neither of the three countries can compositional changes in the immigrant population account for these improvements; in both Italy and Spain, for example, the percentage of immigrant students with educated parents was about 30 percentage points lower in 2015 than in 2006 (Table I.7.2).

Trends in reading and mathematics performance mirror those observed in science, suggesting that, across OECD countries, performance differences between immigrant and non-immigrant students decreased modestly between 2006 and 2015, once students' socio-economic status and familiarity with the language of assessment are taken into account (Tables I.7.15b and I.7.15c).

Figure I.7.13 ▪ **Change between 2006 and 2015 in the science performance difference between immigrant and non-immigrant students**

Score-point difference in science between immigrant and non-immigrant students, before and after accounting for socio-economic status and language spoken at home



Notes: Only countries/economies that participated in both 2006 and 2015 PISA assessments are shown.

Statistically significant differences in science performance between students with and without an immigrant background are marked in a darker tone (see Annex A3).

The change between 2006 and 2015 in the score-point difference in science between students with and without an immigrant background before accounting for students' socio-economic status is shown below the country/economy name. The change between 2006 and 2015 in the score-point difference after accounting for students' socio-economic status is shown above the country/economy name. Only statistically significant changes are shown.

Countries and economies are ranked in ascending order of the score-point difference in science between students with and without an immigrant background in 2015, after accounting for socio-economic status and language spoken at home.

Source: OECD, PISA 2015 Database, Table I.7.15a.

StatLink http://dx.doi.org/10.1787/888933436867

Notes

1. Consistent with the definition of immigration status in Box I.7.1, the treatment of migration in this chapter is restricted to international (i.e. cross-border) migration.

2. Note by Switzerland: In Switzerland, the increase in the weighted share of students with an immigrant background between previous rounds of PISA and PISA 2015 samples is larger than the corresponding shift in the target population according to official statistics.

3. Information on immigrant background is missing for 13.4% of the students included in Germany's PISA 2015 sample, the highest percentage among all participating countries/economies, while information on language spoken at home is missing for 11.7% of students (Table A1.3). The percentage of missing data on the student immigrant background variable in Germany has been high across PISA assessments (Table A5.10). For these reasons, results for Germany should be interpreted with caution.

4. In PISA, a student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and performs in the top quarter of residual scores among students from all countries/economies, after accounting for socio-economic status. For details on the estimation procedure, see Chapter 6.

5. On the one hand, variation across countries in the overall percentage of immigrant students makes it difficult to establish a "concentration threshold" that is equally meaningful for all countries. For instance, if the threshold defines high-concentration schools as those where more than 30% of the students have an immigrant background, it is unlikely that a country where only 5% of students are immigrants would have many schools reaching that threshold. Inversely, for a country where half the students are immigrants, such a threshold would not imply an over-representation of immigrant students, but rather a reflection of the demographic makeup of its student population. On the other hand, variation in school size (and in the within-school sample size) across PISA-participating countries and economies means that, among countries with a similar proportion of immigrant students, those with a greater number of small schools would tend to have a higher percentage of schools above a given concentration threshold.

6. The concentration index has been derived from the segregation index developed by Gorard and Taylor (2002). A description of the index can be found in Annex A3.

7. A description of the index can be found in Annex A3.

8. A desirable property of this measure – the difference between the maximum and the current indices of concentration– is to correlate moderately with the overall percentage of immigrant students in the country/economy. This correlation is *r*=.55 for countries with relatively large immigrant student populations (i.e. those with more than 6.25% of immigrant students). For reference, among the same group of countries, the correlation between the overall percentage of immigrant students in the country/economy and another concentration measure, the percentage of immigrant students attending schools where more than 25% of the students have an immigrant background, is *r*=.87.

9. The indices are constructed to have a mean of zero and a standard deviation of one across OECD countries. Positive values on the indices mean that principals view the amount and/or quality of resources in their schools as an obstacle to provide instruction for their students to a greater extent than the OECD average; inversely, negative values reflect that school principals perceive the lack or inadequacy of resources as an obstacle to instruction to a lesser extent than the OECD average (for more details, see Chapter 6 in Volume II).

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8

What PISA 2015 results imply for policy

A solid base of science literacy is necessary not just for those who are interested in becoming scientists and engineers; all young people need to understand the nature of science and the origin of scientific knowledge so that they can become better citizens and discerning consumers. This chapter analyses what the disparities in student performance, attitudes towards science and expectations of pursuing science-related careers imply for education policy and practice.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

From taking a painkiller to determining what is a "balanced" meal, from drinking pasteurised milk to deciding whether or not to buy a hybrid car, science is pervasive in our lives. Science is not just test tubes and the periodic table; it is the basis of nearly every tool we use – from a simple can opener to the most advanced space explorer. Nor is science the domain of scientists only. Everyone now needs to be able to "think like a scientist": to be able to weigh evidence and come to a conclusion; to understand that scientific "truth" may change over time, as new discoveries are made, and as humans develop a greater understanding of natural forces and of technology's capacities and limitations.

The PISA 2015 assessment focused on 15-year-olds' science literacy – their knowledge of natural and technological phenomena and their ability to think like scientists – while also assessing their proficiency in reading and mathematics. As the world has changed in the 15 years since the first PISA test was conducted, the test, itself, has evolved too to reflect those changes. For the first time, in 2015 the test was delivered entirely on computer in order to allow for more dynamic and interactive assessment tasks. This change should be seen as an acknowledgement that not only are most of today's 15-year-olds already fluent in computer use, but that no matter what occupation they may ultimately choose for themselves, that kind of fluency will be required if these students are to participate fully in their societies.

The last time PISA focused on science was in 2006. Since then, the world of science and technology has changed significantly. The smartphone (e.g. Android, the iPhone and the iPad) was invented and became ubiquitous. Social media (e.g. Facebook, Twitter, YouTube), cloud-based services and advances in robotics/machine learning, based on Big Data, became available and have had a profound impact on our economic and social life (e.g. speech recognition, translation, financial trading, autonomous vehicles, and logistics). The Internet of things as well as augmented and virtual reality emerged. Also, biotechnology advanced considerably since 2006, as evidenced in the possibilities of gene sequencing and genome editing, synthetic biology, stem-cell therapies, bio-printing, optogenetics, regenerative medicine and brain interfaces that became available since then. Against this backdrop of rapid scientific and technological change, it is disappointing that for the majority of countries with comparable data, science performance in PISA remained virtually unchanged since 2006. In fact, only a dozen of countries showed measurable improvement in the science performance of their 15-year-olds, including high-performing education systems, such as Singapore and Macao (China), as well as low-performing ones, such as Peru and Colombia.

HOW UNIVERSAL ARE BASIC SKILLS?

In September 2015, the world's leaders gathered in New York to set ambitious goals for the future of the global community. Goal 4 of the Sustainable Development Goals (SDG) seeks to ensure "inclusive and equitable quality education and promote lifelong learning opportunities for all". This includes that "all learners acquire the knowledge and skills needed to promote sustainable development" (Target 4.7). One way to assess and monitor how well countries are preparing their students for life after compulsory education is to determine the proportion of 15-year-olds who score above the baseline level of proficiency in the PISA test.

In all three PISA core subjects, the baseline level is the level at which students are able to tackle tasks that require, at least, a minimal ability and disposition to think autonomously.

In science, the baseline level of proficiency corresponds to the level at which students can not only use everyday knowledge about familiar scientific phenomena to recognise the correct explanation for them, but can also use such knowledge to identify the question being addressed in a simple experimental design or to identify, in simple cases, whether a conclusion is valid based on the data provided.

In mathematics, the baseline level of skills is defined as the level at which students can not only carry out a routine procedure, such as an arithmetic operation, in situations where all the instructions are given to them, but can also interpret and recognise how a (simple) situation (e.g. comparing the total distance across two alternative routes, or converting prices into a different currency) can be represented mathematically.

In reading, the baseline level of skills is defined as the level at which students can not only read simple and familiar texts and understand them literally, but can also demonstrate, even in the absence of explicit directions, some ability to connect several pieces of information, draw inferences that go beyond the explicitly stated information, and connect a text to their personal experience and knowledge.

The 2009 Canadian Youth in Transition Survey, which followed-up on students who were assessed by PISA in 2000, shows that 15-year-olds scoring below Level 2 in reading face a disproportionately higher risk of not participating in post-secondary education and of poor labour-market outcomes at age 19, and even more so at age 21 (OECD 2010).

A similar longitudinal survey in Switzerland, which followed the PISA 2000 cohort until 2010, shows that students scoring below Level 2 in reading are at high risk of not completing upper secondary education. About 19% of students who had scored at Level 1, and more than 30% of students who had scored below Level 1 had not completed any upper secondary programme by the age of 25, compared to less than 10% of those students who had scored above the baseline level of proficiency in reading (Scharenberg et al., 2014).

Two follow-up studies in Uruguay, based on the 2003 and 2006 PISA cohorts, similarly indicate that students who had scored below Level 2 in the mathematics tests were significantly less likely to complete upper secondary education (Cardozo, 2009) and more likely to have repeated a grade or dropped out of school, even after accounting for other demographic and social differences among students (Ríos González, 2014). A Danish study that linked PISA to the Survey of Adult Skills (a product of the OECD Programme for the International Assessment of Adult Competencies, or PIAAC) also shows that students who had scored below Level 2 in reading in PISA 2000 were more likely to have received income transfers for more than a year between the ages of 18 and 27 – meaning that they were unemployed or ill for long periods (Rosdahl, 2014). And the Longitudinal Study of Australian Youth (LSAY) shows that the 25% of students with the lowest scores in mathematics in 2003 were more likely to be unemployed or not in the labour force in 2013 than the second 25% of students (LSAY, 2014).

The share of students who achieve the baseline level of skills in all three domains (science, reading and mathematics) varies considerably across countries – from more than 80% in Canada, Estonia, Finland, Hong Kong (China), Japan, Macao (China) and Singapore, to less than 20% of students in some middle-income countries. The culturally and geographically diverse set of countries in the former group shows that on all continents, universal basic skills could become a reality within the next generation. At the same time, the small set of countries that achieves this benchmark today shows that much remains to be done in most countries – including some of the wealthiest OECD countries – to attain the Sustainable Development Goals (Table I.2.10a).

HIGHER PUBLIC EXPENDITURE ON EDUCATION HAS NOT ALWAYS DELIVERED BETTER RESULTS

Money is necessary to secure high and equitable performance in school, but it is not sufficient. Only one of the ten PISA-participating countries with the highest cumulative public expenditure per student up to age 15 – Singapore – is among the seven countries/economies where less than 20% of students are low achievers in any of the three domains. But these seven countries/economies include Estonia and Korea, whose public spending per student is below the OECD average.

Perhaps more important, several countries have increased expenditures over the past decade without seeing corresponding improvements in the quality of the learning outcomes measured by PISA. Across OECD countries, expenditure per primary and secondary student rose by almost 20% between 2005 and 2013 (OECD, 2016). Yet, on average across OECD countries, students' mean reading proficiency has stagnated since 2000 (Table I.4.4a), and there has been no notable reduction in the percentage of students performing below the baseline level of proficiency (Tables I.2.2a, I.4.2a and I.5.2a).

Financial resources can explain broad patterns of variation in performance in PISA. For example, 36% of the variation in mean scores is associated with differences in per capita GDP across countries; and 55% of the variation in mean scores is associated with differences in cumulative expenditure on students up to age 15. However, while money relates to learning outcomes among low-spending countries, for the majority of OECD countries there is essentially no relationship between spending per student and outcomes in PISA. What matters are how resources are allocated and the qualitative differences in education policies, cultural norms and professional practices that underlie the performance differences between and within countries (these are discussed in Volume II).

The countries that have improved the most in PISA over the past decade have often shown the capacity to find solutions to the challenges they face, using PISA and other robust sources of evidence, as both a mirror and a way to build consensus about the priorities for action. It is not unusual to see PISA-participating countries improve rapidly between the first two assessments in which they participate. Such improvement could indicate that countries are harvesting some of the early fruits of their efforts to improve their education systems. But sustained improvement over several years and PISA assessments is much more difficult to achieve. Colombia and Portugal are among the few education systems whose reforms have been successful in improving average student performance in science over successive PISA cycles.

ACCESS TO EDUCATION IS STILL NOT UNIVERSAL

In many countries, improving the quality of education will not be sufficient to ensure that, by 2030, all young people leave compulsory schooling with basic skills; these countries must also ensure that all young people complete primary and secondary education. In fact, in some countries, the 15-year-olds who are enrolled in school have access to excellent

education, but there are many 15-year-olds who are no longer in school to benefit from it or are held back in primary grades. In Beijing-Shanghai-Jiangsu-Guangdong (China) (hereafter "B-S-J-G [China]") and Viet Nam, for instance, there are fewer low-achieving students in school than on average across OECD countries; but the PISA target population represents less than 50% of the overall population of 15-year-olds in Viet Nam, and only 64% in B-S-J-G (China).

Meanwhile, in Brazil, Costa Rica, Lebanon and Mexico, fewer than two in three 15-year-olds are in school and eligible to participate in PISA; but among these students, at best about one in three (36% of students in Mexico) attains the baseline level of performance in all three domains. These countries face a double challenge: they must expand secondary education while also ensuring that students who complete compulsory education are at least able to read and understand texts, and to use numbers, at a level that enables them to further develop their potential and participate in knowledge-based societies.

While some OECD countries, and more partner countries and economies, are further from securing universal enrolment for their 15-year-olds, many of them have been gradually advancing towards this goal over the past decades. For instance, between 2003 and 2015, the population of 15-year-olds enrolled in grade 7 or above increased by almost 500 000 students in Brazil, by more than 375 000 students in Turkey and by more than 300 000 students in Mexico, reflecting the increasing capacity of these countries to retain young people in school. These improvements are also evident in improved coverage rates of the national populations of 15-year-olds (enrolled and not enrolled) in PISA samples. Countries showing positive coverage trends also include Costa Rica, Indonesia and Uruguay.

Policies to increase participation in secondary education may focus on providing more resources to schools, either as a way of reducing direct costs of education for families or enabling schools to provide safer and more accessible environments, and specific learning support to children at risk of dropping out. An alternative policy approach is to allocate resources directly to students' families, including through conditional transfer programmes that offer financial incentives to disadvantaged or marginalised families to encourage their children to enrol in and attend school. Brazil, Mexico and Peru have introduced such programmes. Mexico's *Oportunidades* (now rebranded as *Prospera*) and *Programa de Becas de Media Superior* are examples of cash-transfers programmes to poor families aimed to raise enrolment rates in secondary education, especially among girls (OECD, 2013a).

Policy efforts to improve the inclusiveness of education systems through greater access to schooling are particularly urgent in countries with relatively low enrolment rates, and where demographic growth leads to larger populations of primary and secondary school-age children. Meanwhile, efforts to increase access to education should go hand-in-hand with the improvement of quality. Students and parents will not invest their time and resources in formal education if schooling does not improve students' future outcomes.

COUNTRIES DO NOT HAVE TO CHOOSE BETWEEN NURTURING EXCELLENCE IN EDUCATION AND REDUCING UNDERPERFORMANCE.

Basic skills protect individuals from adverse consequences of rapid change in inter-dependent, knowledge-based economies; they help make future growth sustainable and societies resilient. But they are not sufficient for individuals and countries to thrive in a highly advanced economic and social environment. The solutions to the most complex problems that humanity faces today – from climate change to inter-cultural communication and managing technological risks – will come from creative individuals who are willing to engage with these difficult issues and have the ability to do so.

The proportion of top-performing students in PISA – students who are able to understand and communicate complex tasks, formulate mathematically situations that involve several variables, and use their knowledge of and about science to analyse unfamiliar or complex science-related issues – is an indicator of whether education systems succeed in nurturing excellence. On average across OECD countries, about one in six students performs at Level 5 or above in science, reading or mathematics (Table I.2.9a); among them, 3.7% of students are top performers in all three subjects. An estimated one million 15-year-olds in OECD countries can perform at this level in science (Table I.2.9c).

But top performers in PISA are not evenly distributed across countries. In 12 countries and economies – B-S-J-G (China), Canada, Estonia, Finland, Hong Kong (China), Japan, Korea, Macao (China), New Zealand, Singapore, Switzerland and Chinese Taipei – more than one in five students perform at the highest levels (Level 5 or 6) in at least one of the PISA domains; and in Singapore and B-S-J-G (China), 13.7% and 7.6% of students, respectively, reach this level in all three domains.

Macao (China) and Portugal were able to "move everyone up" in science, mathematics and reading performance over the past decade by increasing the number of top performers while simultaneously reducing the number of students who do not achieve the baseline level of skills. Their experiences demonstrate that education systems can nurture top performers and assist struggling students simultaneously.

At the same time, PISA also shows that some education systems prepare a relatively large number of students to achieve at the highest levels, but face bigger challenges in ensuring that struggling students do not fall too far behind. In mathematics, for instance, Switzerland has a significantly larger share of top-performing students than Estonia, despite similar average performance; Israel has a larger share of top-performing students than the United States. In reading, France has one of the largest shares of top-performing students (12.5%), but its mean performance is close to the OECD average. France, Israel and Switzerland do relatively well (compared with countries of similar average performance) in nurturing excellence, but at the same time, they have sizeable shares of students who do not reach the baseline level of proficiency.

GENDER DIFFERENCES IN PERFORMANCE PERSIST

Among the subjects of science, mathematics and reading, science is the one where mean gender differences in performance in PISA are smallest. However, overall similar average performance in science does not reflect the many girls who have difficulty achieving at the highest levels of proficiency – and the large number of boys who struggle to acquire basic skills. In all three domains, boys show larger variation in performance than girls, meaning that the best-performing boys are far ahead of the lowest-achieving boys. Among girls, the difference between the top and lowest performers is narrower.

But for each of these findings, there are considerable variations across countries and years. In Finland, for instance, there are more girls than boys among the top performers in science (and the share of top-performing girls in Finland exceeds the share of top-performing boys in most other countries that participated in PISA). In Hong Kong (China) and Singapore, two of the highest-performing countries and economies, similar shares of boys and girls perform at Level 5 or above in mathematics. In Colombia, the country with the largest gender gap in mathematics performance (in favour of boys) of all PISA-participating countries/economies in 2012, this gap narrowed significantly in 2015 – and the country's highest-achieving girls now score significantly closer to the country's highest-achieving boys. In the United Kingdom, the variation in performance is similar among girls and among boys in all three domains – science, reading and mathematics.

This indicates that gender disparities in performance do not stem from innate differences in aptitude, but rather from factors that parents, teachers, policy makers and opinion leaders can influence. A collective effort to encourage student attitudes that are conducive to success, among both boys and girls, and change the behaviours that impede learning can give boys and girls equal opportunities to realise their potential and to contribute to society with their unique, individual capacities.

Gender differences are also apparent in students' dispositions towards science-related careers, even among students who score similarly in science and who report similar levels of enjoyment in learning science. In Germany, Hungary and Sweden, for instance, boys who score at or above Level 5 in science (top-performing boys) are significantly more likely than top-performing girls to expect a career requiring further training in science (the opposite is observed in Denmark and Poland, but only because many more girls than boys in these countries expect to work as health professionals). This echoes findings from other studies in which many students report enjoying science, but do not perceive science as being something for them (Archer et al. 2010). Perhaps even when students hold positive views of scientists, in general, they find it hard to relate their image of a scientist to themselves (DeWitt and Archer 2015).

POLICY IMPLICATIONS OF RESULTS FROM THE PISA SCIENCE ASSESSMENT

Every day, the public is confronted with new messages based on science. "Revolutionary new toothpaste not only removes more plaque but could save you from a heart attack"; "A pill to cure autism? Study identifies defect in sufferers' cells – that could be treated by existing medication"; "A glass of red wine a day could keep polycystic ovaries at bay". These are just a few of the headlines published on the website of a popular British tabloid on the morning of 19 October 2016.[1]

When newspapers report about the side effects of common drugs; when a friend forwards the link to a website showing the "benefits" of drinking alcohol; when a toothpaste advertisement at the supermarket claims that it has been scientifically proven to kill "99% of bacteria" – it is up to the recipient of these messages to be able to separate science from spin, to identify misrepresentations of findings, and to assess the level of uncertainty, or the trustworthiness, associated with a particular claim. A solid base of science literacy is necessary not just for those who are interested in becoming scientists and engineers. Rather, all youth need to understand the nature of science and the origin of scientific knowledge so that they can become better citizens and discerning consumers.

For this reason, the PISA assessment of science measures not only students' knowledge of major facts, concepts and explanatory theories about the natural world and technological tools; it places equal weight on assessing students' knowledge and understanding of scientific methods and of the nature and origin of scientific knowledge. PISA assessment tasks (some examples of which are presented in Annex C and available on line at www.oecd.org/pisa) measure whether

students can explain phenomena scientifically; they also measure how able and willing students are to evaluate scientific enquiry and to interpret data and evidence scientifically. All three competencies are important in order to understand and engage critically with issues that involve science and technology – which are fast becoming ubiquitous.

PISA results also underline the importance of students' values, beliefs and attitudes towards science: support for scientific approaches to enquiry, interest in science and enjoyment of learning science are all positively related to performance in science and support further engagement with scientific issues over a lifetime. PISA data show, for instance, that students who do not agree that scientific knowledge is tentative are less likely to perform well in science than students who recognise that ideas in science are inherently provisional, and are sometimes revised based on new evidence. They also show that engagement with science and positive attitudes towards science are strongly related, in ways that also depend on students' proficiency in science. In particular, the positive relationship between performance in science and expectations of future careers in science is strongest among students who enjoy learning science the most. This may imply that widespread engagement with science does not come from high academic proficiency alone; nor can positive attitudes compensate for low proficiency. If educators focus on one to the exclusion of the other, then the influence of each is, most likely, undermined. Rather, these results indicate that positive attitudes and strong knowledge and competence reinforce each other in sustaining lifelong engagement with science.

Support widespread engagement with science while meeting the demand for scientific excellence

For most of the 20th century, school science curricula, especially in upper secondary education, tended to focus on providing the foundations for the professional training of a small number of scientists and engineers. These curricula mostly presented science in a form that focused on providing students with the basic facts, laws or theories related to the various disciplines of science rather than on the broad paradigms and the inter-disciplinary aspects related to epistemic and procedural knowledge. Based on students' ability to master those facts and theories, educators tended to identify students who could continue to study science beyond compulsory education, rather than encouraging every student to be engaged with science.

But scientific and technological advances in today's economies, and the pervasiveness of science- and technology-related issues – from understanding food-safety information to improving local waste-management systems, from tackling antibacterial resistance to improving energy efficiency – have changed that mindset. All citizens, not just future scientists and engineers, need to be willing and able to confront science-related dilemmas.

The PISA framework for assessing science recognises that all young people should have an understanding of science and of science-based technology in order to become informed citizens and to engage in critical discussions about issues that involve science and technology. But lifelong engagement with science, beyond compulsory schooling, requires more than knowledge and skills; students will make the most of their knowledge, and participate in science-related activities, only if they are also positively disposed towards science. This, of course, is particularly important for students who aspire to become scientists or engineers, or to work in other science-related occupations.

It is encouraging that students generally reported positive attitudes towards science. Most students expressed a broad interest in science topics and recognised the important role that science plays in their world. In addition, a large majority of students showed support for scientific approaches to enquiry (such as that sound conclusions are based on repeated experiments). This provides a basis on which teaching and learning science in schools can be built.

Improve both skills and attitudes to encourage lifelong engagement with science

For many countries, Chapter 3 paints a picture of increasing engagement, interest and recognition of the usefulness of science among 15-year-old students. For instance, in Ireland, Poland and the United States, students in 2015 reported significantly greater enjoyment of learning science and greater interest in science than their counterparts in 2006 did. In Ireland, New Zealand, Sweden and the United Kingdom, students in 2015 also reported more often than students in 2006 that they thought that what they learn in school science is useful for their future lives and careers.

These positive changes in attitudes towards science are still modest and too often not accompanied by improvements in students' skills. Nevertheless, they could indicate that greater attention to the affective aspects of learning science can, and does, make a difference.

PISA highlights important differences in young people's skills and attitudes towards science across countries and, within countries, across schools. Volume II (Chapter 2) shows that differences in science performance and in attitudes and

dispositions towards science often correlate positively with differences in the amount of learning time devoted to science. They are also positively correlated with certain teaching strategies used by science teachers in their science lessons, such as providing clear explanations of scientific ideas, guiding students' reflection on how a science idea can be applied to a number of different phenomena, or tailoring the lessons to the students in their classes.

But the assessment provides limited insights into the origin of these differences and into how these skills and attitudes can be improved, both in and outside of school. However, the research literature confirms that teachers play an important role in shaping students' attitudes towards learning science and towards pursuing a science career (Jones, Taylor and Forrester, 2011; Logan and Skamp, 2013; Tröbst et al., 2016; also see Kunter, Baumert and Köller, 2007). While hands-on science experiences, museum visits or participation in informal science labs can expand the opportunities to learn science, the quality of teachers, and the mediating role of parents, instructors or scientists with whom children have a personal exchange is crucial for turning these activities into opportunities to enjoy and value science. Interest, enjoyment, utility and achievement do not develop in isolation, simply by putting activities in front of children.

Successful scientists and engineers often emphasise the important role that their secondary school teachers or their family members played in supporting their decision to become scientists. In a retrospective study based on informal accounts of 37 scientists and engineers, activities such as tinkering, building models, and exploring science independently in and outside of school were viewed as factors that influenced interests in science and engineering (Jones, Taylor and Forrester, 2011).

Longitudinal studies that follow students and their teachers over time have also related the quality of teaching to the development of an initial or lasting interest in science. A German study observed how interest evolved over a short period among more than 2000 elementary and lower secondary students who were taught the same content (evaporation and condensation) by different teachers. The researchers found that the use of everyday contexts in instruction, the clarity of teachers' lessons, the role of student-generated explanations, and the occurrence and quality of experiments could explain a significant share of the increase, or decrease, in student interest observed over this short period (Tröbst et al., 2016). A small case study in Australia followed students from the age of 14 to 17 and showed that interest in science increased, or decreased, as a function of the quality of teaching. The most successful teachers were those whom students perceived as providing clear instructions, emphasising deep understanding of concepts rather than broad coverage of content, posing challenges and striving to make science relevant to students' lives (Logan and Skamp, 2013). Other studies suggest that not only students' interest, but their future performance in university also benefits when high school courses cover less material, but in more depth (Schwartz et al., 2009).

While evidence about the role and characteristics of high-quality teachers continues to accumulate, science educators lament the disconnect between what is known about high-quality teaching and what is commonly practiced. The 19th-century French scientist, Claude Bernard, famously wrote that science is a "superb and dazzling hall, but one which may be reached only by passing through a long and ghastly kitchen".[2] Osborne, Simon, and Collins (2003), writing more than a century later, comment that "The essential irony of a discipline that offers intellectual liberation from the shackles of received wisdom is that the education it offers is authoritarian, dogmatic and non-reflexive." (Cross-country differences in science teaching, and their association with students' performance and interest in a science-related career are presented in Chapter 2 of Volume II.)

Challenge stereotypes about science-related occupations to help all boys and girls achieve their potential

PISA consistently finds varying levels of engagement with science and expectations of science-related careers across students who are similarly capable and interested in science. In a majority of countries and economies, students from advantaged backgrounds are more likely to expect a career in science – even among students who perform similarly in science and who reported similar enjoyment of learning science.

Gender differences in attitudes also persist. Several actions have been suggested to close this gender gap and, more generally, to encourage more young people, especially those from groups that are now under-represented in science-related fields, to participate in further science-related study and work.

Stereotypes about scientists and about work in science-related occupations (computer science is a "masculine" field and biology a "feminine" field; scientists achieve success due to brilliance rather than hard work; scientists are "mad") can discourage some students from engaging further with science. Schools can counter these stereotypes, and help students

cultivate a wider perspective on science, through better career information (DeWitt and Archer 2015). Students should have access to information that is accurate, credible and avoids unrealistic or exaggerated portrayals. This information should be compiled by independent observers and made available to both parents and students (OECD, 2008; OECD, 2004). Employers and educators in perceived "masculine" or "feminine" fields can also help eliminate existing stereotypes, such as by promoting awareness that computer sciences ("masculine" and "nerdy") help solve health problems ("feminine" and "caring") (Wang and Degol 2016), or by reaching out and establishing direct contact with students and schools (OECD, 2008).

Providing objective and reliable career information to both boys and girls, including personal contacts with employers and professionals, can help reduce the influence of informal sources of information, which may lack reliability, solid information and impartiality, and confine choices to the known and familiar (OECD, 2004). PISA data show that students sometimes have a limited understanding of what "a career in science" can mean. Other data show that few pupils have a full or accurate understanding of science-related professions; many are largely unaware of the range of career opportunities that are made available with training in science and technology. What they do know often comes from personal interactions – mostly with their teachers, sometimes with family members – or through the media, where scientists are often portrayed as white men in white coats, and engineers as men performing dirty or dull jobs (OECD, 2008).

But the power of personal interactions can also be harnessed in more formal career guidance activities to counter the stereotyped images that otherwise prevail. Providing all children with opportunities for personal contact with science and engineering professionals, such as through employer talks at school, can help children make informed decisions about their desired education and career path, and has been shown, in some contexts, to have a lasting, positive impact (Kashefpakdel and Percy, 2016).

Other research has shown that the school context also has a lasting influence on how likely girls are to pursue a career in science and engineering. According to a longitudinal study in which students from 250 high schools in the United States were followed from 8th grade (prior to entering high school) until high school graduation, gendered career choices are more frequent in high schools that are characterised by weaker curricula and where boys and girls attend different extracurricular activities (Legewie and DiPrete, 2014). By contrast, in schools that offer advanced mathematics and science curricula, and where extracurricular activities, such as sports clubs, attract both boys and girls in similar number, girls and boys are equally likely to report at the end of high school that they plan to major in a science and engineering field.

Promoting a positive and inclusive image of science is also important. Too often, school science is seen as the first segment of a (leaky) pipeline that will ultimately select those who will work as scientists and engineers. Not only does the "pipeline" metaphor discount the many pathways successful scientists have travelled to reach their career goals (Cannady, Greenwald and Harris 2014; Maltese, Melki and Wiebke 2014), it also conveys a negative image of those who do not end up as scientists and engineers. Because knowledge and understanding of science is useful well beyond the work of scientists and is, as PISA argues, necessary for full participation in a world shaped by science-based technology, school science should be promoted more positively – perhaps as a "springboard" to new sources of interest and enjoyment (Archer, Dewitt, and Osborne 2015). Expanding students' awareness about the utility of science beyond teaching and research occupations can help build a more inclusive view of science, from which fewer students feel excluded (Alexander, Johnson, and Kelley 2012).

POLICY IMPLICATIONS OF DIFFERENCES IN EQUITY ACROSS COUNTRIES

Equity in education is a matter of design and concerted policy efforts. Achieving greater equity in education is not only a social justice imperative, it is also a way to use resources more effectively, increase the supply of skills that fuel economic growth, and promote social cohesion. As such, equity should be one of the key objectives in any strategy to improve an education system.

PISA 2015 shows that, in most participating countries and economies, socio-economic status and an immigrant background are associated with significant differences in student performance. For example, disadvantaged students (those in the bottom quarter on the PISA index of economic, social and cultural status within their countries/economies) score 88 points lower in science than advantaged students (those in the top quarter on the index), on average across OECD countries. In B-S-J-G (China), Belgium, CABA (Argentina), France, Hungary, Luxembourg, Malta and Singapore, the difference ranges between 110 and 125 score points (Table I.6.3a).

At the same time, up to 34% of disadvantaged students do not attain the baseline level of proficiency in science (Level 2), on average across OECD countries, compared with only 9% of their advantaged peers (Table I.6.6a). Among students with an immigrant background, the likelihood of low performance is more than twice as high among immigrant students as among non-immigrant students, even after taking their socio-economic status into account (Table I.7.5a).

Yet PISA also shows that the relationship between students' background and their outcomes in education varies widely across countries. In some high-performing countries, this relationship is weaker than average – implying that high achievement and equity in education outcomes are not mutually exclusive. This underlines PISA's definition of equity as high performance for students from all backgrounds, rather than as small variations in student performance only. In PISA 2015, Canada, Denmark, Estonia, Hong Kong (China) and Macao (China) achieved both high levels of performance and equity in education.

PISA is an assessment of the cumulative learning that has occurred since birth. Investments in early childhood education bring relatively large returns as children progress through school (Kautz et al., 2014). By contrast, intervening when students have already fallen behind is often more expensive and less effective, even if skills can be developed at all ages. For most countries, comprehensive education policy must also focus on increasing socio-economic inclusion and enabling more families to provide better support for their children's education. For others, it may also mean improving school offerings and raising the quality of education across the board. And most importantly, high levels of equity and performance should be seen as complementary rather than competing objectives.

Design policies based on how well socio-economic status predicts performance and on how much differences in student performance overlap with socio-economic disparities

Policy makers and school administrators often ask themselves whether efforts to improve student performance and equity should be targeted mainly at low performers or at disadvantaged students.

Countries and economies where an equity-centred policy strategy, as opposed to an achievement-centred strategy, would have the greatest impact are those where there are large performance differences between advantaged and disadvantaged students and a strong relationship between performance and socio-economic status. These countries can promote equity and raise their mean level of achievement by implementing policies that target mainly socio-economic disadvantage. In countries with this profile, the steepness of the socio-economic gradient (the average size of the performance gap associated with a given difference in socio-economic status) suggests that low-performing students could rapidly improve their performance if their socio-economic status were also improved. The stronger-than-average relationship between socio-economic status and performance, however, suggests that very few students overcome the barriers to high performance that are linked to disadvantage.

In PISA 2015, Belgium, Singapore and Switzerland were the only three high-performing countries with below-average levels of equity in education outcomes. Austria, the Czech Republic and France also show below-average equity and score around the OECD average. Where both poor performance and low equity are observed, such as in Hungary and Luxembourg, policies that target both low performers and disadvantaged students would reach those who need support the most since, in these cases, they tend to be the same students. Countries and economies where socio-economic status is a strong predictor of performance and where the gap in performance between advantaged and disadvantaged students is wide would benefit from compensatory policies that provide more resources to disadvantaged students and schools than to their advantaged peers.

A second group of countries includes those where there is a strong relationship between performance and socio-economic status but where the differences in performance between advantaged and disadvantaged students are relatively small. This group includes Chile, Peru and Uruguay. More than one in three students in Chile and Uruguay and more than one in two in Peru perform below the baseline level of proficiency in science. In another 14 counties and economies, including Greece, Mexico, Portugal, Spain and the United States, differences in performance are relatively small, but the impact of socio-economic status on performance is around average. In countries and economies with this profile, a combination of universal policies to improve performance across the board – such as increasing the amount or quality of the time students spend at school – and policies providing more and better resources to disadvantaged students and schools may yield the best results.

A third group of countries and economies are those where performance differences related to socio-economic status are small and there is a weak relationship between student performance and socio-economic status. While these countries/economies tend to show small variation in student performance, their overall levels of achievement can vary greatly. Canada, Denmark, Estonia, Hong Kong (China) and Macao (China) are the only school systems that share above-average performance and above-average equity, whether measured by the strength of the relationship between socio-economic status and performance or by the size of the performance difference across socio-economic groups. Latvia is another high-equity country, but its performance is around the OECD average.

Finland, Japan, Norway and the United Kingdom are also high-achievers with a weak relationship between socio-economic status and performance, but performance differences related to socio-economic status are around average. Beyond universal policies, these countries may consider policies targeted to low performers who may not necessarily be defined by their socio-economic status (for example, immigrant students), or to poor-performing schools, when differences between schools are large.

In another 15 countries that score below average in science, including OECD countries Iceland, Italy and Turkey, socio-economic status is only weakly related to performance, and the differences in performance between advantaged and disadvantaged students are relatively small. In all these countries except Iceland, Italy and the Russian Federation (hereafter "Russia"), more than one in four students performs below the baseline level of proficiency in science. Equity indicators suggest that, in many of these countries, many low-performing students may not come from disadvantaged backgrounds. Thus, by themselves, policies that specifically target disadvantaged students would not address the needs of many of the country's low performers. As is true in high-performing systems, in these countries, universal policies that reach all students and schools, or policies targeted to low-performing schools, regions or other groups not necessarily defined by socio-economic status, are likely to have more of an impact in improving performance while maintaining high levels of equity.

Target special resources to schools with a high concentration of low-performing and disadvantaged students.

In PISA 2015, and in line with previous assessments, performance differences between schools account for slightly less than a third of the overall variation in performance, on average across OECD countries (Table I.6.9). But the extent of between-school differences in performance varies widely across school systems. In high-performing systems where between-school differences are small – as it is the case in Canada, Denmark, Finland, Ireland, Norway and Poland – students can be expected to achieve at high levels regardless of which school they attend.

By contrast, in high-performing countries where between-school variation is above the OECD average, notably B-S-J-G (China), Belgium, Germany, the Netherlands and Slovenia, the school's socio-economic profile is a stronger predictor of student performance. In these countries/economies, differences in mean performance between advantaged and disadvantaged schools are larger than 140 score points in science – that is, about 40 points above the OECD average (Table I.6.11). And in a larger number of countries and economies with below-average performance, most notably in Bulgaria, CABA (Argentina), Hungary, Luxembourg and Peru, socio-economic status also accounts for a large share of the between-school variation in science performance. Once again, this translates into large differences in the mean performance between students attending advantaged schools and those enrolled in disadvantaged schools.

There are two main policy options to address this situation. One is to try to reduce the concentration of disadvantaged and low-performing students in particular schools. PISA shows that, at the system level, more socio-economic inclusion in schools is related to smaller shares of low performers and larger shares of top performers (OECD, 2016). This suggests that policies leading to more social inclusion within schools may result in improvements among low-performing students, without adversely affecting high performers. In education systems that allow parents and students to choose their schools, greater socio-economic diversity in schools can be promoted through regulatory frameworks, better dissemination of information about the available choices and financial incentives. Legislation could guarantee that public and private schools receiving public funding are open to all students regardless of their socio-economic status, prior achievement or other personal characteristics. Chile adopted such policy in its 2009 General Education Law (OECD, 2015a). Education systems might also set admissions quotas for disadvantaged students to ensure that they are represented in all schools. For example, while the French Community of Belgium grants parents a large degree of choice in choosing a secondary school for their child, in oversubscribed schools, around 20% of places are reserved for students who had attended disadvantaged primary schools (OECD, 2013b).

A second policy is to allocate more resources to schools with larger concentrations of low-performing students and to disadvantaged schools. In more than 30 of the countries/economies that participated in PISA 2015, students in advantaged schools have access to better material or human resources than their peers in disadvantaged schools, although this is not the case in all countries with larger-than-average between-school disparities in performance. For instance, the Netherlands makes extensive use of early tracking and has the highest percentage (68%), among OECD countries, of variation in students' science performance between schools. However, there are no differences in the degree of concern about educational resources between principals of advantaged schools and principals of disadvantaged schools. The Dutch system combines an equitable allocation of funds to all schools receving public funding with targeted block grants for schools serving disadvantaged students and for special purposes, such as preventing school dropout (see Box 5.2 in Volume II).

In cases where disparities in resource allocation between schools of different socio-economic profiles stem from residential segregation, giving higher-level authorities responsibility for resource allocation and strengthening their capacity to monitor and support schools at risk can begin to address the problem. Other options include allocating specific goods and/or personnel to disadvantaged schools, including teachers specialised in target subjects and/or with training of particular relevance for low-performing students, providing other professional and administrative staff, and instructional materials (e.g. computers, laboratories, libraries) or improving school infrastructure. For example, Ireland's Delivering Equality of Opportunity in Schools programme is a national plan that identifies socio-economic disadvantage in schools based on the community in which they are located, and provides different kinds of resources and support, depending on the degree of disadvantage (OECD, 2015a).

Beyond measures to promote greater socio-economic inclusion and compensatory resource allocation mechanisms, policies needs to draw from successful school-level practices to promote science literacy. A study covering the entire population of ninth-grade students in Sweden and examining their probability of applying to the Swedish Natural Science Programme (NSP) – a preparatory programme for tertiary studies in scientific fields – found that about 10% of the schools in the country deviated from predictions about the number of applicants based on their socio-economic status. More than half of the schools considered succeeded in compensating for the socio-economic status of their students and boosting their interest in the programme (Anderhag et al., 2013). Identifying successful "outliers" is a first step for closer investigation into teaching and school leadership practices that can make a difference.

Encourage positive attitudes towards learning science among students of all backgrounds.

While PISA 2015 provides an encouraging picture about the levels of engagement with science and support for scientific approaches to enquiry among 15-year-olds in many OECD and partner countries, results also highlight differences in attitudes toward science that are related to socio-economic status. An area where these differences are most apparent are students' expectations to work in a science-related occupation by the age of 30, which indicates 15-year-olds' plans for choosing a scientific field of study in post-secondary education. In more than 40 countries and economies, and after accounting for students' performance in the science assessment (a strong correlate of career expectations), disadvantaged students remain significantly less likely than their advantaged peers to see themselves pursuing a career in science. In the OECD countries Finland and Poland, disadvantaged students are half as likely to expect such a career as their advantaged peers – even if they score similarly in science. In addition, in virtually all PISA-participating countries and economies, advantaged students tend to believe more strongly than disadvantaged students in the value of scientific approaches to enquiry (Table I.6.8).

The main policy implication of these findings is that, in order to foster positive dispositions towards science and promote greater socio-economic diversity among students who go on to pursue scientific careers, school systems need to focus on the psychological and affective factors associated with science performance. Specific programmes might be needed to spark interest in science among students who may not receive such stimulation from their family, and to support students' decision to pursue further studies in science.

The most immediate way to foster interest in science among students with less supportive home environments may be to increase early exposure to high-quality science instruction in schools. A survey of students in urban public schools in Israel found that differences in the interest in pursuing STEM fields in tertiary education related to family background disappear among students enrolled advanced science courses in secondary school (Chachashvili-Bolotin, Milner-Bolotin and Lissitsa, 2016). Museums and science centres could be unofficial partners in this effort. Ethnographic research in the United Kingdom suggests that informal science education institutions could do better at designing programmes that match the levels of knowledge, language skills, and financial capacity of youth from disadvantaged and immigrant backgrounds (Dawson, 2014). To become more inclusive, informal science education institutions may need to welcome – and seek out – visitors from a wider range of social, cultural and linguistic backgrounds.

Reduce differences in exposure to science content in school by adopting rigorous curriculum standards

Inequity in opportunity to learn can translate into significant differences in performance in any subject, but PISA 2015 finds that differences in instruction time related to differences in students' backgrounds are more pronounced in science than in reading or mathematics. The amount of time that students are exposed to science content in the classroom is indeed a key component of opportunity to learn science. On average across OECD countries, a larger percentage of advantaged students than disadvantaged students attends at least one science lesson in school every week. As a result of these differences, advantaged students might be exposed to around 20 more hours of science instruction than their disadvantaged peers (Table I.6.15).

The reasons why students of difference socio-economic status receive more or less instruction in science can, of course, be related to the choices they are given, but also to policies that sort students into different grades or study programmes with varying academic content. In PISA 2015, and after accounting for differences in performance, disadvantaged students are almost twice as likely as advantaged students to have repeated a grade by the time they sit the PISA test – which means they probably have not covered more advanced science content by the age of 15 – and are almost three times more likely to be enrolled in a vocational rather than an academic track – which might also mean that science content is covered in less depth (Tables I.6.14 and I.6.16).

A potential policy response to increase equity in opportunity to learn is to reduce or delay student sorting practices, including early tracking and other forms of ability grouping, that may limit exposure to academic content.

A complementary policy is to adopt robust curricular standards for all students, no matter which school they attend. Shared standards and high-quality, standard-aligned instructional materials can help to ensure that every student develops a baseline levels of skills and is prepared for advanced science coursework and, eventually, post-secondary science-related studies or work. Implementing rigorous and consistent standards across all classrooms does not mean limiting the curricular and pedagogical choices of schools, but rather that the same minimum standards are met by all schools, regardless of their socio-economic intake and specific study programmes. For example, in 2004, Germany introduced common education standards in different subjects, including biology, chemistry and physics. These standards have ensured greater coherence across Germany's three-track school system, leading to more academic content in the *Hauptschule* and *Realschule* vocational tracks (OECD, 2013a).

EDUCATION POLICIES TO SUPPORT IMMIGRANT STUDENTS

The policies and practices that countries design and implement to support immigrant students have a major influence on whether integration in the host communities is successful or not. How well immigrant students do at school is not only related to their attitudes, socio-economic status and prior education, but also to the quality and receptiveness of the host country's education system.

More than one in ten students (12.5%) in PISA 2015 have an immigrant background. Global migration flows mean not only that the proportion of immigrant students has been growing across PISA assessments, but also that this population has become increasingly diverse across host countries (Tables I.7.1 and I.7.2). On average across OECD countries, immigrant students score lower than their non-immigrant peers in all subjects assessed and are more likely not to attain the baseline level of proficiency (Level 2) (Tables I.7.4a-c and I.7.5a-c) . Yet immigrant students are 50% more likely than their non-immigrant peers who perform similarly in science to expect to work in a science-related career by the age of 30 (Table I.7.7). And the difference in science performance between immigrant and non-immigrant students narrowed by 6 score points since PISA 2006. In 2015, socio-economic status and familiarity with the language of instruction and assessment in host countries accounted for about 40% of that difference, on average across OECD countries (Table I.7.15a).

But the outcomes of immigrant students vary widely across countries and economies, depending not only on their socio-economic status and national origin, but also on the characteristics of the school systems of the destination countries. A key policy question is how best to best support immigrants students who face the multiple disadvantage of socio-economic deprivation, low education standards in their countries of origin, and cultural adjustment to host countries, including learning a new language. How, too, can destination countries/economies support the high aspirations of immigrant students and families, and channel the high levels of skills that many of them bring? Previous OECD work describes various education policies that have proven effective in helping immigrant students succeed in school (Nusche, 2009; OECD, 2010; OECD, 2015b).

Short-term, high-impact policy responses

A quick-win policy response is to provide sustained language support for immigrant students with limited proficiency in the language of instruction. Language skills are essential for most learning processes; any student who does not master the language used in school is at a significant disadvantage. Common features of successful language-support programmes include sustained language training across all grade levels, centrally developed curricula, teachers who are specifically trained in second-language acquisition, and a focus on academic language and integration of language and content learning. Since language development and general cognitive development are intertwined, it is best not to postpone teaching of the main curriculum until students fully master their new language. One way to integrate language and academic learning is to develop curricula for second-language learning. Another is to ensure close co-operation between language teachers and classroom teachers, an approach that is widely used in countries that seem most successful in educating immigrant students, such as Australia, Canada and Sweden (Christensen and Stanat, 2007).

Offering high-quality early childhood education, tailored to language development, is another immediate policy response. Entering early education programmes can improve the chances that immigrant students start school at the same level as non-immigrant children. Improved access to pre-primary education may involve offering programmes free of charge to disadvantaged students and linking enrolment to wider social policy programmes to support the integration of immigrant families. To raise awareness of the value of early learning and overcome potential reluctance to enrol children, targeted home visits can help families support their child's learning at home and can also ease entry into appropriate education services.

A third high-impact policy option is to build the capacity of schools receiving immigrant children, as the successful integration of immigrant children depends critically on having high-skilled and well-supported teachers. This can involve providing special training for teachers to better tailor instructional approaches to diverse student populations and to support second-language learning, and also, more generally, reducing teacher turnover in schools serving disadvantaged and immigrant populations, and encouraging high-quality and experienced teachers to work in these schools. Hiring more teachers from ethnic minority or immigrant backgrounds can help reverse the growing disparity between an increasingly diverse student population and a largely homogeneous teacher workforce, especially in countries where immigration is a more recent phenomenon.

Medium-term, high-impact policy responses

Among policy responses with a medium-term horizon is avoiding the concentration immigrant students in the same, disadvantaged schools. Schools that struggle to do well for domestic students will struggle even more with a large population of children who cannot speak or understand the language of instruction. Countries have used three main ways to address the concentration of immigrant and other disadvantaged students in particular schools. The first is to attract and retain other students, including more advantaged students. The second is to better equip immigrant parents with information on how to select the best school for their child. The third is to limit the extent to which advantaged schools can select students on the basis of their family background.

A second set of options is related to limiting the application of stratification policies, including ability grouping, early tracking and grade repetition. Tracking students into different types of school programmes, such as vocational or academic, seems to be especially harmful for immigrant students, particularly when it occurs at an early age. Early separation from mainstream students might prevent immigrant students from developing the linguistic and culturally relevant skills needed to perform well at school.

Policy can also provide extra support and guidance to immigrant parents. This can take the form of engaging in stimulation-oriented interactions, such as reading to and having discussion about school with children, but also of helping to orient student choices and navigate the school system. While immigrant parents often have high aspirations for their children, parents may also feel alienated and limited in their capacity to support children if they have poor language skills or an insufficient understanding of how schools in the host country function. Programmes to support immigrant parents can include home visits to encourage these parents to participate in educational activities, employing trained liaison staff to improve communication between schools and families, and reaching out to parents to involve them in school-based activities. Evidence from an intervention in a disadvantaged school district in France shows that low-cost programmes can boost parents' involvement in their children's education and improve student behaviour at school (Avvisati et al., 2014).

Notes

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2. "S'il fallait donner une comparaison qui exprimât mon sentiment sur la science de la vie, je dirais que c'est un salon superbe tout resplendissant de lumière, dans lequel on ne peut parvenir qu'en passant par une longue et affreuse cuisine." (Bernard 1865), p.28.

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Annex A

PISA 2015 TECHNICAL BACKGROUND

All tables in Annex A are available on line

Note regarding B-S-J-G (China)
B-S-J-G (China) refers to the four PISA participating China provinces : Beijing, Shanghai, Jiangsu, Guangdong.

Note regarding CABA (Argentina)
CABA (Argentina) refers to the Ciudad Autónoma de Buenos Aires, Argentina.

Note regarding FYROM
FYROM refers to the Former Yugoslav Republic of Macedonia.

Notes regarding Cyprus

Note by Turkey: The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the “Cyprus issue”.

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

ANNEX A1
INDICES FROM THE STUDENT AND SCHOOL CONTEXT QUESTIONNAIRE

Explanation of the indices

This section explains the indices derived from the PISA 2015 student and school context questionnaires used in this volume.

Several PISA measures reflect indices that summarise responses from students, their parents, teachers or school representatives (typically principals) to a series of related questions. The questions were selected from a larger pool of questions on the basis of theoretical considerations and previous research. The *PISA 2015 Assessment and Analytical Framework* (OECD, 2016) provides an in-depth description of this conceptual framework. Structural equation modelling was used to confirm the theoretically expected behaviour of the indices and to validate their comparability across countries. For this purpose, a model was estimated separately for each country and collectively for all OECD countries. For a detailed description of other PISA indices and details on the methods, see the *PISA 2015 Technical Report* (OECD, forthcoming).

There are three types of indices: simple indices, new scale indices, and trend scale indices.

Simple indices are the variables that are constructed through the arithmetic transformation or recoding of one or more items in exactly the same way across assessments. Here, item responses are used to calculate meaningful variables, such as the recoding of the four-digit ISCO-08 codes into "Highest parents' socio-economic index (HISEI)" or teacher-student ratio based on information from the school questionnaire.

New and trend scale indices are the variables constructed through the scaling of multiple items. Unless otherwise indicated, the index was scaled using a two-parameter item response model (a generalised partial credit model was used in the case of items with more than two categories) and values of the index correspond to Warm likelihood estimates (WLE) (Warm, 1985). For details on how each scale index was constructed, see the *PISA 2015 Technical Report* (OECD, forthcoming). In general, the scaling was done in three stages:

1. The item parameters were estimated from equally-weighted samples of students from all countries and economies; only cases with a minimum number of three valid responses to items that are part of the index were included. In the case of **trend indices**, a common calibration linking procedure was used: countries/economies that participated in both PISA 2006 and PISA 2015 contributed both samples to the calibration of item parameters; each cycle, and, within each cycle, each country/economy contributed equally to the estimation.
2. The estimates were computed for all students and all schools by anchoring the item parameters obtained in the preceding step.
3. For **new scale indices**, the Warm likelihood estimates were then standardised so that the mean of the index value for the OECD student population was zero and the standard deviation was one (countries being given equal weight in the standardisation process). **Trend indices** were equated so that the mean and standard deviation across OECD countries of rescaled PISA 2006 estimates and of the original estimates included in the PISA 2006 database matched. Trend indices are therefore reported on the same scale as used originally in PISA 2006, so that values can be directly compared to those included in the PISA 2006 database.

Sequential codes were assigned to the different response categories of the questions in the sequence in which the latter appeared in the student, school or parent questionnaires. Where indicated in this section, these codes were inverted for the purpose of constructing indices or scales. Negative values for an index do not necessarily imply that students responded negatively to the underlying questions. A negative value merely indicates that the respondents answered less positively than all respondents did on average across OECD countries. Likewise, a positive value on an index indicates that the respondents answered more favourably, or more positively, on average, than respondents in OECD countries did. Terms enclosed in brackets < > in the following descriptions were replaced in the national versions of the student, school and parent questionnaires by the appropriate national equivalent. For example, the term <qualification at ISCED level 5A> was translated in the United States into "Bachelor's degree, post-graduate certificate program, Master's degree program or first professional degree program". Similarly the term <classes in the language of assessment> in Luxembourg was translated into "German classes" or "French classes", depending on whether students received the German or French version of the assessment instruments.

In addition to simple and scaled indices described in this annex, there are a number of variables from the questionnaires that were used in this volume and correspond to single items not used to construct indices. These non-recoded variables have prefix of "ST" for the questionnaire items in the student questionnaire and "SC" for the items in the school questionnaire. All the context questionnaires, and the PISA international database, including all variables, are available through www.oecd.org/pisa.

Student-level simple indices

Student age

The age of a student (AGE) was calculated as the difference between the year and month of the testing and the year and month of a student's birth. Data on student's age were obtained from both the questionnaire (ST003) and the student tracking forms. If the month of testing was not known for a particular student, the median month for that country was used in the calculation.

Parents' level of education

Students' responses on questions ST005, ST006, ST007, and ST008 regarding parental education were classified using ISCED 1997 (OECD, 1999). Indices on parental education were constructed by recoding educational qualifications into the following categories: (0) None, (1) <ISCED level 1> (primary education), (2) <ISCED level 2> (lower secondary), (3) <ISCED level 3B or 3C> (vocational/pre-vocational upper secondary), (4) <ISCED level 3A> (general upper secondary) and/or <ISCED level 4> (non-tertiary post-secondary), (5) <ISCED level 5B> (vocational tertiary) and (6) <ISCED level 5A> and/or <ISCED level 6> (theoretically oriented tertiary and post-graduate). Indices with these categories were provided for a student's mother (MISCED) and father (FISCED). In addition, the index of highest education level of parents (HISCED) corresponds to the higher ISCED level of either parent. The index of highest education level of parents was also recoded into estimated number of years of schooling (PARED). The correspondence between education levels and years of schooling is available in the *PISA 2015 Technical Report* (OECD, forthcoming).

Parents' highest occupational status

Occupational data for both the student's father and the student's mother were obtained from responses to open-ended questions. The responses were coded to four-digit ISCO codes (ILO, 2007) and then mapped to the international socio-economic index of occupational status (ISEI) (Ganzeboom & Treiman, 2003). In PISA 2015, as in PISA 2012, the new ISCO and ISEI in their 2008 version were used rather than the 1988 versions that had been applied in the previous four cycles (Ganzeboom, 2010). Three indices were calculated based on this information: father's occupational status (BFMJ2); mother's occupational status (BMMJ1); and the highest occupational status of parents (HISEI) which corresponds to the higher ISEI score of either parent or to the only available parent's ISEI score. For all three indices, higher ISEI scores indicate higher levels of occupational status.

Immigrant background

The PISA database contains three country-specific variables relating to the students' country of birth, their mother and father (COBN_S, COBN_M, and COBN_F). The items ST019Q01TA, ST019Q01TB and ST019Q01TC were recoded into the following categories: (1) country of birth is the same as country of assessment and (2) other. The index of immigrant background (IMMIG) was calculated from these variables with the following categories: (1) non-immigrant students (those students who had at least one parent born in the country), (2) second-generation immigrant students (those born in the country of assessment but whose parent(s) were born in another country) and (3) first-generation immigrant students (those students born outside the country of assessment and whose parents were also born in another country). Students with missing responses for either the student or for both parents were assigned missing values for this variable.

Language spoken at home

Students indicated what language they usually speak at home (ST022), and the database includes a derived variable (LANGN) containing a country-specific code for each language. In addition, an internationally comparable variable (ST022Q01TA) was derived from this information with the following categories: (1) language at home is the same as the language of assessment for that student and (2) language at home is another language.

Grade repetition

The grade repetition variable (REPEAT) was computed by recoding variables ST127Q01TA, ST127Q02TA, and ST127Q03TA. REPEAT took the value of "1" if the student had repeated a grade in at least one ISCED level and the value of "0" if "no, never" was chosen at least once, given that none of the repeated grade categories were chosen. The index is assigned a missing value if none of the three categories were ticked in any levels.

Study programme

PISA collects data on study programmes available to 15-year old students in each country. This information is obtained through the student tracking form and the student questionnaire. In the final database, all national programmes are included in a separate derived variable (PROGN) where the first six digits represent the National Centre code, and the last two digits are the nationally specific programme code. All study programmes were classified using the International Standard Classification of Education (ISCED) (OECD, 1999). The following indices were derived from the data on study programmes:

- Programme level (ISCEDL) indicates whether students were at the lower or upper secondary level (ISCED 2 or ISCED 3).
- Programme designation (ISCEDD) indicates the designation of the study programme (A = general programmes designed to give access to the next programme level, B = programmes designed to give access to vocational studies at the next programme level, C = programmes designed to give direct access to the labour market, M = modular programmes that combine any or all of these characteristics).

- Programme orientation (ISCEDO) indicates whether the programme's curricular content was general, pre-vocational or vocational.

Science-related career expectations

In PISA 2015, students were asked to answer a question (ST114) about "what kind of job [they] expect to have when [they] are about 30 years old". Answers to this open-ended question were coded to four-digit ISCO codes (ILO, 2007), in variable OCOD3. This variable was used to derive the index of science-related career expectations.

Science-related career expectations are defined as those career expectations whose realisation requires further engagement with the study of science beyond compulsory education, typically in formal tertiary education settings. The classification of careers into science-related and non-science-related is based on the four-digit ISCO-08 classification of occupations.

Only professionals (major ISCO group 2) and technicians/associate professionals (major ISCO group 3) were considered to fit the definition of science-related career expectations. In a broad sense, several managerial occupations (major ISCO group 1) are clearly science-related: these include research and development managers, hospital managers, construction managers, and other occupations classified under production and specialised services managers (submajor group 13). However, it was considered that when science-related experience and training is an important requirement of a managerial occupation, these are not entry-level jobs and 15-year-old students with science-related career expectations would not expect to be in such a position by age 30.

Several skilled agriculture, forestry and fishery workers (major ISCO group 6) could also be considered to work in science-related occupations. The United States O*NET OnLine (2016) classification of science, technology, engineering and mathematics (STEM) occupations indeed include these occupations. These, however, do not typically require formal science-related training or study after compulsory education. On these grounds, only major occupation groups that require ISCO skill levels 3 and 4 were included among science-related occupational expectations.

Among professionals and technicians/associate professionals, the boundary between science-related and non-science related occupations is sometimes blurred, and different classifications draw different lines.

The classification used in this report includes four groups of jobs: [1]

1. ***Science and engineering professionals:*** All science and engineering professionals (submajor group 21), except product and garment designers (2163), graphic and multimedia designers (2166).
2. ***Health professionals:*** All health professionals in submajor group 22 (e.g. doctors, nurses, veterinarians), with the exception of traditional and complementary medicine professionals (minor group 223).
3. ***ICT professionals:*** All information and communications technology professionals (submajor group 25).
4. ***Science technicians and associate professionals,*** including:
   - physical and engineering science technicians (minor group 311)
   - life science technicians and related associate professionals (minor group 314)
   - air traffic safety electronic technicians (3155)
   - medical and pharmaceutical technicians (minor group 321), except medical and dental prosthetic technicians (3214)
   - telecommunications engineering technicians (3522).

How this classification compares to existing classifications

When three existing classifications of 15-year-olds' science career expectations, all based on the International Standard Classification of Occupations (ISCO), 1988 edition (ISCO-88), are compared to the present classification, based on ISCO-08, a few differences emerge. Some are due to the updated version of occupational codings (as discussed in the next section); the remaining differences are summarised in Table A1.1.

Developing a comparable classification for ISCO-88

The same open-ended question was also included in the PISA 2006 questionnaire (ID in 2006: ST30), but students' answers were coded in the PISA 2006 database according to ISCO-88. It is not possible to ensure a strictly comparable classification. To report changes over time, the correspondence described in Table A1.2 was used to derive a similar classification based on PISA 2006 data.

Table A1.1 ▪ **Differences in the definition of science-related career expectations**

	This classification	OECD (2007)	Sikora and Pokropek (2012)	Kjærnsli and Lie (2011)
Science-related managerial jobs	out	in	in	out
Psychologists	out	in	in	out
Sociologists and social work professionals	out	in	out	out
Photographers and image and sound recording equipment operators, broadcasting and telecommunications equipment operators	out	in	in	out
Statistical, mathematical and related associate professionals	out	out	in	out
Aircraft controllers (e.g. pilots, air traffic controllers)	out	in	in	out
Ship controllers (Ships' desk officers, etc.)	out	out	in	out
Medical assistants, dental assistants, veterinary assistants, nursing and midwifery associate professionals	out	in	in	out
Computer assistants, computer equipment operators and industrial robot controllers	out	out	out	in
Air traffic safety electronic technicians	in	in	in	out
Pharmaceutical technicians and assistants	in	in	in	out
Dieticians and nutritionists	in	in	in	out

Table A1.2 ▪ **ISCO-08 to ISCO-88 correspondence table for science-related career expectations**

Group	ISCO-08	ISCO-88
Science and engineering professionals	21xx (except 2163 and 2166)	21xx (except 213x), 221x
Health professionals	22xx (except 223x)	22xx (except 221x), 3223, 3226
ICT professionals	25xx	213x
Science technicians and associate professionals	311x, 314x, 3155, 321x (except 3214), 3522	311x, 3133, 3145, 3151, 321x, 3228

The main differences between ISCO-88 and ISCO-08, for the purpose of deriving the index of science-related career expectations, are the following:

- Medical equipment operators (ISCO-88: 3133) correspond to medical imaging and therapeutic equipment technicians in ISCO-08; air traffic safety technicians (ISCO-88: 3145) correspond to air traffic safety electronics technicians in ISCO-08; building and fire inspectors (ISCO-88: 3151) mostly correspond to civil engineering technicians in ISCO-08.
- Dieticians and nutritionists (ISC0-88: 3223) are classified among professionals in ISCO-08. For consistency, this ISCO-88 occupation was classified among health professionals.
- Physiotherapists and related associate professionals (ISCO-88: 3226) form two distinct categories in ISCO-08, with physiotherapists classified among professionals. Given that students who expect to work as physiotherapists far outnumber those who expect to work as related associate professionals, this ISCO-88 occupation was classified among health professionals.
- Several health-related occupations classified as "modern health associate professionals" in ISCO-88 are included among health professionals in ISCO-08 (e.g. speech therapist, ophthalmic opticians). While health professionals are, in general, included among science-related careers, health associate professionals are not included among science-related careers. In applying the classification to ISCO-88, the entire code was excluded from science-related careers.
- Telecommunications engineering technicians (ISCO-08: 3522) do not form a separate occupation in ISCO-88, where they can be found among electronics and telecommunications engineering technicians (ISCO-88: 3114).
- Information and communications technology professionals form a distinct submajor group (25) in ISCO-08 but are classified among physical, mathematical and engineering science professionals in ISCO-88.

Student-level scale indices

New scale indices

Interest in science

The index of broad interest in science topics (INTBRSCI) was constructed using students' responses to a new question developed for PISA 2015 (ST095). Students reported on a five-point Likert scale with the categories "not interested", "hardly interested", "interested", "highly interested", and "I don't know what this is", their interest in the following topics: biosphere (e.g. ecosystem services, sustainability); motion and forces (e.g. velocity, friction, magnetic and gravitational forces); energy and its transformation (e.g. conservation, chemical reactions); the Universe and its history; how science can help us prevent disease. The last response category ("I don't know what this is") was recoded as a missing for the purpose of deriving the index INTBRSCI. Higher values on the index reflect greater levels of agreement with these statements.

Epistemic beliefs about science

The index of epistemic beliefs about science (EPIST) was constructed using students' responses to a new question developed for PISA 2015 about students' views on scientific approaches (ST131). Students reported, on a four-point Likert scale with the answering categories "strongly disagree", "disagree", "agree", and "strongly agree", their agreement with the following statements: A good way to know if something is true is to do an experiment; Ideas in <broad science> sometimes change; Good answers are based on evidence from many different experiments; It is good to try experiments more than once to make sure of your findings; Sometimes <broad science> scientists change their minds about what is true in science; and The ideas in <broad science> science books sometimes change. Higher levels on the index correspond to greater levels of agreement with these statements.

Trend scale indices

Enjoyment of science

The index of enjoyment of science (JOYSCIE) was constructed based on a trend question (ST094) from PISA 2006 (ID in 2006: ST16), asking students on a four-point Likert scale with the categories "strongly agree", "agree", "disagree", and "strongly disagree" about their agreement with the following statements: I generally have fun when I am learning <broad science> topics; I like reading about <broad science>; I am happy working on <broad science> topics; I enjoy acquiring new knowledge in <broad science>; and I am interested in learning about <broad science>. The derived variable JOYSCIE was equated to the corresponding scale in the PISA 2006 database, thus allowing for a trend comparison between PISA 2006 and PISA 2015. Higher values on the index reflect greater levels of agreement with these statements.

Science self-efficacy

The index of science self-efficacy (SCIEEFF) was constructed based on a trend question (ST129) that was taken from PISA 2006 (ID in 2006: ST17). Students were asked, using a four-point answering scale with the categories "I could do this easily", "I could do this with a bit of effort", "I would struggle to do this on my own", and "I couldn't do this", to rate how they would perform in the following science tasks: recognise the science question that underlies a newspaper report on a health issue; explain why earthquakes occur more frequently in some areas than in others; describe the role of antibiotics in the treatment of disease; identify the science question associated with the disposal of garbage; predict how changes to an environment will affect the survival of certain species; interpret the scientific information provided on the labelling of food items; discuss how new evidence can lead you to change your understanding about the possibility of life on Mars; and identify the better of two explanations for the formation of acid rain. Responses were reverse-coded so that higher values of the index correspond to higher levels of science self-efficacy. The derived variable SCIEEFF was equated to the corresponding scale in the PISA 2006 database, thus allowing for a trend comparison between PISA 2006 and PISA 2015.

Science activities

The index of science activities (SCIEACT) was constructed based on a trend question (ST146) from PISA 2006 (ID in 2006: ST19). Students were asked to report on a four-point scale with the answering categories "very often", "regularly", "sometimes", and "never or hardly ever" how often they engaged in the following science-related activities: watch TV programmes about <broad science>; borrow or buy books on <broad science> topics; visit web sites about <broad science> topics; read <broad science> magazines or science articles in newspapers; attend a <science club>; simulate natural phenomena in computer programs/virtual labs; simulate technical processes in computer programs/virtual labs; visit web sites of ecology organisations; and follow news of science, environmental, or ecology organizations via blogs and microblogging. Responses were reverse-coded so that higher values of the index correspond to higher levels of students' science activities. The derived variable SCIEACT was equated to the corresponding scale in the PISA 2006 database, thus allowing for a trend comparison between PISA 2006 and PISA 2015.

Instrumental motivation to learn science

The index of instrumental motivation to learn science (INSTSCIE) was constructed based on a trend question (ST113) from PISA 2006 (ID in 2006: ST35). Students reported on a four-point Likert scale with the categories "strongly agree", "agree", "disagree", and "strongly disagree" about their agreement with the statements: Making an effort in my <school science> subject(s) is worth it because this will help me in the work I want to do later on; What I learn in my <school science> subject(s) is important for me because I need this for what I want to do later on; Studying my <school science> subject(s) is worthwhile for me because what I learn will improve my career prospects; and Many things I learn in my <school science> subject(s) will help me to get a job. Responses were reverse-coded so that higher values of the index correspond to higher levels of instrumental motivation. The derived variable INSTSCIE was equated to the corresponding scale in the PISA 2006 database, thus allowing for a trend comparison between PISA 2006 and PISA 2015.

Scaling of indices related to the PISA index of economic social and cultural status

The PISA index of economic, social and cultural status (ESCS) was derived, as in previous cycles, from three variables related to family background: parents' highest level of education (PARED), parents' highest occupation status (HISEI), and home possessions (HOMEPOS), including books in the home. PARED and HISEI are simple indices, described above. HOMEPOS is a proxy measure for family wealth.

Household possessions

In PISA 2015, students reported the availability of 16 household items at home (ST011) including three country-specific household items that were seen as appropriate measures of family wealth within the country's context. In addition, students reported the amount of possessions and books at home (ST012, ST013).

HOMEPOS is a summary index of all household and possession items (ST011, ST012 and ST013). The home possessions scale for PISA 2015 was computed differently than in the previous cycles, to align the IRT model to the one used for all cognitive and non-cognitive scales. Categories for the number of books in the home are unchanged in PISA 2015. The ST011-Items (1="yes", 2="no") were reverse-coded so that a higher level indicates the presence of the indicator.

Computation of ESCS

For the purpose of computing the PISA index of economic, social and cultural status (ESCS), values for students with missing PARED, HISEI or HOMEPOS were imputed with predicted values plus a random component based on a regression on the other two variables. If there were missing data on more than one of the three variables, ESCS was not computed and a missing value was assigned for ESCS.

The PISA index of economic, social and cultural status was derived from a principal component analysis of standardised variables (each variable has an OECD mean of zero and a standard deviation of one), taking the factor scores for the first principal component as measures of the PISA index of economic, social and cultural status. All countries and economies (both OECD and partner countries/economies) contributed equally to the principal component analysis, while in previous cycles, the principal component analysis was based on OECD countries only. However, for the purpose of reporting the ESCS scale has been transformed with zero being the score of an average OECD student and one being the standard deviation across equally weighted OECD countries.

Principal component analysis was also performed for each participating country or economy separately, to determine to what extent the components of the index operate in similar ways across countries or economy.

Computation of a trend-ESCS index

While an index of economic, cultural and social status (ESCS) was included in all past PISA databases, the components of ESCS and the scaling model changed over cycles, meaning that ESCS scores are not comparable across cycles directly. In order to enable a trends study, in PISA 2015 the ESCS was computed for the current cycle and also recomputed for the earlier cycles using a similar methodology.[2]

Before trend scores could be estimated, slight adjustments to the three components had to be made:

- As in PISA 2012, the occupational coding scheme involved in the process of forming HISEI changed from ISCO-88 to ISCO-08, the occupational codes for previous cycles were mapped from the former to the current scheme (see also PISA 2012 Technical Report, Chapter 3).
- In order to make the PARED component comparable across cycles, the same ISCED to PARED mapping scheme was employed for all the cycles.
- To make the HOMEPOS component more comparable across cycles, the variable *Books in the home* (ST013Q01TA) was recoded into a four-level categorical variable (fewer than or equal to 25 books, 26-100 books, 101-500 books, more than 500 books). The trend HOMEPOS scale was constructed in three steps. In the first step, international item parameters for all items (except country-specific items, i.e. ST011Q17NA, ST011Q18NA and ST011Q19NA) administered in PISA 2015 were obtained from a concurrent calibration of the 2015 data. Except for the recoding of variable ST013Q01TA, this step is identical with the regular scaling of HOMEPOS in PISA 2015 (see above). In the second step, unique items from all previous cycles (i.e., 2000-2012) were scaled, fixing most items administered in 2015 to their 2015 parameters, while allowing a limited set of item parameters to be freely estimated but constrained to be equal across countries within cycles. National items (i.e. ST011Q17NA, ST011Q18NA and ST011Q19NA) received unique (country- and cycle- specific) parameters throughout. In the third and final step, index values (WLEs) were generated for all students from previous cycles (2000-2012). Because 17 out of 27 items involved in the computation of the trend HOMEPOS have the same item parameters across cycles, the trend HOMEPOS scores can be regarded to be on a joint scale, allowing for comparisons of countries across cycles and thus allowing to be used in the calculation of trend ESCS.

The principal component analysis for obtaining trend-ESCS scores was then calculated as described above, except that the calculation was done across all cycles using these three comparable components (trend HISEI, trend PARED, and trend HOMEPOS).

School-level scale indices

School resources

PISA 2015 included a question with eight items about school resources, measuring the school principals' perceptions of potential factors hindering the provision of instruction at school ("Is your school's capacity to provide instruction hindered by any of the following issues?"). The four response categories were "not at all", "very little", "to some extent", to "a lot". A similar question was used in previous cycles, but items were reduced and reworded for 2015 focusing on two derived variables. The index on staff shortage (STAFFSHORT) was derived from the four items: a lack of teaching staff; inadequate or poorly qualified teaching staff; a lack of assisting staff; and inadequate or poorly qualified assisting staff. The index of shortage of educational material (EDUSHORT) was scaled using the following four items: a lack of educational material (e.g. textbooks, IT equipment, library or laboratory material); inadequate or poor quality educational material (e.g. textbooks, IT equipment, library or laboratory material); a lack of physical infrastructure (e.g. building, grounds, heating/cooling, lighting and acoustic systems); and inadequate or poor quality physical infrastructure (e.g. building, grounds, heating/cooling, lighting and acoustic systems). Positive values on these indices mean that schools principals view the amount and/or quality of resources in their schools as an obstacle to providing instruction to a greater extent than the OECD average; negative values reflect the perception that the school suffers from a lack or inadequacy of resources to a lesser extent than the OECD average.

Proportion of missing observations for variables used in this volume

Unless otherwise indicated, no adjustment is made for non-response to questionnaires in analyses included in this volume. The reported percentages and estimates based on indices refer to the proportion of the sample with valid responses to the corresponding questionnaire items. Table A1.3, available online, reports the proportion of the sample covered by analyses based on student or school questionnaire variables. Where this proportion shows large variation across countries/economies or across time, caution is required when comparing results on these dimensions.

Table available online

Table A1.3. Weighted share of responding students covered by analyses based on questionnaires
(http://dx.doi.org/10.1787/888933433112)

Notes

1. In the United Kingdom (excluding Scotland), career expectations were coded to the three-digit level only. As a result, the occupations of product and garment designers (ISCO08: 2163) and graphic and multimedia designers (2166) are included among science and engineering professionals, medical and dental prosthetic technicians (3214) are included among science technicians and associate professionals, while telecommunications engineering technicians (3522) are excluded. These careers represent a small percentage of the students classified as having science-related career expectations, such that results are not greatly affected.

2. As a result of this procedure, two indices exist for 2015 (ESCS and trend-ESCS). The Pearson correlation between the two indices is r=.989 across all PISA 2015 participating countries and economies. This includes 22 countries/economies where the correlation was r>.990; another 50 countries/economies where the correlation was r=[.960, .990]; and another country (Georgia) where it was r=.946. In Chapters 6 and 7, in order to maintain consistency across tables, results for 2015 relating to trends in ESCS employ the 2015 ESCS index rather than the 2015 trend-ESCS index.

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ANNEX A2
THE PISA TARGET POPULATION, THE PISA SAMPLES AND THE DEFINITION OF SCHOOLS

Definition of the PISA target population

PISA 2015 provides an assessment of the cumulative outcomes of education and learning at a point at which most young adults are still enrolled in initial education.

A major challenge for an international survey is to ensure that international comparability of national target populations is guaranteed.

Differences between countries in the nature and extent of pre-primary education and care, the age at entry into formal schooling and the institutional structure of education systems do not allow for a definition of internationally comparable grade levels. Consequently, international comparisons of performance in education typically define their populations with reference to a target age group. Some previous international assessments have defined their target population on the basis of the grade level that provides maximum coverage of a particular age cohort. A disadvantage of this approach is that slight variations in the age distribution of students across grade levels often lead to the selection of different target grades in different countries, or between education systems within countries, raising serious questions about the comparability of results across, and at times within, countries. In addition, because not all students of the desired age are usually represented in grade-based samples, there may be a more serious potential bias in the results if the unrepresented students are typically enrolled in the next higher grade in some countries and the next lower grade in others. This would exclude students with potentially higher levels of performance in the former countries and students with potentially lower levels of performance in the latter.

In order to address this problem, PISA uses an age-based definition for its target population, i.e. a definition that is not tied to the institutional structures of national education systems. PISA assesses students who were aged between 15 years and 3 (complete) months and 16 years and 2 (complete) months at the beginning of the assessment period, plus or minus a 1-month allowable variation, and who were enrolled in an educational institution with grade 7 or higher, regardless of the grade level or type of institution in which they were enrolled, and regardless of whether they were in full-time or part-time education. Educational institutions are generally referred to as schools in this publication, although some educational institutions (in particular, some types of vocational education establishments) may not be termed schools in certain countries. As expected from this definition, the average age of students across OECD countries was 15 years and 9 months. The range in country means was 2 months and 18 days (0.20 years), from the minimum country mean of 15 years and 8 months to the maximum country mean of 15 years and 10 months.

Given this definition of population, PISA makes statements about the knowledge and skills of a group of individuals who were born within a comparable reference period, but who may have undergone different educational experiences both in and outside school. In PISA, these knowledge and skills are referred to as the outcomes of education at an age that is common across countries. Depending on countries' policies on school entry, selection and promotion, these students may be distributed over a narrower or a wider range of grades across different education systems, tracks or streams. It is important to consider these differences when comparing PISA results across countries, as observed differences between students at age 15 may no longer appear later on as/if students' educational experiences converge over time.

If a country's scores in science, reading or mathematics are significantly higher than those in another country, it cannot automatically be inferred that the schools or particular parts of the education system in the first country are more effective than those in the second. However, one can legitimately conclude that the cumulative impact of learning experiences in the first country, starting in early childhood and up to the age of 15, and embracing experiences in school, home and beyond, have resulted in higher outcomes in the literacy domains that PISA measures.

The PISA target population does not include residents attending schools in a foreign country. It does, however, include foreign nationals attending schools in the country of assessment.

To accommodate countries that requested grade-based results for the purpose of national analyses, PISA 2015 provided a sampling option to supplement age-based sampling with grade-based sampling.

Population coverage

All countries and economies attempted to maximise the coverage of 15-year-olds enrolled in education in their national samples, including students enrolled in special-education institutions. As a result, PISA 2015 reached standards of population coverage that are unprecedented in international surveys of this kind.

The sampling standards used in PISA permitted countries to exclude up to a total of 5% of the relevant population either by excluding schools or by excluding students within schools. All but 12 countries – the United Kingdom (8.22%), Luxembourg (8.16%), Canada (7.49%), Norway (6.75%), New Zealand (6.54%), Sweden (5.71%), Estonia (5.52%), Australia (5.31%), Montenegro (5.17%), Lithuania (5.12%), Latvia (5.07%), and Denmark (5.04%) – achieved this standard, and in 29 countries and economies, the overall exclusion rate was less than 2%. When language exclusions were accounted for (i.e. removed from the overall exclusion rate), Denmark, Latvia, New Zealand and Sweden no longer had an exclusion rate greater than 5%. For details, see www.pisa.oecd.org.

Exclusions within the above limits include:

- At the school level: schools that were geographically inaccessible or where the administration of the PISA assessment was not considered feasible; and schools that provided teaching only for students in the categories defined under "within-school exclusions", such as schools for the blind. The percentage of 15-year-olds enrolled in such schools had to be less than 2.5% of the nationally desired target population (0.5% maximum for the former group and 2% maximum for the latter group). The magnitude, nature and justification of school-level exclusions are documented in the *PISA 2015 Technical Report* (OECD, forthcoming).
- At the student level: students with an intellectual disability; students with a functional disability; students with limited assessment language proficiency; other (a category defined by the national centres and approved by the international centre); and students taught in a language of instruction for the main domain for which no materials were available. Students could not be excluded solely because of low proficiency or common disciplinary problems. The percentage of 15-year-olds excluded within schools had to be less than 2.5% of the nationally desired target population.

Table A2.1 describes the target population of the countries participating in PISA 2015. Further information on the target population and the implementation of PISA sampling standards can be found in the *PISA 2015 Technical Report* (OECD, forthcoming).

- **Column 1** shows the total number of 15-year-olds according to the most recent available information, which in most countries means the year 2014 as the year before the assessment.
- **Column 2** shows the number of 15-year-olds enrolled in schools in grade 7 or above (as defined above), which is referred to as the "eligible population".
- **Column 3** shows the national desired target population. Countries were allowed to exclude up to 0.5% of students a priori from the eligible population, essentially for practical reasons. The following a priori exclusions exceed this limit but were agreed with the PISA Consortium: Belgium excluded 0.21% of its population for a particular type of student educated while working; Canada excluded 1.22% of its population from Territories and Aboriginal reserves; Chile excluded 0.04% of its students who live in Easter Island, Juan Fernandez Archipelago and Antarctica; and the United Arab Emirates excluded 0.04% of its students who had no information available. The adjudicated region of Massachusetts in the United States excluded 13.11% of its students, and North Carolina excluded 5.64% of its students. For these two regions, the desired target populations cover 15-year-old students in grade 7 or above in public schools only. The students excluded from the desired population are private school students.
- **Column 4** shows the number of students enrolled in schools that were excluded from the national desired target population, either from the sampling frame or later in the field during data collection.
- **Column 5** shows the size of the national desired target population after subtracting the students enrolled in excluded schools. This is obtained by subtracting Column 4 from Column 3.
- **Column 6** shows the percentage of students enrolled in excluded schools. This is obtained by dividing Column 4 by Column 3 and multiplying by 100.
- **Column 7** shows the number of students participating in PISA 2015. Note that in some cases this number does not account for 15-year-olds assessed as part of additional national options.
- **Column 8** shows the weighted number of participating students, i.e. the number of students in the nationally defined target population that the PISA sample represents.
- Each country attempted to maximise the coverage of PISA's target population within the sampled schools. In the case of each sampled school, all eligible students, namely those 15 years of age, regardless of grade, were first listed. Sampled students who were to be excluded had still to be included in the sampling documentation, and a list drawn up stating the reason for their exclusion. Column 9 indicates the total number of excluded students, which is further described and classified into specific categories in Table A2.2.
- **Column 10** indicates the weighted number of excluded students, i.e. the overall number of students in the nationally defined target population represented by the number of students excluded from the sample, which is also described and classified by exclusion categories in Table A2.2. Excluded students were excluded based on five categories: students with an intellectual disability (the student has a mental or emotional disability and is cognitively delayed such that he/she cannot perform in the PISA testing situation); students with a functional disability (the student has a moderate to severe permanent physical disability such that he/she cannot perform in the PISA testing situation); students with limited proficiency in the assessment language (the student is unable to read or speak any of the languages of the assessment in the country and would be unable to overcome the language barrier in the testing situation – typically a student who has received less than one year of instruction in the languages of assessment may be excluded); other (a category defined by the national centres and approved by the international centre); and students taught in a language of instruction for the main domain for which no materials were available.

A corrigendum has been issued for this page. See: http://www.oecd.org/about/publishing/Corrigenda-PISA2015-VolumeI.pdf

[Part 1/1]

Table A2.1 PISA target populations and samples

		Population and sample information												Coverage indices		
		Total population of 15-year-olds	Total enrolled population of 15-year-olds at grade 7 or above	Total in national desired target population	Total school-level exclusions	Total in national desired target population after all school exclusions and before within-school exclusions	School-level exclusion rate (%)	Number of participating students	Weighted number of participating students	Number of excluded students	Weighted number of excluded students	Within-school exclusion rate (%)	Overall exclusion rate (%)	Coverage Index 1: Coverage of national desired population	Coverage Index 2: Coverage of national enrolled population	Coverage Index 3: Coverage of 15-year-old population
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
OECD	Australia	282 888	282 547	282 547	6 940	275 607	2.46	14 530	256 329	681	7 736	2.93	5.31	0.947	0.947	0.906
	Austria	88 013	82 683	82 683	790	81 893	0.96	7 007	73 379	84	866	1.17	2.11	0.979	0.979	0.834
	Belgium	123 630	121 954	121 694	1 597	120 097	1.31	9 651	114 902	39	410	0.36	1.66	0.983	0.981	0.929
	Canada	396 966	381 660	376 994	1 590	375 404	0.42	20 058	331 546	1 830	25 340	7.10	7.49	0.925	0.914	0.835
	Chile	255 440	245 947	245 852	2 641	243 211	1.07	7 053	203 782	37	1 393	0.68	1.75	0.983	0.982	0.798
	Czech Republic	90 391	90 076	90 076	1 814	88 262	2.01	6 894	84 519	25	368	0.43	2.44	0.976	0.976	0.935
	Denmark	68 174	67 466	67 466	605	66 861	0.90	7 161	60 655	514	2 644	4.18	5.04	0.950	0.950	0.890
	Estonia	11 676	11 491	11 491	416	11 075	3.62	5 587	10 834	116	218	1.97	5.52	0.945	0.945	0.928
	Finland	58 526	58 955	58 955	472	58 483	0.80	5 882	56 934	124	1 157	1.99	2.78	0.972	0.972	0.973
	France	807 867	778 679	778 679	28 742	749 937	3.69	6 108	734 944	35	3 620	0.49	4.16	0.958	0.958	0.910
	Germany	774 149	774 149	774 149	11 150	762 999	1.44	6 522	743 969	54	5 342	0.71	2.14	0.979	0.979	0.961
	Greece	105 530	105 253	105 253	953	104 300	0.91	5 532	96 157	58	965	0.99	1.89	0.981	0.981	0.911
	Hungary	94 515	90 065	90 065	1 945	88 120	2.16	5 658	84 644	55	1 009	1.18	3.31	0.967	0.967	0.896
	Iceland	4 250	4 195	4 195	17	4 178	0.41	3 374	3 966	131	132	3.23	3.62	0.964	0.964	0.933
	Ireland	61 234	59 811	59 811	72	59 739	0.12	5 741	59 082	197	1 825	3.00	3.11	0.969	0.969	0.965
	Israel	124 852	118 997	118 997	2 310	116 687	1.94	6 598	117 031	115	1 803	1.52	3.43	0.966	0.966	0.937
	Italy	616 761	567 268	567 268	11 190	556 078	1.97	11 583	495 093	246	9 395	1.86	3.80	0.962	0.962	0.803
	Japan	1 201 615	1 175 907	1 175 907	27 323	1 148 584	2.32	6 647	1 138 349	2	318	0.03	2.35	0.976	0.976	0.947
	Korea	620 687	619 950	619 950	3 555	616 395	0.57	5 581	569 106	20	1 806	0.32	0.89	0.991	0.991	0.917
	Latvia	17 255	16 955	16 955	677	16 278	3.99	4 869	15 320	70	174	1.12	5.07	0.949	0.949	0.888
	Luxembourg	6 327	6 053	6 053	162	5 891	2.68	5 299	5 540	331	331	5.64	8.16	0.918	0.918	0.876
	Mexico	2 257 399	1 401 247	1 401 247	5 905	1 395 342	0.42	7 568	1 392 995	30	6 810	0.49	0.91	0.991	0.991	0.617
	Netherlands	201 670	200 976	200 976	6 866	194 110	3.42	5 385	191 817	14	502	0.26	3.67	0.963	0.963	0.951
	New Zealand	60 162	57 448	57 448	681	56 767	1.19	4 520	54 274	333	3 112	5.42	6.54	0.935	0.935	0.902
	Norway	63 642	63 491	63 491	854	62 637	1.35	5 456	58 083	345	3 366	5.48	6.75	0.933	0.933	0.913
	Poland	380 366	361 600	361 600	6 122	355 478	1.69	4 478	345 709	34	2 418	0.69	2.38	0.976	0.976	0.909
	Portugal	110 939	101 107	101 107	424	100 683	0.42	7 325	97 214	105	860	0.88	1.29	0.987	0.987	0.876
	Slovak Republic	55 674	55 203	55 203	1 376	53 827	2.49	6 350	49 654	114	912	1.80	4.25	0.957	0.957	0.892
	Slovenia	18 078	17 689	17 689	290	17 399	1.64	6 406	16 773	114	247	1.45	3.07	0.969	0.969	0.928
	Spain	440 084	414 276	414 276	2 175	412 101	0.53	6 736	399 935	200	10 893	2.65	3.16	0.968	0.968	0.909
	Sweden	97 749	97 210	97 210	1 214	95 996	1.25	5 458	91 491	275	4 324	4.51	5.71	0.943	0.943	0.936
	Switzerland	85 495	83 655	83 655	2 320	81 335	2.77	5 860	82 223	107	1 357	1.62	4.35	0.956	0.956	0.962
	Turkey	1 324 089	1 100 074	1 100 074	5 746	1 094 328	0.52	5 895	925 366	31	5 359	0.58	1.10	0.989	0.989	0.699
	United Kingdom	747 593	746 328	746 328	23 412	722 916	3.14	14 157	627 703	870	34 747	5.25	8.22	0.918	0.918	0.840
	United States	4 220 325	3 992 053	3 992 053	12 001	3 980 052	0.30	5 712	3 524 497	193	109 580	3.02	3.31	0.967	0.967	0.835
Partners	Albania	48 610	45 163	45 163	10	45 153	0.02	5 215	40 896	0	0	0.00	0.02	1.000	1.000	0.841
	Algeria	389 315	354 936	354 936	0	354 936	0.00	5 519	306 647	0	0	0.00	0.00	1.000	1.000	0.788
	Argentina	718 635	578 308	578 308	2 617	575 691	0.45	6 349	394 917	21	1 367	0.34	0.80	0.992	0.992	0.550
	Brazil	3 803 681	2 853 388	2 853 388	64 392	2 788 996	2.26	23 141	2 425 961	119	13 543	0.56	2.80	0.972	0.972	0.638
	B-S-J-G (China)	2 084 958	1 507 518	1 507 518	58 639	1 448 879	3.89	9 841	1 331 794	33	3 609	0.27	4.15	0.959	0.959	0.639
	Bulgaria	66 601	59 397	59 397	1 124	58 273	1.89	5 928	53 685	49	433	0.80	2.68	0.973	0.973	0.806
	Colombia	760 919	674 079	674 079	37	674 042	0.01	11 795	567 848	9	507	0.09	0.09	0.999	0.999	0.746
	Costa Rica	81 773	66 524	66 524	0	66 524	0.00	6 866	51 897	13	98	0.19	0.19	0.998	0.998	0.635
	Croatia	45 031	35 920	35 920	805	35 115	2.24	5 809	40 899	86	589	1.42	3.63	0.964	0.964	0.908
	Cyprus*	9 255	9 255	9 253	109	9 144	1.18	5 571	8 785	228	292	3.22	4.36	0.956	0.956	0.949
	Dominican Republic	193 153	139 555	139 555	2 382	137 173	1.71	4 740	132 300	4	106	0.08	1.79	0.982	0.982	0.685
	FYROM	16 719	16 717	16 717	259	16 458	1.55	5 324	15 847	8	19	0.12	1.67	0.983	0.983	0.948
	Georgia	48 695	43 197	43 197	1 675	41 522	3.88	5 316	38 334	35	230	0.60	4.45	0.955	0.955	0.787
	Hong Kong (China)	65 100	61 630	61 630	708	60 922	1.15	5 359	57 662	36	374	0.65	1.79	0.982	0.982	0.886
	Indonesia	4 534 216	3 182 816	3 182 816	4 046	3 178 770	0.13	6 513	3 092 773	0	0	0.00	0.13	0.999	0.999	0.682
	Jordan	126 399	121 729	121 729	71	121 658	0.06	7 267	108 669	70	1 006	0.92	0.97	0.990	0.990	0.860
	Kazakhstan	211 407	209 555	209 555	7 475	202 080	3.57	7 841	192 909	0	0	0.00	3.57	0.964	0.964	0.912
	Kosovo	31 546	28 229	28 229	1 156	27 073	4.10	4 826	22 333	50	174	0.77	4.84	0.952	0.952	0.708
	Lebanon	64 044	62 281	62 281	1 300	60 981	2.09	4 546	42 331	0	0	0.00	2.09	0.979	0.979	0.661
	Lithuania	33 163	32 097	32 097	573	31 524	1.79	6 525	29 915	227	1 050	3.39	5.12	0.949	0.949	0.902
	Macao (China)	5 100	4 417	4 417	3	4 414	0.07	4 476	4 507	0	0	0.00	0.07	0.999	0.999	0.884
	Malaysia	540 000	448 838	448 838	2 418	446 420	0.54	8 861	412 524	41	2 344	0.56	1.10	0.989	0.989	0.764
	Malta	4 397	4 406	4 406	63	4 343	1.43	3 634	4 296	41	41	0.95	2.36	0.976	0.976	0.977
	Moldova	31 576	30 601	30 601	182	30 419	0.59	5 325	29 341	21	118	0.40	0.99	0.990	0.990	0.929
	Montenegro	7 524	7 506	7 506	40	7 466	0.53	5 665	6 777	300	332	4.66	5.17	0.948	0.948	0.901
	Peru	580 371	478 229	478 229	6 355	471 874	1.33	6 971	431 738	13	745	0.17	1.50	0.985	0.985	0.744
	Qatar	13 871	13 850	13 850	380	13 470	2.74	12 083	12 951	193	193	1.47	4.17	0.958	0.958	0.934
	Romania	176 334	176 334	176 334	1 823	174 511	1.03	4 876	164 216	3	120	0.07	1.11	0.989	0.989	0.931
	Russia	1 176 473	1 172 943	1 172 943	24 217	1 148 726	2.06	6 036	1 120 932	13	2 469	0.22	2.28	0.977	0.977	0.953
	Singapore	48 218	47 050	47 050	445	46 605	0.95	6 115	46 224	25	179	0.39	1.33	0.987	0.987	0.959
	Chinese Taipei	295 056	287 783	287 783	1 179	286 604	0.41	7 708	251 424	22	647	0.26	0.67	0.993	0.993	0.852
	Thailand	895 513	756 917	756 917	9 646	747 271	1.27	8 249	634 795	22	2 107	0.33	1.60	0.984	0.984	0.709
	Trinidad and Tobago	17 371	17 371	17 371	0	17 371	0.00	4 692	13 197	0	0	0.00	0.00	1.000	1.000	0.760
	Tunisia	122 186	122 186	122 186	679	121 507	0.56	5 375	113 599	3	61	0.05	0.61	0.994	0.994	0.930
	United Arab Emirates	51 687	51 518	51 499	994	50 505	1.93	14 167	46 950	63	152	0.32	2.25	0.978	0.977	0.908
	Uruguay	53 533	43 865	43 865	4	43 861	0.01	6 062	38 287	6	32	0.08	0.09	0.999	0.999	0.715
	Viet Nam	1 803 552	1 032 599	1 032 599	6 557	1 026 042	0.63	5 826	874 859	0	0	0.00	0.63	0.994	0.994	0.485

Notes: For a full explanation of the details in this table please refer to the *PISA 2015 Technical Report* (OECD, forthcoming).
The figure for total national population of 15-year-olds enrolled in Column 2 may occasionally be larger than the total number of 15-year-olds in Column 1 due to differing data sources.
For Mexico, in 2015, the Total population of 15-year-olds enrolled in grade 7 or above is an estimate of the target population size of the sample frame from which the 15-year-olds students were selected for the PISA test. At the time Mexico provided the information to PISA, the official figure for this population was 1 573 952.
* See note at the beginning of this Annex.

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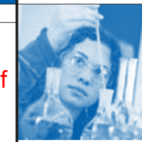

[Part 1/2]

Table A2.2 Exclusions

		Student exclusions (unweighted)					
		Number of excluded students with functional disability (Code 1)	Number of excluded students with intellectual disability (Code 2)	Number of excluded students because of language (Code 3)	Number of excluded students for other reasons (Code 4)	Number of excluded students because of no materials available in the language of instruction (Code 5)	School-level exclusion rate (%)
		(1)	(2)	(3)	(4)	(5)	(6)
OECD	Australia	85	528	68	0	0	681
	Austria	8	15	61	0	0	84
	Belgium	4	18	17	0	0	39
	Canada	156	1 308	366	0	0	1 830
	Chile	6	30	1	0	0	37
	Czech Republic	2	9	14	0	0	25
	Denmark	18	269	156	70	1	514
	Estonia	17	93	6	0	0	116
	Finland	2	90	17	8	7	124
	France	5	21	9	0	0	35
	Germany	4	25	25	0	0	54
	Greece	3	44	11	0	0	58
	Hungary	3	13	9	30	0	55
	Iceland	9	66	47	9	0	131
	Ireland	25	57	55	60	0	197
	Israel	22	68	25	0	0	115
	Italy	78	147	21	0	0	246
	Japan	0	2	0	0	0	2
	Korea	3	17	0	0	0	20
	Latvia	7	47	16	0	0	70
	Luxembourg	4	254	73	0	0	331
	Mexico	4	23	3	0	0	30
	Netherlands	1	13	0	0	0	14
	New Zealand	23	140	167	0	3	333
	Norway	11	253	81	0	0	345
	Poland	11	20	0	3	0	34
	Portugal	4	99	2	0	0	105
	Slovak Republic	7	71	2	34	0	114
	Slovenia	33	36	45	0	0	114
	Spain	9	144	47	0	0	200
	Sweden	154	0	121	0	0	275
	Switzerland	8	42	57	0	0	107
	Turkey	1	23	7	0	0	31
	United Kingdom	77	690	102	0	1	870
	United States	16	120	44	13	0	193
Partners	Albania	0	0	0	0	0	0
	Algeria	0	0	0	0	0	0
	Argentina	10	10	1	0	0	21
	Brazil	20	99	0	0	0	119
	B-S-J-G (China)	6	25	2	0	0	33
	Bulgaria	39	6	4	0	0	49
	Colombia	3	4	2	0	0	9
	Costa Rica	3	1	0	9	0	13
	Croatia	2	75	9	0	0	86
	Cyprus*	12	164	52	0	0	228
	Dominican Republic	1	3	0	0	0	4
	FYROM	7	1	0	0	0	8
	Georgia	3	25	7	0	0	35
	Hong Kong (China)	0	35	1	0	0	36
	Indonesia	0	0	0	0	0	0
	Jordan	43	17	10	0	0	70
	Kazakhstan	0	0	0	0	0	0
	Kosovo	9	13	27	0	0	50
	Lebanon	0	0	0	0	0	0
	Lithuania	12	213	2	0	0	227
	Macao (China)	0	0	0	0	0	0
	Malaysia	10	22	9	0	0	41
	Malta	8	27	6	0	0	41
	Moldova	12	8	1	0	0	21
	Montenegro	14	23	5	0	258	300
	Peru	4	9	0	0	0	13
	Qatar	76	110	7	0	0	193
	Romania	1	1	1	0	0	3
	Russia	3	10	0	0	0	13
	Singapore	3	15	7	0	0	25
	Chinese Taipei	3	19	0	0	0	22
	Thailand	1	19	2	0	0	22
	Trinidad and Tobago	0	0	0	0	0	0
	Tunisia	0	0	3	0	0	3
	United Arab Emirates	16	24	23	0	0	63
	Uruguay	2	4	0	0	0	6
	Viet Nam	0	0	0	0	0	0

Exclusion codes:
Code 1: Functional disability – student has a moderate to severe permanent physical disability.
Code 2: Intellectual disability – student has a mental or emotional disability and has either been tested as cognitively delayed or is considered in the professional opinion of qualified staff to be cognitively delayed.
Code 3: Limited assessment language proficiency – student is not a native speaker of any of the languages of the assessment in the country and has been resident in the country for less than one year.
Code 4: Other reasons defined by the national centres and approved by the international centre.
Code 5: No materials available in the language of instruction.
Note: For a full explanation of the details in this table please refer to the *PISA 2015 Technical Report* (OECD, forthcoming).

* See note at the beginning of this Annex.

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[Part 2/2]

Table A2.2 Exclusions

		Student exclusion (weighted)					
		Weighted number of excluded students with functional disability (Code 1)	Weighted number of excluded students with intellectual disability (Code 2)	Weighted number of excluded students because of language (Code 3)	Weighted number of excluded students for other reasons (Code 4)	Weighted number of excluded students because of no materials available in the language of instruction (Code 5)	Total weighted number of excluded students
		(7)	(8)	(9)	(10)	(11)	(12)
OECD	Australia	932	6 011	793	0	0	7 736
	Austria	74	117	675	0	0	866
	Belgium	33	192	185	0	0	410
	Canada	1 901	18 018	5 421	0	0	25 340
	Chile	194	1 190	9	0	0	1 393
	Czech Republic	40	140	188	0	0	368
	Denmark	122	1 539	551	421	11	2 644
	Estonia	29	176	13	0	0	218
	Finland	18	858	156	67	58	1 157
	France	562	2 144	914	0	0	3 620
	Germany	423	2 562	2 357	0	0	5 342
	Greece	43	729	193	0	0	965
	Hungary	57	284	114	554	0	1 009
	Iceland	9	67	47	9	0	132
	Ireland	213	526	516	570	0	1 825
	Israel	349	1 070	384	0	0	1 803
	Italy	3 316	5 199	880	0	0	9 395
	Japan	0	318	0	0	0	318
	Korea	291	1 515	0	0	0	1 806
	Latvia	21	115	38	0	0	174
	Luxembourg	4	254	73	0	0	331
	Mexico	842	4 802	1 165	0	0	6 810
	Netherlands	33	469	0	0	0	502
	New Zealand	233	1 287	1 568	0	24	3 112
	Norway	105	2 471	790	0	0	3 366
	Poland	876	1 339	0	203	0	2 418
	Portugal	29	818	13	0	0	860
	Slovak Republic	44	567	12	288	0	912
	Slovenia	84	71	92	0	0	247
	Spain	511	7 662	2 720	0	0	10 893
	Sweden	2 380	0	1 944	0	0	4 324
	Switzerland	91	540	726	0	0	1 357
	Turkey	43	4 094	1 222	0	0	5 359
	United Kingdom	2 724	27 808	4 001	0	214	34 747
	United States	7 873	67 816	26 525	7 366	0	109 580
Partners	Albania	0	0	0	0	0	0
	Algeria	0	0	0	0	0	0
	Argentina	579	770	18	0	0	1 367
	Brazil	1 743	11 800	0	0	0	13 543
	B-S-J-G (China)	438	2 970	201	0	0	3 609
	Bulgaria	347	51	35	0	0	433
	Colombia	181	309	17	0	0	507
	Costa Rica	22	5	0	71	0	98
	Croatia	13	501	75	0	0	589
	Cyprus*	16	212	65	0	0	292
	Dominican Republic	24	82	0	0	0	106
	FYROM	15	4	0	0	0	19
	Georgia	19	170	41	0	0	230
	Hong Kong (China)	0	363	11	0	0	374
	Indonesia	0	0	0	0	0	0
	Jordan	656	227	122	0	0	1 006
	Kazakhstan	0	0	0	0	0	0
	Kosovo	28	37	104	0	0	174
	Lebanon	0	0	0	0	0	0
	Lithuania	40	1 000	10	0	0	1 050
	Macao (China)	0	0	0	0	0	0
	Malaysia	663	1 100	580	0	0	2 344
	Malta	8	27	6	0	0	41
	Moldova	66	51	1	0	0	118
	Montenegro	27	38	6	0	261	332
	Peru	224	520	0	0	0	745
	Qatar	76	110	7	0	0	193
	Romania	31	63	26	0	0	120
	Russia	425	2 044	0	0	0	2 469
	Singapore	22	115	43	0	0	179
	Chinese Taipei	78	568	0	0	0	647
	Thailand	114	1 830	163	0	0	2 107
	Trinidad and Tobago	0	0	0	0	0	0
	Tunisia	0	0	61	0	0	61
	United Arab Emirates	30	75	47	0	0	152
	Uruguay	10	22	0	0	0	32
	Viet Nam	0	0	0	0	0	0

Exclusion codes:
Code 1: Functional disability – student has a moderate to severe permanent physical disability.
Code 2: Intellectual disability – student has a mental or emotional disability and has either been tested as cognitively delayed or is considered in the professional opinion of qualified staff to be cognitively delayed.
Code 3: Limited assessment language proficiency – student is not a native speaker of any of the languages of the assessment in the country and has been resident in the country for less than one year.
Code 4: Other reasons defined by the national centres and approved by the international centre.
Code 5: No materials available in the language of instruction.
Note: For a full explanation of the details in this table please refer to the *PISA 2015 Technical Report* (OECD, forthcoming).
* See note at the beginning of this Annex.
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- **Column 11** shows the percentage of students excluded within schools. This is calculated as the weighted number of excluded students (Column 10), divided by the weighted number of excluded and participating students (Column 8 plus Column 10), then multiplied by 100.
- **Column 12** shows the overall exclusion rate, which represents the weighted percentage of the national desired target population excluded from PISA either through school-level exclusions or through the exclusion of students within schools. It is calculated as the school-level exclusion rate (Column 6 divided by 100) plus within-school exclusion rate (Column 11 divided by 100) multiplied by 1 minus the school-level exclusion rate (Column 6 divided by 100). This result is then multiplied by 100.
- **Column 13** presents an index of the extent to which the national desired target population is covered by the PISA sample. Australia, Canada, Denmark, Estonia, Latvia, Lithuania, Luxembourg, Montenegro, New Zealand, Norway, Sweden and the United Kingdom were the only countries where the coverage is below 95%.
- **Column 14** presents an index of the extent to which 15-year-olds enrolled in schools are covered by the PISA sample. The index measures the overall proportion of the national enrolled population that is covered by the non-excluded portion of the student sample. The index takes into account both school-level and student-level exclusions. Values close to 100 indicate that the PISA sample represents the entire education system as defined for PISA 2015. The index is the weighted number of participating students (Column 8) divided by the weighted number of participating and excluded students (Column 8 plus Column 10), times the nationally defined target population (Column 5) divided by the eligible population (Column 2) (times 100).
- **Column 15** presents an index of the coverage of the 15-year-old population. This index is the weighted number of participating students (Column 8) divided by the total population of 15-year-old students (Column 1).

This high level of coverage contributes to the comparability of the assessment results. For example, even assuming that the excluded students would have systematically scored worse than those who participated, and that this relationship is moderately strong, an exclusion rate on the order of 5% would likely lead to an overestimation of national mean scores of less than 5 score points (on a scale with an international mean of 500 score points and a standard deviation of 100 score points). This assessment is based on the following calculations: if the correlation between the propensity of exclusions and student performance is 0.3, resulting mean scores would likely be overestimated by 1 score point if the exclusion rate is 1%, by 3 score points if the exclusion rate is 5%, and by 6 score points if the exclusion rate is 10%. If the correlation between the propensity of exclusions and student performance is 0.5, resulting mean scores would be overestimated by 1 score point if the exclusion rate is 1%, by 5 score points if the exclusion rate is 5%, and by 10 score points if the exclusion rate is 10%. For this calculation, a model was used that assumes a bivariate normal distribution for performance and the propensity to participate. For details, see the *PISA 2015 Technical Report* (OECD, forthcoming).

Sampling procedures and response rates

The accuracy of any survey results depends on the quality of the information on which national samples are based as well as on the sampling procedures. Quality standards, procedures, instruments and verification mechanisms were developed for PISA that ensured that national samples yielded comparable data and that the results could be compared with confidence.

Most PISA samples were designed as two-stage stratified samples (where countries applied different sampling designs, these are documented in the *PISA 2015 Technical Report* [OECD, forthcoming]). The first stage consisted of sampling individual schools in which 15-year-old students could be enrolled. Schools were sampled systematically with probabilities proportional to size, the measure of size being a function of the estimated number of eligible (15-year-old) students enrolled. At least 150 schools were selected in each country (where this number existed), although the requirements for national analyses often required a somewhat larger sample. As the schools were sampled, replacement schools were simultaneously identified, in case a sampled school chose not to participate in PISA 2015.

In the case of Iceland, Luxembourg, Macao (China), Malta and Qatar, all schools and all eligible students within schools were included in the sample.

Experts from the PISA Consortium performed the sample selection process for most participating countries and monitored it closely in those countries that selected their own samples. The second stage of the selection process sampled students within sampled schools. Once schools were selected, a list of each sampled school's 15-year-old students was prepared. From this list, 42 students were then selected with equal probability (all 15-year-old students were selected if fewer than 42 were enrolled). The number of students to be sampled per school could deviate from 42, but could not be less than 20.

Data-quality standards in PISA required minimum participation rates for schools as well as for students. These standards were established to minimise the potential for response biases. In the case of countries meeting these standards, it was likely that any bias resulting from non-response would be negligible, i.e. typically smaller than the sampling error.

A minimum response rate of 85% was required for the schools initially selected. Where the initial response rate of schools was between 65% and 85%, however, an acceptable school-response rate could still be achieved through the use of replacement schools.

This procedure brought with it a risk of increased response bias. Participating countries were, therefore, encouraged to persuade as many of the schools in the original sample as possible to participate. Schools with a student participation rate between 25% and 50% were not regarded as participating schools, but data from these schools were included in the database and contributed to the various estimations. Data from schools with a student participation rate of less than 25% were excluded from the database.

PISA 2015 also required a minimum participation rate of 80% of students within participating schools. This minimum participation rate had to be met at the national level, not necessarily by each participating school. Follow-up sessions were required in schools in which too few students had participated in the original assessment sessions. Student participation rates were calculated over all original schools, and also over all schools, whether original sample or replacement schools, and from the participation of students in both the original assessment and any follow-up sessions. A student who participated in the original or follow-up cognitive sessions was regarded as a participant. Those who attended only the questionnaire session were included in the international database and contributed to the statistics presented in this publication if they provided at least a description of their father's or mother's occupation.

Table A2.3 shows the response rates for students and schools, before and after replacement.

- **Column 1** shows the weighted participation rate of schools before replacement. This is obtained by dividing Column 2 by Column 3.
- **Column 2** shows the weighted number of responding schools before school replacement (weighted by student enrolment).
- **Column 3** shows the weighted number of sampled schools before school replacement (including both responding and non-responding schools, weighted by student enrolment).
- **Column 4** shows the unweighted number of responding schools before school replacement.
- **Column 5** shows the unweighted number of responding and non-responding schools before school replacement.
- **Column 6** shows the weighted participation rate of schools after replacement. This is obtained by dividing Column 7 by Column 8.
- **Column 7** shows the weighted number of responding schools after school replacement (weighted by student enrolment).
- **Column 8** shows the weighted number of schools sampled after school replacement (including both responding and non-responding schools, weighted by student enrolment).
- **Column 9** shows the unweighted number of responding schools after school replacement.
- **Column 10** shows the unweighted number of responding and non-responding schools after school replacement.
- **Column 11** shows the weighted student participation rate after replacement. This is obtained by dividing Column 12 by Column 13.
- **Column 12** shows the weighted number of students assessed.
- **Column 13** shows the weighted number of students sampled (including both students who were assessed and students who were absent on the day of the assessment).
- **Column 14** shows the unweighted number of students assessed. Note that any students in schools with student-response rates of less than 50% were not included in these rates (both weighted and unweighted).
- **Column 15** shows the unweighted number of students sampled (including both students that were assessed and students who were absent on the day of the assessment). Note that any students in schools where fewer than half of the eligible students were assessed were not included in these rates (neither weighted nor unweighted).

Definition of schools

In some countries, subunits within schools were sampled instead of schools, and this may affect the estimation of the between-school variance components. In Austria, the Czech Republic, Germany, Hungary, Japan, Romania and Slovenia, schools with more than one study programme were split into the units delivering these programmes. In the Netherlands, for schools with both lower and upper secondary programmes, schools were split into units delivering each programme level. In the Flemish community of Belgium, in the case of multi-campus schools, implantations (campuses) were sampled, whereas in the French community, in the case of multi-campus schools, the larger administrative units were sampled. In Australia, for schools with more than one campus, the individual campuses were listed for sampling. In Argentina and Croatia, schools that had more than one campus had the locations listed for sampling. In Spain, the schools in the Basque region with multi-linguistic models were split into linguistic models for sampling. In Luxembourg, a school on the border with Germany was split according to the country in which the students resided. In addition, the International schools in Luxembourg were split into the students who were instructed in any of the three official languages, and those in the part of the schools that was excluded because no materials were available in the languages of instruction. The United Arab Emirates had schools split by curricula, and sometimes by gender, with other schools remaining whole. Because of reorganisation, some of Sweden's schools were split into parts, with each part having one principal. In Portugal, schools were reorganised into clusters, with teachers and the principal shared by all units in the school cluster.

A corrigendum has been issued for this page. See: http://www.oecd.org/about/publishing/Corrigenda-PISA2015-VolumeI.pdf

[Part 1/1]

Table A2.3 Response rates

		Initial sample – before school replacement					Final sample – after school replacement					Final sample – students within schools after school replacement				
		Weighted school participation rate before replacement (%)	Weighted number of responding schools (weighted also by enrolment)	Weighted number of schools sampled (responding and non-responding) (weighted also by enrolment)	Number of responding and non-responding schools (unweighted)	Total in national desired target population after all school exclusions and before within-school exclusions	Weighted school participation rate after replacement (%)	Weighted number of responding schools (weighted also by enrolment)	Weighted number of schools sampled (responding and non-responding) (weighted also by enrolment)	Number of responding schools (unweighted)	Number of responding and non-responding schools (unweighted)	Weighted student participation rate after replacement (%)	Number of students assessed (weighted)	Number of students sampled (assessed and absent) (weighted)	Number of students assessed (unweighted)	Number of students sampled (assessed and absent) (unweighted)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
OECD	Australia	94	260 657	276 072	720	788	95	262 130	276 072	723	788	84	204 763	243 789	14 089	17 477
	Austria	100	81 690	81 730	269	273	100	81 690	81 730	269	273	87	63 660	73 521	7 007	9 868
	Belgium	83	98 786	118 915	244	301	95	113 435	118 936	286	301	91	99 760	110 075	9 635	10 602
	Canada	74	283 853	381 133	703	1 008	79	299 512	381 189	726	1 008	81	210 476	260 487	19 604	24 129
	Chile	92	215 139	232 756	207	232	99	230 749	232 757	226	232	93	189 206	202 774	7 039	7 515
	Czech Republic	98	86 354	87 999	339	344	98	86 354	87 999	339	344	89	73 386	82 672	6 835	7 693
	Denmark	90	57 803	63 897	327	371	92	58 837	63 931	331	371	89	49 732	55 830	7 149	8 184
	Estonia	100	11 142	11 154	206	207	100	11 142	11 154	206	207	93	10 088	10 822	5 587	5 994
	Finland	100	58 653	58 782	167	168	100	58 800	58 800	168	168	93	53 198	56 934	5 882	6 294
	France	91	679 984	749 284	232	255	94	706 838	749 284	241	255	88	611 563	693 336	5 980	6 783
	Germany	96	764 423	794 206	245	256	99	785 813	794 206	253	256	93	685 972	735 487	6 476	6 944
	Greece	92	95 030	103 031	190	212	98	101 653	103 218	209	212	94	89 588	94 986	5 511	5 838
	Hungary	93	83 897	89 808	231	251	99	88 751	89 825	244	251	92	77 212	83 657	5 643	6 101
	Iceland	99	4 114	4 163	122	129	99	4 114	4 163	122	129	86	3 365	3 908	3 365	3 908
	Ireland	99	61 023	61 461	167	169	99	61 023	61 461	167	169	89	51 947	58 630	5 741	6 478
	Israel	91	105 192	115 717	169	190	93	107 570	115 717	173	190	90	98 572	108 940	6 598	7 294
	Italy	74	383 933	516 113	414	532	88	451 098	515 515	464	532	88	377 011	430 041	11 477	12 841
	Japan	94	1 087 414	1 151 305	189	200	99	1 139 734	1 151 305	198	200	97	1 096 193	1 127 265	6 647	6 838
	Korea	100	612 937	615 107	168	169	100	612 937	615 107	168	169	99	559 121	567 284	5 581	5 664
	Latvia	86	14 122	16 334	231	269	93	15 103	16 324	248	269	90	12 799	14 155	4 845	5 368
	Luxembourg	100	5 891	5 891	44	44	100	5 891	5 891	44	44	96	5 299	5 540	5 299	5 540
	Mexico	95	1 311 608	1 373 919	269	284	98	1 339 901	1 373 919	275	284	95	1 290 435	1 352 237	7 568	7 938
	Netherlands	63	121 527	191 966	125	201	93	178 929	191 966	184	201	85	152 346	178 985	5 345	6 269
	New Zealand	71	40 623	56 875	145	210	85	48 094	56 913	176	210	80	36 860	45 897	4 453	5 547
	Norway	95	58 824	61 809	229	241	95	58 824	61 809	229	241	91	50 163	55 277	5 456	6 016
	Poland	88	314 288	355 158	151	170	99	352 754	355 158	168	170	88	300 617	343 405	4 466	5 108
	Portugal	86	87 756	102 193	213	254	95	97 516	102 537	238	254	82	75 391	91 916	7 180	8 732
	Slovak Republic	93	50 513	54 499	272	295	99	53 908	54 562	288	295	92	45 357	49 103	6 342	6 900
	Slovenia	98	16 886	17 286	332	349	98	16 896	17 286	333	349	92	15 072	16 424	6 406	7 009
	Spain	99	404 640	409 246	199	201	100	409 246	409 246	201	201	89	356 509	399 935	6 736	7 540
	Sweden	100	93 819	94 097	202	205	100	93 819	94 097	202	205	91	82 582	91 081	5 458	6 013
	Switzerland	93	75 482	81 026	212	232	98	79 481	81 375	225	232	92	74 465	80 544	5 838	6 305
	Turkey	97	1 057 318	1 091 317	175	195	99	1 081 935	1 091 528	187	195	95	874 609	918 816	5 895	6 211
	United Kingdom	84	591 757	707 415	506	598	93	654 992	707 415	547	598	89	517 426	581 252	14 120	16 123
	United States	67	2 601 386	3 902 089	142	213	83	3 244 399	3 893 828	177	213	90	2 629 707	2 929 771	5 712	6 376
Partners	Albania	100	43 809	43 919	229	230	100	43 809	43 919	229	230	94	38 174	40 814	5 213	5 555
	Algeria	96	341 463	355 216	159	166	96	341 463	355 216	159	166	92	274 121	296 434	5 494	5 934
	Argentina	89	508 448	572 941	212	238	97	556 478	572 941	231	238	90	345 508	382 352	6 311	7 016
	Brazil	93	2 509 198	2 692 686	806	889	94	2 533 711	2 693 137	815	889	87	1 996 574	2 286 505	22 791	26 586
	B-S-J-G (China)	88	1 259 845	1 437 201	248	268	100	1 437 652	1 437 652	268	268	97	1 287 710	1 331 794	9 841	10 097
	Bulgaria	100	56 265	56 483	179	180	100	56 600	56 600	180	180	95	50 931	53 685	5 928	6 240
	Colombia	99	664 664	673 817	364	375	100	672 526	673 835	371	375	95	535 682	566 734	11 777	12 611
	Costa Rica	99	66 485	67 073	204	206	99	66 485	67 073	204	206	92	47 494	51 369	6 846	7 411
	Croatia	100	34 575	34 652	160	162	100	34 575	34 652	160	162	91	37 275	40 803	5 809	6 354
	Cyprus*	97	8 830	9 126	122	132	97	8 830	9 126	122	132	94	8 016	8 526	5 561	5 957
	Dominican Republic	99	136 669	138 187	193	195	99	136 669	138 187	193	195	94	122 620	130 700	4 731	5 026
	FYROM	100	16 426	16 472	106	107	100	16 426	16 472	106	107	95	14 999	15 802	5 324	5 617
	Georgia	97	40 552	41 595	256	267	99	41 081	41 566	262	267	94	35 567	37 873	5 316	5 689
	Hong Kong (China)	75	45 603	60 716	115	153	90	54 795	60 715	138	153	93	48 222	51 806	5 359	5 747
	Indonesia	98	3 126 468	3 176 076	232	236	100	3 176 076	3 176 076	236	236	98	3 015 844	3 092 773	6 513	6 694
	Jordan	100	119 024	119 024	250	250	100	119 024	119 024	250	250	97	105 868	108 669	7 267	7 462
	Kazakhstan	100	202 701	202 701	232	232	100	202 701	202 701	232	232	97	187 683	192 921	7 841	8 059
	Kosovo	100	26 924	26 924	224	224	100	26 924	26 924	224	224	99	22 016	22 333	4 826	4 896
	Lebanon	67	40 542	60 882	208	308	87	53 091	60 797	270	308	95	36 052	38 143	4 546	4 788
	Lithuania	99	31 386	31 588	309	311	100	31 543	31 588	310	311	91	27 070	29 889	6 523	7 202
	Macao (China)	100	4 414	4 414	45	45	100	4 414	4 414	45	45	99	4 476	4 507	4 476	4 507
	Malaysia	51	229 340	446 237	147	230	98	437 424	446 100	224	230	97	393 785	407 396	8 843	9 097
	Malta	100	4 341	4 343	59	61	100	4 341	4 343	59	61	85	3 634	4 294	3 634	4 294
	Moldova	100	30 145	30 145	229	229	100	30 145	30 145	229	229	98	28 754	29 341	5 325	5 436
	Montenegro	100	7 301	7 312	64	65	100	7 301	7 312	64	65	94	6 346	6 766	5 665	6 043
	Peru	100	468 406	470 651	280	282	100	469 662	470 651	281	282	99	426 205	430 959	6 971	7 054
	Qatar	99	13 333	13 470	166	168	99	13 333	13 470	166	168	94	12 061	12 819	12 061	12 819
	Romania	99	171 553	172 652	181	182	100	172 495	172 495	182	182	99	162 918	164 216	4 876	4 910
	Russia	99	1 181 937	1 189 441	209	210	99	1 181 937	1 189 441	209	210	97	1 072 914	1 108 068	6 021	6 215
	Singapore	97	45 299	46 620	175	179	98	45 553	46 620	176	179	93	42 241	45 259	6 105	6 555
	Chinese Taipei	100	286 778	286 778	214	214	100	286 778	286 778	214	214	98	246 408	251 424	7 708	7 871
	Thailand	99	739 772	751 010	269	273	100	751 010	751 010	273	273	97	614 996	634 795	8 249	8 491
	Trinidad and Tobago	92	15 904	17 371	141	163	92	15 904	17 371	141	163	79	9 674	12 188	4 587	5 745
	Tunisia	99	121 751	122 767	162	165	99	121 838	122 792	163	165	86	97 337	112 665	5 340	6 175
	United Arab Emirates	99	49 310	50 060	473	477	99	49 310	50 060	473	477	95	43 774	46 263	14 167	15 014
	Uruguay	98	42 986	43 737	217	221	99	43 442	43 737	219	221	86	32 762	38 023	6 059	7 026
	Viet Nam	100	996 757	996 757	188	188	100	996 757	996 757	188	188	100	871 353	874 859	5 826	5 849

* See note at the beginning of this Annex.

StatLink http://dx.doi.org/10.1787/888933433129

Grade levels

Students assessed in PISA 2015 are at various grade levels. The percentage of students at each grade level is presented by country in Table A2.4a and by gender within each country in Table A2.4b.

[Part 1/1]

Table A2.4a Percentage of students at each grade level

		All students											
		7th grade		8th grade		9th grade		10th grade		11th grade		12th grade and above	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	0.0	(0.0)	0.1	(0.0)	11.2	(0.3)	74.6	(0.4)	14.0	(0.4)	0.1	(0.0)
	Austria	0.0	(0.0)	2.0	(0.6)	20.8	(0.9)	71.2	(1.0)	5.9	(0.3)	0.0	(0.0)
	Belgium	0.6	(0.1)	6.4	(0.5)	30.7	(0.7)	61.0	(0.9)	1.3	(0.1)	0.0	(0.0)
	Canada	0.1	(0.0)	0.7	(0.1)	10.8	(0.5)	87.6	(0.6)	0.8	(0.1)	0.0	(0.0)
	Chile	1.7	(0.3)	4.1	(0.6)	24.0	(0.7)	68.1	(1.0)	2.1	(0.2)	0.0	(0.0)
	Czech Republic	0.5	(0.1)	3.9	(0.3)	49.4	(1.2)	46.2	(1.2)	0.0	(0.0)	0.0	c
	Denmark	0.2	(0.1)	16.4	(0.6)	81.9	(0.7)	1.4	(0.5)	0.0	c	0.0	c
	Estonia	0.8	(0.2)	21.3	(0.6)	76.6	(0.6)	1.3	(0.3)	0.0	c	0.0	(0.0)
	Finland	0.5	(0.1)	13.6	(0.4)	85.7	(0.4)	0.0	(0.0)	0.2	(0.1)	0.0	c
	France	0.0	(0.0)	1.0	(0.2)	23.1	(0.6)	72.5	(0.7)	3.2	(0.2)	0.1	(0.1)
	Germany	0.5	(0.1)	7.7	(0.4)	47.3	(0.8)	43.1	(0.8)	1.5	(0.5)	0.0	(0.0)
	Greece	0.2	(0.1)	0.7	(0.2)	3.8	(0.8)	95.3	(0.9)	0.0	c	0.0	c
	Hungary	1.7	(0.3)	8.5	(0.5)	75.8	(0.7)	14.0	(0.5)	0.0	c	0.0	c
	Iceland	0.0	c	0.0	c	0.0	c	100.0	c	0.0	c	0.0	c
	Ireland	0.0	(0.0)	1.8	(0.2)	60.6	(0.7)	26.5	(1.1)	11.1	(0.9)	0.0	c
	Israel	0.0	c	0.1	(0.0)	16.4	(0.9)	82.7	(0.9)	0.9	(0.3)	0.0	c
	Italy	0.1	(0.0)	1.0	(0.2)	15.2	(0.6)	77.2	(0.7)	6.6	(0.3)	0.0	c
	Japan	0.0	c	0.0	c	0.0	c	100.0	(0.0)	0.0	c	0.0	c
	Korea	0.0	c	0.0	c	9.1	(0.8)	90.4	(0.8)	0.5	(0.1)	0.0	c
	Latvia	0.9	(0.2)	11.7	(0.5)	84.4	(0.6)	2.9	(0.3)	0.0	(0.0)	0.0	c
	Luxembourg	0.3	(0.1)	7.9	(0.1)	50.9	(0.1)	40.3	(0.1)	0.6	(0.0)	0.0	c
	Mexico	2.3	(0.3)	4.8	(0.4)	31.9	(1.4)	60.3	(1.6)	0.5	(0.1)	0.2	(0.0)
	Netherlands	0.1	(0.0)	2.8	(0.3)	41.6	(0.6)	54.8	(0.6)	0.8	(0.2)	0.0	(0.0)
	New Zealand	0.0	c	0.0	c	0.0	(0.0)	6.2	(0.3)	88.8	(0.5)	5.0	(0.5)
	Norway	0.0	c	0.0	c	0.6	(0.1)	99.3	(0.2)	0.1	(0.1)	0.0	c
	Poland	0.6	(0.1)	4.9	(0.3)	93.8	(0.4)	0.6	(0.2)	0.0	c	0.0	c
	Portugal	3.2	(0.3)	8.4	(0.5)	22.9	(0.9)	65.1	(1.2)	0.4	(0.1)	0.0	c
	Slovak Republic	2.2	(0.4)	4.6	(0.4)	42.6	(1.3)	50.6	(1.2)	0.1	(0.0)	0.0	c
	Slovenia	0.0	c	0.3	(0.1)	4.8	(0.3)	94.6	(0.4)	0.3	(0.1)	0.0	c
	Spain	0.1	(0.0)	8.6	(0.5)	23.4	(0.6)	67.9	(0.9)	0.1	(0.1)	0.0	c
	Sweden	0.1	(0.1)	3.1	(0.4)	94.9	(0.8)	1.8	(0.7)	0.1	(0.1)	0.0	c
	Switzerland	0.5	(0.1)	11.8	(0.7)	61.3	(1.2)	25.9	(1.3)	0.5	(0.1)	0.0	(0.0)
	Turkey	0.6	(0.1)	2.6	(0.4)	20.7	(1.0)	72.9	(1.2)	3.0	(0.3)	0.1	(0.0)
	United Kingdom	0.0	c	0.0	c	0.0	c	1.6	(0.3)	97.4	(0.4)	1.0	(0.3)
	United States	0.0	(0.0)	0.5	(0.3)	9.6	(0.7)	72.4	(0.9)	17.3	(0.6)	0.1	(0.0)
Partners	Albania	0.2	(0.1)	1.0	(0.2)	35.8	(2.3)	61.7	(2.3)	1.2	(0.7)	0.0	(0.0)
	Algeria	18.8	(1.0)	23.5	(1.1)	35.1	(1.5)	19.4	(2.1)	3.2	(0.7)	0.0	c
	Brazil	3.5	(0.2)	6.4	(0.4)	12.5	(0.5)	35.9	(0.9)	39.2	(0.8)	2.5	(0.2)
	B-S-J-G (China)	1.1	(0.2)	9.2	(0.7)	52.7	(1.7)	34.6	(2.0)	2.2	(0.5)	0.1	(0.0)
	Bulgaria	0.5	(0.2)	3.0	(0.6)	92.2	(0.8)	4.3	(0.4)	0.0	c	0.0	c
	Colombia	5.3	(0.4)	12.3	(0.6)	22.7	(0.6)	40.2	(0.7)	19.5	(0.6)	0.0	c
	Costa Rica	6.2	(0.7)	14.0	(0.7)	33.0	(1.2)	46.5	(1.6)	0.2	(0.1)	0.1	(0.1)
	Croatia	0.0	c	0.2	(0.2)	79.2	(0.5)	20.6	(0.4)	0.0	c	0.0	c
	Cyprus*	0.0	c	0.3	(0.0)	5.8	(0.1)	93.1	(0.1)	0.7	(0.1)	0.0	c
	Dominican Republic	7.1	(0.8)	13.8	(1.2)	20.6	(0.8)	41.9	(1.1)	14.2	(0.7)	2.4	(0.3)
	FYROM	0.1	(0.1)	0.1	(0.1)	70.2	(0.2)	29.7	(0.2)	0.0	c	0.0	c
	Georgia	0.1	(0.0)	0.8	(0.2)	22.0	(0.8)	76.0	(0.9)	1.1	(0.3)	0.0	c
	Hong Kong (China)	1.1	(0.1)	5.6	(0.4)	26.0	(0.7)	66.7	(0.7)	0.6	(0.5)	0.0	c
	Indonesia	2.1	(0.3)	8.1	(0.7)	42.1	(1.5)	45.5	(1.6)	2.3	(0.4)	0.0	(0.0)
	Jordan	0.2	(0.1)	0.6	(0.1)	6.6	(0.4)	92.6	(0.4)	0.0	c	0.0	c
	Kosovo	0.0	(0.1)	0.6	(0.1)	24.9	(0.8)	72.4	(0.9)	2.1	(0.2)	0.0	c
	Lebanon	3.7	(0.5)	8.3	(0.8)	16.6	(1.1)	62.3	(1.4)	9.0	(0.8)	0.1	(0.1)
	Lithuania	0.1	(0.0)	2.6	(0.2)	86.3	(0.4)	11.0	(0.4)	0.0	(0.0)	0.0	c
	Macao (China)	2.9	(0.1)	12.2	(0.2)	29.7	(0.2)	54.5	(0.1)	0.6	(0.1)	0.0	c
	Malta	0.0	c	0.0	c	0.3	(0.1)	6.1	(0.2)	93.6	(0.1)	0.1	(0.0)
	Moldova	0.2	(0.1)	7.6	(0.5)	84.5	(0.8)	7.5	(0.8)	0.0	(0.0)	0.0	c
	Montenegro	0.0	c	0.0	c	83.7	(0.1)	16.3	(0.1)	0.0	c	0.0	c
	Peru	2.5	(0.3)	6.6	(0.4)	15.9	(0.5)	50.2	(0.8)	24.8	(0.8)	0.0	c
	Qatar	0.9	(0.1)	3.5	(0.1)	16.3	(0.1)	60.7	(0.1)	18.0	(0.1)	0.6	(0.0)
	Romania	1.4	(0.3)	8.9	(0.5)	74.8	(0.9)	14.9	(0.7)	0.0	c	0.0	c
	Russia	0.2	(0.1)	6.6	(0.3)	79.7	(1.5)	13.4	(1.5)	0.1	(0.0)	0.0	c
	Singapore	0.0	(0.0)	1.9	(0.3)	7.9	(0.8)	90.0	(1.0)	0.1	(0.0)	0.1	(0.0)
	Chinese Taipei	0.0	c	0.0	c	35.4	(0.7)	64.6	(0.7)	0.0	c	0.0	c
	Thailand	0.2	(0.1)	0.6	(0.2)	23.8	(1.0)	72.9	(1.0)	2.4	(0.4)	0.0	c
	Trinidad and Tobago	3.3	(0.2)	10.8	(0.3)	27.3	(0.3)	56.5	(0.3)	2.2	(0.2)	0.0	c
	Tunisia	4.3	(0.3)	10.6	(0.8)	19.6	(1.3)	60.9	(1.7)	4.6	(0.4)	0.0	c
	United Arab Emirates	0.6	(0.1)	2.5	(0.3)	10.6	(0.7)	53.4	(0.8)	31.4	(0.8)	1.5	(0.1)
	Uruguay	7.5	(0.6)	9.7	(0.5)	20.7	(0.7)	61.3	(1.2)	0.8	(0.1)	0.0	c
	Viet Nam	0.3	(0.1)	1.7	(0.4)	7.7	(1.8)	90.4	(2.2)	0.0	(0.0)	0.0	c
	Argentina**	1.6	(0.4)	9.7	(0.8)	27.4	(1.2)	58.5	(1.6)	2.8	(0.3)	0.0	c
	Kazakhstan**	0.1	(0.1)	2.7	(0.3)	60.4	(1.7)	36.2	(1.8)	0.6	(0.1)	0.0	c
	Malaysia**	0.0	c	0.0	c	3.2	(0.6)	96.4	(0.7)	0.4	(0.3)	0.0	c

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433129

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[Part 1/1]

Table A2.4b Percentage of students at each grade level

		Boys												Girls											
		7th grade		8th grade		9th grade		10th grade		11th grade		12th grade and above		7th grade		8th grade		9th grade		10th grade		11th grade		12th grade and above	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	0.0	(0.0)	0.2	(0.1)	13.2	(0.4)	73.5	(0.5)	13.1	(0.5)	0.0	(0.0)	0.0	(0.0)	0.1	(0.0)	9.2	(0.3)	75.7	(0.5)	14.9	(0.6)	0.1	(0.1)
	Austria	0.1	(0.1)	2.0	(0.4)	21.6	(1.2)	71.1	(1.2)	5.2	(0.4)	0.0	(0.0)	0.0	c	2.0	(0.9)	20.0	(1.0)	71.4	(1.3)	6.6	(0.4)	0.0	(0.0)
	Belgium	0.7	(0.1)	6.7	(0.5)	33.6	(1.0)	57.9	(1.1)	1.2	(0.2)	0.0	c	0.6	(0.1)	6.2	(0.5)	27.7	(0.8)	64.2	(1.1)	1.3	(0.1)	0.0	(0.0)
	Canada	0.1	(0.1)	1.0	(0.2)	11.7	(0.6)	86.5	(0.6)	0.7	(0.1)	0.0	(0.0)	0.1	(0.0)	0.4	(0.1)	9.9	(0.6)	88.8	(0.6)	0.8	(0.1)	0.0	(0.0)
	Chile	2.2	(0.5)	4.8	(0.8)	26.4	(0.9)	64.8	(1.3)	1.8	(0.2)	0.1	(0.1)	1.2	(0.4)	3.5	(0.7)	21.5	(0.8)	71.4	(1.1)	2.4	(0.3)	0.0	c
	Czech Republic	0.6	(0.2)	5.5	(0.5)	52.3	(1.5)	41.5	(1.6)	0.0	(0.0)	0.0	c	0.4	(0.2)	2.2	(0.3)	46.2	(1.5)	51.2	(1.6)	0.0	c	0.0	c
	Denmark	0.3	(0.1)	21.9	(0.9)	76.6	(1.0)	1.2	(0.5)	0.0	c	0.0	c	0.1	(0.1)	10.8	(0.5)	87.3	(0.7)	1.7	(0.6)	0.0	c	0.0	c
	Estonia	1.3	(0.3)	23.7	(0.9)	74.2	(0.8)	0.8	(0.3)	0.0	c	0.0	(0.0)	0.2	(0.1)	18.8	(0.8)	79.1	(0.8)	1.9	(0.4)	0.0	c	0.0	c
	Finland	0.4	(0.1)	15.5	(0.6)	83.9	(0.6)	0.0	(0.0)	0.2	(0.1)	0.0	c	0.5	(0.1)	11.5	(0.5)	87.7	(0.5)	0.0	c	0.3	(0.2)	0.0	c
	France	0.0	c	1.0	(0.2)	26.1	(0.9)	69.6	(1.0)	3.1	(0.3)	0.2	(0.1)	0.1	(0.1)	1.0	(0.2)	20.1	(0.6)	75.4	(0.8)	3.3	(0.3)	0.1	(0.0)
	Germany	0.7	(0.2)	9.0	(0.5)	50.1	(1.0)	38.8	(1.0)	1.4	(0.4)	0.0	(0.0)	0.3	(0.1)	6.3	(0.6)	44.3	(0.9)	47.5	(1.0)	1.6	(0.6)	0.0	c
	Greece	0.4	(0.2)	1.1	(0.3)	4.7	(1.0)	93.8	(1.2)	0.0	c	0.0	c	0.1	(0.1)	0.2	(0.1)	2.8	(0.8)	96.9	(0.8)	0.0	c	0.0	c
	Hungary	1.8	(0.4)	10.1	(0.6)	75.6	(0.9)	12.5	(0.6)	0.0	c	0.0	c	1.6	(0.4)	6.9	(0.8)	76.0	(0.9)	15.5	(0.7)	0.0	c	0.0	c
	Iceland	0.0	c	0.0	c	0.0	c	100.0	c	0.0	c	0.0	c	0.0	c	0.0	c	0.0	c	100.0	c	0.0	c	0.0	c
	Ireland	0.0	c	2.2	(0.3)	62.8	(0.9)	24.1	(1.2)	10.9	(1.0)	0.0	c	0.0	(0.0)	1.4	(0.2)	58.2	(0.9)	29.0	(1.4)	11.3	(1.1)	0.0	c
	Israel	0.0	c	0.1	(0.1)	18.0	(1.2)	80.9	(1.3)	1.1	(0.6)	0.0	c	0.0	c	0.1	(0.0)	14.9	(0.8)	84.4	(0.8)	0.7	(0.1)	0.0	c
	Italy	0.2	(0.1)	1.3	(0.3)	18.1	(0.8)	75.0	(0.9)	5.4	(0.4)	0.0	c	0.1	(0.0)	0.7	(0.2)	12.2	(0.8)	79.3	(1.0)	7.7	(0.5)	0.0	c
	Japan	0.0	c	0.0	c	0.0	c	100.0	c	0.0	c	0.0	c	0.0	c	0.0	c	0.0	c	100.0	c	0.0	c	0.0	c
	Korea	0.0	c	0.0	c	10.1	(1.4)	89.4	(1.4)	0.5	(0.1)	0.0	c	0.0	c	0.0	c	8.0	(0.8)	91.5	(0.8)	0.5	(0.1)	0.0	c
	Latvia	1.5	(0.4)	14.7	(0.8)	81.8	(0.9)	1.9	(0.3)	0.0	(0.0)	0.0	c	0.4	(0.2)	8.7	(0.7)	87.0	(0.7)	3.9	(0.4)	0.0	c	0.0	c
	Luxembourg	0.2	(0.1)	9.4	(0.2)	52.4	(0.3)	37.3	(0.2)	0.7	(0.1)	0.0	c	0.3	(0.1)	6.4	(0.2)	49.4	(0.2)	43.3	(0.2)	0.6	(0.1)	0.0	c
	Mexico	3.1	(0.5)	5.9	(0.6)	32.2	(1.5)	58.0	(1.6)	0.6	(0.2)	0.2	(0.0)	1.5	(0.3)	3.7	(0.4)	31.6	(1.7)	62.5	(1.7)	0.4	(0.1)	0.2	(0.1)
	Netherlands	0.0	(0.0)	3.8	(0.4)	45.3	(0.8)	50.2	(0.8)	0.8	(0.3)	0.0	c	0.1	(0.0)	1.9	(0.3)	38.0	(0.7)	59.3	(0.7)	0.7	(0.2)	0.0	(0.0)
	New Zealand	0.0	c	0.0	c	0.0	c	6.9	(0.5)	88.6	(0.8)	4.5	(0.5)	0.0	c	0.0	c	0.0	(0.0)	5.4	(0.4)	89.1	(0.6)	5.5	(0.6)
	Norway	0.0	c	0.0	c	0.8	(0.2)	99.1	(0.2)	0.1	(0.1)	0.0	c	0.0	c	0.0	c	0.3	(0.1)	99.6	(0.1)	0.1	(0.1)	0.0	c
	Poland	0.9	(0.2)	6.8	(0.5)	92.1	(0.6)	0.2	(0.2)	0.0	c	0.0	c	0.4	(0.1)	3.0	(0.3)	95.6	(0.5)	1.1	(0.3)	0.0	c	0.0	c
	Portugal	4.2	(0.4)	10.5	(0.7)	25.4	(1.0)	59.6	(1.4)	0.3	(0.1)	0.0	c	2.1	(0.4)	6.4	(0.5)	20.5	(0.9)	70.5	(1.2)	0.5	(0.1)	0.0	c
	Slovak Republic	2.4	(0.4)	4.8	(0.5)	43.5	(1.6)	49.4	(1.8)	0.0	c	0.0	c	1.9	(0.5)	4.3	(0.6)	41.7	(1.8)	51.9	(1.8)	0.1	(0.1)	0.0	c
	Slovenia	0.0	c	0.5	(0.2)	5.4	(0.7)	93.9	(0.7)	0.2	(0.1)	0.0	c	0.0	c	0.2	(0.1)	4.1	(0.6)	95.3	(0.6)	0.4	(0.2)	0.0	c
	Spain	0.1	(0.1)	10.7	(0.7)	25.4	(0.8)	63.7	(1.1)	0.1	(0.1)	0.0	c	0.0	c	6.5	(0.5)	21.3	(0.8)	72.1	(1.0)	0.1	(0.1)	0.0	c
	Sweden	0.1	(0.1)	3.5	(0.5)	95.0	(0.9)	1.4	(0.7)	0.1	(0.1)	0.0	c	0.2	(0.1)	2.6	(0.4)	94.9	(1.0)	2.3	(0.9)	0.1	(0.1)	0.0	c
	Switzerland	0.7	(0.2)	13.4	(0.8)	60.7	(1.1)	24.7	(1.2)	0.5	(0.1)	0.0	c	0.3	(0.1)	10.1	(0.8)	62.0	(1.7)	27.2	(1.9)	0.5	(0.2)	0.0	(0.0)
	Turkey	0.8	(0.3)	3.1	(0.6)	25.4	(1.2)	68.4	(1.6)	2.2	(0.4)	0.1	(0.1)	0.4	(0.2)	2.1	(0.4)	16.1	(1.1)	77.5	(1.3)	3.8	(0.4)	0.1	(0.0)
	United Kingdom	0.0	c	0.0	c	0.0	c	1.9	(0.5)	97.3	(0.6)	0.9	(0.3)	0.0	c	0.0	c	0.0	c	1.4	(0.2)	97.5	(0.3)	1.1	(0.3)
	United States	0.0	c	0.5	(0.4)	11.6	(0.8)	72.4	(1.0)	15.3	(0.7)	0.2	(0.1)	0.1	(0.1)	0.5	(0.2)	7.6	(0.6)	72.4	(0.9)	19.4	(0.7)	0.1	(0.0)
Partners	Albania	0.2	(0.2)	0.9	(0.2)	41.2	(2.7)	56.3	(2.6)	1.3	(0.9)	0.0	(0.0)	0.1	(0.1)	1.1	(0.3)	30.4	(2.1)	67.1	(2.2)	1.2	(0.5)	0.1	(0.0)
	Algeria	24.4	(1.3)	25.7	(1.2)	32.6	(1.5)	14.7	(1.9)	2.6	(0.7)	0.0	c	12.6	(1.1)	21.0	(1.2)	37.9	(2.0)	24.6	(2.5)	3.9	(0.8)	0.0	c
	Brazil	4.6	(0.3)	7.8	(0.6)	13.9	(0.6)	36.5	(1.0)	35.3	(0.9)	1.8	(0.2)	2.4	(0.2)	5.0	(0.4)	11.1	(0.6)	35.3	(0.9)	43.0	(0.9)	3.1	(0.2)
	B-S-J-G (China)	1.2	(0.2)	9.9	(0.7)	55.4	(1.7)	31.6	(1.9)	1.9	(0.5)	0.1	(0.0)	1.1	(0.2)	8.4	(0.8)	49.6	(1.8)	38.1	(2.2)	2.6	(0.5)	0.1	(0.1)
	Bulgaria	0.6	(0.2)	4.1	(0.8)	91.8	(1.0)	3.5	(0.4)	0.0	c	0.0	c	0.4	(0.2)	1.8	(0.4)	92.7	(0.7)	5.2	(0.4)	0.0	c	0.0	c
	Colombia	7.2	(0.6)	14.3	(0.8)	25.2	(0.8)	37.1	(0.9)	16.2	(0.8)	0.0	c	3.6	(0.4)	10.5	(0.7)	20.5	(0.9)	42.9	(1.0)	22.5	(0.8)	0.0	c
	Costa Rica	7.8	(0.8)	16.7	(0.8)	34.3	(1.2)	41.2	(1.5)	0.1	(0.0)	0.0	c	4.7	(0.7)	11.4	(0.7)	31.8	(1.4)	51.6	(1.8)	0.3	(0.1)	0.2	(0.1)
	Croatia	0.0	c	0.2	(0.1)	80.5	(0.5)	19.4	(0.5)	0.0	c	0.0	c	0.0	c	0.3	(0.2)	78.0	(0.7)	21.7	(0.7)	0.0	c	0.0	c
	Cyprus*	0.0	c	0.3	(0.1)	6.6	(0.2)	92.4	(0.2)	0.6	(0.1)	0.0	c	0.0	c	0.3	(0.1)	5.1	(0.2)	93.8	(0.2)	0.8	(0.1)	0.0	c
	Dominican Republic	10.3	(1.1)	16.4	(1.5)	23.3	(1.2)	37.2	(1.4)	11.1	(0.8)	1.7	(0.3)	4.0	(0.6)	11.2	(1.1)	18.1	(0.8)	46.5	(1.1)	17.2	(0.8)	3.0	(0.3)
	FYROM	0.2	(0.2)	0.2	(0.2)	70.9	(0.3)	28.8	(0.2)	0.0	c	0.0	c	0.0	c	0.0	c	69.4	(0.3)	30.6	(0.3)	0.0	c	0.0	c
	Georgia	0.1	(0.0)	0.9	(0.2)	23.0	(1.0)	75.2	(1.0)	0.8	(0.2)	0.0	c	0.1	(0.1)	0.7	(0.2)	20.9	(0.9)	76.8	(1.0)	1.5	(0.4)	0.0	c
	Hong Kong (China)	1.3	(0.2)	6.4	(0.5)	28.5	(0.8)	63.3	(0.9)	0.5	(0.4)	0.0	c	1.0	(0.2)	4.7	(0.4)	23.5	(0.8)	70.2	(0.9)	0.6	(0.6)	0.0	c
	Indonesia	2.5	(0.4)	8.9	(0.9)	44.3	(1.9)	42.1	(2.0)	2.1	(0.4)	0.0	(0.0)	1.7	(0.3)	7.2	(1.0)	39.8	(1.9)	48.9	(2.1)	2.4	(0.4)	0.0	c
	Jordan	0.1	(0.1)	0.5	(0.1)	6.6	(0.7)	92.9	(0.7)	0.0	c	0.0	c	0.2	(0.1)	0.7	(0.1)	6.6	(0.6)	92.4	(0.6)	0.0	c	0.0	c
	Kosovo	0.1	(0.1)	0.5	(0.1)	26.4	(0.9)	71.5	(1.0)	1.6	(0.3)	0.0	c	0.0	c	0.7	(0.2)	23.5	(1.0)	73.3	(1.0)	2.5	(0.3)	0.0	c
	Lebanon	4.0	(0.6)	8.2	(0.9)	17.2	(1.4)	63.5	(1.7)	6.9	(0.7)	0.2	(0.1)	3.4	(0.6)	8.3	(1.0)	16.1	(1.2)	61.2	(1.8)	10.8	(1.2)	0.1	(0.1)
	Lithuania	0.2	(0.1)	3.5	(0.3)	87.4	(0.6)	8.8	(0.5)	0.0	(0.0)	0.0	c	0.0	(0.0)	1.7	(0.2)	85.1	(0.7)	13.1	(0.6)	0.0	(0.0)	0.0	c
	Macao (China)	4.3	(0.2)	16.4	(0.3)	30.8	(0.2)	48.2	(0.2)	0.4	(0.1)	0.0	c	1.6	(0.2)	8.0	(0.2)	28.7	(0.3)	60.8	(0.3)	0.9	(0.2)	0.0	c
	Malta	0.0	c	0.0	c	0.5	(0.1)	6.8	(0.3)	92.7	(0.2)	0.0	c	0.0	c	0.0	c	0.1	(0.0)	5.4	(0.2)	94.4	(0.2)	0.1	(0.1)
	Moldova	0.3	(0.1)	8.2	(0.7)	86.3	(0.9)	5.0	(0.9)	0.1	(0.1)	0.0	c	0.2	(0.1)	7.0	(0.6)	82.8	(1.2)	10.1	(1.2)	0.0	c	0.0	c
	Montenegro	0.0	c	0.0	c	85.2	(0.2)	14.8	(0.2)	0.0	c	0.0	c	0.0	c	0.0	c	82.2	(0.2)	17.8	(0.2)	0.0	c	0.0	c
	Peru	3.0	(0.5)	7.5	(0.5)	17.9	(0.7)	48.7	(0.9)	22.9	(1.0)	0.0	c	1.9	(0.3)	5.6	(0.5)	14.0	(0.6)	51.7	(1.0)	26.8	(0.9)	0.0	c
	Qatar	0.8	(0.1)	3.6	(0.1)	18.0	(0.2)	59.3	(0.2)	17.6	(0.2)	0.6	(0.1)	1.0	(0.1)	3.4	(0.1)	14.5	(0.1)	62.1	(0.2)	18.4	(0.2)	0.6	(0.1)
	Romania	1.7	(0.4)	10.7	(0.8)	74.3	(1.0)	13.3	(0.7)	0.0	c	0.0	c	1.1	(0.4)	7.2	(0.8)	75.3	(1.1)	16.4	(0.8)	0.0	c	0.0	c
	Russia	0.2	(0.1)	7.2	(0.5)	80.1	(1.7)	12.4	(1.7)	0.0	(0.0)	0.0	c	0.1	(0.1)	6.0	(0.4)	79.3	(1.5)	14.4	(1.6)	0.1	(0.1)	0.0	c
	Singapore	0.1	(0.0)	1.8	(0.3)	8.9	(0.9)	89.1	(1.1)	0.1	(0.1)	0.0	(0.0)	0.0	(0.0)	2.0	(0.4)	6.9	(0.8)	90.8	(1.1)	0.2	(0.1)	0.1	(0.0)
	Chinese Taipei	0.0	c	0.0	c	36.5	(1.3)	63.5	(1.3)	0.0	c	0.0	c	0.0	c	0.0	c	34.3	(1.3)	65.7	(1.3)	0.0	c	0.0	c
	Thailand	0.2	(0.1)	0.8	(0.3)	25.4	(1.2)	71.4	(1.2)	2.3	(0.4)	0.0	c	0.3	(0.1)	0.5	(0.2)	22.5	(1.3)	74.1	(1.3)	2.6	(0.4)	0.0	c
	Trinidad and Tobago	3.7	(0.3)	14.2	(0.5)	30.8	(0.5)	48.9	(0.5)	2.4	(0.2)	0.0	c	2.8	(0.2)	7.5	(0.4)	23.8	(0.4)	63.9	(0.5)	2.0	(0.3)	0.0	c
	Tunisia	5.9	(0.5)	13.8	(1.0)	22.0	(1.4)	54.0	(1.9)	4.3	(0.5)	0.0	c	3.0	(0.3)	7.8	(0.7)	17.5	(1.4)	67.0	(1.8)	4.8	(0.5)	0.0	c
	United Arab Emirates	0.7	(0.1)	2.9	(0.4)	11.4	(1.1)	54.0	(1.3)	29.6	(1.0)	1.4	(0.2)	0.4	(0.1)	2.2	(0.5)	9.9	(0.9)	52.8	(0.9)	33.1	(1.1)	1.6	(0.2)
	Uruguay	9.2	(0.8)	11.2	(0.7)	22.5	(0.9)	56.5	(1.5)	0.5	(0.1)	0.0	c	6.0	(0.7)	8.3	(0.6)	19.0	(0.8)	65.6	(1.1)	1.1	(0.2)	0.0	c
	Viet Nam	0.5	(0.2)	2.3	(0.6)	11.1	(2.6)	86.1	(3.2)	0.0	c	0.0	c	0.1	(0.0)	1.1	(0.4)	4.6	(1.2)	94.2	(1.4)	0.0	(0.0)	0.0	c
	Argentina**	2.3	(0.6)	11.5	(0.9)	27.8	(1.3)	56.0	(1.8)	2.4	(0.3)	0.0	c	1.0	(0.3)	8.1	(0.9)	26.9	(1.4)	60.8	(1.7)	3.2	(0.3)	0.0	c
	Kazakhstan**	0.1	(0.1)	3.1	(0.4)	62.8	(2.3)	33.5	(2.4)	0.5	(0.1)	0.0	c	0.1	(0.1)	2.3	(0.3)	57.8	(1.7)	39.0	(1.8)	0.7	(0.1)	0.0	c
	Malaysia**	0.0	c	0.0	c	4.2	(0.8)	95.4	(0.9)	0.4	(0.3)	0.0	c	0.0	c	0.0	c	2.3	(0.5)	97.2	(0.6)	0.4	(0.4)	0.0	c

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433129

References

OECD, forthcoming, *PISA 2015 Technical Report*, PISA, OECD Publishing, Paris.

ANNEX A3
TECHNICAL NOTES ON ANALYSES IN THIS VOLUME

Methods and definitions

Relative risk

The relative risk is a measure of the association between an antecedent factor and an outcome factor. The relative risk is simply the ratio of two risks, i.e. the risk of observing the outcome when the antecedent is present and the risk of observing the outcome when the antecedent is not present. Figure A3.1 presents the notation that is used in the following.

Figure A3.1 ▪ **Labels used in a two-way table**

p_{11}	p_{12}	$p_{1.}$
p_{21}	p_{22}	$p_{2.}$
$p_{.1}$	$p_{.2}$	$p_{..}$

p_{ij} represents the probabilities for each cell and is equal to the number of observations in a particular cell divided by the total number of observations. $p_{i.}$, $p_{j.}$ respectively represent the marginal probabilities for each row and for each column. The marginal probabilities are equal to the marginal frequencies divided by the total number of students.

Assuming that rows represent the antecedent factor, with the first row for "having the antecedent" and the second row for "not having the antecedent", and that the columns represent the outcome: the first column for "having the outcome" and the second column for "not having the outcome". The relative risk is then equal to:

$$RR = \frac{(p_{11}/p_{1.})}{(p_{21}/p_{2.})}$$

Odds ratio

The same notation can be used to define the odds ratio, another measure of the relative likelihood of a particular outcome across two groups. The odds ratio for observing the outcome when an antecedent is present is simply

$$OR = \frac{(p_{11}/p_{12})}{(p_{21}/p_{22})}$$

where p_{11}/p_{12} represents the "odds" of observing the outcome when the antecedent is present, and p_{21}/p_{22} represents the "odds" of observing the outcome when the antecedent is not present.

Logistic regression can be used to estimate the odds ratio: the exponentiated logit coefficient for a binary variable is equivalent to the odds ratio. A "generalised" odds ratio, after accounting for other differences across groups, can be estimated by introducing control variables in the logistic regression.

Statistics based on multilevel models

Statistics based on multilevel models include variance components (between- and within-school variance), the index of inclusion derived from these components, and regression coefficients where this has been indicated. Multilevel models are generally specified as two-level regression models (the student and school levels), with normally distributed residuals, and estimated with maximum likelihood estimation. Where the dependent variable is science, reading or mathematics performance, the estimation uses ten plausible values for each student's performance on the mathematics scale. Models were estimated using the Stata ® (version 14.1) "mixed" module.

In multilevel models, weights are used at both the student and school levels. The purpose of these weights is to account for differences in the probabilities of students being selected in the sample. Since PISA applies a two-stage sampling procedure, these differences are due to factors at both the school and the student levels. For the multilevel models, student final weights (W_FSTUWT) were used. Within-school weights correspond to student final weights, rescaled to amount to the sample size within each school. Between-school weights correspond to the sum of final student weights (W_FSTUWT) within each school. The definition of between-school weights is the same as in PISA 2012 initial reports.

The index of inclusion is defined and estimated as:

$$100 * \frac{\sigma_w^2}{\sigma_w^2 + \sigma_b^2}$$

where σ_w^2 and σ_b^2, respectively, represent the within- and between-variance estimates.

The results in multilevel models, and the between-school variance estimate in particular, depend on how schools are defined and organised within countries and by the units that were chosen for sampling purposes. For example, in some countries, some of the schools in the PISA sample were defined as administrative units (even if they spanned several geographically separate institutions, as in Italy); in others they were defined as those parts of larger educational institutions that serve 15-year-olds; in still others they were defined as physical school buildings; and in others they were defined from a management perspective (e.g. entities having a principal). The *PISA 2015 Technical Report* (OECD, forthcoming) and Annex A2 provide an overview of how schools are defined. In Slovenia, for example, the primary sampling unit is defined as a group of students who follow the same study programme within a school (an education track within a school). So in this case, the between-school variation is actually the within-school, between-track difference. The use of stratification variables in the selection of schools may also affect the estimate of the between-school variation, particularly if stratification variables are associated with between-school differences.

Because of the manner in which students were sampled, the within-school variation includes variation between classes as well as between students.

Effect sizes

Sometimes it is useful to compare differences in an index between groups, such as boys and girls, across countries. A problem that may occur in such instances is that the distribution of the index varies across groups or countries. One way to resolve this is to calculate an effect size that accounts for differences in the distributions. An effect size measures the difference between, say, the self-efficacy in science of male and female students in a given country, relative to the average variation in self-efficacy in science among all students in the country.

In accordance with common practices, Table I.3.6 reports effect sizes of less than 0.20 as small, effect sizes on the order of 0.50 as medium, and effect sizes greater than 0.80 as large.

The effect size between two subgroups is calculated as:

$$\frac{m_1 - m_2}{\sqrt{\sigma^2}}$$

where m_1 and m_2, respectively, represent the mean values for the subgroups 1 and 2 and σ^2 represents the overall (between and within-group) variance.

Concentration indices

Index of current concentration

The country/economy-level index of current concentration of immigrant students in schools (or current concentration index) corresponds to the minimum share of students, both immigrant and non-immigrant, who would have to be relocated from one school to another if all schools were to have an identical share of immigrant students and, consequently, an identical share of non-immigrant students. It is defined as

$$\mathrm{CC} = \frac{\sum_{i=1}^{I} N_i \,|\, p_i - p \,|}{N}$$

with N_i equal to the number of students in school i, N equal to the number of students in the population, I equal to the number of schools. $p_i = A_i/N_i$ is the share of immigrant students in school i and $p = A/N$ is the share of immigrant students in the population.

The current concentration index S is related to the segregation index developed by Gorard and Taylor (2002), which corresponds to the percentage of immigrant students who would have to be relocated from one school to another if all schools were to have an identical share of immigrant students, given the initial size of the schools. Gorard and Taylor's segregation index is defined as:

$$S = 0.5 \times \sum_{i=1}^{I} \left| \frac{A_i}{A} - \frac{N_i}{N} \right|$$

The current concentration index can be directly derived from the segregation index as $CC = 2pS$. Gorard and Taylor's segregation index is highly dependent on the percentage of immigrants in the population. If the country has very few immigrants and if these immigrants are mostly enrolled in one international school, then the percentage of immigrants to be moved would be close to 100%. The current concentration index is less sensitive to this extreme case, but remains sensitive to the overall percentage of immigrants in the population.

When the current concentration index is computed from a representative sample it is important to take sampling weights and sampling error into account. The current concentration index can be rewritten as an average across students,

$$\frac{\sum_{i=1}^{I} N_i \,|\, p_i - p \,|}{N} = \frac{1}{N}\sum_{i=1}^{I} N_i \,|\, p_i - p \,| = \frac{1}{N}\sum_{i=1}^{I}\sum_{j=1}^{N_i} |\, p_i - p \,| \cdot$$

It can therefore be readily generalised to weighted samples, simply by replacing the latter expression by a weighted average:

$$\frac{\sum_{i=1}^{I}\sum_{j=1}^{n_i} w_{ij} |\, p_i - p \,|}{\sum_{i=1}^{I}\sum_{j=1}^{n_i} w_{ij}} .$$

The current concentration index can then be computed, at the student level, as the absolute difference between the school percentage of immigrants and the national percentage of immigrants weighted by the final student weight. Standard errors for the index are obtained by replacing the final weight by the 80 weight replicates in the computation.

Index of maximum concentration

The index of maximum concentration is a theoretical maximum of the concentration of immigrant students in schools, given the size of schools and the number of immigrants in a country. It corresponds to the minimum share of students, both immigrant and non-immigrant, who would have to be relocated from one school to another if all schools were to have an identical share of immigrant students, in the counterfactual situation in which all immigrant students were located in the largest schools to begin with. In this hypothetical scenario, the concentration is maximal in the sense that immigrant students are present only in the smallest possible number of schools (given the size of schools and the immigrant population).

The computation of the index requires, first, to sort schools in each country in descending order by their respective school weight (computed as the sum of the final student weights in that school). In a second step, all immigrant students are allocated to the schools according to this sorting, up to the weighted sum of immigrant students in that particular country. The concentration index defined above is then computed. Standard errors for the index are obtained by replacing in the computation the final weight by the 80 weight replicates.

Definition of low- and high-concentration schools

The classification of schools as having either a low or a high concentration of immigrant students is based on a cutpoint that is specific to each country/economy, so that the number of low- and high-concentration schools is not dependent on the share of immigrant students in each education system. The cutpoint is defined as the (weighted) median of the distribution of shares of immigrant students across schools. In each country, approximately 50% of students are in high-concentration schools and 50% of students are in low-concentration schools.

Standard errors and significance tests

The statistics in this report represent estimates of national performance based on samples of students, rather than values that could be calculated if every student in every country had answered every question. Consequently, it is important to measure the degree of uncertainty of the estimates. In PISA, each estimate has an associated degree of uncertainty, which is expressed through a standard error. The use of confidence intervals provides a way to make inferences about the population means and proportions in a manner that reflects the uncertainty associated with the sample estimates. From an observed sample statistic and assuming a normal distribution, it can be inferred that the corresponding population result would lie within the confidence interval in 95 out of 100 replications of the measurement on different samples drawn from the same population.

In many cases, readers are primarily interested in whether a given value in a particular country is different from a second value in the same or another country, e.g. whether girls in a country perform better than boys in the same country. In the tables and charts used in this report, differences are labelled as statistically significant when a difference of that size smaller or larger in absolute value would be observed less than 5% of the time, if there were actually no difference in corresponding population values.

Throughout the report, significance tests were undertaken to assess the statistical significance of the comparisons made.

Gender differences and differences between subgroup means

Gender differences in student performance or other indices were tested for statistical significance. Positive differences indicate higher scores for boys while negative differences indicate higher scores for girls. Generally, differences marked in bold in the tables in this volume are statistically significant at the 95% confidence level.

Similarly, differences between other groups of students (e.g. non-immigrant students and students with an immigrant background) or categories of schools (e.g. advantaged and disadvantaged schools) were tested for statistical significance. The definitions of the subgroups can, in general, be found in the tables and the text accompanying the analysis. Socio-economically (dis) advantaged school are defined as schools in the (bottom) top quarter of the distribution of the average PISA index of economic, social and cultural status (ESCS) across schools within each country/economy. All differences marked in bold in the tables presented in Annex B of this report are statistically significant at the 95% level.

Differences between subgroup means, after accounting for other variables

For many tables, subgroup comparisons were performed both on the observed difference ("before accounting for other variables") and after accounting for other variables, such as the PISA index of economic, social and cultural status of students. The adjusted differences were estimated using linear regression and tested for significance at the 95% confidence level. Significant differences are marked in bold.

Performance differences between the top and bottom quartiles of PISA indices and scales

Differences in average performance between the top and bottom quarters of the PISA indices and scales were tested for statistical significance. Figures marked in bold indicate that performance between the top and bottom quarters of students on the respective index is statistically significantly different at the 95% confidence level.

Change in the performance per unit of the index

For many tables, the difference in student performance per unit on the index shown was calculated. Figures in bold indicate that the differences are statistically significantly different from zero at the 95% confidence level.

Relative risk and odds ratio

Figures in bold in the data tables presented in Annex B of this report indicate that the relative risk/odds ratio is statistically significantly different from 1 at the 95% confidence level. To compute statistical significance around the value of 1 (the null hypothesis), the relative-risk/odds-ratio statistic is assumed to follow a log-normal distribution, rather than a normal distribution, under the null hypothesis.

For many tables, "generalised" odds ratios (after accounting for other variables) are also presented. These odds ratios were estimated using logistic regression and tested for significance against the null hypothesis of an odds ratio equal to 1 (i.e. equal likelihoods, after accounting for other variables).

Range of ranks

To calculate the range of ranks for countries, data are simulated using the mean and standard error of the mean for each relevant country to generate a distribution of possible values. Some 10 000 simulations are implemented and, based on these values, 10 000 possible rankings for each country are produced. For each country, the counts for each rank are aggregated from largest to smallest until they equal 9 500 or more. Then the range of ranks per country is reported, including all the ranks that have been aggregated. This means that there is at least 95% confidence about the range of ranks, and it is safe to assume unimodality in this distribution of ranks. This method has been used in all cycles of PISA since 2003, including PISA 2015.

The main difference between the range of ranks (e.g. Figure I.2.14) and the comparison of countries' mean performance (e.g. Figure I.2.13) is that the former takes account of the multiple comparisons involved in ranking countries/economies, while the latter does not. Therefore, sometimes there is a slight difference between the range of ranks and counting the number of countries above a given country, based on pairwise comparisons of the selected countries' performance. For instance, Beijing, Shanghai, Jiangsu, Guangdong (China) (hereafter B-S-J-G [China]) and Korea have similar mean performance and the same set of countries whose mean score is not statistically different from theirs, based on Figure I.2.13; but the rank for Korea can be restricted to be, with 95% confidence, between 9th and 14th, while the range of ranks for B-S-J-G (China) is wider (between 8th and 16th) (Figure I.2.14). Since it is safe to assume that the distribution of rank estimates for each country has a single mode (unimodality), the results of range of ranks for countries should be used when examining countries' rankings.

Standard errors in statistics estimated from multilevel models

For statistics based on multilevel models (such as the estimates of variance components and regression coefficients from two-level regression models) the standard errors are not estimated with the usual replication method, which accounts for stratification and sampling rates from finite populations. Instead, standard errors are "model-based": their computation assumes that schools, and students within schools, are sampled at random (with sampling probabilities reflected in school and student weights) from a theoretical, infinite population of schools and students which complies with the model's parametric assumptions.

The standard error for the estimated index of inclusion is calculated by deriving an approximate distribution for it from the (model-based) standard errors for the variance components, using the delta method.

Standard errors in trend analyses of performance: link error

Standard errors for comparisons of performance across time account for the uncertainty in the equating procedure that allows scores in different PISA assessments to be expressed on the same scale. This additional source of uncertainty results in more conservative standard errors (larger than standard errors that were estimated before the introduction of this link error) (see Annex A5 for a technical discussion of the link error).

Figures in bold in the data tables for performance trends or changes presented in Annex B of this report indicate that the the change in performance for that particular group is statistically significantly different from 0 at the 95% confidence level. The standard errors used to calculate the statistical significance of the reported performance trend or change include the link error.

References

Gorard, S. and **C. Taylor** (2002), "What is segregation ? A comparison of measures in terms of 'strong' and 'weak' compositional invariance", *Sociology*, Vol.36/4, pp. 875-895, http://dx.doi.org/10.1177/003803850203600405.

OECD (forthcoming), *PISA 2015 Technical Report,* PISA, OECD Publishing, Paris.

ANNEX A4
QUALITY ASSURANCE

Quality assurance procedures were implemented in all parts of PISA 2015, as was done for all previous PISA surveys. The PISA 2015 Technical Standards (www.oecd.org/pisa/) specify the way in which PISA must be implemented in each country, economy and adjudicated region. International contractors monitor the implementation in each of these and adjudicate on their adherence to the standards.

The consistent quality and linguistic equivalence of the PISA 2015 assessment instruments were facilitated by assessing the ease with which the original English version could be translated. Two source versions of the assessment instruments, in English and French were prepared (except for the financial literacy assessment and the operational manuals, which were provided only in English) in order for countries to conduct a double translation design, i.e. two independent translations from the source language(s), and reconciliation by a third person. Detailed instructions for the localisation (adaptation, translation and validation) of the instruments for the field trial and for their review for the main survey, and translation/adaptation guidelines were supplied. An independent team of expert verifiers, appointed and trained by the PISA Consortium, verified each national version against the English and/or French source versions. These translators' mother tongue was the language of instruction in the country concerned, and the translators were knowledgeable about education systems. For further information on PISA translation procedures, see the *PISA 2015 Technical Report* (OECD, forthcoming).

The survey was implemented through standardised procedures. The PISA Consortium provided comprehensive manuals that explained the implementation of the survey, including precise instructions for the work of school co-ordinators and scripts for test administrators to use during the assessment sessions. Proposed adaptations to survey procedures, or proposed modifications to the assessment session script, were submitted to the PISA Consortium for approval prior to verification. The PISA Consortium then verified the national translation and adaptation of these manuals.

To establish the credibility of PISA as valid and unbiased and to encourage uniformity in administering the assessment sessions, test administrators in participating countries were selected using the following criteria: it was required that the test administrator not be the science, reading or mathematics instructor of any students in the sessions he or she would conduct for PISA; and it was considered preferable that the test administrator not be a member of the staff of any school in the PISA sample. Participating countries organised an in-person training session for test administrators.

Participating countries and economies were required to ensure that test administrators worked with the school co-ordinator to prepare the assessment session, including reviewing and updating the Student Tracking Form; completing the Session Attendance Form, which is designed to record students' attendance and instruments allocation; completing the Session Report Form, which is designed to summarise session times, any disturbance to the session, etc.; ensuring that the number of test booklets and questionnaires collected from students tallied with the number sent to the school (paper-based assessment countries) or ensuring that the number of USB sticks used for the assessment were accounted for (computer-based assessment countries); and sending the school questionnaire, student questionnaires, parent and teacher questionnaires (if applicable), and all test materials (both completed and not completed) to the national centre after the testing.

The PISA Consortium responsible for overseeing survey operations implemented all phases of the PISA Quality Monitor (PQM) process: interviewing and hiring PQM candidates in each of the countries, organising their training, selecting the schools to visit, and collecting information from the PQM visits. PQMs are independent contractors located in participating countries who are hired by the international survey operations contractor. They visit a sample of schools to observe test administration and to record the implementation of the documented field-operations procedures in the main survey.

Typically, two or three PQMs were hired for each country, and they visited an average of 15 schools in each country. If there were adjudicated regions in a country, it was usually necessary to hire additional PQMs, as a minimum of five schools were observed in adjudicated regions.

All quality-assurance data collected throughout the PISA 2015 assessment were entered and collated in a central data-adjudication database on the quality of field operations, printing, translation, school and student sampling, and coding.

Comprehensive reports were then generated for the PISA Adjudication Group. This group was formed by the Technical Advisory Group and the Sampling Referee. Its role is to review the adjudication database and reports to recommend adequate treatment to preserve the quality of PISA data. For further information, see the *PISA 2015 Technical Report* (OECD, forthcoming).

The results of adjudication and subsequent further examinations showed that the PISA Technical Standards were met in all countries and economies that participated in PISA 2015 except for those countries listed below:

- In Albania, the PISA assessment was conducted in accordance with the operational standards and guidelines of the OECD. However, because of the ways in which the data were captured, it was not possible to match the data in the test with the data from the student questionnaire. As a result, Albania cannot be included in analyses that relate students' responses from the questionnaires to the test results.
- In Argentina, the PISA assessment was conducted in accordance with the operational standards and guidelines of the OECD. However, there was a significant decline in the proportion of 15-year-olds who were covered by the test, both in absolute and relative numbers. There had been a re-structuring of Argentina's secondary schools, except for those in the adjudicated region of Ciudad Autónoma de Buenos Aires, which is likely to have affected the coverage of eligible schools listed in the sampling frame. As a result, Argentina's results may not be comparable to those of other countries or to results for Argentina from previous years.
- In Kazakhstan, the national coders were found to be lenient in marking. Consequently, the human-coded items did not meet PISA standards and were excluded from the international data. Since human-coded items form an important part of the constructs that are tested by PISA, the exclusion of these items resulted in a significantly smaller coverage of the PISA test. As a result, Kazakhstan's results may not be comparable to those of other countries or to results for Kazakhstan from previous years.
- In Malaysia, the PISA assessment was conducted in accordance with the operational standards and guidelines of the OECD. However, the weighted response rate among the initially sampled Malaysian schools (51%) falls well short of the standard PISA response rate of 85%. Therefore, the results may not be comparable to those of other countries or to results for Malaysia from previous years.

Reference

OECD (forthcoming), *PISA 2015 Technical Report*, OECD Publishing, Paris.

ANNEX A5

CHANGES IN THE ADMINISTRATION AND SCALING OF PISA 2015 AND IMPLICATIONS FOR TRENDS ANALYSES

Comparing science, reading and mathematics performance across PISA cycles

The PISA 2006, 2009, 2012 and 2015 assessments use the same science performance scale, which means that score points on this scale are directly comparable over time. The same is true for the reading performance scale used since PISA 2000 and the mathematics performance scale used since PISA 2003. Comparisons of scores across time are possible because some items are common across assessments and because an equating procedure aligns performance scales that are derived from different calibrations of item parameters to each other.

All estimates of statistical quantities are associated with statistical uncertainty, and this is also true for the transformation parameters used to equate PISA scales over time. A link error that reflects this uncertainty is included in the estimate of the standard error for estimates of PISA performance trends and changes over time. (For more details concerning link errors, see the sections below.)

The uncertainty in equating scales is the product of changes in the way the test is administered (e.g. differences related to the test design) and scaled (e.g. differences related to the calibration samples) across the years. It also reflects the evolving nature of assessment frameworks. PISA revisits the framework for science, reading and mathematics every nine years, according to a rotating schedule, in order to capture the most recent understanding of what knowledge and skills are important for 15-year-olds to acquire in order to participate fully in tomorrow's societies.

Changes in test administration and design can influence somewhat how students respond to test items. Changes in samples and the models used for the scaling produce different estimates of item difficulty. As a consequence, there is some uncertainty when results from one cycle are reported on the scale based on a previous cycle. All cycles of PISA prior to 2015, for instance, differed from each other in the following three ways:

- *The assessment design.*[1] The assessment design can influence how students respond in several ways. For example, students might not perceive the same reading item as equally difficult when it is presented at the beginning of a test, as was mostly the case in PISA 2000, as when it is presented across different places in the test, as was the case in later assessments. Similarly, students may not invest the same effort when the item is part of a 30-minute "reading" sequence in the middle of a mathematics and science test, as was mostly the case when reading was the minor domain in 2003, 2006 and 2012, compared to when reading is the major domain. In PISA, these effects are unsystematic and are typically small, but they are part of the uncertainty in the estimates.
- *The calibration samples.* In PISA cycles prior to 2015, item difficulty was estimated using only the responses of students who participated in the most recent assessment. In PISA 2009 and PISA 2012, the calibration sample was a random subset of 500 students per country/economy. In PISA 2000, 2003 and 2006, the calibration sample included only students from OECD countries (500 per country) (OECD, 2009). This implies that each trend item had as many (independent) estimates of item difficulty as there were cycles in which it was used. These estimates were not identical, and the variability among these estimated item difficulties contributes to the uncertainty of comparisons over PISA cycles. The use of only a subsample of the PISA student data per country further increases this uncertainty, and was justified by the limited computational power available at the time of early PISA cycles.
- *The set and the number of items common to previous assessments.* Just as the uncertainty around country mean performance and item parameters is reduced by including more schools and students in the sample, so the uncertainty around the link between scales is reduced by retaining more items included in previous assessments for the purpose building this link. For the major domain (e.g. science in 2015), the items that are common to prior assessments are a subset of the total number of items that make up the assessment because PISA progressively renews its pool of items in order to reflect the most recent frameworks. The frameworks are based on the current understanding of the reading, mathematics and science competencies that are required of 15-year-olds to be able to thrive in society.

PISA 2015 introduced several improvements in the test design and scaling procedure aimed at reducing the three sources of uncertainty highlighted above. In particular, the assessment design for PISA 2015 reduced or eliminated the difference in construct coverage across domains and students' perception of certain domains as "major" or "minor". In the most frequently implemented version of the test (the computer-based version in countries that assessed collaborative problem solving), for example, 86% of students were tested in two domains only, for one hour each (33% in science and reading, 33% in science and mathematics, and 22% in science and collaborative problem solving, with the order inversed for half of each group) (see OECD [forthcoming] for details). The number of items that are common to previous assessments was also greatly increased for all domains, and most obviously for minor domains. For example, when reading was a minor domain (in 2003 and 2006), only a number of items equivalent to one hour of testing time, or two 30-minute clusters, was used to support the link with PISA 2000; when mathematics was the major domain for the second time in 2012, the number of items linking back to 2003 was equivalent to one-and-a-half hours of testing time. In 2015, science (the major domain), reading and mathematics all use the equivalent of three hours of testing time to support the link with existing scales.

The scaling procedure was also improved by forming the calibration sample based on all student responses from the past four cycles of the assessment. This includes, for all domains, one assessment in which it was the major domain; for the major domain, the sample goes back to the previous cycle in which the domain was major. For the next PISA cycle (2018) the calibration sample will overlap by up to about 75% with the 2015 cycle. As a consequence, the uncertainty due to the re-estimation of item parameters in scaling will be reduced considerably compared to cycles up to 2012.

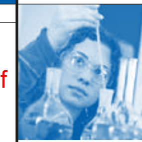
While these improvements can be expected to result in reductions in the link error between 2015 and future cycles, they may add to the uncertainty reflected in link errors between 2015 and past cycles, because past cycles had a different test design and followed a different scaling procedure.

In addition, PISA 2015 introduced further changes in test administration and scaling:

- Change in the assessment mode. Computer-based delivery became the main mode of administration of the PISA test in 2015. All trend items used in PISA 2015 were adapted for delivery on computer. The equivalence between the paper- and computer-based versions of trend items used to measure student proficiency in science, reading and mathematics was assessed on a diverse population of students from all countries/economies that participated in the PISA 2015 assessment as part of an extensive field trial, conducted in all countries/economies that participated in the PISA 2015 assessment. The results of this mode-effect study, concerning the level of equivalence achieved by items ("scalar" equivalence or "metric" equivalence; see e.g. Davidov, Schmidt and Billiet, 2011; Meredith, 1993) informed the scaling of student responses in the main study. Parameters of scalar- and metric-invariant items were constrained to be the same for the entire calibration sample, including respondents who took them in paper- and computer-based mode (see the section on "Comparing PISA results across paper- and computer-based administrations" for further details).
- Change in the scaling model. A more flexible statistical model was fitted to student responses when scaling item parameters. This model, whose broadest form is the generalised partial credit model (i.e. a two-parameter item-response-theory model; see Birnbaum, 1968; Muraki, 1992), includes constraints for trend items so as to retain as many trend items with one-parameter likelihood functions as supported by the data, and is therefore referred to as a "hybrid" model. The one-parameter models on which scaling was based in previous cycles (Masters, 1982; Rasch 1960) are a special case of the current model. The main difference between the current hybrid model and previously used one-parameter models is that the hybrid model does not give equal weight to all items when constructing a score, but rather assigns optimal weights to tasks based on their capacity to distinguish between high- and low-ability students. It can therefore better accommodate the diversity of response formats included in PISA tests.
- Change in the treatment of differential item functioning across countries. In tests such as PISA, where items are translated into multiple languages, some items in some countries may function differently from how the item functions in the majority of countries. For example, terms that are harder to translate into a specific language are not always avoidable. The resulting item-by-country interactions are a potential threat to validity. In past cycles, common item parameters were used for all countries, except for a very small number of items that were considered "dodgy" and therefore treated as "not administered" for some countries (typically, less than a handful of items, for instance if careless errors in translation or printing were found only late in the process). In 2015, the calibration allowed for a (limited) number of country-by-cycle-specific deviations from the international item parameters (Glas and Jehangir, 2014; Oliveri and von Davier, 2014; Oliveri and von Davier, 2011).[2] This approach preserves the comparability of PISA scores across countries and time, which is ensured by the existence of a sufficient number of invariant items, while reducing the (limited) dependency of country rankings on the selection of items included in the assessment, and thus increasing fairness. The *Technical Report* for PISA 2015 provides the number of unique parameters for each country/economy participating in PISA (OECD, forthcoming).
- Change in the treatment of non-reached items. Finally, in PISA 2015, non-reached items (i.e. unanswered items at the end of test booklets) were treated as not administered, whereas in previous PISA cycles they were considered as wrong answers when estimating student proficiency (i.e. in the "scoring" step) but as not administered when estimating item parameters (in the "scaling" step). This change makes the treatment of student responses consistent across the estimation of item parameters and student proficiency, and eliminates potential advantages for countries and test takers who randomly guess answers to multiple-choice questions that they could not complete in time compared to test takers who leave these non-reached items unanswered.[3] However, this new treatment of non-reached items might result in higher scores than would have been estimated in the past for countries with many unanswered items.

Linking PISA 2015 results to the existing reporting scales

This section describes how PISA 2015 results were transformed in order to report the results of PISA 2015 on the existing PISA scales (the reading scale defined in PISA 2000, the mathematics scale defined in PISA 2003, and the science scale defined in PISA 2006).



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In the estimation of item parameters for 2015, based on student responses from the 2006, 2009, 2012 and 2015 cycles, these responses were assumed to come from M distinct populations, where M is the total number of countries/economies that participated in PISA multiplied by the number of cycles in which they participated (multigroup model). Each population m_{ij} (where i identifies the country, and j the cycle) is characterised by a certain mean and variation in proficiency.[4] The proficiency means and standard deviations were part of the parameters estimated by the scaling model together with item parameters. (As in previous cycles, individual estimates of proficiency were only imputed in a second step, performed separately for each country/economy. This "scoring" step was required and completed only for the 2015 cycle). The result of the scaling step is a linked scale, based on the assumption of invariance of item functions across the 2006, 2009, 2012 and 2015 cycles, in which the means and standard deviations of countries are directly comparable across time.

To align the scale established in the scaling step with the existing numerical scale used for reporting PISA results from prior cycles, a linear transformation was applied to the results. The intercept and slope parameters for this transformation were defined by comparing the country/economy means and standard deviations, estimated during the scaling step in the logit scale, to the corresponding means and standard deviations in the PISA scale, obtained in past cycles and published in PISA reports. Specifically, the transformation for science was based on the comparison of the OECD average mean score and (within-country) standard deviation to the OECD average mean score and (within-country) standard deviation in 2006. This transformation preserves the meaning of the PISA scale as "having a mean of 500 and a standard deviation of 100, across OECD countries, the first time a domain is the major domain". A similar procedure was used for mathematics (matching average means and standard deviations for OECD countries to the last cycle in which it was the major domain, i.e. 2012) and reading (matching re-estimated results to the 2009 reported results).

Assessing the impact on trends of changes in the scaling approach introduced in 2015

It is possible to estimate what the past country means would have been if the current approach to scaling student responses were applied to past cycles. This section reports on the comparison between the means published in past PISA reports (e.g. OECD, 2014a) and the country/economy means obtained from the 2015 scaling step.

Table A5.1 shows the correlations between two sets of country means for 2006, 2009, 2012 and 2015: those reported in the tables included in Annex B and discussed throughout this report, and the mean estimates, based on the same data, but produced, under the 2015 scaling approach, as a result of the multiple group model described above. The differences in the means may result from the use of larger calibration samples that pool data from multiple cycles; from the new treatment of differential item functioning across countries and of non-reached items; or from the use of a hybrid item-response-theory model in lieu of the one-parameter models used in past cycles. The column referring to 2015 illustrates the magnitude of differences due to the imputation of scores during the scoring step, which is negligible.

Table A5.1. Correlation of country means under alternative scaling approaches

Across all countries/economies that participated in PISA 2015

	2006	2009	2012	2015
Science	0.9941	0.9961	0.9966	0.9997
Reading	0.9850	0.9949	0.9934	0.9992
Mathematics	0.9953	0.9974	0.9973	0.9995

Note: This table reports the correlation coefficient between the mean estimates included in Annex B, based on cycle-specific scaling approaches, and the means for posterior distributions produced under the 2015 scaling approach.

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The high correlations reported in this table for the years 2006, 2009 and 2012 (all higher than 0.993, with the exception of reading in 2006, for which the correlation is 0.985) indicate that the relative position of countries on the PISA scale is hardly affected by the changes introduced in 2015 in the scaling approach. The magnitude of these correlations across estimates derived under different methodologies is also larger than the magnitude of correlations of mean scores across consecutive PISA assessments, and much larger than the magnitude of correlations of mean scores between two major cycles for the same domain (at intervals of nine years).[5] This means that changes in methodology can, at best, account for only a small part of the changes and trends reported in PISA.

Comparing country means under a consistent scaling approach

Once the country means produced during the scaling of item parameters are transformed in the way described in the previous section, they can be used to assess, for each country, the sensitivity of the trends reported in the main text and in tables included in Annex B to changes in the scaling approach and in the calibration samples introduced in 2015.[6] These transformed means are reported in for science, for reading and for mathematics.

For a large majority of countries/economies, the differences between the mean scores reported in Annex B and the mean scores reported in Tables A5.3, A5.4 and A5.5 are well within the confidence interval associated with the link error (see below).

However, there are some noteworthy exceptions (Figures A5.1, A5.2 and A5.3). In particular, when focusing on changes between 2015 and the last time a domain was major, the following observations emerge:

Science

- The improvement in mean science performance reported for Colombia is almost entirely due to changes in the approach to scaling. The increase in mean score would have been only three points (not significant) had the 2015 approach and calibration sample been used to scale 2006 results. To a lesser extent, the non-significant increases in mean scores reported for Chile, Brazil, Indonesia and Uruguay are also due to the changes in the calibration sample and in the approach to scaling. These four countries would have had less positive trends (but most likely, still not significant) had the past mean scores been reported based on the PISA 2015 scaling approach. It is not possible to identify with certainty which differences between the original scaling of PISA 2006 data and the PISA 2015 re-scaling produced these results. However, a likely cause for these differences is the new treatment of non-reached items. In all these countries, many students did not reach the items placed at the end of the test booklets or forms.
- The United States shows a non-significant improvement (of seven score points) in science between 2006 and 2015. The improvement would have been somewhat larger, and most likely reported as significant (+15 points), had the 2015 approach and calibration sample been used to scale 2006 results. While larger than the reported change, the change observed under the 2015 scaling approach is nevertheless included in the confidence interval for the reported change.

Reading

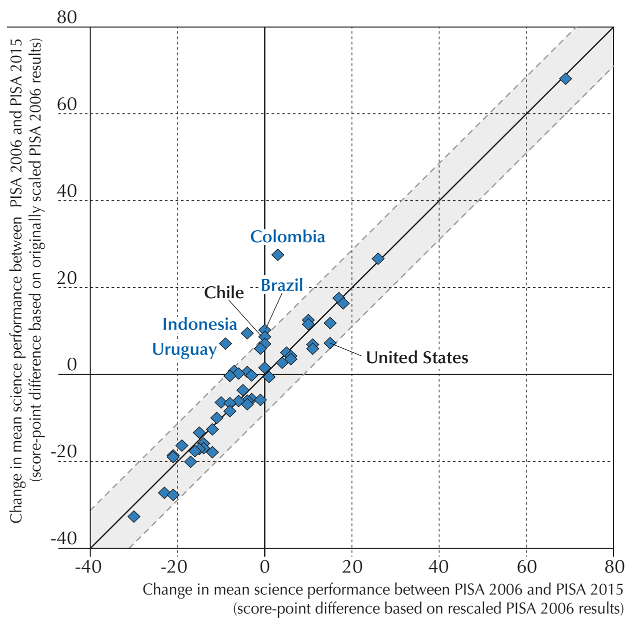
- The negative change between PISA 2009 and PISA 2015 reported for Korea (-22 score points) is, to a large extent, due to the difference in the scaling approach. Had the PISA 2009 results for reading been scaled with the PISA 2015 calibration sample and the PISA 2015 approach to scaling, the difference in results for Korea would have been only -9 points, and most likely would not have been reported as significant. According to the PISA 2015 scaling model, past results in reading for Korea are somewhat over-reported. It is not possible to identify with certainty, from these results, which aspect of the PISA 2015 approach is responsible for the difference. However, a likely cause is the new treatment of differential item functioning. Indeed, most items exhibiting a moderate level of differential item functioning for Korea, and thus receiving country-specific parameters in the PISA 2015 calibration, are items in which the success of students in Korea in past PISA cycles was greater than predicted by the international parameters. To a lesser extent, Thailand shows a similar pattern. The reported negative change (-12 points) would have been reported as not significant (-3 points), had the comparison be made with rescaled 2009 results.
- Denmark shows a non-significant improvement (of 5 points) between PISA 2009 and PISA 2015. However, under the PISA 2015 approach, the improvement would have been 15 points, and most likely be reported as significant.
- Estonia shows a significant improvement of 18 points, but the improvement would have been of only 10 points had the PISA 2009 results been derived using the PISA 2015 scaling model.
- The Netherlands shows a non-significant deterioration (of 5 points) between PISA 2009 and PISA 2015. However, under the PISA 2015 approach, the Netherlands would have seen an increase by 4 points (most likely not significant).
- The improvement in mean reading performance reported for Colombia, Trinidad and Tobago and Uruguay is most likely due to changes in the approach to scaling. The change in mean score would have been close to 0 (and reported as not significant) had the 2015 approach and calibration sample been used to scale 2009 results. Similarly, the increase in the mean score for Peru and Moldova would have only been 15 points and 21 points, respectively (compared to a reported increase of 28 points), under a constant scaling approach. A likely cause for these differences is the new treatment of non-reached items. In all these countries, many students did not reach the items placed at the end of the test booklets or forms.

Mathematics

- The negative changes between PISA 2012 and PISA 2015 reported for Chinese Taipei (-18 score points) and Viet Nam (-17 score points) are, to a large extent, due to the use of a different scaling approach. Had the PISA 2012 results for mathematics been scaled with the PISA 2015 calibration sample and the PISA 2015 approach to scaling, the differences in results for Chinese Taipei and Viet Nam would have been only -3 points and -4 points, respectively, and most likely would not have been reported as significant. The new treatment of differential item functioning may be the main reason for these differences.
- The reported change for Turkey between PISA 2012 and PISA 2015 (-28 score points) would have been only -18 score points had all results been generated under the 2015 scaling approach. While the reported trend amplifies the magnitude of the change, the direction and the significance of the change are similar under the two sets of results.
- The increase in the mathematics mean score for Albania between PISA 2012 and PISA 2015 (+19 score points) would have been smaller and most likely be reported as not significant (+7 points) had all results been generated under a consistent scaling approach. A likely cause for this difference is the new treatment of non-reached items. Similarly, the non-significant increase reported for Uruguay (+9 points) would have been even closer to zero (+1 point) under a consistent scaling approach.
- Singapore shows a deterioration of mean performance of 9 points, which, given the reduced sampling error for this country, is reported as significant. Had the PISA 2012 results been derived using the PISA 2015 scaling model, however, they would have been seven points below the published results; as a result, the difference from PISA 2015 results under a consistent scaling approach would have been of only -2 points.

All other differences between reported changes and changes based on applying the PISA 2015 approach to scaling to past PISA assessments are smaller than the differences expected given the linking errors provided in the following sections of this annex.

Figure A5.1 ■ **Changes in science performance between 2006 and 2015, based on originally scaled and on rescaled results**



Note: The solid line indicates the diagonal, where both changes are equal. The area shaded in grey indicates the confidence interval of the diagonal, based on the link error for comparisons between originally scaled 2006 results and 2015 results (see Table A5.2).
Source: OECD, PISA 2015 Database, Tables I.2.4a and A5.3.
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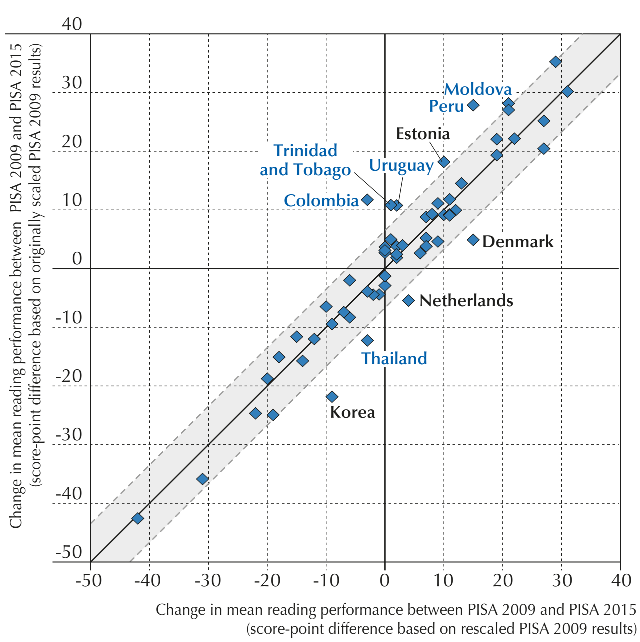
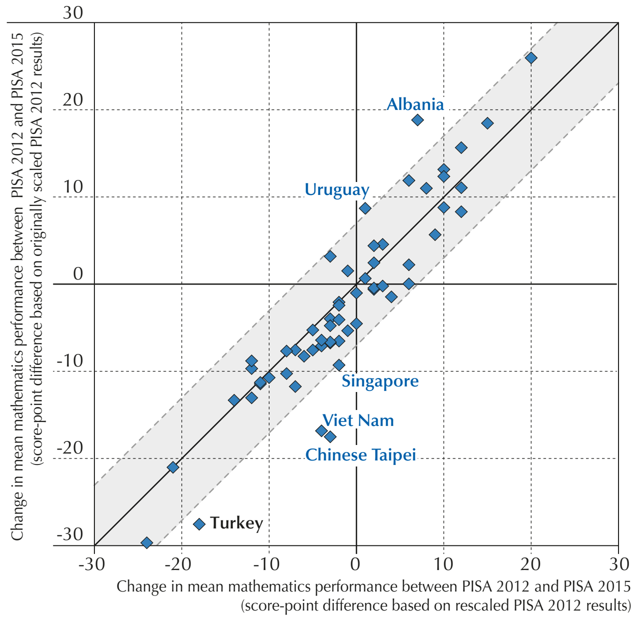
Figure A5.2 ■ **Changes in reading performance between 2009 and 2015, based on originally scaled and on rescaled results**



Note: The solid line indicates the diagonal, where both changes are equal. The area shaded in grey indicates the confidence interval of the diagonal, based on the link error for comparisons between originally scaled 2009 results and 2015 results (see Table A5.2).
Source: OECD, PISA 2015 Database, Tables I.4.4a and A5.4.
StatLink http://dx.doi.org/10.1787/888933433149

Figure A5.3 ▪ **Changes in mathematics performance between 2012 and 2015, based on originally scaled and on rescaled results**



Note: The solid line indicates the diagonal, where both changes are equal. The area shaded in grey indicates the confidence interval of the diagonal, based on the link error for comparisons between originally scaled 2012 results and 2015 results (see Table A5.2).
Source: OECD, PISA 2015 Database, Tables I.5.4a and A5.5.
StatLink http://dx.doi.org/10.1787/888933433156

Comparing PISA results across paper- and computer-based administrations

The equivalence of link items, assessed at the international level, was established in the extensive mode-effect study that was part of the field trial for PISA 2015. These results provide strong support for the assertion that results can be reported on the same scale across modes. In addition, the possibility of country-by-cycle-specific parameters can, to some extent, account for national deviations from the international norm.

The equivalence of link items was first assessed during the field trial (in 2014) on equivalent populations created by random assignment within schools. More than 40 000 students from the countries and economies that were planning to conduct the PISA 2015 assessment on computers were randomly allocated to the computer- or paper-based mode within each school, so that the distribution of student ability was comparable across the two modes. As a result, it was possible to attribute any differences across modes in students' response patterns, particularly differences that exceeded what could be expected due to random variations alone, to an impact of mode of delivery on the item rather than to students' ability to use the mode of delivery. The field trial was designed to examine mode effects at the international level, but not for each national sample or for subsamples with a country.

The mode-effects study asked two main questions:

- Do the items developed in prior PISA cycles for delivery in paper-based mode measure the same skills when delivered on computer? For instance, do all the science items that were adapted for computer delivery measure science skills only, or do they measure a mixture of science and computer skills?
- Is the difficulty of the paper-based versions of these items the same as that of computer-based versions?

Only if an item measured the same skills and was equally difficult across the two modes was it considered to be fully equivalent (i.e. scalar invariant) and to support meaningful comparisons of performance across modes. This analysis of test equivalence was based on pooled data from all countries/economies using explanatory item-response-theory (IRT) models. In these models, two distinct sets of parameters estimate how informative student responses are about proficiency on the intended scale, and what level of proficiency they indicate. The analysis identified three groups of items:

- Group 1: Items that had the same estimated difficulty and discrimination parameters in both modes and were therefore found to be fully equivalent on paper and computer (*scalar invariance*).

- Group 2: Items that had the same discrimination parameter but distinct difficulty parameter (*metric invariance*). Success on these items did say something about proficiency in the domain, in general; but the difficulty of items varied depending on the mode, often because of interface issues, such as answer formats that required free-hand drawing or the construction of equations. Several items proved to be more difficult on computers, and a few items were easier on computers.
- Group 3: Items for which field trial estimates indicated that they measured different skills, depending on the mode (no *metric invariance*).

Items in Group 3 were not used in the computer-based test in the main study (two items in mathematics were used in the paper-based test only). Items from Group 1 and 2 were used, and the stability of item parameters across cycles and modes was further probed during scaling operations for the main study. In the end, the data supported the full (scalar) equivalence across modes for up to 61 items in science, 65 items in reading and 51 items in mathematics.[7] These items function as anchor items or link items for scaling purposes and are the basis for comparisons of performance across modes and across time. For the remaining trend items included in the PISA 2015 main study (24 in science, 38 in reading and 30 in mathematics), metric equivalence was confirmed, but each of these items received a mode-specific difficulty parameter. When comparing students who sat the PISA test in different modes, this subset of metric-invariant items only provides information about the ranking of students' proficiencies within a given mode (and therefore contributes to the measurement precision), but does not provide information to rank students and countries across different modes. Items that reached scalar equivalence have identical item parameters for PBA (paper-based assessment) and CBA (computer-based assessment) in Tables C2.1, C2.3 and C2.4; items that only reached metric equivalence have the same slope parameters, but different difficulty parameters.

The full equivalence of link items across modes, assessed on a population representing all students participating in PISA who took the test on computers, ensures that results can be compared across paper- and computer-based modes, and that the link between these sets of results is solid. It implies, among other things, that if all students who took the PISA 2015 test on computer had taken the same test on paper, their mean score, as well as the proportion of students at the different levels of proficiency, would not have been significantly different.

Annex A6 provides further information on the exploratory analysis of mode-by-group interactions that was carried out on field-trial data. While the results of this analysis, in particular with respect to mode-by-gender interactions, are encouraging, the limitations of field-trial data for this type of exercise must be borne in mind when interpreting results.

Assessing the comparability of new science items and trend items

New science items were developed for PISA 2015 to reflect changes in the PISA framework for assessing science and in the main mode of delivery. Framework revisions that coincide with the development of new items occur periodically in PISA: the reading framework was revised in 2009, and the mathematics framework in 2012. The development of new items in science was guided by the need to provide balanced coverage of all framework aspects, particularly aspects that were refined or given greater emphasis in the PISA 2015 framework compared with the PISA 2006 framework. These include the distinction between epistemic and procedural knowledge, which was only implicit in the prior framework, and the more active component of science literacy. The latter is reflected in the new way science literacy is organised around the competencies to "evaluate and design scientific enquiry" and to "interpret data and evidence scientifically" (along with "explain phenomena scientifically"). These competencies are related to, but clearly do not overlap perfectly with, what was previously described as "identifying scientific issues" and "using scientific evidence".

After the 2015 main study, the possibility of reporting results on the existing science scale, established in 2006, was tested through an assessment of dimensionality. When new and existing science items were treated as related to distinct latent dimensions, the median correlation (across countries/language groups) between these dimensions was 0.92, a relatively high value (similar to the correlation observed among subscales from a same domain). Model-fit statistics confirmed that a unidimensional model fits the data better than a two-dimensional model, supporting the conclusion that new and existing science items form a coherent unidimensional scale with good reliability. Further details on scaling outcomes can be found in the *PISA 2015 Technical Report* (OECD, forthcoming).

Quantifying the uncertainty of scale comparability in the link error

Standard errors for estimates of changes in performance and trends across PISA cycles take into account the uncertainty introduced by the linking of scales produced under separate calibrations. These more conservative standard errors (larger than standard errors that were estimated before the introduction of the linking error) reflect not only the measurement precision and sampling variation as for the usual PISA results, but also the linking error provided in Table A5.2. For PISA 2015, the linking error reflects not only the uncertainty due to the selection of link items, but also the uncertainty due to the changes in the scaling methodology introduced in 2015.

As in past cycles, only the uncertainty around the location of scores from past PISA cycles on the 2015 reporting scale is reflected in the link error. Because this uncertainty about the position in the distribution (a change in the intercept) is cancelled out when looking at location-invariant estimates (such as estimates of the variance, the inter-quartile range, gender gaps, regression coefficients, correlation coefficients, etc.), standard errors for these estimates do not include the linking error.

Link error for scores between two PISA assessments

Link errors for PISA 2015 were estimated based on the comparison of rescaled country/economy means per domain (e.g. those reported in , and) with the corresponding means derived from public use files and produced under the original scaling of each cycle. This new approach for estimating the link errors was used for the first time in PISA 2015. The number of observations used for the computation of each link error equals the number of countries with results in both cycles. Because of the sparse nature of the data underlying the computation of the link error, a robust estimate of the standard deviation was used, based on the S_n statistic (Rousseeuw and Croux, 1993).

Table A5.2. Link errors for comparisons between PISA 2015 and previous assessments

Comparison	Science	Reading	Mathematics
PISA 2000 to 2015		6.8044	
PISA 2003 to 2015		5.3907	5.6080
PISA 2006 to 2015	4.4821	6.6064	3.5111
PISA 2009 to 2015	4.5016	3.4301	3.7853
PISA 2012 to 2015	3.9228	5.2535	3.5462

Note: Comparisons between PISA 2015 scores and previous assessments can only be made when the subject first became a major domain. As a result, comparisons of science performance between PISA 2000 and PISA 2015, for example, are not possible.

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Link error for other types of comparisons of student performance

The link error for regression-based trends in performance and for comparisons based on non-linear transformations of scale scores can be estimated by simulation, based on the link error for comparison of scores between two PISA assessments. In particular presents the estimates of the link error for the comparison of the percentage of students performing below Level 2 and at or above Level 5, while presents the magnitude of the link error associated with the estimation of the average three-year trend.

The estimation of the link errors for the percentage of students performing below Level 2 and at or above Level 5 uses the assumption that the magnitude of the uncertainty associated with the linking of scales follows a normal distribution with a mean of 0 and a standard deviation equal to the scale link error shown in Table A5.2. From this distribution, 500 errors are drawn and added to the first plausible value of each country's/economy's 2015 students, to represent the 500 possible scenarios in which the only source of differences with respect to 2015 is the uncertainty in the link.

By computing the estimate of interest (such as the percentage of students in a particular proficiency level) for each of the 500 replicates, it is possible to assess how the scale link error influences this estimate. The standard deviation of the 500 replicate estimates is used as the link error for the change in the percentage of students scoring in a particular proficiency level. Because the influence of the scale link error on this estimate depends on the exact shape and density of the performance distribution around the cut-off points, link errors for comparisons of proficiency levels are different for each country, and within countries, for boys and girls.

The estimation of the link errors for regression-based trends similarly uses the assumption that the uncertainty in the link follows a normal distribution with a mean of 0 and a standard deviation equal to the scale link error shown in Table A5.2. However, because the interest here lies in trends over more than two assessment years, the covariance between link errors must be considered in addition to the link errors shown in Table A5.2. To simulate data from multiple PISA assessments, 2 000 observations were drawn from a multivariate normal distribution with all means equal to 0 and whose variance/covariance structure is identified by the link error published in Table A5.2 as well as by those between previous PISA reporting scales, published in Table 12.31 of the *PISA 2012 Technical Report* (OECD, 2014b). These draws represent 2 000 possible scenarios in which the real trend is 0, and the estimated trend entirely reflects the uncertainty in the comparability of scores across scales. Link errors for comparisons of the average three-year trend between PISA 2015 and previous assessments depend on the number of cycles involved in the estimation, but are independent of the shape of the performance distribution within each country.

Comparisons of performance: Difference between two assessments and average three-year trend

To evaluate the evolution of performance, analyses report the change in performance between two cycles and the average three-year trend in performance. For reading, where up to six data points are available, curvilinear trend trajectories are also estimated.

Comparisons between two assessments (e.g. a country's/economy's change in performance between PISA 2006 and PISA 2015 or the change in performance of a subgroup) are calculated as:

$$\Delta_{2015\text{-}t} = PISA_{2015} - PISA_t$$

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where $\Delta_{2015\text{-}t}$ is the difference in performance between PISA 2015 and a previous PISA assessment (comparisons are only possible to when the subject first became a major domain or later assessment cycles; as a result, comparisons of mathematics performance between PISA 2015 and PISA 2000 are not possible, nor are comparisons in science performance between PISA 2015 and PISA 2000 or PISA 2003.) $PISA_{2015}$ is the mathematics, reading or science score observed in PISA 2015, and $PISA_t$ is the mathematics, reading or science score observed in a previous assessment. The standard error of the change in performance $\sigma(\Delta_{2015\text{-}t})$ is:

$$\sigma(\Delta_{2015\text{-}t}) = \sqrt{\sigma_{2015}^{2} + \sigma_t^2 + error_{2015,t}^{2}}$$

where σ_{2015} is the standard error observed for $PISA_{2015}$, σ_t is the standard error observed for $PISA_t$ and $error_{2015,t}$ is the link error for comparisons of science, reading or mathematics performance between the PISA 2015 assessment and a previous (t) assessment. The value for $error_{2015,t}$ is shown in Table A5.2 for most of the comparisons and Table A5.6 for comparisons of proficiency levels.

A second set of analyses reported in PISA relates to the average three-year trend in performance. The average three-year trend is the average rate of change observed through a country's/economy's participation in PISA per three-year period – an interval corresponding to the usual interval between two consecutive PISA assessments. Thus, a positive average three-year trend of x points indicates that the country/economy has improved in performance by x points per three-year period since its earliest comparable PISA results. For countries and economies that have participated only in PISA 2012 and PISA 2015, the average three-year trend is equal to the difference between the two assessments.[8]

The average three-year trend in performance is calculated through a regression of the form

$$\text{PISA}_{i,t} = \beta_0 + \beta_1 time_t + \varepsilon_{i,t}$$

where $PISA_{i,t}$ is country i's location on the science, reading or mathematics scale in year t (mean score or percentile of the score distribution), time is a variable measuring time in three-year units, and $\varepsilon_{i,t}$ is an error term indicating the sampling and measurement uncertainty around $PISA_{i,t}$. In the estimation, sampling errors and measurement errors are assumed to be independent across time. Under this specification, the estimate for β_1 indicates the average rate of change per three-year period. Just as a link error is added when drawing comparisons between two PISA assessments, the standard errors for β_1 also include a link error:

$$\sigma(\beta_1) = \sqrt{\sigma_{s,i}^{\,2}(\beta_1) + \sigma_t^2(\beta_1)}$$

where $\sigma_{s,i}(\beta_1)$ is the sampling and imputation error associated with the estimation of β_1 and $\sigma_t^2(\beta_1)$ is the link error associated with the average three-year trend. It is presented in .

The average three-year trend is a more robust measure of a country's/economy's progress in education outcomes as it is based on information available from all assessments. It is thus less sensitive to abnormal measurements that may alter comparisons based on only two assessments. The average three-year trend is calculated as the best-fitting line throughout a country's/economy's participation in PISA. PISA scores are regressed on the year the country participated in PISA (measured in three-year units of time). The average three-year trend also takes into account the fact that, for some countries and economies, the period between PISA assessments is less than three years. This is the case for those countries and economies that participated in PISA 2000 or PISA 2009 as part of PISA+: they conducted the assessment in 2001, 2002 or 2010 instead of 2000 or 2009.

Curvilinear trends in reading are estimated in a similar way, by fitting a quadratic regression function to the PISA results for country i across assessments indexed by t:

$$PISA_{i,t} = \beta_2 + \beta_3 year_t + \beta_4 year_t^2 + \varepsilon_{i,t}$$

where $year_t$ is a variable measuring time in years since 2015 and $year_t^2$ is equal to the square of $year_t$. Because $year$ is scaled such that it is equal to zero in 2015, β_3 indicates the estimated annual rate of change in 2015 and β_2 the acceleration/deceleration of the trend. If β_4 is positive, it indicates that the observed trend is U-shaped, and rates of change in performance observed in years closer to 2012 are higher (more positive) than those observed in earlier years. If β_4 is negative, the observed trend has an inverse-U shape, and rates of change in performance observed in years closer to 2012 are lower (more negative) than those observed in earlier years. Just as a link error is added when in the estimation of the standard errors for the average three-year trend, the standard errors for β_3 and β_4 also include a link error ( ). Curvilinear trends are only estimated for reading, and for countries/economies that can compare their performance across five assessments at least, to avoid over-fitting the data.

Adjusted trends

PISA maintains its technical standards over time. Although this means that trends can be calculated over populations defined in a consistent way, the share of the 15-year-old population that this represents, and/or the demographic characteristics of 15-year-old students can also be subject to change, for example because of migration.

Because trend analyses illustrate the pace of progress of successive cohorts of students, in order to draw reliable conclusions from such results, it is important to examine the extent to which they are driven by changes in the coverage rate of the sample and in the demographic characteristics of students included in the sample. Three sets of trend results were therefore developed: unadjusted trends, adjusted trends accounting for changes in enrolment, and adjusted trends accounting for changes in the demographic characteristics of the sample. Adjusted trends represent trends in performance estimated after neutralising the impact of concurrent changes in the demographic characteristics of the sample.

Adjusted trends accounting for changes in enrolment

To neutralise the impact of changes in enrolment rates (or, more precisely, in the coverage rate of the PISA sample with respect to the total population of 15-year-olds: see Coverage index 3 in Annex A2), the assumption was made that the 15-year-olds not covered by the assessment would all perform below the median level for all 15-year-olds. With this assumption, the median score among all 15-year-olds (for countries where the coverage rate of the sample is at least 50%) and higher percentiles could be computed without the need to specify the level of performance of the 15-year-olds who were not covered.

In practice, the estimation of adjusted trends accounting for changes in enrolment first requires that a single case by country/economy be added to the database, representing all 15-year-olds not covered by the PISA sample. The final student weight for this case is computed as the difference between the total population of 15-year-olds (see Table I.6.1 and Annex A2) and the sum of final student weights for the observations included in the sample (the weighted number of participating students). Similarly, each replicate weight for this case is computed as the difference between the total population of 15-year-olds and the sum of the corresponding replicate weights. Any negative weights resulting from this procedure are replaced by 0. A value below any of the plausible values in the PISA sample is entered for the performance variables of this case.

In a second step, the median and upper percentiles of the distribution are computed on the augmented sample. In a few cases where the coverage rate is below 50%, the estimate for the adjusted median is reported as missing.

Adjusted trends accounting for changes in the demographic characteristics of the sample

A reweighting procedure, analogous to post-stratification, is used to adjust the sample characteristics of past samples to the observed composition of the PISA 2015 sample.

In a first step, the sample included in each assessment cycle is divided into discrete cells, defined by the students' immigrant status (four categories: non-immigrant, first-generation, second-generation, missing), gender (two categories: boy, girl) and relative age (four categories, corresponding to four three-month periods). The few observations included in past PISA datasets with missing gender or age are deleted. This defines, at most, 32 discrete cells for the entire population. However, whenever the number of observations included in one of these 32 cells is less than 10 for a certain country/economy and PISA assessment, the corresponding cell is combined with another, similar cell, according to a sequential algorithm, until all cells reach a minimum sample size of 10.[9]

In a second step, the cells are reweighted so that the sum of final student weights within each cell is constant across assessments, and equal to the sum of final student weights in the PISA 2015 sample. Estimates of the mean and distribution of student performance are then performed on these reweighted samples, representing the (counterfactual) performance that would have been observed, had the samples from previous years had the same composition of the sample in PISA 2015 in terms of the variables used in this re-weighting procedure.

provides, for each country/economy, the number of cells used for post-stratification, as well as, for each cycle, the number of observations excluded from trends accounting for changes in the demographic characteristics of the sample.

provides, for each country/economy, the means of the background variables used for the adjustment.

Comparing items and non-performance scales across PISA cycles

To gather information about students' and schools' characteristics, PISA asks both students and school principals to complete a background questionnaire. Between PISA 2006 and PISA 2015, several questions remained the same, allowing for a comparison of responses to these questions over time. Questions with subtle word changes or questions with major word changes were not compared across time (unless otherwise noted) because it is impossible to discern whether observed changes in the response are due to changes in the construct they are measuring or to changes in the way the construct is being measured.

Also, as described in Annex A1, questionnaire items in PISA are used to construct indices. Two types of indices are used in PISA: simple indices and scale indices.

Simple indices recode a set of responses to questionnaire items. For trends analyses, the values observed in PISA 2006 are compared directly to PISA 2015, just as simple responses to questionnaire items are. This is the case of indices like student-teacher ratio or immigrant status.

Scale indices, on the other hand, are included as Warm likelihood estimates (WLE; Warm, 1989) in the database and are based on a generalised partial credit model (GPCM; see Muraki 1992). Whenever at least part of the questions used in the construction of indices remains intact in PISA 2006 and PISA 2015, scaling of the corresponding index is based on a concurrent calibration with PISA 2006 and PISA 2015 data, followed by a linear transformation to report the resulting scale on the original PISA 2006 scale for the index, which was derived under a partial credit model (PCM; see OECD 2009). This procedure, which is analogous to the procedure used for cognitive scales, ensures that the corresponding index values can be compared.

To evaluate change in these items and scales, analyses report the change in the estimate between two assessments, usually PISA 2006 and PISA 2015. Comparisons between two assessments (e.g. a country's/economy's change index of enjoyment of learning science between PISA 2006 and PISA 2015 or the change in this index for a subgroup) is calculated as:

$$\Delta_{2015,2006} = PISA_{2015} - PISA_{2006}$$

where $\Delta_{2015,t}$ is the difference in the index between PISA 2015 and a previous assessment, $PISA_{2015}$ is the index value observed in PISA 2015, and $PISA_{2006}$ is the index value observed in 2006. The standard error of the change in the index value $\sigma(\Delta_{2015\text{-}2006})$ is:

$$\sigma(\Delta_{2015-2006}) = \sqrt{\sigma^2_{2015} + \sigma^2_{2006}}$$

where σ_{2015} is the standard error observed for $PISA_{2015}$ and σ_{2006} is the standard error observed for $PISA_{2006}$. Standard errors for changes in index values do not include measurement uncertainty and the uncertainty due to the equating procedure, and are therefore somewhat underestimated. Standard errors for changes in responses to single items are not subject to measurement or equating uncertainty.

OECD average

Throughout this report, the OECD average is used as a benchmark. It is calculated as the average across OECD countries, weighting each country equally. Some OECD countries did not participate in certain assessments; other OECD countries do not have comparable results for some assessments; still others did not include certain questions in their questionnaires or changed them substantially from assessment to assessment. In trends tables and figures, the OECD average is reported on consistent sets of OECD countries. For instance, the "OECD average-33" includes only 33 OECD countries that have non-missing observations for the assessments for which this average itself is non-missing. This restriction allows for valid comparisons of the OECD average over time.

Tables available on line (*StatLink* http://dx.doi.org/10.1787/888933433162)

Table A5.3. Mean scores in science since 2006 produced with the 2015 approach to scaling

Table A5.4. Mean scores in reading since 2006 produced with the 2015 approach to scaling

Table A5.5. Mean scores in mathematics since 2006 produced with the 2015 approach to scaling

Table A5.6. Link error for comparisons of proficiency levels between PISA 2015 and previous assessments

Table A5.7. Link error for comparisons of the average three-year change between PISA 2015 and previous assessments

Table A5.8. Link error for the curvilinear trend between PISA 2015 and previous assessments

Table A5.9. Cells used to adjust science, reading and mathematics scores to the PISA 2015 samples

Table A5.10. Descriptive statistics for variables used to adjust science, reading and mathematics scores to the PISA 2015 samples

Notes

1. Also see Carstensen (2013) for the influence of test design on trend measurement.

2. The limited treatment of DIF in past cycles, combined with the cycle-specific calibration sample, has been criticised for leading to trend estimates that are inconsistent with national calibrations using concurrent samples (Urbach, 2013).

3. The number of not reached items is used in PISA 2015 as a source of background information in the generation of plausible values, so that the correlation of not-reached items and proficiency is modelled and accounted for in the results.

4. The model allows for some countries/economies to contribute data for fewer than four assessment years.

5. The correlation of PISA 2009 and PISA 2012 mean scores, for countries/economies that participated in 2015, is 0.985 in science (where both assessments coincide with years in which science was a minor domain, and therefore use the exact same tasks), 0.972 in reading (where PISA 2012 uses only a subset of PISA 2009 tasks) and 0.981 in mathematics (where PISA 2012 coincides with a revision of the framework and a larger set of assessment tasks). PISA 2009 and PISA 2012 are the two cycles with the most similar test design and approach to scaling. The correlation of PISA 2000 and PISA 2009 mean scores in reading (for countries/economies that participated in 2015) is 0.955; the correlation of PISA 2003 and PISA 2012 mean scores in mathematics is 0.953; and the correlation of PISA 2006 and PISA 2015 mean scores in science is 0.947 (0.944 based on results in Table A5.3, derived under a consistent approach to scaling).

6. The country means produced during scaling are those that would have been observed based only on students who have response data on the domains. However, because PISA imputes data for all students in all domains assessed in a country/economy, whether a student has received a booklet that contains units for a domain or not, the model-based mean scores produced during scaling may differ from the mean scores reported in Annex B. However, the effect of imputed scores on means is negligible, as can be seen by comparing the results for 2015 between the estimates, based on the scaling mode, reported in Tables A5.3, A5.4 and A5.5, and the estimates, based on the full population model, reported in Tables I.2.3, I.4.3 and I.5.3.

7. When examining results for a particular country or economy, these numbers must be interpreted as an upper bound on the actual number of scalar invariant items, because of the possibility of country-and-cycle-specific deviations from the international norm.

8. The average three-year trend is related to what was referred to, in previous PISA reports, as the "annualised change" (OECD, 2014a). The average three-year trend can be obtained by multiplying the annualised change by three.

9. Samples are always first separated by immigrant status (unless this would result in groups with fewer than 10 observations), then, within groups defined by immigrant status, by gender (unless this would result in groups with fewer than 10 observations), and finally by age groups. At any stage, if there are groups with fewer than 10 observations, the following mergers are done; within each stage, the sequence of mergers stops as soon as all groups reach a minimum size of 10. Step 1 (immigrant status, within language groups defined previously): merge missing and non-immigrant; merge "first generation" and "second generation"; merge all categories. Step 2 (gender, within immigrant groups defined previously): merge boys and girls. Step 3 (age, within immigrant/gender groups defined previously): merge first and second quarter; merge third and fourth quarter; merge all categories.

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ANNEX A6
THE PISA 2015 FIELD TRIAL MODE-EFFECT STUDY

Available on line only.

It can be found at: www.oecd.org/pisa

Annex B

PISA 2015 DATA

All tables in Annex B are available on line

Annex B1: Results for countries and economies
http://dx.doi.org/10.1787/888933433171
http://dx.doi.org/10.1787/888933433183
http://dx.doi.org/10.1787/888933433195
http://dx.doi.org/10.1787/888933433203
http://dx.doi.org/10.1787/888933433214
http://dx.doi.org/10.1787/888933433226

Annex B2: Results for regions within countries
http://dx.doi.org/10.1787/888933433235

Annex B3: List of tables and figures available on line

Note regarding B-S-J-G (China)
B-S-J-G (China) refers to the four PISA participating China provinces : Beijing, Shanghai, Jiangsu, Guangdong.

Note regarding CABA (Argentina)
CABA (Argentina) refers to the Ciudad Autónoma de Buenos Aires, Argentina.

Note regarding FYROM
FYROM refers to the Former Yugoslav Republic of Macedonia.

Notes regarding Cyprus

Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

ANNEX B1

RESULTS FOR COUNTRIES AND ECONOMIES

[Part 1/1]

Table I.2.1a Percentage of students at each proficiency level in science

		All students															
		Below Level 1b (below 260.54 score points)		Level 1b (from 260.54 to less than 334.94 score points)		Level 1a (from 334.94 to less than 409.54 score points)		Level 2 (from 409.54 to less than 484.14 score points)		Level 3 (from 484.14 to less than 558.73 score points)		Level 4 (from 558.73 to less than 633.33 score points)		Level 5 (from 633.33 to less than 707.93 score points)		Level 6 (above 707.93 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	0.6	(0.1)	4.3	(0.3)	12.8	(0.5)	21.6	(0.5)	27.3	(0.5)	22.3	(0.5)	9.2	(0.4)	2.0	(0.2)
	Austria	0.5	(0.2)	4.5	(0.5)	15.8	(0.8)	23.9	(0.8)	28.1	(0.8)	19.5	(0.8)	6.8	(0.5)	0.9	(0.2)
	Belgium	0.5	(0.1)	4.9	(0.4)	14.4	(0.6)	21.9	(0.6)	26.8	(0.7)	22.5	(0.7)	8.0	(0.4)	1.0	(0.1)
	Canada	0.1	(0.1)	1.8	(0.2)	9.1	(0.4)	20.2	(0.6)	30.3	(0.5)	26.1	(0.7)	10.4	(0.5)	2.0	(0.2)
	Chile	1.0	(0.2)	8.9	(0.6)	25.0	(0.9)	31.0	(1.0)	23.8	(0.9)	9.1	(0.7)	1.2	(0.2)	0.0	(0.0)
	Czech Republic	0.3	(0.1)	4.3	(0.5)	16.1	(0.8)	25.9	(0.8)	27.7	(0.9)	18.4	(0.7)	6.3	(0.4)	0.9	(0.2)
	Denmark	0.3	(0.1)	3.0	(0.3)	12.5	(0.7)	25.9	(0.9)	31.1	(1.1)	20.2	(0.8)	6.1	(0.5)	0.9	(0.2)
	Estonia	0.0	(0.0)	1.2	(0.2)	7.5	(0.6)	20.1	(0.7)	30.7	(0.9)	26.9	(0.9)	11.6	(0.7)	1.9	(0.3)
	Finland	0.3	(0.1)	2.3	(0.3)	8.9	(0.6)	19.1	(0.7)	29.2	(0.8)	26.0	(0.8)	11.9	(0.6)	2.4	(0.3)
	France	0.9	(0.2)	5.8	(0.5)	15.3	(0.6)	22.0	(0.9)	26.5	(0.8)	21.4	(0.8)	7.2	(0.5)	0.8	(0.1)
	Germany	0.4	(0.1)	3.8	(0.4)	12.8	(0.7)	22.7	(0.8)	27.7	(0.8)	22.0	(0.8)	8.8	(0.6)	1.8	(0.2)
	Greece	1.2	(0.3)	9.1	(1.0)	22.4	(1.1)	28.4	(1.1)	25.2	(1.1)	11.6	(0.9)	2.0	(0.3)	0.1	(0.1)
	Hungary	0.8	(0.2)	6.8	(0.6)	18.4	(0.9)	25.5	(0.8)	27.3	(0.9)	16.6	(0.8)	4.3	(0.4)	0.3	(0.1)
	Iceland	0.8	(0.2)	5.8	(0.5)	18.7	(0.9)	29.0	(1.0)	27.3	(0.9)	14.6	(0.8)	3.5	(0.4)	0.3	(0.1)
	Ireland	0.3	(0.1)	2.7	(0.4)	12.4	(0.8)	26.4	(0.9)	31.1	(0.9)	20.1	(0.8)	6.3	(0.4)	0.8	(0.2)
	Israel	2.1	(0.4)	9.5	(0.8)	19.9	(0.9)	24.4	(0.8)	23.3	(1.0)	15.0	(0.8)	5.1	(0.5)	0.7	(0.1)
	Italy	0.6	(0.2)	5.4	(0.5)	17.2	(0.8)	27.1	(0.9)	28.6	(1.0)	17.0	(0.7)	3.8	(0.4)	0.2	(0.1)
	Japan	0.2	(0.1)	1.7	(0.3)	7.7	(0.6)	18.1	(0.8)	28.2	(0.9)	28.8	(0.9)	12.9	(0.8)	2.4	(0.4)
	Korea	0.4	(0.1)	2.9	(0.4)	11.1	(0.7)	21.7	(0.9)	29.2	(0.9)	24.0	(1.0)	9.2	(0.7)	1.4	(0.2)
	Latvia	0.1	(0.1)	2.6	(0.3)	14.5	(0.7)	29.8	(0.8)	31.7	(0.8)	17.4	(0.8)	3.5	(0.4)	0.3	(0.1)
	Luxembourg	0.5	(0.1)	6.4	(0.5)	18.9	(0.6)	24.8	(0.7)	25.1	(0.7)	17.3	(0.6)	6.0	(0.4)	0.9	(0.2)
	Mexico	1.1	(0.3)	11.7	(0.7)	35.0	(1.0)	34.7	(0.9)	15.1	(0.9)	2.3	(0.3)	0.1	(0.1)	0.0	c
	Netherlands	0.3	(0.1)	4.0	(0.5)	14.3	(0.7)	21.8	(0.9)	26.1	(0.9)	22.4	(0.8)	9.5	(0.5)	1.6	(0.2)
	New Zealand	0.4	(0.1)	4.0	(0.4)	13.0	(0.8)	21.6	(0.8)	26.3	(0.8)	21.8	(0.8)	10.1	(0.6)	2.7	(0.4)
	Norway	0.6	(0.1)	4.1	(0.4)	14.0	(0.7)	24.6	(0.8)	29.1	(0.8)	19.6	(0.8)	6.9	(0.5)	1.1	(0.2)
	Poland	0.3	(0.1)	2.6	(0.4)	13.3	(0.7)	26.6	(0.9)	29.9	(0.9)	19.9	(0.8)	6.3	(0.5)	1.0	(0.2)
	Portugal	0.2	(0.1)	3.2	(0.4)	14.0	(0.9)	25.4	(0.8)	28.8	(0.8)	21.0	(0.8)	6.7	(0.5)	0.7	(0.1)
	Slovak Republic	2.1	(0.3)	8.9	(0.7)	19.7	(0.8)	27.6	(0.8)	24.8	(0.7)	13.3	(0.6)	3.3	(0.3)	0.3	(0.1)
	Slovenia	0.2	(0.1)	2.8	(0.3)	11.9	(0.5)	23.3	(0.7)	29.1	(0.9)	22.1	(0.8)	9.1	(0.6)	1.5	(0.3)
	Spain	0.3	(0.1)	3.7	(0.4)	14.3	(0.7)	26.5	(0.7)	31.3	(0.7)	18.9	(0.7)	4.7	(0.4)	0.3	(0.1)
	Sweden	0.9	(0.2)	5.7	(0.5)	15.0	(0.9)	24.0	(0.9)	26.8	(0.9)	19.0	(0.9)	7.2	(0.6)	1.3	(0.2)
	Switzerland	0.5	(0.2)	4.0	(0.5)	13.9	(0.8)	22.8	(0.8)	26.3	(1.1)	22.7	(1.0)	8.6	(0.6)	1.1	(0.2)
	Turkey	1.1	(0.2)	11.8	(1.0)	31.6	(1.5)	31.3	(1.3)	19.1	(1.4)	4.8	(0.9)	0.3	(0.1)	0.0	(0.0)
	United Kingdom	0.4	(0.1)	3.4	(0.3)	13.6	(0.7)	22.6	(0.7)	27.5	(0.7)	21.6	(0.7)	9.1	(0.6)	1.8	(0.2)
	United States	0.5	(0.1)	4.3	(0.5)	15.5	(0.8)	25.5	(0.8)	26.6	(0.9)	19.1	(0.9)	7.3	(0.6)	1.2	(0.2)
	EU total	0.6	(0.0)	4.7	(0.1)	15.3	(0.2)	24.6	(0.2)	27.6	(0.2)	19.6	(0.2)	6.6	(0.2)	1.0	(0.1)
	OECD total	0.6	(0.1)	5.4	(0.2)	17.5	(0.3)	25.4	(0.3)	25.6	(0.3)	17.8	(0.3)	6.5	(0.2)	1.1	(0.1)
	OECD average	0.6	(0.0)	4.9	(0.1)	15.7	(0.1)	24.8	(0.1)	27.2	(0.1)	19.0	(0.1)	6.7	(0.1)	1.1	(0.0)
Partners	Albania	1.6	(0.3)	10.3	(0.8)	29.8	(1.2)	34.5	(1.0)	18.9	(1.3)	4.5	(0.6)	0.3	(0.1)	0.0	(0.0)
	Algeria	3.9	(0.5)	24.1	(1.0)	42.8	(1.0)	22.7	(1.1)	5.6	(0.6)	0.9	(0.2)	0.0	(0.0)	0.0	c
	Brazil	4.4	(0.3)	19.9	(0.6)	32.4	(0.6)	25.4	(0.6)	13.1	(0.6)	4.2	(0.4)	0.6	(0.1)	0.0	(0.0)
	B-S-J-G (China)	0.6	(0.2)	3.8	(0.5)	11.8	(0.9)	20.7	(1.1)	25.8	(1.1)	23.8	(1.1)	11.5	(1.1)	2.1	(0.5)
	Bulgaria	2.7	(0.4)	12.4	(1.0)	22.8	(1.1)	25.2	(1.1)	22.6	(1.2)	11.4	(0.9)	2.7	(0.4)	0.2	(0.1)
	CABA (Argentina)	0.7	(0.3)	4.8	(0.9)	17.2	(1.8)	30.8	(1.9)	29.0	(1.9)	14.9	(1.8)	2.6	(0.7)	0.1	(0.1)
	Colombia	1.7	(0.3)	14.5	(0.9)	32.8	(0.9)	30.6	(0.9)	15.9	(0.7)	4.1	(0.4)	0.3	(0.1)	0.0	(0.0)
	Costa Rica	0.7	(0.2)	10.1	(0.6)	35.6	(1.0)	35.5	(0.8)	15.2	(0.9)	2.7	(0.4)	0.1	(0.1)	0.0	(0.0)
	Croatia	0.4	(0.2)	5.1	(0.5)	19.2	(1.0)	29.5	(0.9)	27.5	(1.0)	14.4	(0.7)	3.6	(0.4)	0.4	(0.1)
	Cyprus*	2.3	(0.3)	12.9	(0.6)	26.9	(0.8)	28.6	(0.8)	19.6	(0.7)	8.1	(0.4)	1.5	(0.2)	0.1	(0.1)
	Dominican Republic	15.8	(1.0)	39.6	(1.3)	30.4	(1.3)	11.3	(0.8)	2.6	(0.5)	0.3	(0.1)	0.0	(0.0)	0.0	c
	FYROM	6.8	(0.5)	22.3	(0.8)	33.8	(0.9)	24.6	(0.7)	10.3	(0.5)	2.0	(0.3)	0.2	(0.1)	0.0	(0.0)
	Georgia	4.2	(0.4)	16.0	(0.9)	30.5	(1.1)	28.2	(1.0)	15.2	(0.7)	4.9	(0.5)	0.8	(0.2)	0.1	(0.1)
	Hong Kong (China)	0.1	(0.1)	1.6	(0.3)	7.8	(0.6)	19.7	(0.9)	36.1	(0.9)	27.4	(1.1)	6.9	(0.6)	0.4	(0.1)
	Indonesia	1.2	(0.4)	14.4	(1.1)	40.4	(1.5)	31.7	(1.3)	10.6	(0.8)	1.6	(0.3)	0.1	(0.1)	0.0	c
	Jordan	4.2	(0.5)	15.2	(0.9)	30.4	(0.9)	30.9	(1.0)	16.1	(0.9)	3.1	(0.4)	0.2	(0.1)	0.0	c
	Kosovo	4.0	(0.5)	24.4	(1.0)	39.3	(1.1)	24.4	(1.0)	7.2	(0.7)	0.7	(0.2)	0.0	(0.0)	0.0	c
	Lebanon	6.8	(0.7)	23.6	(1.3)	32.3	(1.2)	22.0	(1.2)	11.6	(0.9)	3.3	(0.4)	0.4	(0.1)	0.0	(0.0)
	Lithuania	0.5	(0.1)	5.4	(0.5)	18.9	(0.8)	29.7	(0.9)	26.3	(0.7)	15.1	(0.7)	3.9	(0.5)	0.3	(0.1)
	Macao (China)	0.1	(0.1)	1.1	(0.2)	6.9	(0.4)	20.6	(0.7)	34.2	(0.9)	28.0	(0.7)	8.3	(0.5)	0.9	(0.2)
	Malta	3.9	(0.4)	10.6	(0.7)	18.0	(0.9)	23.4	(0.8)	21.7	(0.9)	14.8	(0.9)	6.1	(0.4)	1.6	(0.3)
	Moldova	2.3	(0.3)	11.8	(0.6)	28.2	(0.8)	31.5	(1.2)	19.7	(0.9)	5.9	(0.6)	0.7	(0.1)	0.0	(0.0)
	Montenegro	3.1	(0.3)	15.8	(0.5)	32.1	(0.7)	29.0	(0.6)	15.1	(0.5)	4.4	(0.3)	0.5	(0.1)	0.0	(0.0)
	Peru	2.8	(0.3)	19.0	(0.8)	36.7	(1.0)	27.9	(1.0)	11.5	(0.7)	2.0	(0.3)	0.1	(0.1)	0.0	c
	Qatar	3.9	(0.2)	17.9	(0.5)	28.0	(0.6)	24.6	(0.5)	16.4	(0.5)	7.5	(0.3)	1.6	(0.1)	0.1	(0.0)
	Romania	0.9	(0.2)	9.3	(0.9)	28.4	(1.4)	35.0	(1.4)	19.9	(1.0)	5.9	(0.7)	0.7	(0.2)	0.0	(0.0)
	Russia	0.1	(0.1)	2.9	(0.4)	15.2	(1.0)	31.2	(0.9)	30.9	(0.9)	16.0	(0.9)	3.5	(0.4)	0.2	(0.1)
	Singapore	0.2	(0.1)	2.0	(0.2)	7.5	(0.5)	15.1	(0.5)	23.4	(0.6)	27.7	(0.7)	18.6	(0.7)	5.6	(0.4)
	Chinese Taipei	0.3	(0.1)	2.7	(0.3)	9.4	(0.6)	18.1	(0.6)	27.0	(0.9)	27.1	(0.8)	12.7	(0.8)	2.7	(0.5)
	Thailand	1.1	(0.2)	11.9	(0.8)	33.7	(1.1)	32.2	(0.9)	16.0	(0.8)	4.6	(0.6)	0.4	(0.2)	0.0	(0.0)
	Trinidad and Tobago	2.9	(0.5)	15.0	(0.7)	27.9	(0.9)	27.1	(0.8)	18.3	(0.7)	7.3	(0.5)	1.3	(0.2)	0.1	(0.1)
	Tunisia	1.6	(0.3)	20.0	(1.1)	44.2	(1.1)	26.6	(1.1)	6.8	(0.6)	0.7	(0.3)	0.0	(0.0)	0.0	c
	United Arab Emirates	2.6	(0.3)	13.0	(0.6)	26.1	(0.7)	26.9	(0.6)	19.0	(0.7)	9.5	(0.5)	2.5	(0.2)	0.2	(0.1)
	Uruguay	1.2	(0.2)	11.2	(0.8)	28.4	(0.9)	30.3	(0.8)	20.3	(0.8)	7.4	(0.5)	1.2	(0.2)	0.1	(0.0)
	Viet Nam	0.0	(0.0)	0.2	(0.1)	5.7	(0.7)	25.3	(1.4)	36.6	(1.2)	23.9	(1.2)	7.1	(0.8)	1.2	(0.5)
	Argentina**	1.4	(0.3)	10.1	(0.8)	28.2	(1.0)	34.2	(1.0)	20.1	(1.1)	5.3	(0.5)	0.7	(0.2)	0.0	(0.0)
	Kazakhstan**	0.2	(0.1)	4.1	(0.6)	23.8	(1.3)	38.2	(1.2)	23.9	(1.3)	8.1	(0.9)	1.7	(0.5)	0.1	(0.1)
	Malaysia**	0.5	(0.1)	7.3	(0.7)	25.9	(1.2)	36.4	(1.0)	23.6	(1.1)	5.8	(0.6)	0.6	(0.2)	0.0	(0.0)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/2]

Table I.2.2a Percentage of low achievers and top performers in science, 2006 through 2015

		Proficiency levels in PISA 2006				Proficiency levels in PISA 2009				Proficiency levels in PISA 2012				Proficiency levels in PISA 2015			
		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	12.9	(0.6)	14.6	(0.7)	12.6	(0.6)	14.5	(0.8)	13.6	(0.5)	13.6	(0.5)	17.6	(0.6)	11.2	(0.5)
	Austria	16.3	(1.4)	10.0	(0.8)	m	m	m	m	15.8	(1.0)	7.9	(0.7)	20.8	(1.0)	7.7	(0.5)
	Belgium	17.0	(1.0)	10.1	(0.5)	18.0	(0.8)	10.1	(0.7)	17.7	(0.9)	9.1	(0.4)	19.8	(0.9)	9.0	(0.4)
	Canada	10.0	(0.6)	14.4	(0.5)	9.6	(0.5)	12.1	(0.5)	10.4	(0.5)	11.3	(0.5)	11.1	(0.5)	12.4	(0.6)
	Chile	39.7	(2.1)	1.9	(0.3)	32.3	(1.4)	1.1	(0.2)	34.5	(1.6)	1.0	(0.2)	34.8	(1.2)	1.2	(0.2)
	Czech Republic	15.5	(1.2)	11.6	(0.9)	17.3	(1.2)	8.4	(0.7)	13.8	(1.1)	7.6	(0.6)	20.7	(1.0)	7.3	(0.5)
	Denmark	18.4	(1.1)	6.8	(0.7)	16.6	(0.8)	6.7	(0.6)	16.7	(1.0)	6.8	(0.7)	15.9	(0.8)	7.0	(0.6)
	Estonia	7.7	(0.6)	11.5	(0.8)	8.3	(0.8)	10.4	(0.8)	5.0	(0.5)	12.8	(0.7)	8.8	(0.7)	13.5	(0.7)
	Finland	4.1	(0.5)	20.9	(0.8)	6.0	(0.5)	18.7	(0.9)	7.7	(0.6)	17.1	(0.7)	11.5	(0.7)	14.3	(0.6)
	France	21.2	(1.4)	8.0	(0.7)	19.3	(1.3)	8.1	(0.8)	18.7	(1.0)	7.9	(0.8)	22.1	(0.9)	8.0	(0.5)
	Germany	15.4	(1.3)	11.8	(0.7)	14.8	(1.0)	12.8	(0.8)	12.2	(0.9)	12.2	(1.0)	17.0	(1.0)	10.6	(0.6)
	Greece	24.0	(1.3)	3.4	(0.4)	25.3	(1.6)	3.1	(0.4)	25.5	(1.5)	2.5	(0.4)	32.7	(1.9)	2.1	(0.3)
	Hungary	15.0	(1.0)	6.9	(0.6)	14.1	(1.4)	5.4	(0.6)	18.0	(1.1)	5.9	(0.8)	26.0	(1.0)	4.6	(0.5)
	Iceland	20.6	(0.8)	6.3	(0.5)	17.9	(0.7)	7.0	(0.4)	24.0	(0.8)	5.2	(0.6)	25.3	(0.9)	3.8	(0.4)
	Ireland	15.5	(1.1)	9.4	(0.7)	15.2	(1.1)	8.7	(0.8)	11.1	(0.9)	10.7	(0.6)	15.3	(1.0)	7.1	(0.5)
	Israel	36.1	(1.4)	5.2	(0.6)	33.1	(1.2)	3.9	(0.4)	28.9	(1.7)	5.8	(0.6)	31.4	(1.4)	5.8	(0.5)
	Italy	25.3	(0.9)	4.6	(0.3)	20.6	(0.6)	5.8	(0.3)	18.7	(0.7)	6.1	(0.4)	23.2	(1.0)	4.1	(0.4)
	Japan	12.0	(1.0)	15.1	(0.8)	10.7	(1.0)	16.9	(0.9)	8.5	(0.9)	18.2	(1.2)	9.6	(0.7)	15.3	(1.0)
	Korea	11.2	(1.1)	10.3	(1.1)	6.3	(0.8)	11.6	(1.1)	6.6	(0.8)	11.7	(1.1)	14.4	(0.9)	10.6	(0.8)
	Latvia	17.4	(1.2)	4.1	(0.4)	14.7	(1.2)	3.1	(0.5)	12.4	(1.0)	4.4	(0.5)	17.2	(0.8)	3.8	(0.4)
	Luxembourg	22.1	(0.5)	5.9	(0.4)	23.7	(0.8)	6.7	(0.5)	22.2	(0.6)	8.2	(0.5)	25.9	(0.7)	6.9	(0.4)
	Mexico	50.9	(1.4)	0.3	(0.1)	47.4	(1.0)	0.2	(0.0)	47.0	(0.8)	0.1	(0.0)	47.8	(1.3)	0.1	(0.1)
	Netherlands	13.0	(1.0)	13.1	(0.9)	13.2	(1.6)	12.7	(1.2)	13.1	(1.1)	11.8	(1.1)	18.5	(1.0)	11.1	(0.6)
	New Zealand	13.7	(0.7)	17.6	(0.8)	13.4	(0.7)	17.6	(0.8)	16.3	(0.9)	13.4	(0.7)	17.4	(0.9)	12.8	(0.7)
	Norway	21.1	(1.3)	6.1	(0.5)	15.8	(0.9)	6.4	(0.6)	19.6	(1.1)	7.5	(0.6)	18.7	(0.8)	8.0	(0.5)
	Poland	17.0	(0.8)	6.8	(0.5)	13.1	(0.8)	7.5	(0.5)	9.0	(0.7)	10.8	(1.0)	16.3	(0.8)	7.3	(0.6)
	Portugal	24.5	(1.4)	3.1	(0.4)	16.5	(1.1)	4.2	(0.5)	19.0	(1.4)	4.5	(0.5)	17.4	(0.9)	7.4	(0.5)
	Slovak Republic	20.2	(1.0)	5.8	(0.5)	19.3	(1.2)	6.2	(0.6)	26.9	(1.6)	4.9	(0.7)	30.7	(1.1)	3.6	(0.4)
	Slovenia	13.9	(0.6)	12.9	(0.6)	14.8	(0.5)	9.9	(0.6)	12.9	(0.6)	9.6	(0.7)	15.0	(0.5)	10.6	(0.6)
	Spain	19.6	(0.9)	4.9	(0.4)	18.2	(0.9)	4.0	(0.3)	15.7	(0.7)	4.8	(0.3)	18.3	(0.8)	5.0	(0.4)
	Sweden	16.4	(0.8)	7.9	(0.5)	19.1	(1.0)	8.1	(0.6)	22.2	(1.1)	6.3	(0.5)	21.6	(1.1)	8.5	(0.7)
	Switzerland	16.1	(0.9)	10.5	(0.8)	14.0	(0.8)	10.7	(0.9)	12.8	(0.7)	9.3	(0.8)	18.5	(1.1)	9.8	(0.6)
	Turkey	46.6	(1.6)	0.9	(0.3)	30.0	(1.5)	1.1	(0.3)	26.4	(1.5)	1.8	(0.4)	44.5	(2.1)	0.3	(0.1)
	United Kingdom	16.7	(0.8)	13.7	(0.6)	15.0	(0.8)	11.4	(0.7)	15.0	(1.1)	11.2	(0.8)	17.4	(0.8)	10.9	(0.7)
	United States	24.4	(1.6)	9.1	(0.7)	18.1	(1.1)	9.2	(1.0)	18.1	(1.3)	7.5	(0.7)	20.3	(1.1)	8.5	(0.6)
	OECD average-34	19.9	(0.2)	8.7	(0.1)	17.8	(0.2)	8.4	(0.1)	17.7	(0.2)	8.3	(0.1)	21.3	(0.2)	7.7	(0.1)
	OECD average-35	19.8	(0.2)	8.7	(0.1)	m	m	m	m	17.6	(0.2)	8.3	(0.1)	21.2	(0.2)	7.7	(0.1)
Partners	Albania	m	m	m	m	57.3	(2.0)	0.1	(0.1)	53.1	(1.2)	0.4	(0.1)	41.7	(1.7)	0.4	(0.2)
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	70.8	(1.4)	0.0	(0.0)
	Brazil	61.0	(1.4)	0.6	(0.2)	54.2	(1.3)	0.6	(0.1)	55.2	(1.1)	0.3	(0.1)	56.6	(1.1)	0.7	(0.1)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m	16.2	(1.3)	13.6	(1.4)
	Bulgaria	42.6	(2.4)	3.1	(0.6)	38.8	(2.5)	2.6	(0.5)	36.9	(2.0)	3.1	(0.6)	37.9	(1.9)	2.9	(0.4)
	CABA (Argentina)	m	m	m	m	m	m	m	m	40.8	(3.0)	1.5	(0.5)	22.7	(2.4)	2.7	(0.8)
	Colombia	60.2	(1.8)	0.2	(0.1)	54.1	(1.9)	0.1	(0.1)	56.2	(1.6)	0.1	(0.1)	49.0	(1.3)	0.4	(0.1)
	Costa Rica	m	m	m	m	39.0	(1.5)	0.3	(0.1)	39.3	(1.7)	0.2	(0.1)	46.4	(1.2)	0.1	(0.1)
	Croatia	17.0	(0.9)	5.1	(0.5)	18.5	(1.1)	3.7	(0.6)	17.3	(0.9)	4.6	(0.8)	24.6	(1.2)	3.9	(0.4)
	Cyprus*	m	m	m	m	m	m	m	m	38.0	(0.7)	2.0	(0.3)	42.1	(0.8)	1.6	(0.2)
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m	85.7	(1.1)	0.0	(0.0)
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	62.9	(0.8)	0.2	(0.1)
	Georgia	m	m	m	m	65.6	(1.3)	0.2	(0.1)	m	m	m	m	50.8	(1.3)	0.9	(0.2)
	Hong Kong (China)	8.7	(0.8)	15.9	(0.9)	6.6	(0.7)	16.2	(1.0)	5.6	(0.6)	16.7	(1.0)	9.4	(0.7)	7.4	(0.6)
	Indonesia	61.6	(3.4)	0.0	(0.0)	65.6	(2.3)	0.0	(0.0)	66.6	(2.2)	0.0	(0.0)	56.0	(1.6)	0.1	(0.1)
	Jordan	44.3	(1.2)	0.6	(0.2)	45.6	(1.7)	0.5	(0.2)	49.6	(1.5)	0.2	(0.2)	49.8	(1.4)	0.2	(0.1)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	67.7	(1.1)	0.0	(0.0)
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	62.6	(1.7)	0.4	(0.1)
	Lithuania	20.3	(1.0)	5.0	(0.7)	17.0	(1.1)	4.6	(0.5)	16.1	(1.1)	5.1	(0.5)	24.7	(1.1)	4.2	(0.5)
	Macao (China)	10.3	(0.5)	5.3	(0.4)	9.6	(0.4)	4.8	(0.5)	8.8	(0.5)	6.7	(0.4)	8.1	(0.4)	9.2	(0.5)
	Malta	m	m	m	m	32.5	(0.8)	6.0	(0.6)	m	m	m	m	32.5	(0.8)	7.6	(0.5)
	Moldova	m	m	m	m	47.3	(1.5)	0.2	(0.1)	m	m	m	m	42.2	(1.1)	0.7	(0.2)
	Montenegro	50.2	(0.9)	0.3	(0.1)	53.6	(1.0)	0.2	(0.1)	50.7	(0.7)	0.4	(0.1)	51.0	(0.7)	0.5	(0.1)
	Peru	m	m	m	m	68.3	(1.7)	0.2	(0.1)	68.5	(2.0)	0.0	(0.1)	58.5	(1.4)	0.1	(0.1)
	Qatar	79.1	(0.4)	0.3	(0.1)	65.2	(0.6)	1.4	(0.1)	62.6	(0.5)	1.5	(0.1)	49.8	(0.5)	1.7	(0.2)
	Romania	46.9	(2.4)	0.5	(0.1)	41.4	(2.1)	0.4	(0.1)	37.3	(1.6)	0.9	(0.3)	38.5	(1.8)	0.7	(0.2)
	Russia	22.2	(1.4)	4.2	(0.5)	22.0	(1.4)	4.4	(0.5)	18.8	(1.1)	4.3	(0.6)	18.2	(1.1)	3.7	(0.4)
	Singapore	m	m	m	m	11.5	(0.5)	19.9	(0.6)	9.6	(0.5)	22.7	(0.8)	9.6	(0.4)	24.2	(0.6)
	Chinese Taipei	11.6	(1.0)	14.6	(0.9)	11.1	(0.7)	8.8	(0.9)	9.8	(0.8)	8.3	(0.6)	12.4	(0.8)	15.4	(1.1)
	Thailand	46.1	(1.2)	0.4	(0.1)	42.8	(1.6)	0.6	(0.3)	33.6	(1.6)	0.9	(0.3)	46.7	(1.5)	0.5	(0.2)
	Trinidad and Tobago	m	m	m	m	49.9	(0.7)	1.9	(0.2)	m	m	m	m	45.8	(0.8)	1.4	(0.2)
	Tunisia	62.8	(1.4)	0.1	(0.1)	53.7	(1.4)	0.2	(0.1)	55.3	(1.9)	0.1	(0.1)	65.9	(1.3)	0.0	(0.0)
	United Arab Emirates	m	m	m	m	m	m	m	m	35.2	(1.3)	2.5	(0.3)	41.8	(1.1)	2.8	(0.2)
	Uruguay	42.1	(1.4)	1.4	(0.2)	42.6	(1.1)	1.5	(0.2)	46.9	(1.3)	1.0	(0.2)	40.8	(1.1)	1.3	(0.2)
	Viet Nam	m	m	m	m	m	m	m	m	6.7	(1.1)	8.1	(1.1)	5.9	(0.8)	8.3	(1.2)
	Argentina**	56.3	(2.5)	0.4	(0.1)	52.4	(1.9)	0.7	(0.2)	50.9	(2.2)	0.2	(0.1)	39.7	(1.5)	0.7	(0.2)
	Kazakhstan**	m	m	m	m	55.4	(1.6)	0.3	(0.2)	41.9	(1.8)	0.2	(0.1)	28.1	(1.6)	1.8	(0.6)
	Malaysia**	m	m	m	m	43.0	(1.5)	0.2	(0.1)	45.5	(1.6)	0.3	(0.1)	33.7	(1.5)	0.6	(0.2)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Costa Rica, Georgia, Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 2/2]

Table I.2.2a Percentage of low achievers and top performers in science, 2006 through 2015

		Change between 2006 and 2015 (PISA 2015 - PISA 2006)				Change between 2009 and 2015 (PISA 2015 - PISA 2009)				Change between 2012 and 2015 (PISA 2015 - PISA 2012)			
		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)	
		% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	**4.8**	(1.4)	**-3.4**	(1.2)	**5.1**	(1.4)	**-3.4**	(1.3)	**4.0**	(1.1)	**-2.4**	(1.0)
	Austria	4.5	(2.5)	**-2.3**	(1.1)	m	m	m	m	**5.0**	(2.0)	-0.1	(1.0)
	Belgium	2.7	(2.0)	-1.1	(1.1)	1.7	(1.9)	-1.1	(1.2)	2.1	(1.7)	-0.1	(0.9)
	Canada	1.1	(1.0)	-2.1	(1.8)	1.5	(1.0)	0.3	(1.8)	0.7	(0.9)	1.1	(1.5)
	Chile	-4.9	(4.3)	-0.7	(0.4)	2.6	(4.1)	0.2	(0.3)	0.3	(3.4)	0.2	(0.2)
	Czech Republic	**5.1**	(2.5)	**-4.3**	(1.2)	3.3	(2.5)	-1.1	(1.1)	**6.9**	(2.2)	-0.3	(0.9)
	Denmark	-2.6	(2.0)	0.2	(1.1)	-0.7	(1.8)	0.3	(1.0)	-0.8	(1.6)	0.3	(1.0)
	Estonia	1.1	(1.2)	2.0	(2.0)	0.5	(1.3)	3.1	(2.0)	**3.7**	(1.0)	0.7	(1.6)
	Finland	**7.4**	(1.2)	**-6.6**	(2.1)	**5.4**	(1.2)	**-4.4**	(2.1)	**3.8**	(1.1)	-2.7	(1.7)
	France	0.9	(2.3)	0.0	(1.0)	2.8	(2.3)	-0.1	(1.1)	3.3	(1.9)	0.1	(1.0)
	Germany	1.6	(2.0)	-1.2	(1.1)	2.2	(1.8)	-2.2	(1.2)	**4.8**	(1.6)	-1.6	(1.2)
	Greece	**8.7**	(3.6)	**-1.3**	(0.5)	**7.4**	(3.8)	-0.9	(0.5)	**7.2**	(3.2)	-0.4	(0.5)
	Hungary	**11.0**	(2.5)	**-2.3**	(0.8)	**11.9**	(2.7)	-0.8	(0.8)	**8.0**	(2.2)	-1.3	(0.9)
	Iceland	4.8	(2.5)	**-2.6**	(0.7)	7.4	(2.4)	**-3.2**	(0.7)	1.3	(2.0)	-1.5	(0.8)
	Ireland	-0.2	(2.2)	**-2.4**	(1.0)	0.2	(2.2)	-1.7	(1.0)	**4.2**	(1.8)	**-3.7**	(0.8)
	Israel	-4.7	(3.1)	0.6	(0.8)	-1.7	(3.0)	**1.9**	(0.7)	2.5	(2.9)	0.0	(0.8)
	Italy	-2.0	(2.5)	-0.5	(0.6)	2.6	(2.5)	**-1.7**	(0.6)	**4.5**	(2.1)	**-2.0**	(0.6)
	Japan	-2.4	(1.3)	0.3	(2.3)	-1.1	(1.4)	-1.6	(2.4)	1.2	(1.2)	-2.9	(2.2)
	Korea	3.1	(1.7)	0.3	(1.6)	**8.0**	(1.6)	-1.0	(1.6)	**7.8**	(1.4)	-1.1	(1.6)
	Latvia	-0.2	(2.0)	-0.3	(0.6)	2.5	(2.0)	0.7	(0.6)	**4.9**	(1.6)	-0.6	(0.7)
	Luxembourg	3.8	(2.0)	1.0	(0.7)	2.2	(2.1)	0.2	(0.8)	**3.6**	(1.7)	-1.3	(0.8)
	Mexico	-3.2	(7.3)	-0.2	(0.1)	0.4	(7.2)	-0.1	(0.1)	0.8	(5.6)	0.0	(0.1)
	Netherlands	**5.6**	(2.1)	-2.0	(1.4)	**5.4**	(2.4)	-1.6	(1.6)	**5.4**	(1.9)	-0.7	(1.4)
	New Zealand	**3.7**	(1.7)	**-4.8**	(1.4)	**4.1**	(1.7)	**-4.8**	(1.5)	1.2	(1.6)	-0.5	(1.3)
	Norway	-2.4	(2.3)	1.9	(1.0)	2.9	(2.1)	1.6	(1.1)	-0.9	(1.9)	0.4	(1.0)
	Poland	-0.7	(2.3)	0.6	(1.0)	3.1	(2.3)	-0.2	(1.0)	**7.2**	(1.9)	**-3.5**	(1.3)
	Portugal	**-7.1**	(2.4)	**4.3**	(0.9)	0.9	(2.2)	**3.3**	(1.0)	-1.6	(2.1)	**2.9**	(0.9)
	Slovak Republic	**10.5**	(2.5)	**-2.2**	(0.7)	**11.4**	(2.6)	**-2.6**	(0.7)	3.9	(2.5)	-1.3	(0.8)
	Slovenia	1.1	(1.4)	**-2.3**	(1.1)	0.2	(1.3)	0.7	(1.2)	2.1	(1.1)	1.0	(1.1)
	Spain	-1.4	(2.1)	0.1	(0.7)	0.1	(2.1)	1.0	(0.6)	2.6	(1.7)	0.2	(0.6)
	Sweden	**5.3**	(2.2)	0.6	(1.1)	2.5	(2.3)	0.4	(1.1)	-0.6	(2.0)	**2.2**	(1.0)
	Switzerland	2.4	(2.0)	-0.7	(1.6)	**4.4**	(2.0)	-1.0	(1.6)	**5.6**	(1.7)	0.5	(1.3)
	Turkey	-2.1	(5.4)	-0.6	(0.4)	**14.5**	(5.4)	**-0.8**	(0.3)	**18.1**	(4.4)	**-1.5**	(0.4)
	United Kingdom	0.7	(1.8)	**-2.9**	(1.2)	2.4	(1.8)	-0.5	(1.3)	2.4	(1.7)	-0.3	(1.2)
	United States	-4.1	(2.5)	-0.6	(1.3)	2.2	(2.3)	-0.7	(1.4)	2.2	(2.1)	1.1	(1.2)
	OECD average-34	1.4	(1.8)	-1.0	(0.6)	**3.5**	(1.8)	-0.6	(0.6)	**3.6**	(1.4)	-0.6	(0.5)
	OECD average-35	1.5	(1.8)	-1.0	(0.6)	m	m	m	m	**3.6**	(1.4)	-0.5	(0.5)
Partners	Albania	m	m	m	m	**-15.6**	(6.1)	0.3	(0.2)	**-11.4**	(4.7)	-0.1	(0.2)
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	-4.4	(4.3)	0.1	(0.3)	2.4	(4.3)	0.1	(0.2)	1.4	(3.4)	**0.4**	(0.2)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	-4.8	(3.9)	-0.2	(0.8)	-1.0	(3.9)	0.2	(0.7)	1.0	(3.3)	-0.2	(0.7)
	CABA (Argentina)	m	m	m	m	m	m	m	m	**-18.1**	(4.3)	1.2	(0.9)
	Colombia	**-11.2**	(5.2)	0.2	(0.1)	-5.1	(5.3)	**0.2**	(0.1)	-7.1	(4.2)	0.2	(0.1)
	Costa Rica	m	m	m	m	7.3	(6.9)	-0.2	(0.1)	7.0	(5.4)	-0.1	(0.1)
	Croatia	**7.7**	(3.5)	-1.2	(0.6)	6.2	(3.6)	0.2	(0.8)	**7.4**	(2.9)	-0.6	(0.9)
	Cyprus*	m	m	m	m	m	m	m	m	4.1	(2.9)	-0.4	(0.4)
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	**-14.8**	(4.8)	**0.6**	(0.2)	m	m	m	m
	Hong Kong (China)	0.7	(1.3)	**-8.6**	(1.5)	**2.8**	(1.3)	**-8.8**	(1.6)	**3.9**	(1.1)	**-9.3**	(1.5)
	Indonesia	-5.7	(8.2)	0.1	(0.1)	-9.6	(7.9)	0.1	(0.1)	-10.6	(6.2)	0.1	(0.1)
	Jordan	5.4	(4.9)	**-0.5**	(0.2)	4.1	(5.1)	-0.3	(0.2)	0.2	(4.1)	-0.1	(0.2)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	4.4	(3.0)	-0.8	(0.9)	**7.7**	(3.1)	-0.4	(0.7)	**8.7**	(2.6)	-0.9	(0.7)
	Macao (China)	**-2.2**	(0.9)	**3.9**	(1.4)	-1.6	(0.9)	**4.4**	(1.5)	-0.7	(0.8)	**2.5**	(1.2)
	Malta	m	m	m	m	0.0	(2.2)	1.7	(0.9)	m	m	m	m
	Moldova	m	m	m	m	-5.1	(5.2)	**0.5**	(0.2)	m	m	m	m
	Montenegro	0.8	(4.7)	0.2	(0.2)	-2.5	(4.7)	0.2	(0.2)	0.3	(3.7)	0.1	(0.2)
	Peru	m	m	m	m	**-9.8**	(4.7)	-0.1	(0.1)	**-10.0**	(3.9)	0.1	(0.1)
	Qatar	**-29.3**	(3.0)	**1.4**	(0.2)	**-15.4**	(3.1)	0.3	(0.2)	**-12.8**	(2.4)	0.2	(0.2)
	Romania	-8.4	(5.1)	0.2	(0.2)	-2.8	(5.0)	0.3	(0.2)	1.2	(4.0)	-0.2	(0.3)
	Russia	-4.0	(3.0)	-0.4	(0.7)	-3.8	(3.0)	-0.6	(0.7)	-0.6	(2.4)	-0.5	(0.7)
	Singapore	m	m	m	m	**-1.9**	(0.9)	4.3	(3.0)	0.0	(0.8)	1.5	(2.4)
	Chinese Taipei	0.8	(1.5)	0.7	(2.4)	1.4	(1.3)	**6.6**	(2.4)	**2.6**	(1.3)	**7.0**	(2.0)
	Thailand	0.7	(6.2)	0.1	(0.2)	3.9	(6.3)	-0.2	(0.3)	**13.1**	(5.1)	-0.5	(0.3)
	Trinidad and Tobago	m	m	m	m	-4.1	(3.6)	-0.5	(0.3)	m	m	m	m
	Tunisia	3.1	(6.2)	-0.1	(0.1)	12.2	(6.2)	-0.1	(0.1)	**10.6**	(5.1)	-0.1	(0.1)
	United Arab Emirates	m	m	m	m	m	m	m	m	**6.6**	(2.9)	0.3	(0.3)
	Uruguay	-1.4	(4.6)	-0.2	(0.3)	-1.8	(4.5)	-0.2	(0.3)	-6.1	(3.7)	0.2	(0.3)
	Viet Nam	m	m	m	m	m	m	m	m	-0.8	(1.5)	0.1	(1.7)
	Argentina**	**-16.5**	(4.9)	0.3	(0.2)	**-12.7**	(4.6)	0.1	(0.3)	**-11.1**	(4.0)	**0.5**	(0.2)
	Kazakhstan**	m	m	m	m	**-27.3**	(6.7)	**1.5**	(0.6)	**-13.9**	(5.5)	**1.6**	(0.6)
	Malaysia**	m	m	m	m	-9.3	(5.2)	0.4	(0.2)	**-11.8**	(4.2)	0.2	(0.2)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Costa Rica, Georgia, Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.3 Mean score and variation in science performance

		Mean score		Standard deviation		Percentiles													
						5th		10th		25th		Median (50th)		75th		90th		95th	
		Mean	S.E.	S.D.	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
OECD	Australia	510	(1.5)	102	(0.9)	336	(2.6)	372	(2.5)	438	(2.2)	515	(1.8)	583	(1.9)	639	(2.2)	672	(2.8)
	Austria	495	(2.4)	97	(1.3)	335	(3.8)	365	(3.4)	424	(3.6)	498	(2.9)	565	(2.8)	621	(3.0)	652	(3.6)
	Belgium	502	(2.3)	100	(1.2)	332	(3.4)	364	(3.8)	429	(3.5)	508	(2.9)	577	(2.2)	629	(2.1)	657	(2.2)
	Canada	528	(2.1)	92	(0.9)	369	(3.3)	404	(2.9)	465	(2.5)	531	(2.5)	593	(2.2)	644	(2.6)	674	(2.7)
	Chile	447	(2.4)	86	(1.3)	308	(3.1)	336	(2.7)	385	(3.0)	445	(3.2)	509	(3.2)	560	(3.3)	589	(3.4)
	Czech Republic	493	(2.3)	95	(1.4)	338	(4.1)	367	(3.7)	424	(3.4)	493	(3.0)	561	(2.5)	618	(3.1)	650	(3.8)
	Denmark	502	(2.4)	90	(1.1)	351	(3.8)	383	(3.6)	440	(3.1)	504	(2.8)	565	(2.8)	617	(3.2)	648	(4.0)
	Estonia	534	(2.1)	89	(1.1)	384	(4.3)	416	(3.3)	473	(2.7)	537	(2.4)	597	(2.7)	648	(2.9)	677	(3.7)
	Finland	531	(2.4)	96	(1.3)	364	(4.6)	402	(4.2)	466	(3.5)	535	(2.9)	599	(2.5)	651	(2.7)	681	(3.5)
	France	495	(2.1)	102	(1.4)	322	(4.1)	355	(3.7)	421	(3.4)	501	(2.5)	571	(2.4)	623	(2.8)	652	(3.3)
	Germany	509	(2.7)	99	(1.5)	342	(4.4)	376	(4.3)	439	(3.6)	512	(3.3)	580	(2.8)	636	(2.9)	669	(3.8)
	Greece	455	(3.9)	92	(1.8)	305	(5.7)	333	(5.6)	388	(5.2)	456	(4.5)	522	(3.8)	575	(4.1)	604	(4.5)
	Hungary	477	(2.4)	96	(1.6)	319	(4.0)	347	(4.1)	406	(3.5)	480	(3.3)	547	(3.0)	601	(3.5)	630	(3.7)
	Iceland	473	(1.7)	91	(1.2)	324	(3.5)	354	(3.1)	408	(2.9)	474	(2.5)	538	(2.3)	593	(3.3)	622	(3.9)
	Ireland	503	(2.4)	89	(1.3)	356	(5.0)	387	(3.9)	441	(3.2)	503	(2.9)	565	(2.5)	618	(2.5)	648	(3.2)
	Israel	467	(3.4)	106	(1.6)	295	(4.9)	327	(4.6)	389	(4.4)	466	(4.6)	544	(4.1)	606	(3.7)	640	(3.5)
	Italy	481	(2.5)	91	(1.4)	328	(4.1)	359	(3.8)	415	(3.2)	483	(3.5)	547	(2.8)	599	(2.8)	626	(3.3)
	Japan	538	(3.0)	93	(1.6)	375	(5.3)	412	(4.4)	475	(3.9)	545	(3.4)	605	(3.2)	655	(4.0)	683	(4.7)
	Korea	516	(3.1)	95	(1.5)	352	(4.7)	388	(4.5)	451	(3.8)	520	(3.7)	584	(3.3)	636	(3.7)	665	(3.9)
	Latvia	490	(1.6)	82	(1.1)	355	(3.3)	382	(3.0)	432	(2.4)	491	(2.2)	548	(2.0)	596	(2.2)	623	(3.3)
	Luxembourg	483	(1.1)	100	(1.1)	323	(2.9)	351	(2.6)	407	(2.2)	482	(1.7)	556	(1.7)	615	(2.3)	649	(3.1)
	Mexico	416	(2.1)	71	(1.1)	301	(3.2)	325	(2.5)	366	(2.2)	414	(2.4)	464	(2.8)	510	(3.1)	535	(3.4)
	Netherlands	509	(2.3)	101	(1.5)	341	(4.0)	372	(4.3)	434	(3.9)	512	(2.9)	583	(2.5)	638	(2.9)	668	(3.6)
	New Zealand	513	(2.4)	104	(1.4)	341	(3.5)	374	(3.8)	439	(3.8)	516	(3.0)	588	(2.8)	647	(3.5)	682	(3.8)
	Norway	498	(2.3)	96	(1.3)	338	(3.8)	370	(3.3)	432	(3.0)	501	(2.7)	566	(2.9)	622	(3.3)	655	(3.9)
	Poland	501	(2.5)	91	(1.3)	354	(4.3)	384	(3.4)	437	(2.9)	502	(3.0)	565	(3.1)	619	(3.5)	650	(4.0)
	Portugal	501	(2.4)	92	(1.1)	349	(3.8)	379	(3.2)	435	(3.4)	503	(3.3)	568	(2.7)	620	(3.1)	649	(3.1)
	Slovak Republic	461	(2.6)	99	(1.5)	296	(5.3)	329	(4.6)	391	(3.6)	463	(2.9)	532	(2.8)	588	(3.2)	621	(3.7)
	Slovenia	513	(1.3)	95	(1.1)	354	(3.1)	386	(2.6)	445	(2.1)	515	(1.8)	581	(2.1)	636	(3.0)	667	(3.6)
	Spain	493	(2.1)	88	(1.1)	344	(4.0)	374	(3.5)	432	(2.9)	496	(2.4)	556	(2.4)	605	(2.4)	633	(2.9)
	Sweden	493	(3.6)	102	(1.4)	322	(4.7)	357	(4.6)	421	(4.2)	496	(4.1)	567	(4.2)	625	(4.0)	658	(4.4)
	Switzerland	506	(2.9)	100	(1.5)	339	(4.7)	373	(4.1)	433	(4.3)	509	(3.5)	580	(3.3)	632	(2.9)	662	(3.3)
	Turkey	425	(3.9)	79	(1.9)	301	(3.8)	325	(3.5)	368	(3.7)	421	(4.9)	482	(5.5)	532	(6.1)	560	(5.7)
	United Kingdom	509	(2.6)	100	(1.0)	345	(2.9)	377	(3.2)	438	(2.9)	512	(3.3)	581	(3.1)	638	(3.2)	670	(3.5)
	United States	496	(3.2)	99	(1.4)	336	(4.1)	368	(3.9)	425	(3.7)	495	(3.8)	567	(3.9)	626	(3.9)	658	(4.9)
	EU total	495	(0.7)	98	(0.4)	333	(1.3)	364	(1.1)	425	(1.0)	497	(0.9)	565	(0.8)	620	(1.0)	652	(1.1)
	OECD total	488	(1.1)	100	(0.5)	328	(1.3)	358	(1.2)	414	(1.3)	487	(1.4)	560	(1.4)	620	(1.4)	653	(1.5)
	OECD average	493	(0.4)	94	(0.2)	336	(0.7)	368	(0.6)	426	(0.6)	495	(0.5)	561	(0.5)	615	(0.5)	645	(0.6)
Partners	Albania	427	(3.3)	78	(1.5)	301	(3.8)	328	(3.2)	373	(3.2)	426	(3.6)	481	(4.8)	530	(5.0)	558	(4.7)
	Algeria	376	(2.6)	69	(1.5)	268	(3.4)	291	(3.3)	329	(2.5)	373	(2.5)	419	(3.2)	465	(4.5)	496	(6.1)
	Brazil	401	(2.3)	89	(1.3)	265	(2.4)	291	(2.1)	337	(1.9)	394	(2.5)	460	(3.3)	522	(4.1)	558	(4.6)
	B-S-J-G (China)	518	(4.6)	103	(2.5)	341	(6.5)	377	(6.0)	445	(5.6)	524	(5.6)	595	(5.3)	649	(5.6)	677	(6.5)
	Bulgaria	446	(4.4)	102	(2.1)	283	(4.8)	313	(4.8)	370	(5.3)	446	(5.8)	521	(5.1)	578	(5.2)	611	(5.6)
	CABA (Argentina)	475	(6.3)	86	(2.7)	331	(8.4)	364	(7.7)	416	(7.0)	476	(7.4)	537	(7.4)	586	(7.9)	612	(8.6)
	Colombia	416	(2.4)	80	(1.3)	291	(3.9)	315	(3.1)	357	(2.8)	412	(2.8)	471	(2.9)	524	(3.4)	554	(3.5)
	Costa Rica	420	(2.1)	70	(1.2)	310	(2.6)	332	(2.3)	370	(2.3)	416	(2.3)	466	(2.8)	514	(3.3)	541	(3.7)
	Croatia	475	(2.5)	89	(1.2)	332	(3.5)	360	(3.3)	411	(3.4)	474	(3.3)	538	(2.8)	593	(3.3)	624	(3.9)
	Cyprus*	433	(1.4)	93	(1.2)	286	(2.9)	314	(2.5)	365	(2.1)	429	(2.0)	497	(2.2)	557	(2.8)	590	(4.1)
	Dominican Republic	332	(2.6)	72	(1.8)	224	(3.0)	244	(2.7)	281	(2.5)	326	(2.8)	376	(3.3)	429	(4.9)	461	(6.3)
	FYROM	384	(1.2)	85	(1.3)	248	(3.2)	277	(3.0)	325	(1.9)	381	(1.7)	440	(2.1)	496	(2.7)	528	(4.1)
	Georgia	411	(2.4)	91	(1.3)	267	(3.8)	297	(3.7)	348	(3.0)	408	(3.1)	471	(3.1)	531	(3.9)	566	(4.5)
	Hong Kong (China)	523	(2.5)	81	(1.4)	379	(5.5)	413	(4.5)	473	(3.5)	529	(2.7)	579	(2.6)	622	(2.7)	646	(3.2)
	Indonesia	403	(2.6)	68	(1.6)	296	(4.1)	319	(3.2)	356	(2.9)	399	(3.1)	447	(3.3)	493	(3.9)	522	(4.9)
	Jordan	409	(2.7)	84	(1.6)	268	(5.2)	299	(3.8)	351	(3.4)	410	(3.1)	468	(3.0)	517	(3.4)	544	(3.5)
	Kosovo	378	(1.7)	71	(1.1)	266	(3.3)	289	(2.2)	328	(2.2)	375	(1.9)	426	(2.2)	474	(3.7)	501	(4.3)
	Lebanon	386	(3.4)	90	(1.8)	249	(4.6)	276	(3.9)	322	(3.6)	379	(4.2)	446	(5.1)	511	(4.9)	545	(5.2)
	Lithuania	475	(2.7)	91	(1.4)	329	(3.2)	357	(3.8)	410	(2.9)	473	(2.8)	540	(3.3)	597	(3.7)	626	(4.3)
	Macao (China)	529	(1.1)	81	(1.0)	389	(3.6)	420	(2.3)	474	(1.7)	532	(1.7)	586	(1.8)	630	(2.0)	656	(3.2)
	Malta	465	(1.6)	118	(1.5)	273	(4.2)	310	(4.3)	382	(3.4)	466	(2.9)	548	(2.8)	618	(3.4)	656	(4.4)
	Moldova	428	(2.0)	86	(1.4)	290	(4.0)	318	(3.0)	367	(2.6)	427	(2.4)	488	(2.9)	541	(3.1)	570	(3.8)
	Montenegro	411	(1.0)	85	(0.9)	277	(2.8)	304	(2.1)	352	(1.5)	407	(1.5)	468	(1.9)	526	(2.9)	558	(3.1)
	Peru	397	(2.4)	77	(1.4)	278	(3.2)	301	(2.6)	342	(2.4)	392	(2.7)	448	(3.3)	500	(3.9)	529	(4.7)
	Qatar	418	(1.0)	99	(0.7)	268	(1.9)	295	(1.8)	344	(1.3)	410	(1.4)	486	(2.1)	554	(1.9)	589	(2.4)
	Romania	435	(3.2)	79	(1.7)	309	(4.2)	334	(3.8)	379	(3.6)	433	(3.6)	488	(4.1)	539	(5.1)	570	(5.4)
	Russia	487	(2.9)	82	(1.1)	352	(4.1)	379	(3.8)	428	(3.4)	486	(3.6)	544	(3.3)	595	(3.5)	623	(3.7)
	Singapore	556	(1.2)	104	(0.9)	373	(3.7)	412	(2.8)	485	(2.2)	564	(1.6)	631	(1.8)	683	(2.2)	712	(3.1)
	Chinese Taipei	532	(2.7)	100	(1.9)	358	(4.6)	395	(4.6)	465	(3.5)	540	(2.7)	603	(3.5)	655	(4.2)	685	(4.9)
	Thailand	421	(2.8)	78	(1.6)	301	(2.7)	324	(2.9)	365	(2.6)	416	(3.1)	473	(3.6)	528	(4.9)	559	(6.0)
	Trinidad and Tobago	425	(1.4)	94	(1.1)	279	(4.0)	306	(3.5)	356	(1.9)	420	(2.0)	491	(2.1)	551	(3.3)	585	(3.7)
	Tunisia	386	(2.1)	65	(1.6)	287	(3.1)	306	(2.6)	341	(2.2)	382	(2.5)	428	(2.5)	472	(3.8)	500	(5.3)
	United Arab Emirates	437	(2.4)	99	(1.1)	284	(3.3)	312	(2.8)	364	(2.8)	431	(3.1)	505	(3.2)	571	(3.2)	608	(3.0)
	Uruguay	435	(2.2)	87	(1.3)	301	(2.8)	326	(2.6)	372	(2.4)	431	(2.7)	496	(3.0)	552	(3.6)	583	(4.2)
	Viet Nam	525	(3.9)	77	(2.3)	404	(4.7)	428	(4.1)	470	(4.3)	522	(4.0)	576	(4.5)	624	(6.6)	655	(8.3)
	Argentina**	432	(2.9)	81	(1.2)	303	(4.1)	329	(3.5)	376	(3.4)	431	(3.2)	487	(3.4)	536	(3.7)	567	(4.1)
	Kazakhstan**	456	(3.7)	76	(2.6)	340	(4.2)	363	(3.3)	403	(3.2)	451	(3.6)	505	(4.6)	558	(6.9)	590	(8.7)
	Malaysia**	443	(3.0)	76	(1.4)	320	(3.7)	345	(3.5)	389	(3.4)	443	(3.4)	496	(3.4)	541	(3.9)	568	(5.0)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.4a Mean science performance, 2006 through 2015

		PISA 2006		PISA 2009		PISA 2012		PISA 2015		Change between 2006 and 2015 (PISA 2015 - PISA 2006)		Change between 2009 and 2015 (PISA 2015 - PISA 2009)		Change between 2012 and 2015 (PISA 2015 - PISA 2012)		Average 3-year trend in science performance across PISA assessments		
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	p-value
OECD	Australia	527	(2.3)	527	(2.5)	521	(1.8)	510	(1.5)	**-17**	(5.2)	**-17**	(5.4)	**-12**	(4.6)	**-5.7**	(1.7)	0.001
	Austria	511	(3.9)	m	m	506	(2.7)	495	(2.4)	**-16**	(6.4)	m	m	**-11**	(5.4)	**-4.9**	(2.2)	0.023
	Belgium	510	(2.5)	507	(2.5)	505	(2.2)	502	(2.3)	-8	(5.6)	-5	(5.6)	-3	(5.0)	-2.7	(1.8)	0.149
	Canada	534	(2.0)	529	(1.6)	525	(1.9)	528	(2.1)	-7	(5.3)	-1	(5.2)	2	(4.8)	-2.3	(1.8)	0.188
	Chile	438	(4.3)	447	(2.9)	445	(2.9)	447	(2.4)	9	(6.7)	-1	(5.9)	2	(5.4)	2.4	(2.1)	0.273
	Czech Republic	513	(3.5)	500	(3.0)	508	(3.0)	493	(2.3)	**-20**	(6.1)	-8	(5.9)	**-15**	(5.4)	**-5.2**	(2.0)	0.009
	Denmark	496	(3.1)	499	(2.5)	498	(2.7)	502	(2.4)	6	(5.9)	3	(5.7)	3	(5.3)	1.7	(1.9)	0.386
	Estonia	531	(2.5)	528	(2.7)	541	(1.9)	534	(2.1)	3	(5.6)	6	(5.6)	-7	(4.9)	2.2	(1.8)	0.223
	Finland	563	(2.0)	554	(2.3)	545	(2.2)	531	(2.4)	**-33**	(5.5)	**-23**	(5.6)	**-15**	(5.1)	**-10.6**	(1.8)	0.000
	France	495	(3.4)	498	(3.6)	499	(2.6)	495	(2.1)	0	(6.0)	-3	(6.1)	-4	(5.1)	0.0	(2.0)	0.987
	Germany	516	(3.8)	520	(2.8)	524	(3.0)	509	(2.7)	-7	(6.5)	-11	(5.9)	**-15**	(5.6)	-1.7	(2.1)	0.428
	Greece	473	(3.2)	470	(4.0)	467	(3.1)	455	(3.9)	**-19**	(6.8)	**-15**	(7.2)	-12	(6.4)	**-5.9**	(2.2)	0.008
	Hungary	504	(2.7)	503	(3.1)	494	(2.9)	477	(2.4)	**-27**	(5.8)	**-26**	(6.0)	**-18**	(5.5)	**-8.9**	(1.9)	0.000
	Iceland	491	(1.6)	496	(1.4)	478	(2.1)	473	(1.7)	**-18**	(5.1)	**-22**	(5.0)	-5	(4.8)	**-7.0**	(1.7)	0.000
	Ireland	508	(3.2)	508	(3.3)	522	(2.5)	503	(2.4)	-6	(6.0)	-5	(6.1)	**-19**	(5.2)	-0.4	(2.0)	0.859
	Israel	454	(3.7)	455	(3.1)	470	(5.0)	467	(3.4)	13	(6.8)	12	(6.5)	-4	(7.2)	**5.4**	(2.2)	0.016
	Italy	475	(2.0)	489	(1.8)	494	(1.9)	481	(2.5)	5	(5.5)	-8	(5.5)	**-13**	(5.0)	2.0	(1.8)	0.255
	Japan	531	(3.4)	539	(3.4)	547	(3.6)	538	(3.0)	7	(6.3)	-1	(6.4)	-8	(6.1)	2.8	(2.1)	0.176
	Korea	522	(3.4)	538	(3.4)	538	(3.7)	516	(3.1)	-6	(6.4)	**-22**	(6.5)	**-22**	(6.2)	-1.9	(2.1)	0.375
	Latvia	490	(3.0)	494	(3.1)	502	(2.8)	490	(1.6)	1	(5.6)	-4	(5.7)	**-12**	(5.0)	1.1	(1.8)	0.533
	Luxembourg	486	(1.1)	484	(1.2)	491	(1.3)	483	(1.1)	-4	(4.7)	-1	(4.8)	**-8**	(4.3)	-0.3	(1.6)	0.863
	Mexico	410	(2.7)	416	(1.8)	415	(1.3)	416	(2.1)	6	(5.7)	0	(5.3)	1	(4.7)	1.7	(1.8)	0.347
	Netherlands	525	(2.7)	522	(5.4)	522	(3.5)	509	(2.3)	**-16**	(5.7)	-14	(7.4)	**-13**	(5.7)	**-4.9**	(1.9)	0.011
	New Zealand	530	(2.7)	532	(2.6)	516	(2.1)	513	(2.4)	**-17**	(5.7)	**-19**	(5.7)	-2	(5.1)	**-6.7**	(1.9)	0.000
	Norway	487	(3.1)	500	(2.6)	495	(3.1)	498	(2.3)	**12**	(5.9)	-1	(5.7)	4	(5.5)	3.1	(1.9)	0.112
	Poland	498	(2.3)	508	(2.4)	526	(3.1)	501	(2.5)	4	(5.6)	-7	(5.7)	**-24**	(5.6)	2.9	(1.9)	0.117
	Portugal	474	(3.0)	493	(2.9)	489	(3.7)	501	(2.4)	**27**	(5.9)	8	(5.9)	**12**	(5.9)	**7.6**	(1.9)	0.000
	Slovak Republic	488	(2.6)	490	(3.0)	471	(3.6)	461	(2.6)	**-28**	(5.8)	**-29**	(6.0)	-10	(5.9)	**-10.2**	(1.9)	0.000
	Slovenia	519	(1.1)	512	(1.1)	514	(1.3)	513	(1.3)	-6	(4.8)	1	(4.8)	-1	(4.3)	-1.5	(1.6)	0.331
	Spain	488	(2.6)	488	(2.1)	496	(1.8)	493	(2.1)	4	(5.6)	5	(5.4)	-4	(4.8)	2.1	(1.8)	0.237
	Sweden	503	(2.4)	495	(2.7)	485	(3.0)	493	(3.6)	-10	(6.2)	-2	(6.4)	9	(6.1)	**-4.0**	(2.0)	0.049
	Switzerland	512	(3.2)	517	(2.8)	515	(2.7)	506	(2.9)	-6	(6.2)	-11	(6.1)	-10	(5.6)	-2.0	(2.0)	0.327
	Turkey	424	(3.8)	454	(3.6)	463	(3.9)	425	(3.9)	2	(7.1)	**-28**	(7.0)	**-38**	(6.8)	1.5	(2.3)	0.508
	United Kingdom	515	(2.3)	514	(2.5)	514	(3.4)	509	(2.6)	-6	(5.6)	-4	(5.8)	-5	(5.8)	-1.5	(1.9)	0.426
	United States	489	(4.2)	502	(3.6)	497	(3.8)	496	(3.2)	7	(6.9)	-6	(6.6)	-1	(6.3)	1.8	(2.3)	0.424
	OECD average-34	498	(0.5)	501	(0.5)	501	(0.5)	493	(0.4)	-5	(4.5)	-8	(4.5)	**-8**	(4.0)	-1.3	(1.5)	0.382
	OECD average-35	498	(0.5)	m	m	501	(0.5)	493	(0.4)	-5	(4.5)	m	m	**-8**	(4.0)	-1.4	(1.5)	0.346
Partners	Albania	m	m	391	(3.9)	397	(2.4)	427	(3.3)	m	m	**37**	(6.8)	**30**	(5.7)	**18.3**	(3.4)	0.000
	Algeria	m	m	m	m	m	m	376	(2.6)	m	m	m	m	m	m	m	m	m
	Brazil	390	(2.8)	405	(2.4)	402	(2.1)	401	(2.3)	10	(5.8)	-5	(5.6)	-1	(5.0)	2.7	(1.9)	0.147
	B-S-J-G (China)	m	m	m	m	m	m	518	(4.6)	m	m	m	m	m	m	m	m	m
	Bulgaria	434	(6.1)	439	(5.9)	446	(4.8)	446	(4.4)	12	(8.7)	6	(8.6)	-1	(7.6)	4.2	(2.8)	0.136
	CABA (Argentina)	m	m	m	m	425	(8.6)	475	(6.3)	m	m	m	m	**51**	(11.3)	**50.6**	(11.3)	0.000
	Colombia	388	(3.4)	402	(3.6)	399	(3.1)	416	(2.4)	**28**	(6.1)	**14**	(6.2)	**17**	(5.5)	**8.0**	(2.0)	0.000
	Costa Rica	m	m	430	(2.8)	429	(2.9)	420	(2.1)	m	m	-11	(5.7)	-10	(5.3)	-6.7	(3.4)	0.050
	Croatia	493	(2.4)	486	(2.8)	491	(3.1)	475	(2.5)	**-18**	(5.7)	-11	(5.9)	**-16**	(5.6)	**-4.8**	(1.9)	0.011
	Cyprus*	m	m	m	m	438	(1.2)	433	(1.4)	m	m	m	m	-5	(4.3)	-5.1	(4.3)	0.240
	Dominican Republic	m	m	m	m	m	m	332	(2.6)	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	384	(1.2)	m	m	m	m	m	m	m	m	m
	Georgia	m	m	373	(2.9)	m	m	411	(2.4)	m	m	**38**	(5.9)	m	m	**23.1**	(3.5)	0.000
	Hong Kong (China)	542	(2.5)	549	(2.8)	555	(2.6)	523	(2.5)	**-19**	(5.7)	**-26**	(5.9)	**-32**	(5.4)	**-5.2**	(1.9)	0.006
	Indonesia	393	(5.7)	383	(3.8)	382	(3.8)	403	(2.6)	10	(7.7)	**21**	(6.4)	**21**	(6.0)	2.8	(2.5)	0.254
	Jordan	422	(2.8)	415	(3.5)	409	(3.1)	409	(2.7)	**-13**	(5.9)	-7	(6.3)	-1	(5.7)	**-4.6**	(2.0)	0.018
	Kosovo	m	m	m	m	m	m	378	(1.7)	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	386	(3.4)	m	m	m	m	m	m	m	m	m
	Lithuania	488	(2.8)	491	(2.9)	496	(2.6)	475	(2.7)	**-13**	(5.9)	**-16**	(6.0)	**-20**	(5.4)	-3.2	(1.9)	0.093
	Macao (China)	511	(1.1)	511	(1.0)	521	(0.8)	529	(1.1)	**18**	(4.7)	**17**	(4.7)	8	(4.2)	**6.3**	(1.6)	0.000
	Malta	m	m	461	(1.7)	m	m	465	(1.6)	m	m	3	(5.1)	m	m	2.1	(3.1)	0.499
	Moldova	m	m	413	(3.0)	m	m	428	(2.0)	m	m	**15**	(5.8)	m	m	**9.1**	(3.5)	0.008
	Montenegro	412	(1.1)	401	(2.0)	410	(1.1)	411	(1.0)	0	(4.7)	**10**	(5.0)	1	(4.2)	0.7	(1.6)	0.638
	Peru	m	m	369	(3.5)	373	(3.6)	397	(2.4)	m	m	**27**	(6.2)	**24**	(5.8)	**13.7**	(3.0)	0.000
	Qatar	349	(0.9)	379	(0.9)	384	(0.7)	418	(1.0)	**68**	(4.7)	**38**	(4.7)	**34**	(4.1)	**20.9**	(1.6)	0.000
	Romania	418	(4.2)	428	(3.4)	439	(3.3)	435	(3.2)	**16**	(6.9)	7	(6.5)	-4	(6.0)	**6.0**	(2.2)	0.007
	Russia	479	(3.7)	478	(3.3)	486	(2.9)	487	(2.9)	7	(6.5)	8	(6.3)	0	(5.7)	2.9	(2.1)	0.162
	Singapore	m	m	542	(1.4)	551	(1.5)	556	(1.2)	m	m	**14**	(4.9)	4	(4.4)	**6.9**	(2.4)	0.004
	Chinese Taipei	532	(3.6)	520	(2.6)	523	(2.3)	532	(2.7)	0	(6.3)	**12**	(5.9)	9	(5.3)	0.2	(2.0)	0.912
	Thailand	421	(2.1)	425	(3.0)	444	(2.9)	421	(2.8)	0	(5.7)	-4	(6.1)	**-23**	(5.7)	2.1	(1.9)	0.270
	Trinidad and Tobago	m	m	410	(1.2)	m	m	425	(1.4)	m	m	**14**	(4.9)	m	m	**7.2**	(2.4)	0.003
	Tunisia	386	(3.0)	401	(2.7)	398	(3.5)	386	(2.1)	1	(5.8)	**-14**	(5.6)	**-12**	(5.6)	0.0	(1.9)	0.992
	United Arab Emirates	m	m	m	m	448	(2.8)	437	(2.4)	m	m	m	m	**-12**	(5.4)	**-11.6**	(5.4)	0.031
	Uruguay	428	(2.7)	427	(2.6)	416	(2.8)	435	(2.2)	7	(5.7)	8	(5.6)	**20**	(5.3)	1.0	(1.9)	0.580
	Viet Nam	m	m	m	m	528	(4.3)	525	(3.9)	m	m	m	m	-4	(7.0)	-3.8	(7.0)	0.590
	Argentina**	391	(6.1)	401	(4.6)	406	(3.9)	432	(2.9)	**41**	(8.1)	**31**	(7.0)	**27**	(6.2)	**12.7**	(2.6)	0.000
	Kazakhstan**	m	m	400	(3.1)	425	(3.0)	456	(3.7)	m	m	**56**	(6.6)	**32**	(6.1)	**28.0**	(3.3)	0.000
	Malaysia**	m	m	422	(2.7)	420	(3.0)	443	(3.0)	m	m	**21**	(6.0)	**23**	(5.8)	**13.3**	(3.6)	0.000

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Costa Rica, Georgia. Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.6a Percentage of low achievers and top performers in science, by gender (PISA 2015)

		Boys				Girls				Gender differences (boys - girls)			
		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	18.7	(0.7)	12.8	(0.7)	16.6	(0.7)	9.5	(0.5)	**2.0**	(0.8)	**3.3**	(0.8)
	Austria	19.2	(1.3)	10.1	(0.9)	22.4	(1.3)	5.3	(0.7)	-3.2	(1.8)	**4.8**	(1.1)
	Belgium	19.1	(1.1)	10.9	(0.7)	20.5	(1.1)	7.0	(0.6)	-1.5	(1.4)	**3.9**	(0.9)
	Canada	12.0	(0.7)	13.4	(0.8)	10.1	(0.6)	11.4	(0.7)	**1.9**	(0.7)	**2.0**	(1.0)
	Chile	32.3	(1.5)	1.7	(0.3)	37.4	(1.5)	0.8	(0.2)	**-5.1**	(1.9)	**0.9**	(0.3)
	Czech Republic	20.9	(1.5)	9.0	(0.7)	20.5	(1.3)	5.5	(0.6)	0.4	(1.9)	**3.6**	(0.9)
	Denmark	15.7	(1.0)	8.4	(0.9)	16.0	(1.2)	5.6	(0.6)	-0.3	(1.4)	**2.7**	(0.9)
	Estonia	9.9	(0.9)	15.0	(0.9)	7.6	(0.7)	12.0	(0.9)	**2.3**	(1.1)	**3.0**	(1.1)
	Finland	14.5	(0.9)	13.2	(0.8)	8.2	(0.7)	15.5	(0.9)	**6.3**	(1.0)	**-2.3**	(1.1)
	France	23.3	(1.2)	9.4	(0.7)	20.8	(1.1)	6.6	(0.6)	2.5	(1.5)	**2.8**	(0.8)
	Germany	15.9	(1.2)	12.4	(0.9)	18.1	(1.0)	8.7	(0.6)	**-2.2**	(1.1)	**3.6**	(1.0)
	Greece	36.0	(2.2)	2.4	(0.4)	29.2	(1.9)	1.9	(0.3)	**6.8**	(1.9)	0.5	(0.5)
	Hungary	26.4	(1.4)	5.3	(0.6)	25.6	(1.3)	3.9	(0.5)	0.8	(1.7)	**1.4**	(0.7)
	Iceland	26.4	(1.2)	4.2	(0.7)	24.3	(1.3)	3.4	(0.5)	2.1	(1.7)	0.8	(0.9)
	Ireland	15.7	(1.2)	9.0	(0.8)	14.9	(1.1)	5.0	(0.5)	0.8	(1.4)	**4.0**	(0.9)
	Israel	32.8	(1.8)	7.5	(0.7)	30.1	(1.7)	4.3	(0.5)	2.7	(2.1)	**3.2**	(0.8)
	Italy	21.5	(1.2)	5.3	(0.5)	24.9	(1.6)	2.8	(0.4)	-3.3	(1.9)	**2.5**	(0.6)
	Japan	8.9	(0.9)	18.1	(1.5)	10.3	(0.8)	12.5	(1.0)	-1.4	(1.0)	**5.5**	(1.6)
	Korea	17.3	(1.4)	11.6	(1.2)	11.2	(1.0)	9.6	(0.8)	**6.0**	(1.6)	2.0	(1.3)
	Latvia	20.0	(1.0)	3.8	(0.5)	14.5	(1.0)	3.8	(0.6)	**5.5**	(1.4)	0.1	(0.7)
	Luxembourg	25.6	(1.0)	8.5	(0.6)	26.1	(0.8)	5.4	(0.5)	-0.5	(1.2)	**3.1**	(0.7)
	Mexico	46.5	(1.6)	0.2	(0.1)	49.1	(1.4)	0.0	(0.0)	-2.6	(1.6)	0.2	(0.1)
	Netherlands	19.3	(1.3)	12.8	(0.8)	17.8	(1.0)	9.4	(0.7)	1.5	(1.4)	**3.5**	(1.0)
	New Zealand	18.4	(1.2)	14.8	(0.9)	16.5	(1.1)	10.9	(0.8)	1.9	(1.4)	**3.9**	(1.1)
	Norway	20.0	(1.0)	9.3	(0.7)	17.4	(1.0)	6.6	(0.6)	**2.6**	(1.2)	**2.6**	(0.9)
	Poland	16.4	(1.1)	8.9	(0.8)	16.1	(1.1)	5.7	(0.8)	0.2	(1.4)	**3.3**	(1.0)
	Portugal	17.7	(1.0)	9.6	(0.8)	17.1	(1.2)	5.2	(0.6)	0.6	(1.2)	**4.5**	(0.9)
	Slovak Republic	31.9	(1.3)	4.2	(0.5)	29.5	(1.5)	3.0	(0.5)	2.4	(1.7)	**1.2**	(0.6)
	Slovenia	16.2	(0.8)	10.8	(0.8)	13.7	(0.7)	10.4	(1.0)	**2.4**	(1.1)	0.5	(1.4)
	Spain	18.4	(1.0)	6.3	(0.5)	18.2	(1.0)	3.7	(0.5)	0.2	(1.2)	**2.7**	(0.7)
	Sweden	23.4	(1.5)	9.5	(0.8)	19.8	(1.2)	7.5	(0.9)	**3.6**	(1.4)	**2.0**	(1.0)
	Switzerland	18.8	(1.2)	11.1	(0.8)	18.1	(1.3)	8.3	(0.9)	0.7	(1.4)	**2.9**	(1.1)
	Turkey	46.0	(2.5)	0.3	(0.1)	42.9	(2.3)	0.3	(0.2)	3.2	(2.5)	0.0	(0.2)
	United Kingdom	17.5	(1.0)	11.5	(0.8)	17.3	(1.0)	10.2	(0.9)	0.1	(1.2)	1.3	(1.1)
	United States	20.6	(1.2)	9.7	(0.9)	20.1	(1.3)	7.3	(0.8)	0.5	(1.4)	**2.4**	(1.0)
	OECD average-35	21.8	(0.2)	8.9	(0.1)	20.7	(0.2)	6.5	(0.1)	**1.1**	(0.3)	**2.4**	(0.2)
Partners	Albania	48.9	(2.2)	0.3	(0.1)	34.6	(1.6)	0.4	(0.2)	**14.3**	(2.1)	-0.1	(0.2)
	Algeria	74.4	(1.6)	0.0	(0.0)	66.8	(1.7)	0.0	(0.1)	**7.6**	(1.9)	0.0	(0.1)
	Brazil	55.6	(1.2)	0.9	(0.2)	57.5	(1.2)	0.5	(0.1)	-1.9	(1.1)	**0.4**	(0.2)
	B-S-J-G (China)	16.0	(1.4)	15.0	(1.3)	16.5	(1.4)	11.9	(1.7)	-0.4	(1.1)	**3.1**	(1.1)
	Bulgaria	41.6	(2.2)	2.9	(0.5)	33.7	(2.1)	2.8	(0.5)	**7.8**	(2.1)	0.1	(0.6)
	CABA (Argentina)	21.7	(2.8)	4.0	(1.2)	23.6	(2.8)	1.4	(0.7)	-1.9	(2.8)	**2.6**	(1.3)
	Colombia	46.6	(1.7)	0.5	(0.2)	51.2	(1.5)	0.2	(0.1)	**-4.6**	(1.6)	0.2	(0.2)
	Costa Rica	41.3	(1.4)	0.2	(0.1)	51.3	(1.5)	0.1	(0.1)	**-9.9**	(1.6)	0.1	(0.1)
	Croatia	24.7	(1.5)	5.1	(0.6)	24.6	(1.5)	2.9	(0.5)	0.1	(1.7)	**2.1**	(0.7)
	Cyprus*	47.3	(1.0)	1.8	(0.4)	37.0	(1.1)	1.4	(0.3)	**10.3**	(1.4)	0.4	(0.5)
	Dominican Republic	85.0	(1.3)	0.0	(0.0)	86.5	(1.2)	0.0	(0.0)	-1.6	(1.2)	0.0	(0.0)
	FYROM	67.2	(1.0)	0.2	(0.1)	58.1	(1.1)	0.2	(0.1)	**9.0**	(1.4)	0.0	(0.2)
	Georgia	54.8	(1.7)	0.9	(0.3)	46.3	(1.4)	0.8	(0.2)	**8.5**	(1.7)	0.1	(0.4)
	Hong Kong (China)	10.6	(1.0)	8.4	(0.9)	8.2	(0.9)	6.3	(0.8)	**2.4**	(1.2)	**2.1**	(1.0)
	Indonesia	57.3	(1.9)	0.1	(0.1)	54.6	(1.9)	0.1	(0.1)	2.8	(2.0)	-0.1	(0.1)
	Jordan	59.3	(1.9)	0.1	(0.1)	40.4	(2.0)	0.2	(0.1)	**18.9**	(2.8)	0.0	(0.2)
	Kosovo	69.8	(1.2)	0.0	(0.0)	65.7	(1.6)	0.0	(0.0)	**4.1**	(1.7)	0.0	(0.0)
	Lebanon	61.7	(2.1)	0.6	(0.2)	63.5	(2.0)	0.3	(0.1)	-1.8	(2.3)	0.4	(0.2)
	Lithuania	26.9	(1.2)	4.4	(0.7)	22.5	(1.3)	3.9	(0.5)	**4.3**	(1.4)	0.5	(0.7)
	Macao (China)	10.1	(0.6)	10.0	(0.8)	6.0	(0.5)	8.3	(0.7)	**4.1**	(0.8)	1.7	(1.2)
	Malta	35.2	(1.1)	7.7	(0.7)	29.8	(1.1)	7.5	(0.7)	**5.4**	(1.6)	0.2	(1.1)
	Moldova	44.1	(1.3)	0.7	(0.2)	40.3	(1.5)	0.7	(0.2)	**3.8**	(1.6)	0.0	(0.3)
	Montenegro	52.6	(1.0)	0.6	(0.2)	49.4	(0.9)	0.3	(0.1)	**3.3**	(1.3)	0.3	(0.2)
	Peru	56.2	(1.7)	0.2	(0.1)	60.7	(1.8)	0.1	(0.1)	**-4.5**	(2.0)	0.1	(0.1)
	Qatar	55.3	(0.7)	1.9	(0.2)	44.1	(0.6)	1.5	(0.2)	**11.2**	(0.9)	0.4	(0.3)
	Romania	40.1	(2.1)	0.7	(0.3)	37.0	(2.0)	0.6	(0.3)	3.2	(1.8)	0.1	(0.4)
	Russia	18.3	(1.4)	4.5	(0.6)	18.0	(1.3)	3.1	(0.4)	0.4	(1.6)	1.4	(0.7)
	Singapore	10.2	(0.6)	26.5	(0.9)	8.9	(0.6)	21.7	(0.9)	1.3	(0.9)	**4.7**	(1.3)
	Chinese Taipei	12.8	(1.0)	16.6	(1.6)	12.1	(1.0)	14.1	(1.6)	0.7	(1.2)	2.5	(2.4)
	Thailand	49.6	(2.0)	0.4	(0.2)	44.6	(1.5)	0.5	(0.2)	**5.0**	(1.9)	-0.1	(0.3)
	Trinidad and Tobago	50.5	(1.2)	1.1	(0.3)	41.3	(1.1)	1.6	(0.3)	**9.1**	(1.6)	-0.5	(0.4)
	Tunisia	64.6	(1.5)	0.1	(0.1)	67.0	(1.4)	0.0	(0.0)	-2.3	(1.4)	0.0	(0.1)
	United Arab Emirates	48.8	(1.5)	3.2	(0.3)	34.9	(1.4)	2.4	(0.3)	**13.9**	(2.0)	0.8	(0.5)
	Uruguay	40.1	(1.6)	1.7	(0.4)	41.4	(1.3)	0.8	(0.2)	-1.3	(1.7)	**0.9**	(0.4)
	Viet Nam	6.6	(0.9)	8.5	(1.2)	5.3	(0.8)	8.0	(1.5)	1.3	(0.8)	0.5	(1.1)
	Argentina**	36.4	(1.7)	1.0	(0.3)	42.8	(1.8)	0.4	(0.2)	**-6.4**	(1.8)	**0.6**	(0.3)
	Kazakhstan**	29.1	(1.8)	2.0	(0.7)	27.0	(1.7)	1.6	(0.5)	2.1	(1.6)	0.5	(0.5)
	Malaysia**	36.3	(1.8)	0.7	(0.3)	31.4	(1.6)	0.4	(0.2)	**4.9**	(1.4)	0.3	(0.2)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.6b Percentage of low achievers and top performers in science, by gender (PISA 2006)

		Boys				Girls				Gender differences (boys - girls)			
		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	13.9	(0.8)	15.6	(1.0)	11.8	(0.7)	13.6	(0.8)	**2.1**	(0.9)	2.1	(1.3)
	Austria	15.2	(1.5)	11.3	(1.0)	17.5	(2.0)	8.6	(0.9)	-2.4	(2.2)	**2.6**	(1.2)
	Belgium	17.9	(1.3)	11.2	(0.7)	16.0	(1.2)	8.9	(0.7)	1.9	(1.5)	**2.3**	(0.9)
	Canada	10.6	(0.8)	15.7	(0.7)	9.4	(0.7)	13.2	(0.7)	1.1	(0.8)	**2.5**	(0.9)
	Chile	35.8	(2.5)	2.4	(0.6)	44.3	(2.2)	1.3	(0.5)	**-8.5**	(2.2)	1.1	(0.8)
	Czech Republic	14.3	(1.3)	11.9	(1.1)	17.1	(1.6)	11.2	(1.3)	-2.9	(1.7)	0.7	(1.4)
	Denmark	17.8	(1.3)	7.8	(1.0)	19.0	(1.4)	5.8	(0.6)	-1.2	(1.4)	**2.0**	(1.0)
	Estonia	8.6	(0.9)	11.8	(1.0)	6.7	(0.7)	11.2	(1.0)	1.9	(1.1)	0.6	(1.2)
	Finland	5.0	(0.6)	21.6	(1.1)	3.2	(0.6)	20.2	(1.0)	**1.8**	(0.7)	1.4	(1.4)
	France	22.0	(1.7)	9.6	(0.9)	20.4	(1.5)	6.5	(0.9)	1.6	(1.6)	**3.2**	(1.2)
	Germany	14.9	(1.5)	13.7	(1.1)	15.8	(1.5)	9.8	(0.8)	-0.9	(1.4)	**3.8**	(1.3)
	Greece	28.1	(1.9)	4.0	(0.5)	19.9	(1.3)	2.8	(0.5)	**8.2**	(2.1)	1.2	(0.7)
	Hungary	15.5	(1.3)	8.4	(1.0)	14.5	(1.3)	5.2	(0.8)	1.1	(1.7)	**3.3**	(1.2)
	Iceland	22.4	(1.1)	6.6	(0.7)	18.7	(1.0)	6.0	(0.7)	**3.6**	(1.3)	0.6	(1.0)
	Ireland	16.5	(1.5)	10.3	(1.0)	14.5	(1.1)	8.5	(0.8)	2.1	(1.6)	1.8	(1.1)
	Israel	37.4	(2.0)	6.6	(0.9)	34.9	(1.7)	3.9	(0.5)	2.4	(2.4)	**2.8**	(0.9)
	Italy	25.5	(1.2)	5.4	(0.5)	25.0	(1.1)	3.8	(0.4)	0.4	(1.5)	**1.6**	(0.6)
	Japan	12.8	(1.4)	17.0	(1.1)	11.3	(1.5)	13.1	(1.0)	1.5	(2.0)	**3.8**	(1.6)
	Korea	12.4	(1.5)	11.1	(1.4)	10.1	(1.3)	9.5	(1.1)	2.3	(1.6)	1.6	(1.3)
	Latvia	19.1	(1.3)	4.3	(0.6)	15.8	(1.3)	3.9	(0.5)	**3.3**	(1.3)	0.5	(0.7)
	Luxembourg	22.0	(1.0)	7.3	(0.6)	22.2	(1.1)	4.4	(0.5)	-0.1	(1.7)	**2.9**	(0.9)
	Mexico	49.5	(1.7)	0.3	(0.1)	52.2	(1.4)	0.2	(0.1)	-2.7	(1.5)	0.1	(0.1)
	Netherlands	12.2	(1.1)	15.0	(1.1)	13.7	(1.4)	11.2	(0.8)	-1.5	(1.3)	**3.7**	(1.1)
	New Zealand	15.3	(1.1)	18.4	(1.1)	12.2	(0.8)	16.9	(1.1)	**3.1**	(1.2)	1.5	(1.6)
	Norway	22.4	(1.6)	6.7	(0.7)	19.6	(1.3)	5.5	(0.7)	**2.8**	(1.4)	1.2	(1.0)
	Poland	17.3	(1.0)	8.1	(0.7)	16.7	(1.0)	5.4	(0.6)	0.7	(1.0)	**2.7**	(0.8)
	Portugal	24.2	(1.8)	4.0	(0.6)	24.7	(1.6)	2.3	(0.3)	-0.4	(1.8)	**1.8**	(0.6)
	Slovak Republic	20.1	(1.4)	6.7	(0.8)	20.3	(1.5)	4.8	(0.5)	-0.2	(2.1)	**2.0**	(0.9)
	Slovenia	15.3	(0.8)	12.7	(1.0)	12.5	(0.8)	13.1	(1.0)	**2.8**	(1.0)	-0.5	(1.6)
	Spain	19.6	(1.1)	5.6	(0.5)	19.7	(1.1)	4.1	(0.5)	-0.1	(1.2)	**1.5**	(0.6)
	Sweden	17.2	(1.2)	8.6	(0.7)	15.5	(0.9)	7.2	(0.8)	1.8	(1.4)	1.4	(1.1)
	Switzerland	15.6	(1.0)	11.1	(0.9)	16.6	(1.1)	9.8	(1.0)	-1.0	(1.0)	1.3	(0.9)
	Turkey	50.1	(2.0)	0.9	(0.4)	42.3	(2.2)	0.9	(0.4)	**7.8**	(2.6)	0.0	(0.4)
	United Kingdom	16.7	(1.0)	16.0	(0.9)	16.7	(1.0)	11.5	(0.8)	0.0	(1.2)	**4.5**	(1.1)
	United States	25.8	(2.0)	10.0	(1.0)	23.0	(1.5)	8.2	(0.9)	2.8	(1.7)	1.7	(1.1)
	OECD average-35	20.3	(0.2)	9.7	(0.1)	19.3	(0.2)	7.8	(0.1)	**1.0**	(0.3)	**1.9**	(0.2)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	58.4	(1.5)	0.8	(0.3)	63.3	(1.6)	0.4	(0.2)	**-4.9**	(1.3)	0.4	(0.3)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	46.7	(2.8)	3.3	(0.8)	38.3	(2.8)	2.8	(0.6)	**8.5**	(2.9)	0.6	(0.6)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	57.4	(2.3)	0.2	(0.1)	62.6	(2.4)	0.1	(0.1)	-5.2	(2.9)	0.1	(0.2)
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	18.2	(1.3)	5.4	(0.5)	15.7	(1.3)	4.8	(0.6)	2.5	(1.8)	0.7	(0.7)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	9.3	(1.1)	17.6	(1.3)	8.2	(0.9)	14.3	(1.2)	1.1	(1.2)	3.2	(1.7)
	Indonesia	58.7	(4.8)	0.0	(0.1)	64.7	(2.5)	0.0	(0.0)	-6.1	(3.8)	0.0	(0.1)
	Jordan	50.8	(1.8)	0.6	(0.3)	37.9	(1.7)	0.7	(0.2)	**12.9**	(2.6)	-0.1	(0.3)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	22.1	(1.2)	4.6	(0.7)	18.5	(1.3)	5.4	(0.8)	**3.6**	(1.6)	-0.8	(0.7)
	Macao (China)	11.3	(0.7)	6.6	(0.6)	9.2	(0.7)	4.0	(0.5)	**2.1**	(1.0)	**2.5**	(0.8)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	50.8	(1.3)	0.3	(0.2)	49.6	(1.2)	0.2	(0.2)	1.2	(1.8)	0.1	(0.2)
	Peru	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	83.9	(0.6)	0.4	(0.1)	74.2	(0.7)	0.2	(0.1)	**9.7**	(1.1)	0.2	(0.2)
	Romania	48.3	(2.3)	0.7	(0.3)	45.5	(3.0)	0.2	(0.1)	2.8	(2.2)	0.5	(0.3)
	Russia	22.6	(1.6)	5.1	(0.7)	21.8	(1.6)	3.4	(0.5)	0.7	(1.5)	**1.7**	(0.7)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	11.7	(1.2)	15.8	(1.3)	11.6	(1.3)	13.4	(1.3)	0.1	(1.4)	2.4	(2.0)
	Thailand	51.8	(1.8)	0.5	(0.2)	41.9	(1.5)	0.4	(0.1)	**9.9**	(2.2)	0.1	(0.3)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	63.6	(1.6)	0.1	(0.1)	62.0	(1.7)	0.1	(0.1)	1.5	(1.9)	0.0	(0.2)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	44.0	(2.0)	1.9	(0.4)	40.4	(1.5)	1.0	(0.3)	3.6	(2.1)	0.9	(0.5)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	58.8	(2.6)	0.4	(0.2)	54.0	(3.0)	0.5	(0.2)	4.8	(2.6)	0.0	(0.3)
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.6d Change between 2006 and 2015 in the percentage of low achievers and top performers in science, by gender (PISA 2015 - PISA 2006)

		Boys				Girls				Gender differences (boys - girls)			
		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)		Below Level 2 (less than 409.54 score points)		Level 5 or above (above 633.33 score points)	
		% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	**4.8**	(1.4)	-2.8	(1.6)	**4.8**	(1.7)	**-4.0**	(1.2)	-0.1	(1.2)	1.2	(1.5)
	Austria	4.1	(2.6)	-1.2	(1.6)	4.9	(3.1)	**-3.3**	(1.2)	-0.8	(2.8)	2.2	(1.7)
	Belgium	1.1	(2.1)	-0.3	(1.5)	4.5	(2.4)	-1.8	(1.2)	-3.3	(2.1)	1.5	(1.3)
	Canada	1.5	(1.2)	-2.3	(1.9)	0.7	(1.1)	-1.8	(1.9)	0.8	(1.1)	-0.5	(1.4)
	Chile	-3.5	(4.5)	-0.7	(0.7)	-6.9	(4.6)	-0.5	(0.5)	3.4	(2.9)	-0.2	(0.9)
	Czech Republic	**6.6**	(2.8)	-2.8	(1.5)	3.3	(2.9)	**-5.8**	(1.5)	3.3	(2.5)	2.9	(1.6)
	Denmark	-2.1	(2.4)	0.6	(1.5)	-3.0	(2.1)	-0.2	(1.0)	0.9	(2.0)	0.8	(1.3)
	Estonia	1.3	(1.5)	3.2	(2.5)	0.9	(1.4)	0.8	(1.9)	0.4	(1.5)	2.4	(1.6)
	Finland	**9.5**	(1.7)	**-8.4**	(2.0)	**5.0**	(1.0)	-4.7	(2.5)	**4.5**	(1.2)	**-3.7**	(1.8)
	France	1.3	(2.5)	-0.3	(1.4)	0.4	(2.7)	0.1	(1.2)	0.9	(2.2)	-0.4	(1.4)
	Germany	1.0	(2.3)	-1.3	(1.7)	2.3	(2.1)	-1.1	(1.1)	-1.3	(1.8)	-0.2	(1.6)
	Greece	**7.8**	(3.8)	**-1.6**	(0.7)	**9.2**	(4.0)	-1.0	(0.6)	-1.4	(2.8)	-0.7	(0.8)
	Hungary	**10.9**	(3.0)	**-3.2**	(1.2)	**11.1**	(2.7)	-1.3	(1.0)	-0.3	(2.4)	-1.9	(1.4)
	Iceland	4.1	(2.4)	**-2.5**	(1.0)	5.6	(3.0)	**-2.6**	(1.0)	-1.5	(2.1)	0.2	(1.4)
	Ireland	-0.9	(2.8)	-1.3	(1.4)	0.4	(2.1)	**-3.5**	(1.0)	-1.3	(2.1)	2.2	(1.4)
	Israel	-4.6	(3.4)	0.8	(1.3)	-4.9	(3.7)	0.4	(0.7)	0.3	(3.2)	0.4	(1.2)
	Italy	-3.9	(2.7)	-0.1	(0.9)	-0.2	(2.9)	-1.0	(0.6)	-3.8	(2.5)	0.9	(0.8)
	Japan	**-3.9**	(1.7)	1.1	(3.1)	-1.0	(1.8)	-0.6	(2.0)	-2.9	(2.3)	1.7	(2.2)
	Korea	**4.9**	(2.3)	0.5	(2.1)	1.2	(1.8)	0.0	(1.6)	3.7	(2.2)	0.4	(1.8)
	Latvia	0.9	(2.5)	-0.5	(0.8)	-1.3	(2.0)	-0.1	(0.9)	2.2	(1.9)	-0.4	(1.0)
	Luxembourg	3.6	(2.3)	1.2	(1.0)	3.9	(2.2)	1.0	(0.8)	-0.4	(2.1)	0.2	(1.2)
	Mexico	-3.1	(7.3)	-0.1	(0.2)	-3.2	(7.4)	-0.2	(0.1)	0.1	(2.1)	0.0	(0.2)
	Netherlands	**7.0**	(2.6)	-2.1	(1.8)	4.1	(2.1)	-1.9	(1.3)	2.9	(1.9)	-0.3	(1.4)
	New Zealand	3.1	(2.0)	-3.6	(1.9)	**4.3**	(1.9)	**-6.0**	(1.7)	-1.2	(1.9)	2.4	(1.9)
	Norway	-2.4	(2.5)	2.6	(1.3)	-2.3	(2.4)	1.2	(1.1)	-0.2	(1.8)	1.4	(1.4)
	Poland	-1.0	(2.3)	0.8	(1.2)	-0.5	(2.7)	0.2	(1.2)	-0.4	(1.8)	0.6	(1.3)
	Portugal	**-6.5**	(2.5)	**5.6**	(1.3)	**-7.6**	(2.7)	**2.9**	(0.8)	1.1	(2.2)	**2.7**	(1.1)
	Slovak Republic	**11.8**	(2.8)	**-2.6**	(1.0)	**9.2**	(2.9)	**-1.8**	(0.7)	2.6	(2.7)	-0.8	(1.1)
	Slovenia	0.9	(1.7)	-1.8	(1.4)	1.3	(1.4)	-2.8	(1.8)	-0.4	(1.5)	1.0	(2.1)
	Spain	-1.2	(2.0)	0.7	(0.9)	-1.5	(2.6)	-0.5	(0.8)	0.3	(1.7)	1.1	(0.9)
	Sweden	**6.2**	(2.7)	1.0	(1.3)	**4.4**	(2.1)	0.3	(1.3)	1.8	(2.0)	0.7	(1.4)
	Switzerland	3.2	(2.0)	0.1	(1.9)	1.5	(2.5)	-1.5	(1.6)	1.8	(1.8)	1.6	(1.4)
	Turkey	-4.1	(6.1)	-0.6	(0.4)	0.6	(5.5)	-0.6	(0.4)	-4.6	(3.6)	0.0	(0.5)
	United Kingdom	0.7	(1.9)	**-4.5**	(1.6)	0.6	(2.0)	-1.3	(1.3)	0.1	(1.7)	**-3.2**	(1.6)
	United States	-5.2	(2.8)	-0.2	(1.6)	-2.9	(2.8)	-0.9	(1.4)	-2.3	(2.2)	0.7	(1.5)
	OECD average-35	1.5	(1.7)	-0.8	(0.7)	1.4	(1.8)	**-1.3**	(0.5)	0.1	(0.4)	**0.5**	(0.2)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	-2.7	(3.7)	0.1	(0.4)	-5.8	(5.1)	0.1	(0.2)	3.1	(1.7)	-0.1	(0.3)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	-5.2	(4.4)	-0.4	(0.9)	-4.5	(4.1)	0.1	(0.8)	-0.6	(3.6)	-0.5	(0.9)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	**-10.8**	(4.8)	0.2	(0.2)	-11.4	(6.2)	0.1	(0.1)	0.5	(3.3)	0.1	(0.2)
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	6.5	(3.6)	-0.4	(0.9)	**8.9**	(3.8)	**-1.8**	(0.8)	-2.4	(2.5)	1.5	(1.0)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	1.3	(1.8)	**-9.1**	(2.1)	0.0	(1.4)	**-8.0**	(1.6)	1.4	(1.7)	-1.1	(2.0)
	Indonesia	-1.3	(8.0)	0.0	(0.1)	-10.2	(9.3)	0.1	(0.1)	**8.8**	(4.3)	-0.1	(0.1)
	Jordan	8.5	(5.7)	-0.4	(0.3)	2.5	(4.9)	**-0.5**	(0.2)	6.0	(3.8)	0.0	(0.3)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	4.8	(3.2)	-0.2	(1.0)	4.0	(3.2)	-1.5	(1.0)	0.8	(2.1)	1.3	(1.0)
	Macao (China)	-1.2	(1.3)	3.5	(1.8)	**-3.2**	(1.0)	**4.3**	(1.5)	2.0	(1.3)	-0.8	(1.5)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	1.8	(4.8)	0.3	(0.2)	-0.3	(4.8)	0.1	(0.2)	2.1	(2.3)	0.2	(0.3)
	Peru	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	**-28.6**	(3.0)	**1.4**	(0.3)	**-30.1**	(3.3)	**1.3**	(0.2)	1.5	(1.4)	0.2	(0.3)
	Romania	-8.2	(5.6)	0.0	(0.4)	-8.5	(5.1)	0.4	(0.3)	0.3	(2.9)	-0.4	(0.5)
	Russia	-4.3	(3.2)	-0.6	(1.0)	-3.9	(3.1)	-0.3	(0.7)	-0.4	(2.2)	-0.3	(1.0)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	1.1	(1.7)	0.8	(3.0)	0.5	(1.8)	0.8	(2.7)	0.6	(1.8)	0.1	(3.1)
	Thailand	-2.2	(6.1)	-0.1	(0.3)	2.7	(6.6)	0.1	(0.3)	-4.9	(2.9)	-0.2	(0.4)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	1.1	(6.5)	0.0	(0.1)	4.9	(6.1)	-0.1	(0.1)	-3.9	(2.3)	0.1	(0.2)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	-3.9	(4.8)	-0.2	(0.6)	1.0	(4.8)	-0.1	(0.4)	-5.0	(2.7)	0.0	(0.7)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	**-22.4**	(4.6)	0.6	(0.4)	**-11.2**	(5.7)	-0.1	(0.3)	**-11.1**	(3.2)	0.7	(0.4)
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.8a Science performance, by gender (PISA 2015)

	Boys								Girls								Gender differences (boys - girls)							
	Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		50th percentile		90th percentile	
	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD																								
Australia	511	(2.1)	365	(3.3)	516	(2.9)	647	(3.0)	509	(1.7)	378	(3.0)	513	(2.2)	631	(2.7)	2	(2.3)	**-13**	(3.9)	3	(3.4)	**16**	(3.9)
Austria	504	(3.6)	368	(5.1)	508	(4.8)	634	(4.8)	486	(3.1)	361	(4.9)	489	(3.9)	605	(4.3)	**19**	(4.8)	7	(7.0)	**19**	(6.3)	**28**	(6.0)
Belgium	508	(3.1)	366	(4.5)	514	(4.2)	637	(2.9)	496	(2.7)	361	(5.1)	503	(3.5)	619	(2.8)	**12**	(3.6)	5	(5.6)	**11**	(4.8)	**18**	(3.8)
Canada	528	(2.5)	398	(3.7)	532	(3.0)	648	(3.5)	527	(2.3)	409	(3.3)	530	(2.8)	640	(3.4)	1	(2.4)	**-10**	(3.9)	2	(3.2)	**9**	(4.4)
Chile	454	(3.1)	341	(4.1)	453	(3.7)	571	(4.6)	440	(2.7)	331	(3.7)	438	(3.4)	550	(4.0)	**15**	(3.4)	9	(5.2)	**15**	(4.1)	**21**	(5.0)
Czech Republic	497	(3.3)	365	(4.9)	499	(4.3)	628	(4.1)	488	(2.5)	369	(4.9)	488	(3.2)	606	(4.0)	**9**	(3.7)	-4	(6.4)	**10**	(4.5)	**22**	(5.3)
Denmark	505	(2.6)	384	(4.1)	506	(3.5)	625	(4.6)	499	(3.2)	383	(5.1)	502	(3.6)	608	(4.6)	6	(3.3)	1	(5.9)	4	(4.1)	**17**	(5.6)
Estonia	536	(2.7)	410	(5.2)	539	(2.9)	654	(3.5)	533	(2.3)	421	(4.1)	534	(3.0)	642	(3.9)	3	(2.8)	-11	(6.1)	5	(3.8)	**11**	(4.9)
Finland	521	(2.7)	387	(5.2)	525	(3.6)	648	(3.9)	541	(2.6)	422	(5.1)	544	(3.2)	653	(3.6)	**-19**	(2.4)	**-34**	(5.8)	**-19**	(3.8)	-6	(4.8)
France	496	(2.7)	349	(5.0)	503	(3.5)	630	(3.7)	494	(2.7)	361	(3.9)	499	(3.6)	616	(3.5)	2	(3.4)	**-13**	(5.6)	4	(5.0)	**14**	(4.3)
Germany	514	(3.2)	380	(6.1)	516	(4.0)	645	(4.3)	504	(2.8)	372	(4.4)	508	(3.7)	626	(3.6)	**10**	(2.6)	8	(5.9)	7	(3.9)	**20**	(4.4)
Greece	451	(4.6)	326	(5.9)	449	(5.9)	577	(4.8)	459	(3.9)	343	(6.6)	462	(4.1)	573	(4.5)	**-9**	(3.7)	**-16**	(6.5)	**-13**	(5.1)	4	(4.7)
Hungary	478	(3.4)	348	(5.1)	480	(4.6)	606	(4.4)	475	(2.9)	346	(4.9)	480	(4.2)	595	(4.2)	3	(4.0)	2	(6.6)	0	(5.8)	**12**	(5.3)
Iceland	472	(2.6)	348	(4.8)	472	(3.9)	594	(5.5)	475	(2.1)	360	(4.1)	475	(3.3)	591	(4.2)	-3	(3.4)	-12	(6.6)	-3	(5.3)	3	(7.0)
Ireland	508	(3.2)	384	(5.4)	509	(3.7)	629	(3.6)	497	(2.6)	389	(4.5)	498	(3.2)	604	(3.3)	**11**	(3.2)	-5	(5.9)	**11**	(3.8)	**25**	(4.6)
Israel	469	(4.7)	321	(5.5)	467	(7.1)	618	(5.1)	464	(4.1)	334	(5.8)	466	(4.9)	593	(4.4)	4	(5.5)	-12	(7.3)	2	(7.4)	**25**	(5.8)
Italy	489	(3.1)	363	(4.5)	493	(4.0)	609	(3.3)	472	(3.6)	354	(5.9)	474	(4.9)	585	(3.6)	**17**	(4.6)	9	(6.6)	**18**	(6.2)	**24**	(4.5)
Japan	545	(4.1)	416	(5.8)	552	(4.5)	665	(5.7)	532	(2.9)	407	(5.3)	538	(3.8)	644	(4.1)	**14**	(3.9)	9	(6.8)	**14**	(4.6)	**21**	(6.1)
Korea	511	(4.6)	375	(6.2)	516	(5.6)	640	(4.9)	521	(3.3)	403	(4.9)	525	(3.8)	631	(3.8)	-10	(5.0)	**-28**	(7.6)	-9	(5.9)	9	(5.6)
Latvia	485	(2.0)	373	(3.8)	484	(2.9)	595	(3.0)	496	(2.2)	392	(4.2)	497	(2.8)	597	(3.7)	**-11**	(2.8)	**-19**	(5.7)	**-12**	(3.8)	-2	(4.9)
Luxembourg	487	(1.7)	350	(3.9)	484	(2.6)	625	(3.4)	479	(1.5)	351	(3.5)	480	(2.6)	605	(2.7)	**8**	(2.3)	-1	(4.8)	4	(3.7)	**21**	(4.0)
Mexico	420	(2.6)	326	(3.1)	416	(3.3)	519	(4.0)	412	(2.3)	324	(3.5)	411	(2.5)	499	(3.6)	**8**	(2.3)	1	(4.0)	5	(3.1)	**20**	(4.0)
Netherlands	511	(2.9)	371	(4.6)	512	(3.5)	646	(3.7)	507	(2.5)	374	(5.5)	511	(3.6)	630	(3.7)	4	(3.0)	-3	(5.0)	1	(4.1)	**16**	(4.8)
New Zealand	516	(3.2)	369	(5.1)	519	(4.2)	657	(4.9)	511	(2.7)	380	(4.3)	513	(3.9)	638	(4.2)	5	(3.6)	-12	(6.1)	6	(5.1)	**19**	(5.9)
Norway	500	(2.7)	365	(4.7)	504	(3.1)	629	(4.3)	497	(2.7)	377	(4.4)	499	(3.3)	613	(4.0)	3	(2.9)	**-12**	(6.0)	5	(4.0)	**16**	(5.6)
Poland	504	(2.9)	383	(4.7)	504	(4.0)	628	(4.7)	498	(2.8)	385	(4.4)	500	(3.6)	609	(5.1)	**6**	(2.9)	-2	(6.0)	4	(4.1)	**18**	(6.0)
Portugal	506	(2.9)	376	(4.5)	509	(4.1)	631	(3.8)	496	(2.6)	381	(3.7)	498	(3.3)	607	(3.7)	**10**	(2.3)	-4	(4.6)	**11**	(3.8)	**24**	(4.8)
Slovak Republic	460	(3.0)	327	(4.9)	461	(4.0)	592	(4.2)	461	(3.3)	333	(6.3)	465	(4.0)	584	(4.0)	-1	(3.5)	-6	(6.2)	-4	(5.2)	8	(5.0)
Slovenia	510	(1.9)	382	(3.4)	511	(3.1)	638	(4.2)	516	(1.9)	391	(4.3)	518	(3.1)	635	(4.6)	**-6**	(2.7)	-9	(5.5)	-8	(5.0)	3	(6.6)
Spain	496	(2.5)	372	(4.4)	499	(3.2)	613	(3.5)	489	(2.5)	375	(4.4)	493	(2.9)	597	(3.0)	**7**	(2.7)	-3	(5.1)	6	(3.6)	**17**	(4.1)
Sweden	491	(4.1)	349	(5.5)	492	(4.9)	630	(4.9)	496	(3.7)	366	(5.8)	499	(4.4)	620	(5.0)	-5	(3.1)	**-16**	(6.8)	-7	(3.9)	10	(5.4)
Switzerland	508	(3.1)	370	(4.9)	514	(4.0)	638	(3.4)	502	(3.5)	376	(5.0)	505	(4.2)	626	(4.6)	6	(3.1)	-6	(5.4)	**9**	(4.4)	**12**	(5.0)
Turkey	422	(4.5)	322	(4.5)	418	(5.7)	529	(6.6)	429	(4.4)	329	(4.6)	425	(5.6)	535	(7.0)	-6	(4.2)	-7	(6.2)	-7	(5.8)	-6	(5.1)
United Kingdom	510	(2.9)	375	(4.5)	511	(4.0)	641	(4.3)	509	(3.3)	378	(3.9)	513	(3.8)	635	(4.8)	1	(3.5)	-3	(5.2)	-1	(4.1)	6	(5.9)
United States	500	(3.7)	366	(5.1)	500	(4.9)	632	(4.6)	493	(3.4)	370	(5.0)	491	(3.9)	619	(4.6)	**7**	(3.1)	-4	(5.8)	**9**	(4.8)	**13**	(5.3)
OECD average-35	495	(0.5)	365	(0.8)	497	(0.7)	621	(0.7)	491	(0.5)	371	(0.8)	494	(0.6)	608	(0.7)	**4**	(0.6)	**-6**	(1.0)	**3**	(0.8)	**14**	(0.9)
Partners																								
Albania	415	(4.0)	315	(4.5)	412	(4.6)	523	(6.5)	439	(3.0)	344	(4.0)	439	(3.7)	536	(4.8)	**-24**	(3.1)	**-29**	(5.7)	**-27**	(4.4)	**-12**	(5.5)
Algeria	369	(3.0)	286	(4.4)	367	(3.3)	456	(4.5)	383	(3.1)	297	(3.5)	380	(3.4)	474	(6.1)	**-14**	(3.2)	**-12**	(5.4)	**-13**	(3.9)	**-18**	(6.2)
Brazil	403	(2.5)	289	(2.5)	395	(2.9)	529	(4.3)	399	(2.4)	293	(2.4)	393	(2.6)	515	(4.4)	**4**	(1.6)	-4	(2.8)	2	(2.4)	**15**	(3.7)
B-S-J-G (China)	522	(4.5)	378	(6.7)	530	(5.8)	653	(4.6)	513	(5.3)	377	(6.4)	517	(5.8)	642	(7.5)	**9**	(3.0)	1	(5.3)	**12**	(3.9)	**11**	(5.0)
Bulgaria	438	(5.3)	306	(4.8)	434	(6.8)	577	(6.6)	454	(4.4)	323	(6.8)	458	(6.3)	580	(5.6)	**-15**	(4.5)	**-17**	(5.9)	**-23**	(6.8)	-4	(6.7)
CABA (Argentina)	483	(7.2)	365	(9.8)	484	(9.1)	598	(9.6)	468	(7.1)	363	(10.2)	470	(8.1)	575	(9.0)	**14**	(6.7)	3	(12.2)	14	(8.8)	**24**	(9.8)
Colombia	421	(3.1)	318	(3.9)	418	(3.8)	531	(4.2)	411	(2.4)	313	(3.6)	407	(3.0)	516	(3.9)	**10**	(2.9)	5	(4.2)	**11**	(3.6)	**16**	(5.2)
Costa Rica	429	(2.5)	337	(3.4)	426	(2.9)	525	(3.8)	411	(2.2)	328	(2.7)	407	(2.6)	499	(4.0)	**18**	(2.1)	**9**	(3.7)	**19**	(3.0)	**26**	(4.0)
Croatia	478	(3.2)	358	(4.4)	477	(4.3)	603	(4.2)	473	(2.8)	363	(3.8)	472	(4.0)	584	(3.5)	6	(3.5)	-5	(5.2)	5	(5.2)	**19**	(4.7)
Cyprus*	424	(1.7)	302	(3.1)	417	(2.8)	560	(4.6)	441	(1.9)	331	(4.2)	440	(2.2)	554	(4.0)	**-17**	(2.4)	**-29**	(4.9)	**-23**	(3.5)	6	(6.2)
Dominican Republic	332	(3.2)	245	(3.6)	325	(3.8)	434	(6.2)	331	(2.6)	244	(3.8)	327	(2.9)	425	(4.9)	2	(2.7)	1	(4.9)	-2	(3.7)	9	(5.5)
FYROM	374	(1.6)	266	(3.2)	370	(2.4)	489	(4.7)	394	(1.8)	290	(3.3)	392	(2.7)	502	(4.1)	**-20**	(2.3)	**-24**	(4.2)	**-23**	(3.8)	-12	(6.6)
Georgia	403	(3.3)	287	(4.8)	398	(3.8)	529	(5.7)	420	(2.3)	311	(4.1)	417	(3.1)	533	(3.9)	**-16**	(3.1)	**-25**	(6.2)	**-19**	(3.7)	-4	(6.3)
Hong Kong (China)	523	(3.1)	406	(5.0)	529	(3.5)	627	(3.7)	524	(3.4)	422	(5.6)	529	(3.7)	617	(3.7)	-1	(4.1)	**-15**	(6.7)	-1	(4.8)	9	(4.8)
Indonesia	401	(3.0)	318	(3.8)	397	(3.6)	491	(4.5)	405	(2.8)	320	(3.5)	402	(3.2)	496	(5.0)	-4	(2.8)	-2	(3.9)	-5	(3.4)	-5	(5.2)
Jordan	389	(3.9)	278	(5.3)	388	(4.7)	504	(4.8)	428	(3.6)	329	(5.2)	429	(4.2)	526	(4.2)	**-39**	(5.4)	**-51**	(7.7)	**-41**	(6.1)	**-22**	(6.3)
Kosovo	374	(2.0)	283	(2.8)	369	(2.9)	472	(4.8)	383	(2.1)	295	(3.9)	381	(2.9)	476	(4.4)	**-9**	(2.4)	**-12**	(5.0)	**-12**	(4.0)	-4	(5.8)
Lebanon	388	(4.0)	272	(5.3)	380	(5.6)	516	(6.8)	386	(3.7)	279	(4.7)	378	(4.6)	506	(5.1)	2	(3.7)	-7	(6.2)	2	(5.5)	10	(6.9)
Lithuania	472	(3.3)	350	(4.4)	469	(3.7)	599	(5.2)	479	(2.8)	364	(4.1)	478	(3.5)	595	(4.1)	**-7**	(3.0)	**-14**	(4.7)	-9	(4.5)	4	(5.5)
Macao (China)	525	(1.5)	409	(3.3)	528	(2.4)	634	(3.8)	532	(1.5)	433	(3.4)	536	(2.4)	627	(2.7)	**-8**	(2.1)	**-24**	(4.6)	**-7**	(3.3)	7	(5.0)
Malta	460	(2.5)	303	(5.0)	459	(4.4)	618	(4.8)	470	(2.2)	319	(6.0)	472	(3.7)	618	(4.9)	**-11**	(3.3)	**-15**	(6.8)	**-13**	(5.6)	0	(6.6)
Moldova	425	(2.4)	313	(4.1)	422	(2.9)	541	(3.9)	431	(2.4)	323	(4.2)	431	(3.0)	541	(4.3)	**-7**	(2.8)	-9	(5.3)	**-9**	(3.9)	0	(5.1)
Montenegro	409	(1.7)	298	(2.8)	404	(2.3)	529	(4.3)	414	(1.3)	312	(2.6)	411	(2.0)	522	(3.1)	**-5**	(2.2)	**-14**	(3.7)	**-7**	(2.9)	8	(5.5)
Peru	402	(2.8)	305	(3.7)	397	(3.3)	507	(4.7)	392	(2.9)	298	(3.3)	388	(3.3)	492	(4.5)	**10**	(3.3)	7	(4.2)	**9**	(3.9)	**15**	(5.1)
Qatar	406	(1.4)	282	(2.3)	394	(1.7)	553	(2.7)	429	(1.3)	315	(2.5)	424	(1.6)	554	(2.5)	**-23**	(1.7)	**-33**	(3.0)	**-30**	(2.4)	-1	(3.6)
Romania	432	(3.7)	330	(4.8)	430	(4.4)	537	(6.1)	438	(3.4)	338	(4.0)	436	(4.0)	541	(5.5)	**-6**	(3.0)	-8	(4.6)	-7	(4.3)	-4	(5.7)
Russia	489	(3.6)	378	(5.1)	487	(4.2)	600	(4.8)	485	(3.1)	381	(4.1)	484	(4.0)	589	(3.7)	4	(3.2)	-2	(5.3)	3	(4.0)	**11**	(4.7)
Singapore	559	(1.8)	408	(4.0)	568	(2.4)	692	(3.6)	552	(1.7)	416	(3.9)	561	(2.4)	673	(3.1)	**6**	(2.5)	-8	(5.8)	7	(3.7)	**19**	(4.8)
Chinese Taipei	535	(4.1)	393	(5.6)	544	(4.4)	659	(6.1)	530	(3.8)	398	(5.8)	536	(3.8)	650	(6.9)	4	(5.8)	-5	(6.8)	9	(6.2)	9	(9.8)
Thailand	416	(3.6)	318	(3.6)	411	(4.2)	524	(6.7)	425	(2.9)	330	(3.2)	420	(3.4)	530	(5.6)	**-9**	(3.2)	**-12**	(3.9)	**-10**	(4.1)	-6	(6.8)
Trinidad and Tobago	414	(2.1)	295	(6.0)	408	(3.4)	543	(4.3)	435	(1.9)	319	(3.6)	430	(2.8)	559	(3.7)	**-20**	(2.7)	**-24**	(6.7)	**-22**	(4.3)	**-16**	(5.6)
Tunisia	388	(2.4)	307	(3.1)	384	(2.9)	476	(4.4)	385	(2.2)	306	(3.2)	381	(2.7)	468	(4.5)	**4**	(1.8)	1	(3.4)	3	(2.6)	8	(4.5)
United Arab Emirates	424	(3.4)	295	(3.5)	413	(4.3)	571	(5.5)	449	(3.0)	334	(3.9)	445	(3.6)	571	(4.1)	**-26**	(4.4)	**-39**	(4.9)	**-32**	(5.4)	0	(7.0)
Uruguay	440	(3.1)	327	(3.4)	434	(4.0)	562	(4.9)	431	(2.2)	325	(3.4)	429	(2.9)	542	(3.7)	**9**	(3.0)	1	(4.1)	5	(4.3)	**20**	(4.9)
Viet Nam	523	(4.0)	424	(4.4)	521	(5.3)	626	(6.4)	526	(4.2)	432	(4.5)	523	(3.8)	622	(7.8)	-3	(2.8)	**-8**	(4.1)	-2	(4.2)	4	(6.1)
Argentina**	440	(3.2)	335	(4.3)	440	(3.7)	546	(4.5)	425	(3.2)	324	(3.9)	424	(3.7)	527	(4.1)	**15**	(2.9)	**11**	(4.7)	**15**	(3.9)	**19**	(4.8)
Kazakhstan**	455	(4.1)	361	(4.2)	450	(4.0)	558	(8.2)	458	(3.8)	365	(4.1)	453	(4.0)	558	(6.9)	-3	(3.1)	-4	(4.6)	-3	(3.6)	-1	(6.2)
Malaysia**	441	(3.3)	339	(3.9)	440	(4.1)	545	(5.0)	445	(3.1)	350	(4.2)	446	(3.4)	537	(3.9)	-4	(2.3)	**-11**	(4.1)	-6	(3.5)	**8**	(3.8)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.8b Science performance, by gender (PISA 2006)

		Boys								Girls								Gender differences (boys - girls)							
		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		50th percentile		90th percentile	
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	527	(3.2)	388	(4.5)	532	(3.8)	658	(4.7)	527	(2.7)	400	(3.8)	529	(2.9)	649	(3.1)	0	(3.8)	**-12**	(4.8)	3	(4.5)	9	(5.6)
	Austria	515	(4.2)	384	(6.2)	518	(5.4)	640	(4.9)	507	(4.9)	372	(10.1)	516	(5.1)	627	(4.4)	8	(4.9)	12	(9.8)	2	(5.7)	**13**	(5.7)
	Belgium	511	(3.3)	371	(7.0)	517	(3.9)	639	(2.4)	510	(3.2)	377	(6.5)	520	(3.8)	629	(3.4)	1	(4.1)	-6	(7.8)	-3	(5.7)	**10**	(4.0)
	Canada	536	(2.5)	406	(4.7)	543	(2.8)	656	(3.4)	532	(2.1)	412	(3.6)	537	(2.9)	646	(3.2)	4	(2.2)	-6	(4.3)	6	(3.2)	**10**	(4.6)
	Chile	448	(5.4)	332	(4.8)	444	(6.2)	571	(7.9)	426	(4.4)	314	(4.9)	423	(5.2)	547	(8.2)	**22**	(4.8)	**18**	(5.0)	**21**	(5.3)	**24**	(10.1)
	Czech Republic	515	(4.2)	390	(4.7)	514	(5.8)	642	(5.3)	510	(4.8)	377	(8.3)	515	(5.0)	638	(5.6)	5	(5.6)	13	(8.5)	-1	(7.4)	4	(6.6)
	Denmark	500	(3.6)	375	(5.9)	503	(4.0)	623	(5.5)	491	(3.4)	373	(5.6)	493	(4.1)	608	(4.1)	**9**	(3.2)	2	(6.2)	**10**	(4.1)	**14**	(5.9)
	Estonia	530	(3.1)	416	(5.1)	531	(3.6)	642	(4.6)	533	(2.9)	429	(4.4)	535	(3.9)	638	(4.4)	-4	(3.1)	**-12**	(5.4)	-4	(4.8)	4	(6.1)
	Finland	562	(2.6)	444	(4.6)	564	(3.1)	676	(3.7)	565	(2.4)	461	(4.1)	567	(2.9)	669	(3.4)	-3	(2.9)	**-17**	(5.7)	-3	(3.4)	7	(5.0)
	France	497	(4.3)	353	(7.7)	502	(5.8)	632	(4.5)	494	(3.6)	364	(6.2)	500	(5.2)	615	(4.2)	3	(4.0)	-11	(8.0)	2	(6.3)	**16**	(5.2)
	Germany	519	(4.6)	381	(8.3)	524	(5.6)	649	(4.8)	512	(3.8)	381	(7.2)	519	(3.8)	633	(3.9)	7	(3.7)	1	(7.7)	5	(4.9)	**16**	(5.8)
	Greece	468	(4.5)	340	(8.1)	471	(5.2)	593	(4.7)	479	(3.4)	370	(5.9)	483	(4.6)	584	(4.6)	**-11**	(4.7)	**-30**	(8.6)	-12	(6.2)	9	(5.9)
	Hungary	507	(3.3)	386	(5.7)	509	(4.5)	625	(5.1)	501	(3.5)	392	(5.6)	502	(4.7)	607	(4.9)	6	(4.2)	-6	(7.5)	7	(6.0)	**18**	(6.7)
	Iceland	488	(2.6)	358	(5.1)	490	(4.7)	617	(4.7)	494	(2.1)	373	(4.4)	496	(2.6)	612	(3.7)	-6	(3.4)	**-15**	(6.2)	-7	(5.8)	4	(6.3)
	Ireland	508	(4.3)	381	(6.5)	509	(4.7)	635	(4.7)	509	(3.3)	390	(5.2)	510	(4.4)	626	(3.8)	0	(4.3)	-9	(7.3)	-1	(6.0)	9	(5.4)
	Israel	456	(5.6)	304	(8.7)	452	(7.6)	612	(5.8)	452	(4.2)	316	(5.9)	452	(5.0)	590	(4.8)	3	(6.5)	-13	(10.1)	-1	(8.7)	**22**	(6.6)
	Italy	477	(2.8)	347	(4.2)	481	(3.6)	605	(3.8)	474	(2.5)	356	(3.7)	474	(3.3)	592	(3.4)	3	(3.5)	-8	(5.4)	7	(4.7)	**13**	(5.1)
	Japan	533	(4.9)	392	(7.3)	541	(5.7)	661	(3.6)	530	(5.1)	401	(9.5)	537	(5.7)	647	(4.4)	3	(7.4)	-8	(11.9)	4	(8.1)	**13**	(5.7)
	Korea	521	(4.8)	397	(7.4)	527	(5.3)	638	(5.0)	523	(3.9)	409	(6.4)	526	(3.8)	632	(4.5)	-2	(5.5)	-12	(8.3)	1	(6.6)	6	(5.1)
	Latvia	486	(3.5)	375	(5.3)	488	(4.3)	597	(5.8)	493	(3.2)	385	(5.2)	496	(3.7)	596	(3.8)	**-7**	(3.1)	-10	(6.3)	-8	(4.6)	1	(6.5)
	Luxembourg	491	(1.8)	356	(3.7)	495	(2.7)	619	(3.4)	482	(1.8)	360	(4.2)	486	(2.1)	598	(3.1)	**9**	(2.9)	-4	(5.8)	**9**	(3.5)	**20**	(5.0)
	Mexico	413	(3.2)	308	(5.5)	410	(3.6)	523	(4.6)	406	(2.6)	304	(4.0)	405	(2.8)	510	(3.4)	**7**	(2.2)	5	(4.8)	5	(2.8)	**13**	(4.6)
	Netherlands	528	(3.2)	397	(6.8)	531	(4.2)	653	(4.4)	521	(3.1)	393	(6.6)	529	(4.7)	639	(3.9)	**7**	(3.0)	4	(7.7)	2	(4.8)	**14**	(4.9)
	New Zealand	528	(3.9)	382	(6.2)	532	(4.5)	671	(5.6)	532	(3.6)	397	(6.0)	536	(5.0)	664	(4.5)	-4	(5.2)	-15	(8.1)	-4	(6.5)	8	(7.3)
	Norway	484	(3.8)	355	(8.8)	487	(4.0)	614	(4.6)	489	(3.2)	374	(5.2)	489	(4.2)	607	(4.4)	-4	(3.4)	**-19**	(8.4)	-2	(4.5)	6	(5.8)
	Poland	500	(2.7)	379	(3.2)	499	(4.0)	623	(4.2)	496	(2.6)	384	(4.0)	497	(3.9)	607	(4.3)	3	(2.5)	-6	(4.5)	2	(4.8)	**16**	(5.3)
	Portugal	477	(3.7)	357	(7.1)	478	(4.7)	595	(4.8)	472	(3.2)	358	(5.0)	474	(3.7)	582	(3.7)	5	(3.3)	-1	(6.8)	4	(4.5)	12	(6.3)
	Slovak Republic	491	(3.9)	366	(6.4)	492	(5.1)	616	(4.5)	485	(3.0)	370	(5.3)	485	(3.7)	601	(4.7)	6	(4.7)	-4	(8.5)	6	(5.7)	**15**	(5.6)
	Slovenia	515	(2.0)	385	(3.5)	512	(2.9)	646	(5.3)	523	(1.9)	397	(4.2)	524	(2.6)	649	(5.2)	**-8**	(3.2)	**-12**	(5.7)	**-12**	(4.1)	-2	(8.2)
	Spain	491	(2.9)	367	(4.8)	494	(3.6)	609	(2.8)	486	(2.7)	373	(4.4)	489	(3.2)	598	(3.9)	4	(2.4)	-5	(4.8)	5	(3.5)	**11**	(3.7)
	Sweden	504	(2.7)	378	(6.9)	506	(3.9)	626	(3.9)	503	(2.9)	384	(4.2)	505	(4.4)	619	(4.1)	1	(3.0)	-5	(7.6)	1	(4.4)	7	(5.8)
	Switzerland	514	(3.3)	378	(5.9)	520	(3.7)	639	(4.0)	509	(3.6)	378	(5.0)	513	(4.1)	633	(4.2)	**6**	(2.7)	0	(4.8)	7	(3.6)	6	(3.9)
	Turkey	418	(4.6)	318	(3.6)	409	(4.3)	540	(11.3)	430	(4.1)	334	(4.8)	424	(4.6)	540	(9.6)	**-12**	(4.1)	**-16**	(5.7)	**-15**	(5.4)	-1	(8.0)
	United Kingdom	520	(3.0)	372	(6.1)	524	(3.2)	663	(4.9)	510	(2.8)	379	(5.1)	512	(3.4)	641	(4.0)	**10**	(3.4)	-6	(6.0)	**11**	(4.6)	**22**	(6.5)
	United States	489	(5.1)	345	(7.0)	490	(5.8)	633	(4.8)	489	(4.0)	355	(6.3)	487	(4.6)	623	(6.0)	1	(3.5)	-11	(6.8)	4	(4.7)	10	(6.0)
	OECD average-35	499	(0.6)	370	(1.0)	501	(0.8)	625	(0.8)	497	(0.6)	377	(1.0)	500	(0.7)	614	(0.8)	**2**	(0.7)	**-6**	(1.2)	2	(0.9)	**11**	(1.0)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	395	(3.2)	282	(4.6)	390	(3.2)	517	(7.8)	386	(2.9)	280	(3.6)	380	(3.0)	504	(5.1)	**9**	(2.3)	2	(4.9)	**9**	(3.0)	**14**	(6.9)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	426	(6.6)	292	(7.2)	419	(7.4)	573	(10.1)	443	(6.9)	310	(10.2)	442	(8.7)	579	(8.1)	**-17**	(5.8)	-18	(9.8)	**-23**	(8.8)	-5	(7.9)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	393	(4.1)	280	(5.2)	394	(5.0)	506	(4.6)	384	(4.1)	279	(6.0)	385	(4.4)	486	(5.3)	9	(4.6)	1	(6.8)	9	(5.9)	**20**	(6.3)
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	492	(3.3)	380	(5.0)	491	(3.8)	607	(3.9)	494	(3.1)	387	(5.2)	495	(4.0)	601	(4.5)	-2	(4.1)	-7	(6.7)	-5	(4.9)	6	(5.2)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	546	(3.5)	415	(8.2)	554	(3.6)	661	(5.0)	539	(3.5)	421	(6.3)	544	(4.2)	650	(3.7)	7	(4.9)	-6	(9.1)	10	(5.8)	**11**	(5.7)
	Indonesia	399	(8.2)	310	(4.9)	394	(7.5)	499	(15.5)	387	(3.7)	305	(3.0)	384	(3.9)	476	(7.7)	12	(6.3)	5	(4.5)	11	(5.9)	24	(12.6)
	Jordan	408	(4.5)	290	(5.9)	408	(4.3)	528	(8.3)	436	(3.3)	331	(4.7)	435	(3.6)	544	(4.6)	**-29**	(5.3)	**-41**	(7.0)	**-27**	(5.6)	-16	(8.4)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	483	(3.1)	367	(4.2)	484	(3.4)	602	(5.7)	493	(3.1)	374	(4.7)	494	(3.2)	606	(5.4)	**-9**	(2.8)	-7	(6.0)	**-10**	(3.5)	-5	(7.3)
	Macao (China)	513	(1.8)	403	(4.0)	516	(2.8)	617	(3.2)	509	(1.6)	413	(3.1)	511	(2.7)	603	(3.3)	4	(2.7)	**-10**	(5.0)	5	(3.8)	**14**	(5.1)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	411	(1.7)	310	(3.4)	408	(2.6)	519	(3.9)	413	(1.7)	314	(2.9)	410	(2.4)	515	(4.3)	-2	(2.6)	-5	(4.7)	-2	(3.7)	3	(5.2)
	Peru	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	334	(1.2)	237	(2.4)	322	(1.7)	450	(4.9)	365	(1.3)	276	(2.1)	357	(1.9)	467	(4.0)	**-32**	(1.9)	**-39**	(3.2)	**-36**	(2.5)	**-18**	(6.9)
	Romania	417	(4.1)	311	(4.2)	414	(5.9)	530	(6.4)	419	(4.8)	319	(7.3)	418	(5.5)	522	(6.5)	-2	(3.3)	-9	(6.1)	-4	(4.6)	8	(6.7)
	Russia	481	(4.1)	362	(6.3)	480	(5.0)	604	(4.8)	478	(3.7)	367	(5.4)	478	(3.8)	590	(4.7)	3	(2.7)	-5	(5.0)	2	(3.9)	**14**	(5.1)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	536	(4.3)	401	(6.1)	544	(5.2)	653	(4.3)	529	(5.1)	402	(6.2)	535	(5.9)	646	(4.9)	7	(6.0)	-1	(6.9)	10	(7.2)	7	(6.9)
	Thailand	411	(3.4)	311	(5.5)	406	(3.8)	522	(4.9)	428	(2.5)	338	(3.7)	424	(2.8)	526	(4.6)	**-17**	(3.9)	**-27**	(6.1)	**-19**	(4.3)	-3	(6.0)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	383	(3.2)	280	(4.8)	380	(3.7)	494	(7.1)	388	(3.5)	285	(4.5)	386	(3.2)	496	(7.3)	-5	(3.4)	-6	(6.1)	-6	(3.8)	-2	(8.1)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	427	(4.0)	301	(7.7)	425	(4.5)	554	(5.0)	430	(2.7)	312	(5.2)	431	(3.7)	545	(4.2)	-3	(4.0)	-11	(9.4)	-6	(5.6)	9	(5.6)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	384	(6.5)	249	(13.3)	386	(7.1)	511	(6.9)	397	(6.8)	266	(7.5)	400	(7.4)	527	(8.7)	**-13**	(5.6)	-17	(11.3)	-14	(7.1)	-15	(8.9)
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.8d Change between 2006 and 2015 in science performance, by gender (PISA 2015 - PISA 2006)

		Boys								Girls								Gender differences (boys - girls)							
		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		50th percentile		90th percentile	
		Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	**-16**	(5.9)	**-23**	(7.1)	**-16**	(6.5)	-11	(7.1)	**-18**	(5.5)	**-22**	(6.6)	**-16**	(5.8)	**-18**	(6.1)	2	(4.4)	-1	(6.1)	0	(5.6)	7	(6.8)
	Austria	-10	(7.1)	-16	(9.2)	-9	(8.6)	-6	(8.2)	**-21**	(7.4)	-11	(12.1)	**-26**	(7.8)	**-22**	(7.6)	11	(6.9)	-5	(12.1)	**17**	(8.5)	16	(8.3)
	Belgium	-3	(6.4)	-5	(9.4)	-3	(7.3)	-1	(5.9)	**-14**	(6.1)	-15	(9.4)	**-17**	(6.8)	-10	(6.3)	**11**	(5.4)	11	(9.6)	14	(7.5)	8	(5.5)
	Canada	-8	(5.7)	-8	(7.4)	-11	(6.1)	-8	(6.6)	-5	(5.4)	-3	(6.6)	-6	(6.0)	-6	(6.5)	-3	(3.2)	-4	(5.8)	-4	(4.5)	-1	(6.3)
	Chile	6	(7.6)	9	(7.8)	9	(8.5)	0	(10.2)	13	(6.8)	**17**	(7.6)	15	(7.7)	3	(10.2)	-7	(5.9)	-9	(7.2)	-6	(6.8)	-3	(11.3)
	Czech Republic	**-18**	(7.0)	**-25**	(8.1)	-15	(8.5)	-14	(8.0)	**-22**	(7.0)	-8	(10.7)	**-27**	(7.4)	**-32**	(8.2)	4	(6.7)	-17	(10.7)	11	(8.7)	**18**	(8.4)
	Denmark	5	(6.3)	9	(8.4)	3	(7.0)	3	(8.4)	7	(6.5)	10	(8.8)	9	(7.1)	0	(7.7)	-3	(4.6)	-2	(8.5)	-7	(5.8)	3	(8.2)
	Estonia	6	(6.1)	-7	(8.6)	8	(6.4)	12	(7.3)	-1	(5.8)	-8	(7.5)	0	(6.7)	4	(7.4)	7	(4.2)	1	(8.1)	9	(6.1)	8	(7.8)
	Finland	**-40**	(5.8)	**-57**	(8.3)	**-39**	(6.5)	**-28**	(7.0)	**-24**	(5.7)	**-39**	(7.9)	**-23**	(6.2)	**-16**	(6.7)	**-16**	(3.8)	**-18**	(8.1)	**-16**	(5.1)	-12	(7.0)
	France	-1	(6.8)	-4	(10.2)	1	(8.1)	-1	(7.4)	0	(6.3)	-3	(8.6)	-1	(7.8)	1	(7.1)	-1	(5.3)	-1	(9.8)	2	(8.0)	-3	(6.8)
	Germany	-5	(7.2)	-1	(11.3)	-8	(8.3)	-4	(7.9)	-8	(6.5)	-9	(9.5)	-10	(6.9)	-7	(6.9)	3	(4.5)	7	(9.7)	2	(6.3)	3	(7.3)
	Greece	**-17**	(7.9)	-13	(11.0)	**-22**	(9.0)	**-16**	(8.1)	**-20**	(6.8)	**-27**	(9.9)	**-21**	(7.6)	-11	(7.8)	3	(6.0)	14	(10.8)	-1	(8.0)	-4	(7.6)
	Hungary	**-29**	(6.5)	**-38**	(8.9)	**-30**	(7.9)	**-19**	(8.1)	**-25**	(6.4)	**-46**	(8.7)	**-22**	(7.7)	-13	(7.9)	-3	(5.8)	8	(10.0)	-8	(8.3)	-6	(8.6)
	Iceland	**-16**	(5.8)	-10	(8.4)	**-17**	(7.6)	**-23**	(8.5)	**-19**	(5.4)	-13	(7.5)	**-21**	(6.1)	**-21**	(7.2)	3	(4.8)	4	(9.1)	4	(7.9)	-1	(9.4)
	Ireland	0	(7.0)	3	(9.5)	-1	(7.5)	-6	(7.4)	-11	(6.2)	-1	(8.2)	-12	(7.0)	**-22**	(6.8)	**11**	(5.4)	4	(9.4)	12	(7.1)	**16**	(7.1)
	Israel	13	(8.6)	18	(11.2)	16	(11.3)	6	(8.9)	12	(7.4)	17	(9.4)	13	(8.3)	3	(7.9)	1	(8.5)	0	(12.5)	3	(11.4)	3	(8.8)
	Italy	**12**	(6.2)	**16**	(7.6)	11	(7.0)	4	(6.7)	-2	(6.2)	-1	(8.3)	1	(7.4)	-7	(6.7)	**14**	(5.8)	**17**	(8.5)	11	(7.7)	11	(6.8)
	Japan	12	(7.8)	**24**	(10.4)	11	(8.5)	4	(8.1)	2	(7.4)	6	(11.8)	1	(8.2)	-3	(7.5)	10	(8.4)	17	(13.8)	10	(9.3)	7	(8.4)
	Korea	-10	(8.0)	**-22**	(10.7)	-11	(8.9)	3	(8.4)	-2	(6.8)	-6	(9.2)	-1	(7.0)	0	(7.4)	-8	(7.5)	-16	(11.3)	-10	(8.9)	3	(7.6)
	Latvia	-1	(6.0)	-2	(7.9)	-3	(6.8)	-2	(7.9)	3	(5.9)	7	(8.1)	1	(6.4)	1	(6.9)	-4	(4.2)	-9	(8.4)	-4	(6.0)	-3	(8.1)
	Luxembourg	-4	(5.1)	-6	(7.0)	-11	(5.8)	7	(6.6)	-3	(5.1)	-8	(7.1)	-6	(5.6)	6	(6.1)	-2	(3.7)	3	(7.5)	-5	(5.1)	0	(6.4)
	Mexico	7	(6.1)	**17**	(7.8)	6	(6.6)	-4	(7.6)	5	(5.7)	**21**	(6.9)	6	(5.9)	-11	(6.7)	2	(3.2)	-3	(6.3)	0	(4.2)	7	(6.1)
	Netherlands	**-18**	(6.2)	**-26**	(9.3)	**-19**	(7.1)	-7	(7.3)	**-15**	(6.0)	**-19**	(9.7)	**-18**	(7.4)	-9	(7.0)	-3	(4.2)	-7	(9.1)	-1	(6.3)	1	(6.9)
	New Zealand	-13	(6.8)	-13	(9.2)	-13	(7.6)	-14	(8.7)	**-21**	(6.3)	-17	(8.7)	**-23**	(7.7)	**-26**	(7.6)	9	(6.3)	3	(10.1)	10	(8.2)	11	(9.4)
	Norway	**16**	(6.5)	10	(10.9)	**17**	(6.7)	**16**	(7.7)	8	(6.1)	3	(8.1)	10	(7.0)	6	(7.5)	7	(4.5)	7	(10.4)	7	(6.0)	10	(8.1)
	Poland	5	(6.0)	4	(7.3)	5	(7.2)	5	(7.8)	2	(5.9)	1	(7.4)	3	(6.9)	2	(8.0)	3	(3.8)	4	(7.5)	2	(6.3)	3	(8.0)
	Portugal	**29**	(6.5)	**20**	(9.5)	**30**	(7.7)	**37**	(7.6)	**24**	(6.1)	**23**	(7.6)	**24**	(6.7)	**25**	(6.9)	5	(4.1)	-3	(8.2)	7	(5.9)	12	(7.9)
	Slovak Republic	**-31**	(6.7)	**-39**	(9.3)	**-31**	(7.9)	**-24**	(7.6)	**-24**	(6.3)	**-37**	(9.4)	**-21**	(7.0)	**-17**	(7.6)	-7	(5.9)	-2	(10.5)	-11	(7.7)	-7	(7.5)
	Slovenia	-5	(5.3)	-3	(6.7)	-1	(6.1)	-9	(8.1)	-7	(5.2)	-6	(7.5)	-6	(6.0)	-14	(8.2)	2	(4.2)	2	(7.9)	4	(6.5)	5	(10.6)
	Spain	6	(5.9)	5	(7.9)	6	(6.6)	4	(6.3)	3	(5.8)	3	(7.7)	4	(6.2)	-1	(6.6)	2	(3.6)	2	(7.0)	1	(5.0)	5	(5.5)
	Sweden	-13	(6.7)	**-29**	(9.9)	-14	(7.7)	4	(7.7)	-7	(6.5)	**-18**	(8.5)	-6	(7.7)	1	(7.8)	-6	(4.3)	-11	(10.2)	-8	(5.9)	3	(7.9)
	Switzerland	-6	(6.4)	-9	(8.9)	-6	(7.1)	-1	(6.9)	-6	(6.7)	-3	(8.4)	-8	(7.4)	-7	(7.7)	1	(4.1)	-6	(7.2)	2	(5.7)	6	(6.4)
	Turkey	4	(7.8)	3	(7.3)	8	(8.4)	-10	(13.8)	-2	(7.5)	-5	(8.0)	1	(8.5)	-5	(12.7)	6	(5.9)	9	(8.4)	8	(7.9)	-5	(9.5)
	United Kingdom	-10	(6.1)	3	(8.8)	-12	(6.8)	**-22**	(7.9)	-1	(6.2)	-1	(7.8)	0	(6.8)	-7	(7.7)	-9	(4.9)	3	(8.0)	**-13**	(6.2)	-15	(8.8)
	United States	10	(7.7)	**21**	(9.8)	10	(8.8)	-1	(8.0)	4	(6.9)	14	(9.2)	4	(7.5)	-4	(8.8)	6	(4.7)	7	(8.9)	6	(6.7)	3	(8.0)
	OECD average-35	-4	(4.6)	-5	(4.7)	-4	(4.6)	-4	(4.6)	-6	(4.5)	-6	(4.7)	-6	(4.6)	-7	(4.6)	1	(0.9)	0	(1.6)	1	(1.2)	**3**	(1.3)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	8	(6.0)	6	(6.9)	6	(6.2)	12	(10.0)	**13**	(5.8)	**13**	(6.3)	**12**	(6.0)	11	(8.1)	-5	(2.8)	-6	(5.7)	-7	(3.8)	1	(7.8)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	13	(9.6)	14	(9.7)	15	(11.0)	3	(12.9)	11	(9.3)	13	(13.0)	15	(11.6)	2	(10.8)	2	(7.4)	1	(11.5)	0	(11.1)	1	(10.4)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	**28**	(6.8)	**37**	(7.9)	**23**	(7.7)	**25**	(7.7)	**27**	(6.6)	**34**	(8.3)	**22**	(7.0)	**29**	(8.0)	1	(5.5)	4	(8.0)	1	(6.9)	-4	(8.2)
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	**-14**	(6.4)	**-22**	(8.1)	-14	(7.3)	-5	(7.3)	**-22**	(6.1)	**-24**	(7.9)	**-23**	(7.2)	**-18**	(7.2)	8	(5.3)	3	(8.4)	9	(7.1)	13	(7.0)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	**-23**	(6.5)	-8	(10.6)	**-25**	(6.7)	**-35**	(7.7)	**-15**	(6.6)	1	(9.6)	**-15**	(7.2)	**-33**	(6.9)	-8	(6.4)	-9	(11.3)	-10	(7.5)	-2	(7.5)
	Indonesia	2	(9.8)	8	(7.7)	2	(9.4)	-8	(16.8)	**18**	(6.5)	**15**	(6.5)	**18**	(6.8)	**20**	(10.2)	**-16**	(6.9)	-7	(5.9)	**-15**	(6.8)	**-29**	(13.6)
	Jordan	**-19**	(7.4)	-12	(9.1)	**-20**	(7.8)	**-24**	(10.6)	-8	(6.6)	-2	(8.3)	-6	(7.1)	**-17**	(7.7)	-10	(7.6)	-10	(10.4)	-14	(8.3)	-6	(10.5)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	-12	(6.3)	**-17**	(7.6)	**-15**	(6.7)	-3	(9.0)	**-13**	(6.1)	-10	(7.7)	**-17**	(6.5)	-11	(8.1)	2	(4.1)	-7	(7.6)	2	(5.7)	8	(9.2)
	Macao (China)	**12**	(5.1)	6	(6.9)	**13**	(5.8)	**16**	(6.7)	**23**	(5.0)	**20**	(6.4)	**25**	(5.7)	**24**	(6.2)	**-11**	(3.5)	**-14**	(6.8)	**-12**	(5.1)	-7	(7.2)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	-2	(5.1)	-12	(6.3)	-4	(5.6)	11	(7.4)	1	(5.0)	-2	(5.9)	1	(5.5)	7	(7.0)	-3	(3.4)	-10	(6.0)	-5	(4.7)	4	(7.6)
	Peru	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	**73**	(4.8)	**45**	(5.6)	**72**	(5.1)	**104**	(7.1)	**64**	(4.8)	**39**	(5.6)	**67**	(5.1)	**87**	(6.5)	**9**	(2.5)	6	(4.4)	6	(3.4)	**17**	(7.8)
	Romania	**15**	(7.1)	**20**	(7.8)	16	(8.6)	7	(9.9)	**18**	(7.4)	**19**	(9.5)	**19**	(8.1)	**19**	(9.6)	-4	(4.5)	1	(7.7)	-3	(6.3)	-13	(8.8)
	Russia	8	(7.0)	16	(9.3)	7	(7.9)	-4	(8.1)	6	(6.6)	14	(8.2)	6	(7.1)	-1	(7.5)	1	(4.2)	2	(7.3)	2	(5.6)	-2	(6.9)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	-1	(7.4)	-9	(9.4)	0	(8.2)	5	(8.7)	1	(7.8)	-4	(9.6)	1	(8.3)	4	(9.6)	-3	(8.3)	-4	(9.7)	-1	(9.5)	1	(12.0)
	Thailand	5	(6.7)	7	(8.0)	5	(7.2)	2	(9.4)	-3	(5.9)	-8	(6.6)	-4	(6.3)	4	(8.5)	8	(5.0)	**15**	(7.2)	9	(6.0)	-2	(9.1)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	5	(6.0)	**27**	(7.3)	4	(6.5)	-18	(9.4)	-3	(6.1)	**20**	(7.1)	-5	(6.1)	**-28**	(9.6)	**9**	(3.8)	7	(7.0)	**9**	(4.6)	9	(9.3)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	**13**	(6.7)	**25**	(9.5)	9	(7.5)	8	(8.3)	2	(5.7)	13	(7.7)	-2	(6.5)	-3	(7.1)	**12**	(5.0)	12	(10.3)	11	(7.1)	11	(7.4)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	**56**	(8.5)	**86**	(14.7)	**54**	(9.2)	**34**	(9.4)	**28**	(8.8)	**58**	(9.6)	**25**	(9.4)	0	(10.6)	**28**	(6.3)	**28**	(12.2)	**29**	(8.1)	**34**	(10.1)
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.9a Top performers in science, reading and mathematics

		15-year-old students who are:																Percentage of top performers in science who are also top performers in reading and mathematics	
		Not top performers in any of the three domains		Top performers only in science		Top performers only in reading		Top performers only in mathematics		Top performers in science and reading but not in mathematics		Top performers in science and mathematics but not in reading		Top performers in reading and mathematics but not in science		Top performers in all three domains			
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	81.6	(0.6)	2.0	(0.2)	3.3	(0.3)	3.0	(0.3)	1.7	(0.3)	2.4	(0.3)	0.9	(0.1)	5.1	(0.4)	45.5	(2.5)
	Austria	83.8	(0.9)	0.9	(0.2)	2.1	(0.3)	5.4	(0.7)	0.7	(0.2)	2.6	(0.3)	1.0	(0.2)	3.4	(0.3)	44.6	(3.2)
	Belgium	80.3	(0.7)	0.9	(0.2)	2.2	(0.2)	6.7	(0.4)	0.7	(0.1)	2.8	(0.2)	1.8	(0.3)	4.6	(0.3)	50.9	(2.4)
	Canada	77.3	(0.9)	1.5	(0.2)	4.1	(0.4)	4.7	(0.5)	2.0	(0.3)	2.4	(0.2)	1.5	(0.2)	6.4	(0.4)	52.0	(2.1)
	Chile	96.7	(0.4)	0.3	(0.1)	1.4	(0.2)	0.6	(0.1)	0.3	(0.1)	0.2	(0.1)	0.2	(0.1)	0.4	(0.1)	34.2	(7.2)
	Czech Republic	86.0	(0.8)	0.8	(0.2)	2.1	(0.3)	3.5	(0.5)	0.7	(0.2)	1.9	(0.2)	1.1	(0.2)	3.9	(0.4)	53.9	(4.0)
	Denmark	85.1	(0.8)	0.9	(0.2)	1.8	(0.3)	5.1	(0.5)	0.6	(0.2)	2.4	(0.4)	1.0	(0.2)	3.1	(0.4)	43.9	(4.4)
	Estonia	79.6	(0.9)	2.1	(0.3)	2.3	(0.3)	3.8	(0.5)	1.8	(0.3)	3.5	(0.4)	0.8	(0.2)	6.1	(0.5)	45.2	(3.0)
	Finland	78.6	(0.8)	2.9	(0.3)	3.9	(0.4)	2.4	(0.3)	3.0	(0.3)	2.4	(0.3)	0.8	(0.2)	6.0	(0.4)	42.1	(2.4)
	France	81.6	(0.8)	0.8	(0.2)	4.9	(0.5)	3.7	(0.4)	1.3	(0.3)	1.4	(0.2)	1.8	(0.3)	4.5	(0.4)	56.5	(3.1)
	Germany	80.8	(1.0)	1.3	(0.2)	3.6	(0.4)	3.7	(0.4)	1.3	(0.2)	2.6	(0.3)	1.3	(0.2)	5.4	(0.4)	51.0	(3.3)
	Greece	93.2	(0.6)	0.3	(0.1)	2.2	(0.3)	1.9	(0.3)	0.4	(0.1)	0.5	(0.1)	0.6	(0.1)	0.9	(0.2)	44.0	(6.2)
	Hungary	89.7	(0.7)	0.6	(0.1)	1.1	(0.2)	3.9	(0.4)	0.4	(0.1)	1.5	(0.3)	0.6	(0.1)	2.1	(0.3)	45.8	(4.9)
	Iceland	86.8	(0.8)	0.4	(0.2)	2.2	(0.4)	5.2	(0.6)	0.3	(0.1)	1.0	(0.2)	2.0	(0.3)	2.1	(0.3)	55.5	(6.7)
	Ireland	84.5	(0.7)	0.6	(0.2)	3.8	(0.5)	3.1	(0.4)	1.2	(0.2)	1.1	(0.2)	1.6	(0.2)	4.1	(0.4)	57.8	(4.0)
	Israel	86.1	(1.0)	0.6	(0.1)	3.5	(0.4)	3.1	(0.5)	0.9	(0.2)	1.0	(0.2)	1.4	(0.3)	3.3	(0.3)	56.7	(4.2)
	Italy	86.5	(0.8)	0.4	(0.1)	2.2	(0.4)	5.9	(0.6)	0.3	(0.1)	1.5	(0.2)	1.3	(0.2)	1.9	(0.2)	46.0	(4.4)
	Japan	74.2	(1.3)	2.4	(0.3)	1.8	(0.3)	7.4	(0.7)	1.2	(0.2)	5.1	(0.5)	1.3	(0.3)	6.5	(0.7)	42.5	(2.6)
	Korea	74.4	(1.4)	0.8	(0.2)	3.2	(0.4)	9.0	(0.8)	0.7	(0.1)	3.1	(0.4)	2.8	(0.3)	5.9	(0.6)	55.7	(3.5)
	Latvia	91.7	(0.5)	0.7	(0.2)	1.8	(0.4)	2.3	(0.3)	0.6	(0.2)	1.0	(0.2)	0.4	(0.1)	1.5	(0.2)	40.2	(4.7)
	Luxembourg	85.9	(0.5)	0.7	(0.2)	2.4	(0.4)	3.7	(0.3)	0.9	(0.2)	1.6	(0.2)	1.1	(0.2)	3.7	(0.3)	53.1	(3.3)
	Mexico	99.4	(0.1)	0.0	(0.0)	0.2	(0.1)	0.2	(0.1)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.1	(0.0)	42.2	(21.8)
	Netherlands	80.0	(0.8)	1.4	(0.2)	2.1	(0.4)	5.0	(0.5)	0.9	(0.2)	2.7	(0.3)	1.8	(0.3)	6.1	(0.5)	54.8	(3.0)
	New Zealand	79.5	(0.9)	2.2	(0.3)	4.4	(0.5)	2.4	(0.3)	2.5	(0.3)	2.2	(0.3)	0.8	(0.2)	5.9	(0.5)	46.3	(3.0)
	Norway	82.4	(0.8)	0.8	(0.2)	5.0	(0.4)	3.1	(0.4)	1.2	(0.2)	1.5	(0.2)	1.6	(0.3)	4.5	(0.4)	56.1	(4.5)
	Poland	84.2	(1.0)	0.7	(0.2)	2.4	(0.4)	4.7	(0.6)	0.5	(0.2)	2.1	(0.3)	1.3	(0.3)	4.0	(0.5)	54.7	(4.4)
	Portugal	84.4	(0.8)	1.0	(0.2)	2.5	(0.4)	4.6	(0.5)	0.7	(0.2)	2.5	(0.3)	1.1	(0.2)	3.3	(0.3)	43.8	(3.3)
	Slovak Republic	90.3	(0.6)	0.6	(0.1)	0.9	(0.2)	4.4	(0.5)	0.3	(0.1)	1.3	(0.2)	0.8	(0.2)	1.4	(0.2)	39.3	(4.9)
	Slovenia	81.9	(0.7)	1.3	(0.3)	2.1	(0.3)	4.6	(0.5)	1.2	(0.2)	3.2	(0.4)	0.8	(0.2)	4.8	(0.5)	45.5	(3.6)
	Spain	89.1	(0.7)	0.8	(0.1)	2.1	(0.4)	3.1	(0.4)	0.7	(0.2)	1.5	(0.2)	0.7	(0.1)	1.9	(0.3)	39.0	(4.9)
	Sweden	83.3	(1.1)	1.2	(0.2)	3.9	(0.4)	3.2	(0.5)	1.1	(0.3)	2.2	(0.3)	1.0	(0.2)	3.9	(0.5)	46.0	(3.2)
	Switzerland	77.8	(1.2)	1.0	(0.2)	1.4	(0.3)	9.4	(0.8)	0.5	(0.2)	3.9	(0.4)	1.5	(0.3)	4.4	(0.4)	44.9	(3.1)
	Turkey	98.4	(0.4)	0.1	(0.1)	0.3	(0.1)	0.8	(0.3)	0.0	(0.0)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	28.4	(15.1)
	United Kingdom	83.1	(0.8)	2.2	(0.3)	2.3	(0.3)	3.1	(0.3)	1.8	(0.2)	2.5	(0.3)	0.7	(0.2)	4.4	(0.4)	40.5	(2.4)
	United States	86.7	(0.8)	1.7	(0.3)	3.3	(0.4)	1.0	(0.3)	2.4	(0.3)	0.9	(0.2)	0.5	(0.2)	3.5	(0.4)	40.9	(3.5)
	EU total	84.4	(0.3)	1.0	(0.1)	2.8	(0.1)	3.9	(0.1)	1.0	(0.1)	1.9	(0.1)	1.2	(0.1)	3.7	(0.1)	48.6	(1.1)
	OECD total	86.0	(0.3)	1.2	(0.1)	2.5	(0.1)	3.1	(0.1)	1.3	(0.1)	1.7	(0.1)	0.9	(0.1)	3.5	(0.1)	45.7	(1.2)
	OECD average	84.7	(0.1)	1.1	(0.0)	2.5	(0.1)	3.9	(0.1)	1.0	(0.0)	2.0	(0.0)	1.1	(0.0)	3.7	(0.1)	46.8	(1.0)
Partners	Albania	98.0	(0.4)	0.1	(0.1)	0.7	(0.2)	0.8	(0.2)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	22.5	(16.4)
	Algeria	99.9	(0.1)	0.0	(0.0)	0.0	(0.0)	0.1	(0.1)	0.0	(0.0)	0.0	(0.0)	0.0	c	0.0	c	m	m
	Brazil	97.8	(0.3)	0.2	(0.1)	1.0	(0.2)	0.4	(0.1)	0.2	(0.0)	0.1	(0.1)	0.1	(0.1)	0.2	(0.1)	28.2	(7.5)
	B-S-J-G (China)	72.3	(2.0)	0.6	(0.2)	1.1	(0.2)	11.2	(1.0)	0.4	(0.1)	5.0	(0.5)	1.9	(0.3)	7.6	(1.1)	55.8	(3.8)
	Bulgaria	93.1	(0.8)	0.5	(0.1)	1.5	(0.3)	2.0	(0.4)	0.5	(0.1)	0.8	(0.2)	0.5	(0.2)	1.2	(0.3)	40.4	(5.9)
	CABA (Argentina)	92.5	(1.5)	1.0	(0.5)	2.3	(0.7)	2.1	(0.7)	0.3	(0.2)	0.7	(0.3)	0.5	(0.3)	0.7	(0.3)	26.2	(9.2)
	Colombia	98.8	(0.2)	0.1	(0.0)	0.7	(0.1)	0.1	(0.1)	0.1	(0.0)	0.0	(0.0)	0.1	(0.1)	0.1	(0.1)	35.1	(11.5)
	Costa Rica	99.1	(0.2)	0.0	(0.0)	0.5	(0.1)	0.1	(0.1)	0.1	(0.1)	0.0	(0.0)	0.1	(0.1)	0.0	(0.0)	33.5	(30.5)
	Croatia	90.7	(0.6)	0.6	(0.1)	2.6	(0.4)	2.0	(0.3)	0.6	(0.1)	0.9	(0.2)	0.8	(0.2)	1.9	(0.3)	49.0	(5.5)
	Cyprus*	94.5	(0.4)	0.3	(0.1)	1.8	(0.3)	1.8	(0.3)	0.3	(0.1)	0.4	(0.2)	0.4	(0.1)	0.6	(0.1)	39.0	(8.1)
	Dominican Republic	99.9	(0.1)	0.0	(0.0)	0.1	(0.1)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	m	m
	FYROM	99.0	(0.2)	0.1	(0.1)	0.1	(0.1)	0.7	(0.2)	0.0	(0.0)	0.1	(0.1)	0.1	(0.0)	0.0	(0.0)	16.6	(23.2)
	Georgia	97.4	(0.5)	0.4	(0.1)	0.6	(0.1)	0.9	(0.3)	0.1	(0.0)	0.2	(0.1)	0.3	(0.1)	0.2	(0.1)	22.3	(8.6)
	Hong Kong (China)	70.7	(1.2)	0.2	(0.1)	2.4	(0.3)	15.4	(0.9)	0.2	(0.1)	2.2	(0.3)	4.1	(0.5)	4.8	(0.6)	65.6	(4.4)
	Indonesia	99.2	(0.2)	0.0	(0.0)	0.1	(0.1)	0.6	(0.2)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	21.5	(20.8)
	Jordan	99.4	(0.2)	0.1	(0.1)	0.2	(0.1)	0.2	(0.1)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	4.2	(8.0)
	Kosovo	100.0	(0.0)	0.0	(0.0)	0.0	c	0.0	(0.0)	0.0	c	0.0	(0.0)	0.0	c	0.0	c	m	m
	Lebanon	97.5	(0.4)	0.1	(0.1)	0.4	(0.2)	1.5	(0.3)	0.0	(0.0)	0.1	(0.1)	0.2	(0.1)	0.2	(0.1)	39.0	(15.4)
	Lithuania	90.5	(0.8)	0.5	(0.1)	1.6	(0.3)	3.1	(0.4)	0.4	(0.1)	1.4	(0.3)	0.6	(0.2)	1.8	(0.3)	43.4	(4.6)
	Macao (China)	76.1	(0.6)	0.8	(0.2)	0.9	(0.2)	12.8	(0.6)	0.4	(0.1)	3.7	(0.4)	1.1	(0.2)	4.3	(0.4)	46.5	(3.8)
	Malta	84.7	(0.6)	1.6	(0.3)	1.3	(0.3)	5.4	(0.6)	0.6	(0.1)	2.7	(0.4)	0.9	(0.2)	2.8	(0.3)	36.6	(4.1)
	Moldova	97.2	(0.3)	0.2	(0.1)	0.7	(0.2)	1.1	(0.2)	0.1	(0.1)	0.2	(0.1)	0.2	(0.1)	0.2	(0.1)	24.8	(9.2)
	Montenegro	97.5	(0.3)	0.1	(0.1)	0.9	(0.3)	1.0	(0.2)	0.1	(0.0)	0.1	(0.1)	0.2	(0.1)	0.2	(0.1)	46.1	(14.8)
	Peru	99.4	(0.2)	0.0	(0.0)	0.2	(0.1)	0.3	(0.1)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	31.1	(20.5)
	Qatar	96.6	(0.2)	0.4	(0.1)	0.6	(0.1)	1.0	(0.2)	0.3	(0.1)	0.5	(0.1)	0.2	(0.1)	0.6	(0.1)	33.8	(3.9)
	Romania	95.7	(0.6)	0.2	(0.1)	0.9	(0.2)	2.0	(0.4)	0.0	(0.0)	0.2	(0.1)	0.8	(0.2)	0.3	(0.1)	41.2	(13.6)
	Russia	87.0	(0.9)	0.5	(0.2)	3.2	(0.5)	4.9	(0.6)	0.6	(0.2)	1.0	(0.2)	1.2	(0.2)	1.7	(0.2)	45.0	(5.2)
	Singapore	60.9	(0.8)	1.6	(0.2)	1.5	(0.3)	11.4	(0.6)	1.1	(0.2)	7.7	(0.5)	2.0	(0.3)	13.7	(0.6)	56.6	(2.1)
	Chinese Taipei	70.1	(1.2)	1.1	(0.2)	0.4	(0.1)	13.5	(0.8)	0.3	(0.1)	8.4	(0.7)	0.7	(0.2)	5.6	(0.7)	36.5	(3.4)
	Thailand	98.3	(0.4)	0.1	(0.1)	0.1	(0.1)	1.0	(0.3)	0.0	(0.0)	0.2	(0.1)	0.1	(0.0)	0.1	(0.1)	28.6	(10.2)
	Trinidad and Tobago	95.8	(0.3)	0.3	(0.1)	1.2	(0.2)	1.1	(0.2)	0.1	(0.1)	0.4	(0.1)	0.5	(0.1)	0.5	(0.2)	36.5	(9.6)
	Tunisia	99.4	(0.2)	0.0	c	0.0	(0.0)	0.5	(0.2)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	m	m
	United Arab Emirates	94.2	(0.4)	0.6	(0.1)	1.1	(0.2)	1.6	(0.2)	0.4	(0.1)	0.7	(0.1)	0.3	(0.1)	1.1	(0.2)	38.7	(4.8)
	Uruguay	96.4	(0.5)	0.2	(0.1)	1.4	(0.3)	0.6	(0.2)	0.3	(0.1)	0.2	(0.1)	0.3	(0.1)	0.5	(0.1)	43.1	(9.5)
	Viet Nam	88.0	(1.5)	2.2	(0.3)	0.2	(0.1)	3.4	(0.5)	0.2	(0.1)	3.8	(0.6)	0.2	(0.1)	2.0	(0.6)	24.8	(5.0)
	Argentina**	98.1	(0.3)	0.3	(0.2)	0.6	(0.1)	0.5	(0.2)	0.1	(0.1)	0.1	(0.1)	0.1	(0.0)	0.1	(0.1)	17.7	(8.6)
	Kazakhstan**	94.5	(0.9)	0.8	(0.3)	0.4	(0.2)	3.1	(0.6)	0.1	(0.1)	0.8	(0.3)	0.1	(0.1)	0.2	(0.1)	10.3	(5.9)
	Malaysia**	97.7	(0.5)	0.1	(0.1)	0.1	(0.1)	1.5	(0.3)	0.0	(0.0)	0.3	(0.1)	0.1	(0.1)	0.2	(0.1)	30.8	(14.2)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.10a Low achievers in science, reading and mathematics

	15-year-old students who are:																Percentage of low achievers in science who are also low achievers in reading and mathematics	
	Not low achievers in any of the three domains		Low achievers only in science		Low achievers only in reading		Low achievers only in mathematics		Low achievers in science and reading but not in mathematics		Low achievers in science and mathematics but not in reading		Low achievers in reading and mathematics but not in science		Low achievers in all three domains			
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD																		
Australia	71.7	(0.7)	1.4	(0.2)	3.1	(0.3)	5.7	(0.4)	1.9	(0.2)	3.2	(0.3)	2.0	(0.2)	11.1	(0.4)	63.0	(1.6)
Austria	69.4	(1.1)	1.7	(0.3)	4.3	(0.4)	3.7	(0.5)	2.9	(0.4)	2.7	(0.3)	1.9	(0.3)	13.5	(0.9)	64.8	(2.5)
Belgium	72.6	(1.0)	1.9	(0.2)	2.8	(0.3)	3.3	(0.4)	2.6	(0.3)	2.6	(0.3)	1.5	(0.2)	12.7	(0.8)	64.0	(2.3)
Canada	80.8	(0.8)	1.2	(0.2)	2.3	(0.3)	4.7	(0.4)	1.4	(0.2)	2.6	(0.3)	1.1	(0.2)	5.9	(0.4)	53.6	(2.2)
Chile	47.0	(1.3)	1.2	(0.2)	1.4	(0.3)	14.1	(0.8)	1.0	(0.2)	9.3	(0.6)	2.6	(0.3)	23.3	(1.0)	66.8	(1.8)
Czech Republic	70.0	(1.2)	1.8	(0.3)	3.8	(0.4)	3.7	(0.4)	2.7	(0.4)	2.5	(0.4)	1.9	(0.4)	13.7	(0.9)	66.1	(2.0)
Denmark	77.2	(1.0)	2.5	(0.3)	3.4	(0.4)	2.7	(0.3)	3.3	(0.4)	2.6	(0.4)	0.8	(0.2)	7.5	(0.6)	47.1	(2.8)
Estonia	83.1	(0.8)	1.0	(0.2)	3.2	(0.4)	3.7	(0.4)	1.5	(0.3)	1.6	(0.3)	1.2	(0.3)	4.7	(0.4)	54.0	(3.8)
Finland	81.4	(0.9)	1.4	(0.2)	2.0	(0.3)	4.0	(0.4)	1.6	(0.2)	2.2	(0.3)	1.2	(0.2)	6.3	(0.6)	54.8	(3.8)
France	69.7	(0.9)	1.8	(0.2)	2.8	(0.3)	3.9	(0.4)	2.3	(0.3)	3.2	(0.3)	1.7	(0.2)	14.8	(0.9)	67.0	(2.1)
Germany	75.5	(1.1)	2.0	(0.3)	3.0	(0.4)	3.4	(0.4)	2.3	(0.3)	2.9	(0.3)	1.1	(0.2)	9.8	(0.8)	57.8	(2.8)
Greece	56.7	(1.9)	2.6	(0.3)	2.2	(0.3)	6.7	(0.5)	2.7	(0.4)	6.6	(0.7)	1.7	(0.3)	20.7	(1.7)	63.3	(2.6)
Hungary	63.8	(1.2)	1.4	(0.2)	3.7	(0.5)	4.3	(0.4)	3.0	(0.4)	3.0	(0.4)	2.2	(0.3)	18.5	(1.0)	71.2	(2.1)
Iceland	65.2	(1.1)	3.9	(0.5)	3.6	(0.4)	4.2	(0.5)	3.6	(0.5)	4.6	(0.5)	1.6	(0.3)	13.2	(0.7)	52.0	(2.4)
Ireland	79.3	(0.9)	2.9	(0.4)	1.2	(0.2)	3.6	(0.4)	1.6	(0.3)	4.0	(0.5)	0.6	(0.2)	6.8	(0.6)	44.1	(2.7)
Israel	59.9	(1.5)	3.1	(0.3)	2.1	(0.3)	5.1	(0.4)	2.8	(0.4)	5.3	(0.5)	1.5	(0.3)	20.2	(1.1)	64.2	(1.9)
Italy	66.6	(1.2)	3.0	(0.3)	3.7	(0.5)	4.8	(0.5)	3.4	(0.4)	4.6	(0.5)	1.6	(0.2)	12.2	(0.8)	52.7	(2.4)
Japan	82.4	(1.0)	1.0	(0.2)	4.0	(0.4)	2.5	(0.4)	1.9	(0.3)	1.2	(0.2)	1.4	(0.3)	5.6	(0.6)	58.1	(3.9)
Korea	77.9	(1.2)	2.0	(0.2)	2.6	(0.4)	3.7	(0.4)	2.0	(0.3)	2.7	(0.3)	1.4	(0.3)	7.7	(0.7)	53.3	(2.9)
Latvia	71.6	(1.0)	1.5	(0.3)	3.3	(0.4)	6.0	(0.7)	2.1	(0.3)	3.1	(0.3)	1.8	(0.3)	10.5	(0.6)	60.6	(2.6)
Luxembourg	65.2	(0.6)	2.0	(0.2)	3.6	(0.4)	3.8	(0.4)	3.5	(0.3)	3.4	(0.4)	1.6	(0.3)	17.0	(0.5)	65.7	(1.7)
Mexico	35.9	(1.3)	2.6	(0.3)	2.3	(0.4)	10.8	(0.6)	2.5	(0.4)	8.9	(0.6)	3.1	(0.4)	33.8	(1.2)	70.7	(1.6)
Netherlands	74.9	(1.1)	2.5	(0.3)	3.0	(0.4)	2.2	(0.3)	2.8	(0.4)	2.3	(0.3)	1.3	(0.3)	10.9	(0.8)	58.8	(2.3)
New Zealand	71.9	(1.1)	1.5	(0.3)	3.1	(0.4)	5.8	(0.5)	1.9	(0.3)	3.5	(0.3)	1.7	(0.3)	10.6	(0.6)	60.7	(2.4)
Norway	74.6	(1.0)	3.2	(0.4)	2.7	(0.4)	3.1	(0.4)	2.4	(0.3)	4.1	(0.4)	0.9	(0.2)	8.9	(0.5)	47.8	(2.1)
Poland	75.7	(1.0)	2.1	(0.3)	2.9	(0.4)	4.0	(0.5)	2.1	(0.4)	3.8	(0.4)	1.2	(0.2)	8.3	(0.6)	50.9	(2.3)
Portugal	70.8	(1.1)	1.4	(0.2)	2.6	(0.4)	6.7	(0.4)	1.4	(0.3)	3.8	(0.4)	2.5	(0.4)	10.7	(0.6)	61.8	(2.1)
Slovak Republic	59.2	(1.1)	3.1	(0.3)	5.3	(0.5)	2.9	(0.3)	4.8	(0.5)	2.8	(0.4)	2.0	(0.3)	20.1	(1.0)	65.5	(1.7)
Slovenia	76.7	(0.6)	1.6	(0.2)	3.2	(0.4)	3.6	(0.4)	2.3	(0.3)	2.9	(0.4)	1.4	(0.2)	8.2	(0.4)	54.7	(2.2)
Spain	71.7	(1.0)	1.6	(0.2)	2.5	(0.4)	6.0	(0.4)	2.0	(0.3)	4.4	(0.4)	1.4	(0.2)	10.3	(0.7)	56.5	(2.3)
Sweden	70.3	(1.4)	2.9	(0.3)	3.2	(0.3)	3.8	(0.4)	2.7	(0.4)	4.6	(0.4)	1.1	(0.2)	11.4	(0.8)	52.6	(2.1)
Switzerland	73.3	(1.2)	2.3	(0.3)	4.7	(0.5)	2.2	(0.4)	3.9	(0.5)	2.2	(0.4)	1.3	(0.3)	10.1	(0.8)	54.6	(3.2)
Turkey	40.7	(2.2)	2.2	(0.3)	3.0	(0.5)	8.8	(0.8)	2.8	(0.4)	8.3	(0.6)	3.0	(0.4)	31.2	(1.8)	70.1	(1.6)
United Kingdom	71.0	(1.0)	1.6	(0.2)	3.5	(0.4)	5.8	(0.5)	2.1	(0.3)	3.7	(0.4)	2.3	(0.3)	10.1	(0.7)	57.8	(3.2)
United States	66.4	(1.5)	1.2	(0.2)	1.9	(0.3)	9.0	(0.8)	1.2	(0.2)	4.4	(0.5)	2.4	(0.3)	13.6	(0.9)	66.8	(2.3)
EU total	70.1	(0.3)	2.1	(0.1)	3.2	(0.1)	4.5	(0.1)	2.5	(0.1)	3.6	(0.1)	1.7	(0.1)	12.3	(0.2)	59.8	(0.7)
OECD total	65.2	(0.5)	1.7	(0.1)	2.7	(0.1)	6.6	(0.2)	2.0	(0.1)	4.5	(0.2)	2.0	(0.1)	15.2	(0.3)	64.8	(0.8)
OECD average	69.2	(0.2)	2.0	(0.0)	3.0	(0.1)	4.9	(0.1)	2.4	(0.1)	3.8	(0.1)	1.7	(0.0)	13.0	(0.1)	59.2	(0.4)
Partners																		
Albania	33.6	(1.9)	1.6	(0.3)	8.0	(0.8)	9.1	(0.7)	3.6	(0.5)	5.5	(0.6)	7.6	(0.7)	31.1	(1.6)	74.5	(2.0)
Algeria	9.3	(1.0)	1.0	(0.2)	4.8	(0.6)	6.0	(0.6)	3.9	(0.4)	4.7	(0.6)	9.1	(0.7)	61.1	(1.7)	86.4	(1.1)
Brazil	25.2	(1.1)	1.3	(0.2)	1.7	(0.2)	12.8	(0.6)	1.6	(0.3)	9.7	(0.6)	3.7	(0.3)	44.1	(1.1)	77.8	(1.1)
B-S-J-G (China)	73.9	(1.6)	1.1	(0.2)	6.1	(0.6)	1.9	(0.3)	3.0	(0.4)	1.2	(0.2)	1.8	(0.3)	10.9	(1.0)	67.2	(2.4)
Bulgaria	48.0	(2.0)	1.3	(0.2)	5.0	(0.5)	5.9	(0.5)	3.6	(0.4)	3.4	(0.4)	3.3	(0.4)	29.6	(1.7)	78.1	(1.7)
CABA (Argentina)	60.1	(3.1)	1.8	(0.6)	3.0	(0.9)	11.0	(1.8)	1.1	(0.5)	5.3	(1.2)	3.2	(0.7)	14.5	(1.9)	64.1	(4.6)
Colombia	31.5	(1.1)	0.6	(0.1)	1.0	(0.2)	15.4	(0.8)	0.6	(0.1)	9.6	(0.7)	3.1	(0.4)	38.2	(1.5)	78.0	(1.5)
Costa Rica	32.6	(1.3)	1.5	(0.3)	1.9	(0.2)	15.2	(0.9)	1.5	(0.2)	10.3	(0.6)	3.9	(0.6)	33.0	(1.2)	71.3	(1.5)
Croatia	62.6	(1.4)	2.0	(0.3)	1.9	(0.3)	8.9	(0.7)	1.5	(0.2)	6.6	(0.6)	2.0	(0.3)	14.5	(1.0)	58.9	(2.4)
Cyprus*	45.9	(0.8)	4.0	(0.4)	3.4	(0.5)	6.5	(0.5)	4.1	(0.4)	7.9	(0.6)	2.0	(0.3)	26.1	(0.6)	62.0	(1.4)
Dominican Republic	7.3	(0.9)	1.3	(0.3)	0.2	(0.1)	6.1	(0.7)	0.6	(0.2)	13.1	(0.9)	0.7	(0.2)	70.7	(1.5)	82.4	(1.2)
FYROM	17.6	(0.6)	2.3	(0.3)	6.0	(0.5)	5.0	(0.5)	3.9	(0.4)	4.4	(0.4)	8.6	(0.5)	52.2	(0.9)	83.0	(1.1)
Georgia	30.4	(1.1)	4.7	(0.4)	4.9	(0.5)	6.4	(0.5)	2.9	(0.3)	6.8	(0.6)	7.5	(0.5)	36.3	(1.2)	71.5	(1.4)
Hong Kong (China)	85.6	(0.9)	1.3	(0.3)	2.2	(0.3)	2.0	(0.3)	1.8	(0.3)	1.7	(0.3)	0.7	(0.2)	4.5	(0.5)	48.2	(3.5)
Indonesia	23.1	(1.3)	1.9	(0.3)	4.2	(0.4)	9.9	(0.7)	2.1	(0.3)	9.7	(0.7)	6.8	(0.6)	42.3	(1.6)	75.5	(1.4)
Jordan	26.0	(1.2)	1.8	(0.3)	2.8	(0.3)	15.4	(1.1)	1.8	(0.3)	10.4	(0.6)	6.0	(0.5)	35.7	(1.4)	71.7	(1.3)
Kosovo	13.2	(0.7)	1.1	(0.3)	5.5	(0.5)	5.2	(0.8)	2.5	(0.5)	3.7	(0.5)	8.4	(0.7)	60.4	(1.0)	89.2	(0.9)
Lebanon	22.6	(1.5)	2.8	(0.3)	7.4	(0.7)	2.2	(0.4)	7.1	(0.6)	2.1	(0.3)	5.3	(0.6)	50.7	(1.7)	80.9	(1.2)
Lithuania	64.6	(1.1)	2.1	(0.3)	4.6	(0.5)	4.2	(0.4)	3.3	(0.4)	4.0	(0.5)	1.9	(0.3)	15.3	(0.8)	62.0	(1.8)
Macao (China)	85.0	(0.5)	0.9	(0.2)	4.5	(0.3)	1.7	(0.3)	2.9	(0.4)	0.7	(0.2)	0.7	(0.2)	3.5	(0.3)	43.6	(3.8)
Malta	56.4	(0.8)	3.0	(0.4)	6.2	(0.6)	2.5	(0.4)	5.2	(0.6)	2.4	(0.5)	2.3	(0.4)	21.9	(0.7)	67.4	(2.1)
Moldova	37.3	(1.0)	2.8	(0.3)	6.0	(0.6)	8.3	(0.8)	3.6	(0.4)	5.8	(0.5)	6.1	(0.7)	30.1	(1.0)	71.2	(1.4)
Montenegro	37.0	(0.8)	4.5	(0.4)	2.6	(0.3)	7.1	(0.6)	4.0	(0.4)	9.5	(0.5)	2.2	(0.3)	33.0	(0.8)	64.7	(1.3)
Peru	27.6	(1.4)	2.0	(0.3)	2.0	(0.3)	8.9	(0.7)	2.2	(0.3)	7.5	(0.6)	3.0	(0.4)	46.7	(1.4)	79.9	(1.3)
Qatar	34.9	(0.5)	1.3	(0.1)	2.9	(0.3)	8.0	(0.4)	2.2	(0.3)	4.3	(0.3)	4.4	(0.3)	42.0	(0.5)	84.3	(0.9)
Romania	45.5	(1.9)	5.4	(0.7)	5.0	(0.6)	5.7	(0.6)	4.1	(0.5)	4.7	(0.5)	5.2	(0.6)	24.3	(1.5)	63.1	(2.1)
Russia	70.8	(1.5)	3.0	(0.4)	4.1	(0.6)	5.7	(0.5)	3.2	(0.4)	4.3	(0.5)	1.2	(0.3)	7.7	(0.7)	42.4	(2.6)
Singapore	85.5	(0.5)	1.2	(0.2)	3.0	(0.3)	1.2	(0.2)	2.7	(0.3)	0.9	(0.2)	0.6	(0.1)	4.8	(0.3)	49.9	(3.2)
Chinese Taipei	79.2	(0.9)	0.8	(0.2)	4.9	(0.4)	1.9	(0.2)	2.4	(0.3)	0.9	(0.1)	1.6	(0.3)	8.3	(0.6)	67.0	(2.5)
Thailand	34.9	(1.6)	1.8	(0.3)	5.0	(0.5)	8.7	(0.6)	4.5	(0.5)	4.7	(0.5)	4.7	(0.5)	35.8	(1.5)	76.5	(1.5)
Trinidad and Tobago	39.6	(0.8)	3.1	(0.4)	3.2	(0.4)	6.7	(0.6)	1.7	(0.3)	8.1	(0.6)	4.6	(0.4)	32.9	(0.8)	71.8	(1.5)
Tunisia	16.2	(1.0)	1.0	(0.3)	4.6	(0.5)	6.9	(0.6)	3.3	(0.5)	4.3	(0.5)	6.3	(0.6)	57.3	(1.4)	86.9	(1.2)
United Arab Emirates	43.4	(1.1)	1.9	(0.2)	3.0	(0.3)	8.6	(0.5)	2.9	(0.4)	5.7	(0.4)	3.2	(0.3)	31.3	(1.1)	74.9	(1.5)
Uruguay	41.9	(1.1)	1.3	(0.2)	2.7	(0.3)	10.8	(0.6)	1.7	(0.3)	7.0	(0.5)	3.8	(0.4)	30.8	(1.1)	75.4	(1.4)
Viet Nam	76.6	(1.9)	0.2	(0.1)	3.7	(0.5)	8.5	(0.7)	0.4	(0.1)	0.9	(0.2)	5.3	(0.8)	4.5	(0.6)	75.2	(3.7)
Argentina**	37.0	(1.6)	1.7	(0.3)	3.6	(0.4)	13.0	(0.9)	1.6	(0.3)	6.6	(0.6)	6.7	(0.6)	29.9	(1.4)	75.1	(1.5)
Kazakhstan**	46.1	(2.0)	2.9	(0.4)	13.0	(1.2)	6.4	(0.8)	5.9	(0.7)	3.4	(0.6)	6.5	(0.7)	15.9	(1.3)	56.6	(2.9)
Malaysia**	51.9	(1.7)	1.5	(0.3)	5.2	(0.6)	6.0	(0.6)	3.9	(0.5)	3.4	(0.4)	3.2	(0.5)	24.9	(1.3)	73.8	(1.7)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.11 Socio-economic indicators and performance in science

		Mean performance in science	Socio-economic indicators					Adjusted performance in science after accounting for per capita GDP
			Per capita GDP (in equivalent USD converted using PPPs) 2014[1]	Cumulative expenditure per student between 6 and 15 years (in equivalent USD converted using PPPs)[1]	Percentage of 35-44 year-olds with tertiary education[2]	Share of students in their own country whose PISA index of economic, social and cultural status is below -1	Proportion of 15-year-olds with an immigrant background (first generation)	
OECD	**Australia**	510	45 925	92 316	45.9	6.4	12.3	503
	Austria	495	47 682	132 955	33.2	8.5	7.6	487
	Belgium	502	43 435	110 316	42.2	10.8	8.7	498
	Canada	528	45 066	94 254	60.6	3.9	14.2	522
	Chile	447	22 071	40 607	24.2	34.4	1.6	473
	Czech Republic	493	31 186	63 576	21.2	15.9	1.7	503
	Denmark	502	45 537	103 852	40.6	5.2	2.8	495
	Estonia	534	28 140	63 858	39.0	8.8	0.7	549
	Finland	531	40 676	101 527	49.9	4.1	2.2	529
	France	495	39 328	89 435	39.1	14.1	4.5	495
	Germany	509	46 401	92 214	28.5	12.1	3.7	502
	Greece	455	26 851	m	27.1	19.2	3.8	472
	Hungary	477	25 069	47 229	24.5	23.1	1.1	497
	Iceland	473	43 993	107 811	42.0	1.6	2.8	468
	Ireland	503	49 393	91 171	49.0	8.2	11.0	493
	Israel	467	33 703	64 973	52.8	8.9	4.5	473
	Italy	481	35 463	86 701	19.4	18.3	4.8	485
	Japan	538	36 619	93 200	28.5	13.8	0.2	542
	Korea	516	33 395	79 517	56.4	11.9	0.1	523
	Latvia	490	23 548	59 899	31.4	31.8	1.0	513
	Luxembourg	483	98 460	187 459	55.8	17.9	21.4	442
	Mexico	416	17 315	27 848	17.5	59.0	0.9	452
	Netherlands	509	48 253	99 430	37.6	6.3	2.2	500
	New Zealand	513	37 679	80 890	40.7	7.5	16.2	515
	Norway	498	65 614	135 227	48.7	2.8	6.1	476
	Poland	501	25 262	67 767	31.9	26.2	0.2	521
	Portugal	501	28 760	83 050	26.4	33.8	4.1	515
	Slovak Republic	461	28 327	58 382	20.7	12.9	0.6	475
	Slovenia	513	30 403	92 850	34.7	11.6	3.3	524
	Spain	493	33 629	74 947	42.8	36.9	9.1	500
	Sweden	493	45 297	110 733	46.1	5.9	7.6	487
	Switzerland	506	59 540	173 151	44.8	11.0	10.4	487
	Turkey	425	19 788	32 752	15.9	64.4	0.3	456
	United Kingdom	509	40 233	114 920	45.8	8.5	8.8	508
	United States	496	54 629	115 180	47.2	14.8	7.4	482
	OECD average	493	39 333	90 294	37.5	16.6	5.4	493
Partners	**Albania**	427	11 108	m	m	46,9	0,2	483
	Algeria	376	14 244	m	m	60,6	0,0	421
	Brazil	401	15 893	38 190	14,1	50,5	0,3	441
	B-S-J-G (China)	518	m	m	m	58,4	0,2	m
	Bulgaria	446	17 260	29 980	m	19,5	0,5	482
	CABA (Argentina)	475	m	m	m	21,0	6,2	m
	Colombia	416	13 357	24 395	23,0	50,2	0,2	464
	Costa Rica	420	14 885	46 531	18,3	45,2	2,6	463
	Croatia	475	20 939	50 722	m	17,3	1,8	503
	Cyprus*	433	29 790	112 133	m	9,7	8,0	445
	Dominican Republic	332	13 964	24 264	m	47,3	0,8	377
	FYROM	384	13 523	m	m	19,7	0,7	431
	Georgia	411	6 666	11 704	m	25,9	0,3	490
	Hong Kong (China)	523	55 195	m	m	33,9	13,8	508
	Indonesia	403	10 517	m	8,5	78,5	0,1	461
	Jordan	409	12 050	m	m	27,6	3,1	461
	Kosovo	378	9 114	m	m	15,2	0,7	443
	Lebanon	386	17 462	m	m	32,8	1,8	422
	Lithuania	475	27 581	48 389	37,6	18,8	0,4	491
	Macao (China)	529	127 051	m	m	31,5	18,9	477
	Malta	465	31 661	112 780	m	19,1	3,5	474
	Moldova	428	4 983	m	m	38,7	0,4	519
	Montenegro	411	14 656	25 786	m	16,6	1,9	455
	Peru	397	12 043	20 114	m	56,0	0,1	449
	Qatar	418	138 050	m	m	4,2	40,0	362
	Romania	435	20 348	m	m	31,0	0,1	464
	Russia	487	22 990	51 492	55,3	9,2	3,1	510
	Singapore	556	82 515	130 611	m	15,0	14,1	523
	Chinese Taipei	532	22 648	46 009	m	18,3	0,1	557
	Thailand	421	16 804	27 220	m	62,6	0,1	459
	Trinidad and Tobago	425	31 967	m	m	20,0	1,5	434
	Tunisia	386	11 436	m	m	46,6	0,5	441
	United Arab Emirates	437	67 674	m	m	3,7	34,4	413
	Uruguay	435	20 881	31 811	m	46,4	0,3	463
	Viet Nam	525	5 629	m	m	80,4	0,0	611
	Argentina**	432	21 795	48 947	m	44,7	1,4	458
	Kazakhstan**	456	23 429	22 689	m	13,1	3,6	479
	Malaysia**	443	25 639	m	m	34,2	0,1	462

1. Source: OECD, PISA 2015 Database, Table II.6.59.
2. Source: OECD, *Education at a Glance 2015: OECD Indicators*.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.2.12a Index of epistemic beliefs

Percentage of students who reported "agree" or "strongly agree"

			Index of epistemic beliefs		Percentage of students who agreed with the following statements:											
					A good way to know if something is true is to do an experiment		Ideas in <broad science> sometimes change		Good answers are based on evidence from many different experiments		It is good to try experiments more than once to make sure of your findings		Sometimes <broad science> scientists change their minds about what is true in science		The ideas in <broad science> science books sometimes change	
			Mean index	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia		0.26	(0.01)	89.3	(0.3)	91.5	(0.3)	92.0	(0.3)	93.0	(0.3)	87.3	(0.3)	85.6	(0.4)
	Austria		-0.14	(0.02)	73.3	(0.8)	62.6	(0.8)	76.3	(0.7)	77.0	(0.6)	67.1	(0.7)	66.7	(0.7)
	Belgium		0.00	(0.01)	87.7	(0.5)	82.2	(0.6)	87.6	(0.5)	86.2	(0.5)	81.6	(0.5)	79.5	(0.6)
	Canada		0.30	(0.01)	89.3	(0.4)	89.4	(0.4)	91.2	(0.3)	91.6	(0.3)	88.1	(0.3)	87.2	(0.4)
	Chile		-0.15	(0.02)	80.1	(0.7)	77.0	(0.7)	81.3	(0.7)	83.1	(0.7)	74.9	(0.7)	70.8	(0.7)
	Czech Republic		-0.23	(0.02)	82.1	(0.7)	78.7	(0.7)	84.2	(0.7)	83.4	(0.7)	81.4	(0.7)	76.8	(0.7)
	Denmark		0.17	(0.02)	88.4	(0.5)	84.6	(0.6)	88.6	(0.6)	87.3	(0.6)	88.9	(0.6)	81.0	(0.6)
	Estonia		0.01	(0.01)	87.8	(0.5)	84.6	(0.5)	89.0	(0.5)	88.9	(0.5)	82.9	(0.4)	85.3	(0.5)
	Finland		-0.07	(0.02)	84.1	(0.6)	84.3	(0.6)	87.5	(0.6)	87.0	(0.6)	77.9	(0.6)	80.8	(0.6)
	France		0.01	(0.02)	87.5	(0.5)	83.0	(0.6)	86.2	(0.6)	84.2	(0.6)	80.7	(0.5)	79.9	(0.6)
	Germany		-0.16	(0.02)	78.2	(0.9)	70.9	(0.8)	78.8	(0.8)	76.5	(0.9)	65.3	(0.9)	66.1	(0.9)
	Greece		-0.19	(0.02)	80.2	(0.7)	69.7	(0.9)	84.6	(0.8)	84.2	(0.8)	74.9	(0.7)	69.5	(0.7)
	Hungary		-0.36	(0.02)	77.8	(0.8)	71.2	(0.8)	80.5	(0.7)	80.0	(0.8)	67.8	(0.8)	70.3	(0.8)
	Iceland		0.29	(0.02)	87.3	(0.6)	87.9	(0.6)	89.7	(0.5)	90.1	(0.6)	86.5	(0.6)	85.1	(0.6)
	Ireland		0.21	(0.01)	93.4	(0.4)	91.8	(0.4)	93.2	(0.4)	93.9	(0.3)	81.6	(0.5)	81.8	(0.6)
	Israel		0.18	(0.02)	85.9	(0.7)	83.5	(0.6)	85.9	(0.7)	86.1	(0.6)	80.6	(0.7)	78.4	(0.8)
	Italy		-0.10	(0.02)	85.6	(0.6)	80.2	(0.6)	83.9	(0.7)	86.9	(0.6)	76.6	(0.7)	76.2	(0.5)
	Japan		-0.06	(0.02)	80.6	(0.6)	82.4	(0.6)	84.6	(0.5)	81.2	(0.5)	76.3	(0.6)	76.9	(0.7)
	Korea		0.02	(0.02)	86.2	(0.6)	89.5	(0.6)	87.0	(0.6)	87.5	(0.6)	87.9	(0.7)	86.2	(0.7)
	Latvia		-0.26	(0.01)	80.8	(0.6)	79.0	(0.7)	80.6	(0.6)	76.6	(0.6)	78.7	(0.6)	77.8	(0.7)
	Luxembourg		-0.15	(0.01)	79.8	(0.6)	68.1	(0.7)	80.2	(0.6)	78.4	(0.7)	67.8	(0.7)	68.0	(0.7)
	Mexico		-0.17	(0.02)	83.8	(0.5)	75.8	(0.7)	83.5	(0.6)	80.2	(0.6)	75.1	(0.6)	77.3	(0.6)
	Netherlands		-0.19	(0.01)	85.5	(0.6)	80.7	(0.6)	85.3	(0.6)	85.4	(0.5)	77.3	(0.6)	71.7	(0.7)
	New Zealand		0.22	(0.02)	89.7	(0.5)	90.7	(0.6)	91.5	(0.5)	92.9	(0.4)	86.5	(0.6)	83.8	(0.7)
	Norway		-0.01	(0.02)	84.0	(0.6)	83.3	(0.6)	86.8	(0.5)	85.3	(0.5)	83.7	(0.6)	80.5	(0.6)
	Poland		-0.08	(0.02)	86.5	(0.6)	77.8	(0.7)	84.8	(0.6)	84.9	(0.6)	79.6	(0.6)	83.0	(0.6)
	Portugal		0.28	(0.02)	90.4	(0.4)	90.9	(0.4)	90.9	(0.5)	93.4	(0.3)	89.4	(0.5)	89.8	(0.5)
	Slovak Republic		-0.35	(0.02)	75.3	(0.8)	74.5	(0.7)	78.4	(0.7)	76.7	(0.7)	75.2	(0.7)	72.5	(0.7)
	Slovenia		0.07	(0.02)	88.6	(0.5)	86.6	(0.5)	89.4	(0.4)	90.0	(0.5)	81.3	(0.7)	78.3	(0.7)
	Spain		0.11	(0.02)	85.5	(0.5)	82.1	(0.6)	86.9	(0.5)	87.9	(0.5)	81.0	(0.6)	81.2	(0.6)
	Sweden		0.14	(0.02)	85.6	(0.6)	85.9	(0.7)	87.3	(0.6)	88.2	(0.6)	85.6	(0.7)	83.8	(0.7)
	Switzerland		-0.07	(0.02)	81.0	(0.8)	69.6	(0.8)	81.4	(0.8)	79.6	(0.8)	70.7	(0.9)	70.8	(0.8)
	Turkey		-0.17	(0.03)	73.3	(0.9)	71.9	(1.0)	76.1	(0.9)	75.9	(0.8)	72.0	(0.9)	71.3	(0.9)
	United Kingdom		0.22	(0.02)	90.0	(0.5)	91.6	(0.4)	91.0	(0.4)	92.7	(0.4)	87.1	(0.5)	86.7	(0.5)
	United States		0.25	(0.02)	90.0	(0.5)	91.6	(0.5)	91.2	(0.4)	91.7	(0.5)	86.1	(0.5)	86.8	(0.6)
	OECD average		0.00	(0.00)	84.4	(0.1)	81.3	(0.1)	85.6	(0.1)	85.4	(0.1)	79.6	(0.1)	78.5	(0.1)
Partners	Albania		-0.03	(0.02)	84.6	(0.7)	78.3	(0.6)	75.2	(0.8)	85.2	(0.6)	75.4	(0.8)	88.6	(0.6)
	Algeria		-0.31	(0.02)	78.5	(0.9)	71.0	(0.8)	74.8	(0.7)	78.4	(0.8)	63.9	(0.8)	64.8	(0.8)
	Brazil		-0.07	(0.01)	85.1	(0.4)	84.4	(0.5)	87.6	(0.4)	88.4	(0.4)	82.1	(0.5)	78.9	(0.5)
	B-S-J-G (China)		-0.08	(0.02)	89.0	(0.6)	82.7	(0.7)	91.5	(0.5)	86.8	(0.6)	82.3	(0.6)	82.2	(0.6)
	Bulgaria		-0.18	(0.02)	80.9	(0.9)	76.6	(0.9)	82.4	(0.9)	80.2	(0.8)	77.3	(0.7)	76.6	(0.9)
	CABA (Argentina)		0.09	(0.04)	83.7	(1.1)	85.0	(1.2)	84.4	(1.2)	86.9	(0.8)	79.7	(0.9)	75.2	(1.2)
	Colombia		-0.19	(0.01)	80.8	(0.7)	77.3	(0.6)	82.4	(0.6)	84.0	(0.5)	74.6	(0.7)	71.9	(0.6)
	Costa Rica		-0.15	(0.02)	79.2	(0.6)	74.7	(0.6)	81.5	(0.6)	83.2	(0.6)	78.0	(0.6)	76.7	(0.6)
	Croatia		0.03	(0.02)	89.0	(0.6)	86.6	(0.6)	89.3	(0.5)	84.7	(0.5)	83.4	(0.6)	82.7	(0.6)
	Cyprus*		-0.15	(0.02)	78.2	(0.6)	73.6	(0.6)	80.8	(0.6)	79.9	(0.6)	75.5	(0.7)	74.0	(0.6)
	Dominican Republic		-0.10	(0.03)	78.3	(0.9)	77.3	(0.9)	80.4	(0.9)	79.5	(0.8)	74.0	(0.9)	71.0	(0.9)
	FYROM		-0.18	(0.01)	78.4	(0.5)	78.3	(0.6)	81.1	(0.5)	83.9	(0.5)	75.3	(0.6)	76.5	(0.6)
	Georgia		0.05	(0.02)	86.2	(0.6)	86.5	(0.6)	86.2	(0.6)	86.0	(0.6)	82.1	(0.7)	78.2	(0.7)
	Hong Kong (China)		0.04	(0.02)	85.1	(0.5)	88.7	(0.5)	90.2	(0.5)	90.2	(0.6)	88.3	(0.6)	86.3	(0.6)
	Indonesia		-0.30	(0.01)	91.7	(0.5)	61.9	(0.8)	84.1	(0.5)	89.8	(0.4)	69.4	(0.7)	58.2	(0.8)
	Jordan		-0.13	(0.02)	74.9	(1.1)	75.4	(0.9)	79.1	(0.8)	80.8	(0.7)	71.7	(0.8)	71.0	(0.9)
	Kosovo		0.03	(0.02)	84.2	(0.7)	80.1	(0.7)	84.9	(0.6)	86.8	(0.6)	74.3	(0.8)	76.8	(0.7)
	Lebanon		-0.24	(0.03)	79.4	(1.2)	65.5	(1.3)	81.2	(0.9)	81.3	(1.0)	68.2	(1.2)	67.4	(1.2)
	Lithuania		0.11	(0.02)	81.0	(0.6)	78.9	(0.6)	81.1	(0.6)	79.1	(0.5)	77.5	(0.6)	76.6	(0.6)
	Macao (China)		-0.06	(0.01)	87.8	(0.5)	88.1	(0.5)	91.0	(0.5)	82.3	(0.6)	86.0	(0.6)	85.2	(0.6)
	Malta		0.09	(0.02)	85.1	(0.6)	85.5	(0.6)	88.7	(0.5)	89.3	(0.5)	75.6	(0.7)	77.2	(0.7)
	Moldova		-0.14	(0.01)	82.0	(0.6)	82.7	(0.7)	86.8	(0.6)	85.2	(0.6)	80.4	(0.6)	74.2	(0.7)
	Montenegro		-0.32	(0.02)	71.3	(0.8)	74.3	(0.7)	76.9	(0.7)	78.6	(0.6)	74.7	(0.8)	75.3	(0.7)
	Peru		-0.16	(0.01)	81.5	(0.6)	79.4	(0.6)	81.8	(0.5)	84.4	(0.5)	76.3	(0.6)	75.0	(0.6)
	Qatar		-0.10	(0.01)	79.9	(0.4)	78.3	(0.4)	82.5	(0.4)	83.1	(0.4)	76.7	(0.4)	76.0	(0.4)
	Romania		-0.38	(0.02)	76.5	(1.4)	66.1	(1.3)	81.6	(1.0)	79.5	(1.1)	66.7	(1.0)	62.9	(0.9)
	Russia		-0.26	(0.02)	78.8	(0.9)	78.9	(0.8)	82.5	(0.7)	82.0	(0.7)	80.6	(0.6)	77.7	(0.8)
	Singapore		0.22	(0.01)	91.2	(0.4)	89.4	(0.4)	93.9	(0.3)	95.0	(0.3)	87.5	(0.5)	86.6	(0.4)
	Chinese Taipei		0.31	(0.02)	87.6	(0.5)	93.8	(0.3)	94.2	(0.3)	93.7	(0.3)	93.5	(0.3)	93.7	(0.3)
	Thailand		-0.07	(0.02)	88.9	(0.6)	87.7	(0.5)	88.6	(0.5)	89.5	(0.5)	87.0	(0.6)	87.4	(0.5)
	Trinidad and Tobago		-0.02	(0.02)	86.2	(0.6)	79.5	(0.7)	87.2	(0.6)	88.2	(0.5)	74.9	(0.8)	75.1	(0.7)
	Tunisia		-0.31	(0.02)	77.8	(0.8)	66.4	(1.0)	79.6	(0.8)	82.4	(0.8)	69.4	(0.8)	68.9	(0.9)
	United Arab Emirates		0.04	(0.01)	84.1	(0.5)	81.6	(0.5)	85.2	(0.4)	86.7	(0.4)	80.4	(0.5)	79.7	(0.5)
	Uruguay		-0.13	(0.02)	78.6	(0.7)	80.3	(0.6)	80.4	(0.7)	82.0	(0.6)	77.4	(0.6)	77.5	(0.6)
	Viet Nam		-0.15	(0.02)	81.8	(0.7)	81.6	(0.6)	88.1	(0.6)	83.2	(0.7)	77.9	(0.8)	77.9	(0.7)
	Argentina**		-0.26	(0.02)	74.6	(0.8)	76.3	(0.8)	76.2	(0.7)	78.7	(0.8)	74.1	(0.8)	69.1	(0.7)
	Kazakhstan**		-0.04	(0.02)	84.2	(0.6)	78.9	(0.6)	87.2	(0.6)	86.6	(0.6)	79.6	(0.7)	73.8	(0.8)
	Malaysia**		0.06	(0.02)	92.3	(0.5)	84.9	(0.6)	91.6	(0.6)	91.0	(0.5)	85.3	(0.5)	80.1	(0.6)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/2]

Table I.2.12b Index of epistemic beliefs and performance in science, by national quarters of this index

Results based on students' self-reports

		Index of epistemic beliefs											Performance in science, by national quarters of this index							
		All students		Variability in this index		Bottom quarter		Second quarter		Third quarter		Top quarter		Bottom quarter		Second quarter		Third quarter		Top quarter	
		Mean index	S.E.	S.D.	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.
OECD	Australia	0.26	(0.01)	0.99	(0.01)	-0.82	(0.02)	-0.19	(0.00)	0.47	(0.02)	1.58	(0.02)	464	(2.3)	492	(2.7)	537	(2.3)	568	(2.7)
	Austria	-0.14	(0.02)	1.14	(0.01)	-1.52	(0.03)	-0.57	(0.02)	0.21	(0.03)	1.34	(0.03)	445	(3.5)	485	(4.0)	525	(3.7)	553	(3.4)
	Belgium	0.00	(0.01)	0.95	(0.01)	-1.11	(0.03)	-0.26	(0.01)	0.15	(0.02)	1.21	(0.02)	465	(3.6)	510	(3.1)	531	(2.5)	558	(3.2)
	Canada	0.30	(0.01)	1.05	(0.01)	-0.87	(0.02)	-0.18	(0.01)	0.53	(0.02)	1.71	(0.02)	491	(3.0)	511	(2.3)	554	(2.8)	572	(2.7)
	Chile	-0.15	(0.02)	1.02	(0.01)	-1.39	(0.03)	-0.37	(0.02)	0.00	(0.02)	1.16	(0.03)	420	(3.7)	439	(3.2)	459	(3.9)	490	(3.9)
	Czech Republic	-0.23	(0.02)	0.85	(0.01)	-1.22	(0.03)	-0.37	(0.02)	-0.14	(0.01)	0.83	(0.03)	449	(3.8)	499	(2.8)	503	(3.3)	549	(3.3)
	Denmark	0.17	(0.02)	1.03	(0.02)	-1.05	(0.04)	-0.19	(0.01)	0.45	(0.03)	1.46	(0.03)	462	(3.1)	494	(2.8)	528	(3.6)	558	(3.4)
	Estonia	0.01	(0.01)	0.88	(0.01)	-1.00	(0.02)	-0.22	(0.01)	0.12	(0.02)	1.14	(0.02)	494	(3.7)	527	(3.2)	544	(3.1)	581	(3.3)
	Finland	-0.07	(0.02)	0.94	(0.01)	-1.16	(0.03)	-0.25	(0.01)	0.00	(0.02)	1.13	(0.03)	483	(3.9)	527	(2.6)	545	(3.3)	590	(3.2)
	France	0.01	(0.02)	0.96	(0.01)	-1.11	(0.03)	-0.27	(0.01)	0.13	(0.02)	1.29	(0.03)	460	(3.9)	504	(2.7)	522	(3.4)	539	(3.7)
	Germany	-0.16	(0.02)	1.01	(0.01)	-1.33	(0.03)	-0.57	(0.02)	0.06	(0.03)	1.20	(0.03)	471	(4.2)	521	(5.0)	534	(5.5)	571	(4.9)
	Greece	-0.19	(0.02)	0.89	(0.01)	-1.20	(0.03)	-0.50	(0.02)	-0.04	(0.02)	0.99	(0.03)	415	(5.4)	453	(3.7)	468	(5.2)	505	(3.9)
	Hungary	-0.36	(0.02)	0.85	(0.01)	-1.35	(0.02)	-0.60	(0.02)	-0.19	(0.00)	0.69	(0.03)	433	(3.8)	490	(3.9)	480	(4.0)	528	(3.5)
	Iceland	0.29	(0.02)	1.16	(0.02)	-1.02	(0.04)	-0.19	(0.01)	0.55	(0.04)	1.83	(0.03)	438	(3.1)	452	(3.2)	505	(3.6)	522	(3.4)
	Ireland	0.21	(0.01)	0.85	(0.01)	-0.74	(0.02)	-0.15	(0.01)	0.41	(0.02)	1.32	(0.02)	466	(4.4)	488	(3.5)	522	(3.5)	545	(3.1)
	Israel	0.18	(0.02)	1.11	(0.01)	-1.18	(0.04)	-0.20	(0.02)	0.47	(0.03)	1.62	(0.03)	409	(4.1)	461	(4.5)	509	(4.3)	522	(3.9)
	Italy	-0.10	(0.02)	0.88	(0.01)	-1.14	(0.03)	-0.32	(0.01)	0.01	(0.02)	1.04	(0.02)	440	(3.2)	478	(3.4)	495	(3.4)	525	(3.7)
	Japan	-0.06	(0.02)	1.03	(0.01)	-1.25	(0.03)	-0.33	(0.01)	0.01	(0.02)	1.33	(0.03)	488	(3.4)	537	(3.7)	551	(3.9)	587	(3.7)
	Korea	0.02	(0.02)	0.97	(0.02)	-0.98	(0.04)	-0.19	(0.00)	-0.06	(0.02)	1.32	(0.04)	474	(4.8)	502	(3.3)	520	(5.2)	571	(3.5)
	Latvia	-0.26	(0.01)	0.90	(0.01)	-1.34	(0.02)	-0.44	(0.02)	-0.09	(0.01)	0.86	(0.03)	457	(2.7)	487	(3.2)	494	(2.7)	531	(2.8)
	Luxembourg	-0.15	(0.01)	1.05	(0.01)	-1.39	(0.02)	-0.48	(0.02)	0.07	(0.02)	1.23	(0.02)	435	(2.8)	485	(2.7)	511	(3.4)	544	(2.8)
	Mexico	-0.17	(0.02)	0.93	(0.01)	-1.28	(0.02)	-0.39	(0.02)	-0.05	(0.02)	1.04	(0.03)	399	(3.1)	418	(2.7)	418	(3.3)	446	(3.4)
	Netherlands	-0.19	(0.01)	0.83	(0.01)	-1.17	(0.03)	-0.35	(0.01)	-0.09	(0.01)	0.84	(0.02)	460	(3.6)	514	(3.2)	519	(3.7)	573	(3.2)
	New Zealand	0.22	(0.02)	0.95	(0.01)	-0.82	(0.03)	-0.19	(0.00)	0.41	(0.03)	1.49	(0.03)	476	(3.5)	492	(4.9)	548	(3.9)	572	(3.9)
	Norway	-0.01	(0.02)	1.01	(0.01)	-1.17	(0.03)	-0.23	(0.01)	0.06	(0.02)	1.32	(0.03)	455	(3.6)	495	(3.0)	513	(3.3)	557	(3.3)
	Poland	-0.08	(0.02)	0.95	(0.01)	-1.21	(0.03)	-0.29	(0.01)	0.05	(0.02)	1.12	(0.03)	462	(3.7)	497	(3.5)	513	(3.7)	542	(3.6)
	Portugal	0.28	(0.02)	0.99	(0.01)	-0.74	(0.02)	-0.19	(0.00)	0.36	(0.04)	1.68	(0.03)	466	(3.8)	478	(2.9)	519	(3.5)	551	(3.5)
	Slovak Republic	-0.35	(0.02)	0.93	(0.01)	-1.49	(0.03)	-0.53	(0.02)	-0.18	(0.01)	0.80	(0.02)	413	(3.5)	470	(3.7)	480	(3.0)	519	(3.5)
	Slovenia	0.07	(0.02)	0.93	(0.01)	-1.03	(0.03)	-0.20	(0.00)	0.27	(0.02)	1.24	(0.03)	479	(3.2)	500	(3.2)	533	(3.5)	560	(3.0)
	Spain	0.11	(0.02)	1.01	(0.01)	-1.12	(0.03)	-0.21	(0.01)	0.40	(0.03)	1.37	(0.02)	455	(3.2)	480	(3.3)	517	(2.6)	537	(2.8)
	Sweden	0.14	(0.02)	1.06	(0.01)	-1.09	(0.04)	-0.19	(0.00)	0.29	(0.04)	1.54	(0.03)	452	(4.0)	482	(3.8)	527	(5.2)	561	(4.7)
	Switzerland	-0.07	(0.02)	1.03	(0.01)	-1.31	(0.03)	-0.42	(0.02)	0.17	(0.03)	1.27	(0.03)	453	(4.7)	505	(3.9)	534	(4.8)	553	(4.4)
	Turkey	-0.17	(0.03)	1.18	(0.01)	-1.61	(0.04)	-0.48	(0.03)	0.00	(0.03)	1.41	(0.03)	394	(4.3)	423	(4.4)	437	(5.1)	458	(5.2)
	United Kingdom	0.22	(0.02)	0.95	(0.01)	-0.81	(0.03)	-0.18	(0.01)	0.41	(0.02)	1.46	(0.02)	466	(3.6)	496	(3.1)	535	(3.9)	564	(3.8)
	United States	0.25	(0.02)	1.05	(0.02)	-0.88	(0.04)	-0.19	(0.00)	0.42	(0.04)	1.65	(0.03)	459	(3.7)	475	(3.6)	522	(5.2)	548	(4.0)
	OECD average	0.00	(0.00)	0.98	(0.00)	-1.14	(0.00)	-0.31	(0.00)	0.16	(0.00)	1.27	(0.00)	453	(0.6)	488	(0.6)	513	(0.7)	544	(0.6)
Partners	Albania	-0.03	(0.02)	0.81	(0.01)	-1.04	(0.02)	-0.35	(0.01)	0.27	(0.02)	1.00	(0.02)	m	m	m	m	m	m	m	m
	Algeria	-0.31	(0.02)	0.86	(0.01)	-1.32	(0.02)	-0.67	(0.02)	-0.09	(0.02)	0.83	(0.02)	359	(3.6)	371	(3.1)	384	(3.7)	396	(3.5)
	Brazil	-0.07	(0.01)	0.91	(0.01)	-1.07	(0.02)	-0.27	(0.01)	-0.10	(0.01)	1.16	(0.03)	383	(3.4)	413	(3.1)	416	(4.2)	452	(4.4)
	B-S-J-G (China)	-0.08	(0.02)	0.85	(0.01)	-1.00	(0.02)	-0.25	(0.01)	-0.12	(0.02)	1.04	(0.04)	479	(6.4)	512	(4.0)	511	(6.7)	574	(5.9)
	Bulgaria	-0.18	(0.02)	0.98	(0.02)	-1.36	(0.03)	-0.36	(0.02)	-0.09	(0.02)	1.08	(0.04)	405	(6.2)	463	(3.8)	466	(6.2)	509	(4.8)
	CABA (Argentina)	0.09	(0.04)	1.00	(0.03)	-1.16	(0.05)	-0.20	(0.04)	0.41	(0.04)	1.33	(0.05)	436	(6.9)	467	(7.8)	488	(6.7)	520	(8.7)
	Colombia	-0.19	(0.01)	0.93	(0.01)	-1.28	(0.02)	-0.42	(0.02)	-0.07	(0.01)	1.02	(0.02)	391	(4.3)	417	(2.5)	425	(3.2)	447	(3.0)
	Costa Rica	-0.15	(0.02)	1.01	(0.01)	-1.36	(0.03)	-0.37	(0.01)	-0.03	(0.02)	1.15	(0.03)	404	(2.8)	417	(2.5)	429	(3.0)	449	(3.6)
	Croatia	0.03	(0.02)	0.93	(0.01)	-1.04	(0.03)	-0.21	(0.01)	0.15	(0.02)	1.22	(0.02)	439	(3.7)	467	(3.6)	493	(4.1)	517	(3.1)
	Cyprus*	-0.15	(0.02)	1.04	(0.01)	-1.36	(0.02)	-0.44	(0.02)	-0.04	(0.02)	1.23	(0.03)	390	(2.8)	431	(2.3)	449	(2.8)	491	(2.9)
	Dominican Republic	-0.10	(0.03)	1.18	(0.02)	-1.57	(0.04)	-0.38	(0.02)	0.10	(0.04)	1.44	(0.04)	315	(3.6)	342	(3.7)	358	(5.5)	363	(4.1)
	FYROM	-0.18	(0.01)	0.85	(0.01)	-1.22	(0.02)	-0.39	(0.01)	-0.01	(0.02)	0.90	(0.02)	353	(2.9)	382	(3.0)	395	(3.3)	421	(2.8)
	Georgia	0.05	(0.02)	0.92	(0.01)	-1.05	(0.02)	-0.26	(0.01)	0.25	(0.02)	1.26	(0.02)	362	(3.7)	398	(2.9)	430	(3.9)	466	(3.4)
	Hong Kong (China)	0.04	(0.02)	0.95	(0.01)	-0.94	(0.04)	-0.19	(0.00)	-0.02	(0.02)	1.31	(0.02)	495	(4.1)	519	(3.1)	528	(3.1)	555	(3.1)
	Indonesia	-0.30	(0.01)	0.69	(0.01)	-1.07	(0.01)	-0.59	(0.01)	-0.17	(0.01)	0.63	(0.02)	386	(3.4)	405	(3.0)	401	(3.1)	424	(3.4)
	Jordan	-0.13	(0.02)	1.05	(0.01)	-1.44	(0.03)	-0.44	(0.03)	0.18	(0.03)	1.19	(0.02)	367	(3.4)	404	(3.2)	433	(4.6)	448	(3.6)
	Kosovo	0.03	(0.02)	0.93	(0.01)	-1.14	(0.02)	-0.28	(0.02)	0.35	(0.02)	1.18	(0.03)	353	(2.7)	372	(2.9)	394	(3.2)	405	(3.1)
	Lebanon	-0.24	(0.03)	0.88	(0.02)	-1.27	(0.03)	-0.59	(0.04)	-0.02	(0.03)	0.94	(0.03)	344	(4.3)	384	(5.6)	395	(5.2)	429	(5.6)
	Lithuania	0.11	(0.02)	1.18	(0.01)	-1.40	(0.02)	-0.25	(0.02)	0.50	(0.02)	1.60	(0.03)	437	(3.7)	465	(2.8)	509	(4.3)	509	(3.2)
	Macao (China)	-0.06	(0.01)	0.81	(0.01)	-0.94	(0.02)	-0.24	(0.01)	-0.07	(0.01)	1.00	(0.02)	504	(2.6)	522	(2.3)	527	(2.6)	562	(2.2)
	Malta	0.09	(0.02)	0.92	(0.01)	-1.04	(0.02)	-0.22	(0.01)	0.38	(0.02)	1.24	(0.03)	401	(3.7)	447	(3.9)	502	(3.7)	531	(3.7)
	Moldova	-0.14	(0.01)	0.76	(0.01)	-1.06	(0.02)	-0.35	(0.01)	0.04	(0.02)	0.84	(0.02)	397	(3.4)	417	(2.7)	441	(3.0)	474	(3.4)
	Montenegro	-0.32	(0.02)	0.98	(0.01)	-1.49	(0.02)	-0.51	(0.02)	-0.18	(0.01)	0.91	(0.03)	386	(2.2)	422	(2.3)	425	(2.6)	455	(2.7)
	Peru	-0.16	(0.01)	0.92	(0.01)	-1.31	(0.02)	-0.34	(0.01)	-0.01	(0.02)	1.01	(0.02)	380	(3.2)	402	(3.3)	417	(2.8)	443	(3.4)
	Qatar	-0.10	(0.01)	1.04	(0.01)	-1.37	(0.02)	-0.30	(0.01)	0.05	(0.01)	1.23	(0.02)	376	(2.3)	422	(2.0)	448	(2.1)	481	(2.2)
	Romania	-0.38	(0.02)	0.75	(0.01)	-1.28	(0.03)	-0.68	(0.03)	-0.17	(0.02)	0.61	(0.02)	410	(4.8)	431	(4.2)	437	(4.3)	463	(4.2)
	Russia	-0.26	(0.02)	0.88	(0.02)	-1.28	(0.03)	-0.38	(0.02)	-0.19	(0.01)	0.84	(0.04)	454	(3.9)	488	(3.2)	491	(4.2)	530	(3.3)
	Singapore	0.22	(0.01)	0.92	(0.01)	-0.71	(0.02)	-0.19	(0.00)	0.34	(0.02)	1.46	(0.02)	519	(2.8)	529	(2.5)	581	(2.3)	601	(2.8)
	Chinese Taipei	0.31	(0.02)	1.01	(0.01)	-0.65	(0.02)	-0.19	(0.00)	0.32	(0.04)	1.76	(0.03)	492	(3.4)	506	(3.6)	545	(4.2)	588	(3.8)
	Thailand	-0.07	(0.02)	0.77	(0.01)	-0.89	(0.03)	-0.19	(0.00)	-0.14	(0.02)	0.96	(0.04)	392	(3.6)	416	(3.0)	421	(2.8)	462	(4.9)
	Trinidad and Tobago	-0.02	(0.02)	0.94	(0.01)	-1.18	(0.03)	-0.29	(0.01)	0.27	(0.03)	1.14	(0.02)	387	(3.1)	423	(3.4)	448	(3.2)	467	(3.5)
	Tunisia	-0.31	(0.02)	0.89	(0.01)	-1.32	(0.02)	-0.62	(0.02)	-0.16	(0.01)	0.86	(0.03)	368	(2.7)	392	(3.2)	394	(3.7)	417	(3.6)
	United Arab Emirates	0.04	(0.01)	1.00	(0.01)	-1.16	(0.02)	-0.23	(0.01)	0.23	(0.02)	1.34	(0.02)	390	(3.1)	429	(3.1)	467	(4.4)	487	(3.1)
	Uruguay	-0.13	(0.02)	1.06	(0.01)	-1.42	(0.03)	-0.32	(0.01)	0.01	(0.02)	1.23	(0.03)	406	(2.9)	443	(3.2)	455	(3.6)	489	(3.7)
	Viet Nam	-0.15	(0.02)	0.72	(0.01)	-1.02	(0.02)	-0.38	(0.02)	0.04	(0.02)	0.78	(0.03)	497	(3.9)	513	(4.4)	529	(4.9)	559	(6.1)
	Argentina**	-0.26	(0.02)	0.96	(0.01)	-1.45	(0.03)	-0.51	(0.02)	-0.02	(0.02)	0.96	(0.02)	400	(4.0)	428	(3.2)	440	(3.4)	468	(4.1)
	Kazakhstan**	-0.04	(0.02)	0.92	(0.01)	-1.15	(0.03)	-0.31	(0.01)	0.18	(0.03)	1.11	(0.03)	435	(3.9)	452	(4.7)	466	(4.5)	473	(4.9)
	Malaysia**	0.06	(0.02)	0.82	(0.01)	-0.86	(0.03)	-0.19	(0.00)	0.13	(0.03)	1.15	(0.03)	414	(4.4)	431	(3.4)	452	(4.0)	480	(3.3)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 2/2]

Table I.2.12b Index of epistemic beliefs and performance in science, by national quarters of this index

Results based on students' self-reports

		Difference in science performance between students in the top quarter and students in the bottom quarter of this index		Change in the science score per unit of this index		Increased likelihood of students in the bottom quarter of this index scoring in the bottom quarter of the national science performance distribution		Explained variance in student performance in science (r-squared x 100)	
		Score dif.	S.E.	Score dif.	S.E.	Relative risk	S.E.	%	S.E.
OECD	Australia	**104**	(3.2)	**39**	(1.3)	**2.2**	(0.1)	14.9	(0.8)
	Austria	**108**	(4.3)	**36**	(1.4)	**2.6**	(0.2)	18.0	(1.2)
	Belgium	**93**	(3.9)	**34**	(1.5)	**2.4**	(0.1)	11.8	(0.9)
	Canada	**81**	(3.2)	**29**	(1.1)	**2.1**	(0.1)	11.3	(0.8)
	Chile	**70**	(4.5)	**23**	(1.4)	**1.8**	(0.1)	7.3	(0.8)
	Czech Republic	**100**	(5.2)	**41**	(1.8)	**2.5**	(0.1)	14.0	(1.1)
	Denmark	**95**	(4.1)	**32**	(1.6)	**2.5**	(0.1)	14.2	(1.2)
	Estonia	**87**	(4.3)	**36**	(1.8)	**2.2**	(0.1)	12.7	(1.1)
	Finland	**107**	(4.2)	**38**	(1.8)	**2.4**	(0.1)	14.6	(1.3)
	France	**79**	(5.3)	**30**	(1.7)	**2.1**	(0.1)	8.9	(1.0)
	Germany	**101**	(5.7)	**34**	(2.0)	**2.4**	(0.2)	12.1	(1.3)
	Greece	**90**	(5.6)	**36**	(2.1)	**2.1**	(0.2)	12.6	(1.3)
	Hungary	**95**	(4.8)	**35**	(2.0)	**2.3**	(0.1)	9.7	(1.0)
	Iceland	**84**	(4.9)	**28**	(1.6)	**2.3**	(0.1)	13.1	(1.3)
	Ireland	**79**	(4.2)	**36**	(1.6)	**1.9**	(0.1)	12.0	(0.9)
	Israel	**113**	(4.9)	**38**	(1.6)	**2.9**	(0.2)	16.9	(1.2)
	Italy	**86**	(4.4)	**34**	(1.7)	**2.3**	(0.1)	10.7	(1.1)
	Japan	**99**	(3.9)	**34**	(1.5)	**2.4**	(0.1)	14.1	(1.0)
	Korea	**97**	(4.9)	**38**	(1.6)	**2.2**	(0.1)	15.2	(1.0)
	Latvia	**74**	(4.0)	**27**	(1.6)	**2.0**	(0.1)	8.8	(0.9)
	Luxembourg	**108**	(4.3)	**35**	(1.4)	**2.6**	(0.1)	14.3	(1.1)
	Mexico	**47**	(4.0)	**17**	(1.5)	**1.7**	(0.1)	5.1	(0.8)
	Netherlands	**113**	(4.3)	**46**	(1.7)	**2.5**	(0.1)	15.9	(1.1)
	New Zealand	**97**	(5.2)	**40**	(1.9)	**2.0**	(0.1)	14.0	(1.2)
	Norway	**102**	(4.4)	**35**	(1.5)	**2.4**	(0.1)	13.9	(1.0)
	Poland	**80**	(4.6)	**27**	(1.7)	**2.1**	(0.1)	8.0	(0.9)
	Portugal	**86**	(4.1)	**33**	(1.3)	**1.9**	(0.1)	13.2	(1.0)
	Slovak Republic	**106**	(4.5)	**36**	(1.8)	**2.6**	(0.2)	12.7	(1.0)
	Slovenia	**81**	(4.9)	**33**	(1.9)	**2.0**	(0.1)	10.7	(1.1)
	Spain	**82**	(3.7)	**30**	(1.4)	**2.2**	(0.1)	12.1	(1.0)
	Sweden	**109**	(5.4)	**38**	(1.9)	**2.5**	(0.1)	16.9	(1.4)
	Switzerland	**100**	(6.2)	**34**	(2.0)	**2.5**	(0.2)	13.0	(1.3)
	Turkey	**64**	(5.3)	**18**	(1.5)	**2.0**	(0.1)	7.4	(1.0)
	United Kingdom	**98**	(4.4)	**37**	(1.8)	**2.3**	(0.1)	12.5	(1.1)
	United States	**90**	(4.9)	**32**	(1.6)	**2.0**	(0.1)	11.8	(1.0)
	OECD average	**91**	(0.8)	**33**	(0.3)	**2.3**	(0.0)	12.4	(0.2)
Partners	Albania	m	m	m	m	m	m	m	m
	Algeria	**37**	(3.7)	**16**	(1.4)	**1.5**	(0.1)	4.0	(0.6)
	Brazil	**69**	(3.8)	**27**	(1.6)	**1.7**	(0.1)	7.1	(0.7)
	B-S-J-G (China)	**95**	(6.7)	**37**	(2.9)	**1.9**	(0.1)	9.5	(1.2)
	Bulgaria	**104**	(6.2)	**34**	(2.1)	**2.6**	(0.2)	11.8	(1.2)
	CABA (Argentina)	**84**	(7.5)	**28**	(2.6)	**2.2**	(0.2)	11.4	(1.8)
	Colombia	**56**	(4.1)	**21**	(1.4)	**1.9**	(0.1)	6.2	(0.7)
	Costa Rica	**46**	(3.6)	**16**	(1.4)	**1.5**	(0.1)	5.5	(0.9)
	Croatia	**78**	(4.4)	**32**	(1.7)	**2.1**	(0.1)	11.5	(1.1)
	Cyprus*	**101**	(3.5)	**33**	(1.4)	**2.4**	(0.1)	14.2	(1.0)
	Dominican Republic	**48**	(5.1)	**13**	(1.5)	**1.9**	(0.2)	4.5	(0.9)
	FYROM	**68**	(4.1)	**30**	(1.8)	**2.0**	(0.1)	9.0	(1.0)
	Georgia	**105**	(4.7)	**42**	(1.7)	**2.6**	(0.2)	18.3	(1.2)
	Hong Kong (China)	**60**	(3.9)	**23**	(1.3)	**1.8**	(0.1)	7.3	(0.8)
	Indonesia	**38**	(3.7)	**16**	(2.1)	**1.5**	(0.1)	2.7	(0.6)
	Jordan	**81**	(4.5)	**28**	(1.6)	**2.5**	(0.2)	12.9	(1.3)
	Kosovo	**52**	(3.8)	**22**	(1.5)	**1.9**	(0.2)	8.2	(1.0)
	Lebanon	**86**	(7.0)	**35**	(3.0)	**2.2**	(0.2)	11.4	(1.7)
	Lithuania	**72**	(3.6)	**22**	(1.0)	**2.3**	(0.1)	8.4	(0.7)
	Macao (China)	**58**	(3.2)	**26**	(1.5)	**1.7**	(0.1)	6.8	(0.7)
	Malta	**131**	(5.3)	**54**	(2.3)	**2.6**	(0.2)	18.9	(1.4)
	Moldova	**77**	(4.4)	**37**	(1.9)	**2.0**	(0.1)	11.5	(1.1)
	Montenegro	**69**	(3.5)	**23**	(1.4)	**1.9**	(0.1)	7.4	(0.8)
	Peru	**63**	(3.3)	**23**	(1.3)	**2.0**	(0.1)	8.1	(0.8)
	Qatar	**105**	(3.0)	**33**	(1.1)	**2.5**	(0.1)	12.3	(0.7)
	Romania	**53**	(5.7)	**27**	(2.6)	**1.7**	(0.1)	6.5	(1.2)
	Russia	**75**	(3.6)	**27**	(1.5)	**2.0**	(0.1)	8.6	(0.9)
	Singapore	**82**	(4.0)	**34**	(1.5)	**1.8**	(0.1)	9.3	(0.8)
	Chinese Taipei	**96**	(4.8)	**38**	(1.8)	**2.0**	(0.1)	15.2	(1.1)
	Thailand	**70**	(4.4)	**35**	(2.1)	**1.9**	(0.1)	11.8	(1.2)
	Trinidad and Tobago	**81**	(4.3)	**28**	(1.7)	**2.1**	(0.1)	7.8	(0.9)
	Tunisia	**49**	(4.3)	**18**	(1.6)	**1.8**	(0.1)	5.9	(0.9)
	United Arab Emirates	**97**	(3.6)	**33**	(1.3)	**2.4**	(0.1)	11.5	(0.8)
	Uruguay	**83**	(4.4)	**27**	(1.4)	**2.1**	(0.1)	11.1	(1.0)
	Viet Nam	**63**	(6.1)	**31**	(3.0)	**1.8**	(0.1)	8.6	(1.4)
	Argentina**	**68**	(4.5)	**23**	(1.7)	**2.0**	(0.1)	7.8	(1.0)
	Kazakhstan**	**38**	(4.9)	**14**	(1.9)	**1.6**	(0.1)	2.7	(0.7)
	Malaysia**	**66**	(4.3)	**29**	(1.8)	**2.0**	(0.1)	10.2	(1.1)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433171

[Part 1/1]

Table I.3.1a Index of enjoyment of science

Percentage of students who reported that they "agree" or "strongly agree"

		Index of enjoyment of science		Percentage of students who agreed with the following statements:									
				I generally have fun when I am learning <broad science> topics		I like reading about <broad science>		I am happy working on <broad science> topics		I enjoy acquiring new knowledge in <broad science>		I am interested in learning about <broad science>	
		Mean index	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	0.12	(0.02)	64.6	(0.7)	52.7	(0.7)	67.3	(0.6)	71.7	(0.6)	67.4	(0.6)
	Austria	-0.32	(0.02)	53.4	(0.9)	38.3	(0.9)	42.1	(0.9)	46.6	(1.0)	49.4	(0.9)
	Belgium	-0.03	(0.02)	62.0	(0.7)	49.2	(0.7)	60.1	(0.6)	63.9	(0.6)	69.1	(0.6)
	Canada	0.40	(0.01)	74.9	(0.5)	62.6	(0.6)	68.8	(0.5)	79.0	(0.5)	78.8	(0.5)
	Chile	0.08	(0.02)	67.3	(0.7)	53.0	(0.7)	57.3	(0.7)	67.8	(0.7)	66.5	(0.7)
	Czech Republic	-0.34	(0.02)	52.7	(0.9)	40.5	(0.7)	34.8	(0.7)	61.0	(0.8)	41.8	(0.9)
	Denmark	0.12	(0.02)	65.4	(0.8)	54.2	(0.9)	63.7	(0.8)	63.8	(0.8)	69.7	(0.7)
	Estonia	0.16	(0.01)	71.3	(0.7)	59.4	(0.7)	58.1	(0.7)	77.4	(0.6)	62.7	(0.7)
	Finland	-0.07	(0.02)	64.3	(1.0)	56.0	(0.8)	49.6	(0.8)	49.8	(0.9)	60.9	(0.9)
	France	-0.03	(0.02)	68.5	(0.7)	44.8	(0.8)	44.7	(0.7)	68.0	(0.7)	71.9	(0.6)
	Germany	-0.18	(0.02)	58.6	(0.9)	40.4	(0.9)	42.9	(0.9)	50.2	(0.9)	56.1	(0.9)
	Greece	0.13	(0.02)	65.0	(0.9)	55.7	(0.9)	57.7	(0.9)	73.3	(0.7)	71.6	(0.9)
	Hungary	-0.23	(0.02)	46.6	(0.9)	46.6	(0.8)	50.9	(0.9)	59.5	(0.9)	52.3	(0.9)
	Iceland	0.15	(0.02)	66.0	(0.7)	57.7	(0.8)	62.2	(0.8)	70.0	(0.7)	63.0	(0.8)
	Ireland	0.20	(0.02)	64.3	(1.0)	56.1	(1.0)	70.8	(0.9)	78.0	(0.7)	73.8	(0.8)
	Israel	0.09	(0.02)	62.4	(0.9)	54.9	(1.0)	59.8	(0.9)	69.2	(0.8)	66.5	(0.8)
	Italy	0.00	(0.02)	58.1	(1.0)	54.6	(1.0)	63.6	(0.9)	66.2	(0.9)	69.0	(1.0)
	Japan	-0.33	(0.02)	49.9	(0.9)	34.9	(1.0)	35.0	(1.0)	54.7	(0.9)	47.7	(1.0)
	Korea	-0.14	(0.02)	59.0	(0.8)	43.4	(0.9)	48.2	(0.9)	59.9	(0.8)	53.7	(1.0)
	Latvia	0.09	(0.02)	68.8	(0.9)	59.0	(0.8)	64.0	(0.8)	73.6	(0.7)	63.7	(0.9)
	Luxembourg	0.10	(0.02)	66.5	(0.7)	51.5	(0.7)	52.7	(0.6)	65.2	(0.7)	68.3	(0.7)
	Mexico	0.42	(0.02)	85.6	(0.6)	69.6	(0.9)	59.0	(0.9)	84.1	(0.6)	80.1	(0.7)
	Netherlands	-0.52	(0.02)	39.6	(0.9)	36.5	(0.8)	30.4	(0.7)	49.6	(0.8)	45.7	(0.9)
	New Zealand	0.20	(0.02)	66.4	(0.8)	52.2	(0.9)	70.8	(0.8)	76.3	(0.6)	71.9	(0.7)
	Norway	0.12	(0.02)	64.4	(0.7)	53.4	(0.8)	62.5	(0.8)	70.0	(0.7)	66.0	(0.7)
	Poland	0.02	(0.02)	61.3	(0.9)	59.9	(0.9)	51.2	(1.0)	72.2	(0.8)	57.6	(0.9)
	Portugal	0.32	(0.02)	74.2	(0.7)	66.0	(0.8)	62.9	(0.8)	84.1	(0.5)	78.3	(0.7)
	Slovak Republic	-0.24	(0.02)	56.9	(0.8)	42.9	(0.7)	39.5	(0.8)	59.6	(0.7)	50.7	(0.9)
	Slovenia	-0.36	(0.02)	47.9	(0.8)	43.3	(0.8)	33.9	(0.8)	51.6	(0.8)	49.6	(0.8)
	Spain	0.03	(0.02)	62.3	(0.9)	49.6	(0.9)	57.1	(0.8)	64.6	(0.8)	71.2	(0.8)
	Sweden	0.08	(0.03)	64.5	(0.9)	57.0	(1.0)	46.3	(1.1)	65.7	(0.9)	62.9	(0.9)
	Switzerland	-0.02	(0.02)	66.1	(1.0)	47.4	(0.9)	47.9	(0.9)	62.9	(1.0)	63.6	(0.9)
	Turkey	0.15	(0.02)	61.9	(0.9)	62.2	(0.8)	60.7	(0.9)	69.7	(0.8)	69.9	(0.8)
	United Kingdom	0.15	(0.02)	66.9	(0.8)	51.8	(0.9)	72.2	(0.7)	71.5	(0.8)	69.3	(0.8)
	United States	0.23	(0.02)	71.7	(0.7)	56.7	(0.9)	68.9	(0.9)	75.8	(0.8)	72.7	(0.8)
	OECD average	0.02	(0.00)	62.8	(0.1)	51.8	(0.1)	54.8	(0.1)	66.5	(0.1)	63.8	(0.1)
Partners	Albania	0.72	(0.02)	84.1	(0.6)	80.5	(0.7)	78.3	(0.8)	89.7	(0.5)	85.0	(0.6)
	Algeria	0.46	(0.02)	76.3	(0.8)	76.2	(0.9)	70.0	(0.7)	82.8	(0.7)	78.9	(0.8)
	Brazil	0.23	(0.01)	67.5	(0.7)	64.0	(0.6)	65.4	(0.6)	80.1	(0.5)	77.2	(0.5)
	B-S-J-G (China)	0.37	(0.02)	81.0	(0.7)	79.1	(0.6)	70.5	(0.8)	81.3	(0.7)	77.3	(0.7)
	Bulgaria	0.28	(0.02)	74.4	(0.9)	68.1	(0.8)	64.8	(0.8)	79.4	(0.8)	74.6	(0.8)
	CABA (Argentina)	-0.20	(0.04)	47.0	(1.6)	47.5	(1.8)	30.9	(1.6)	64.3	(1.7)	72.4	(1.3)
	Colombia	0.32	(0.01)	75.6	(0.6)	64.9	(0.7)	66.2	(0.7)	78.9	(0.6)	78.8	(0.6)
	Costa Rica	0.35	(0.02)	74.2	(0.7)	67.5	(0.7)	64.7	(0.7)	80.0	(0.7)	78.1	(0.7)
	Croatia	-0.11	(0.02)	55.1	(0.8)	55.0	(0.9)	49.0	(0.8)	68.9	(0.9)	57.1	(0.9)
	Cyprus*	0.15	(0.02)	63.9	(0.7)	56.4	(0.7)	62.1	(0.7)	72.3	(0.6)	69.7	(0.7)
	Dominican Republic	0.54	(0.02)	75.1	(0.8)	75.8	(0.9)	72.3	(1.0)	83.4	(0.7)	84.1	(0.7)
	FYROM	0.48	(0.02)	76.2	(0.7)	77.4	(0.7)	75.5	(0.7)	81.8	(0.7)	79.2	(0.8)
	Georgia	0.34	(0.02)	75.8	(0.7)	72.7	(0.8)	73.2	(0.7)	82.4	(0.6)	70.8	(0.7)
	Hong Kong (China)	0.28	(0.02)	75.8	(0.7)	66.0	(0.9)	61.0	(0.9)	77.6	(0.7)	75.5	(0.8)
	Indonesia	0.65	(0.01)	90.2	(0.4)	88.1	(0.6)	82.1	(0.6)	95.4	(0.3)	89.2	(0.5)
	Jordan	0.53	(0.02)	77.5	(0.9)	75.1	(0.8)	73.8	(0.8)	80.0	(0.8)	78.0	(0.7)
	Kosovo	0.92	(0.02)	85.9	(0.7)	88.4	(0.5)	85.3	(0.6)	91.8	(0.4)	89.0	(0.5)
	Lebanon	0.38	(0.02)	69.5	(1.3)	65.5	(1.2)	71.2	(1.1)	79.6	(1.0)	79.1	(0.9)
	Lithuania	0.36	(0.02)	72.6	(0.7)	66.1	(0.7)	61.4	(0.7)	78.9	(0.6)	73.5	(0.6)
	Macao (China)	0.20	(0.01)	76.7	(0.6)	63.6	(0.6)	57.6	(0.6)	75.6	(0.6)	73.7	(0.6)
	Malta	0.18	(0.02)	67.6	(0.9)	52.4	(0.8)	64.5	(0.8)	73.4	(0.7)	70.2	(0.7)
	Moldova	0.33	(0.01)	65.7	(0.9)	77.5	(0.8)	59.9	(0.9)	86.8	(0.5)	84.8	(0.6)
	Montenegro	0.09	(0.02)	64.7	(0.7)	63.0	(0.7)	59.0	(0.8)	67.7	(0.7)	66.3	(0.7)
	Peru	0.40	(0.01)	80.5	(0.7)	73.1	(0.7)	73.1	(0.7)	81.4	(0.6)	79.4	(0.7)
	Qatar	0.36	(0.01)	74.4	(0.4)	67.7	(0.4)	73.0	(0.5)	77.8	(0.4)	75.9	(0.5)
	Romania	-0.03	(0.02)	49.9	(1.1)	54.8	(1.3)	50.1	(0.9)	73.7	(1.1)	74.2	(1.2)
	Russia	0.00	(0.02)	65.7	(1.2)	57.5	(0.9)	48.6	(0.9)	66.5	(1.0)	65.8	(0.9)
	Singapore	0.59	(0.01)	84.0	(0.5)	77.1	(0.5)	80.9	(0.5)	85.8	(0.5)	83.0	(0.5)
	Chinese Taipei	-0.06	(0.02)	65.8	(0.7)	51.8	(0.8)	50.3	(0.8)	59.4	(0.7)	53.2	(0.7)
	Thailand	0.42	(0.01)	85.2	(0.5)	77.0	(0.6)	80.7	(0.6)	87.6	(0.6)	85.3	(0.5)
	Trinidad and Tobago	0.19	(0.02)	67.4	(0.8)	56.1	(0.9)	64.4	(0.7)	74.2	(0.7)	71.1	(0.7)
	Tunisia	0.52	(0.02)	74.8	(0.8)	74.1	(0.8)	71.8	(0.7)	88.4	(0.6)	85.8	(0.6)
	United Arab Emirates	0.47	(0.02)	76.3	(0.5)	73.0	(0.6)	76.7	(0.5)	82.0	(0.5)	78.8	(0.5)
	Uruguay	-0.10	(0.02)	58.7	(0.8)	46.6	(0.8)	48.1	(0.8)	64.0	(0.8)	64.1	(0.8)
	Viet Nam	0.65	(0.02)	89.3	(0.5)	86.5	(0.7)	87.6	(0.6)	84.2	(0.6)	87.4	(0.6)
	Argentina**	-0.09	(0.02)	54.8	(0.9)	52.8	(0.9)	38.6	(0.9)	65.6	(0.9)	73.5	(0.7)
	Kazakhstan**	0.85	(0.02)	89.7	(0.5)	87.9	(0.6)	85.9	(0.6)	91.7	(0.4)	89.8	(0.5)
	Malaysia**	0.52	(0.02)	85.0	(0.7)	78.5	(0.9)	79.8	(0.7)	86.5	(0.7)	82.7	(0.7)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.1b Index of enjoyment of science and science performance, by national quarters of this index

Results based on students' self-reports

		Index of enjoyment of science											
		All students		Variability in this index		Bottom quarter		Second quarter		Third quarter		Top quarter	
		Mean index	S.E.	S.D.	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.
OECD	Australia	0.12	(0.02)	1.17	(0.01)	-1.43	(0.02)	-0.18	(0.02)	0.49	(0.01)	1.59	(0.03)
	Austria	-0.32	(0.02)	1.25	(0.01)	-1.90	(0.02)	-0.76	(0.03)	0.03	(0.03)	1.35	(0.03)
	Belgium	-0.03	(0.02)	1.12	(0.01)	-1.50	(0.02)	-0.32	(0.02)	0.37	(0.01)	1.33	(0.03)
	Canada	0.40	(0.01)	1.14	(0.01)	-1.08	(0.02)	0.16	(0.02)	0.65	(0.01)	1.87	(0.01)
	Chile	0.08	(0.02)	1.09	(0.01)	-1.30	(0.02)	-0.27	(0.02)	0.42	(0.01)	1.46	(0.03)
	Czech Republic	-0.34	(0.02)	0.98	(0.01)	-1.53	(0.03)	-0.62	(0.01)	-0.10	(0.02)	0.91	(0.03)
	Denmark	0.12	(0.02)	1.14	(0.01)	-1.33	(0.03)	-0.23	(0.02)	0.48	(0.02)	1.55	(0.04)
	Estonia	0.16	(0.01)	1.02	(0.01)	-1.10	(0.02)	-0.17	(0.02)	0.47	(0.01)	1.44	(0.03)
	Finland	-0.07	(0.02)	1.01	(0.01)	-1.27	(0.02)	-0.47	(0.02)	0.31	(0.02)	1.13	(0.03)
	France	-0.03	(0.02)	1.11	(0.01)	-1.47	(0.03)	-0.34	(0.02)	0.31	(0.02)	1.38	(0.03)
	Germany	-0.18	(0.02)	1.21	(0.01)	-1.66	(0.03)	-0.64	(0.02)	0.14	(0.03)	1.46	(0.04)
	Greece	0.13	(0.02)	1.12	(0.01)	-1.31	(0.03)	-0.19	(0.02)	0.48	(0.02)	1.54	(0.03)
	Hungary	-0.23	(0.02)	1.07	(0.01)	-1.54	(0.03)	-0.59	(0.02)	0.15	(0.02)	1.08	(0.03)
	Iceland	0.15	(0.02)	1.26	(0.01)	-1.49	(0.03)	-0.19	(0.04)	0.51	(0.01)	1.78	(0.04)
	Ireland	0.20	(0.02)	1.10	(0.01)	-1.24	(0.03)	-0.06	(0.03)	0.52	(0.01)	1.58	(0.03)
	Israel	0.09	(0.02)	1.25	(0.01)	-1.56	(0.03)	-0.27	(0.03)	0.50	(0.02)	1.71	(0.03)
	Italy	0.00	(0.02)	1.02	(0.01)	-1.31	(0.03)	-0.28	(0.03)	0.40	(0.02)	1.18	(0.03)
	Japan	-0.33	(0.02)	1.15	(0.01)	-1.75	(0.03)	-0.73	(0.02)	-0.03	(0.04)	1.19	(0.03)
	Korea	-0.14	(0.02)	1.17	(0.01)	-1.57	(0.03)	-0.58	(0.02)	0.28	(0.02)	1.33	(0.04)
	Latvia	0.09	(0.02)	0.95	(0.01)	-1.10	(0.03)	-0.18	(0.02)	0.44	(0.02)	1.21	(0.03)
	Luxembourg	0.10	(0.02)	1.22	(0.01)	-1.47	(0.02)	-0.30	(0.02)	0.47	(0.02)	1.70	(0.02)
	Mexico	0.42	(0.02)	0.96	(0.01)	-0.80	(0.03)	0.19	(0.02)	0.68	(0.02)	1.62	(0.02)
	Netherlands	-0.52	(0.02)	1.07	(0.01)	-1.94	(0.03)	-0.80	(0.02)	-0.18	(0.02)	0.84	(0.02)
	New Zealand	0.20	(0.02)	1.12	(0.01)	-1.26	(0.03)	-0.09	(0.02)	0.51	(0.02)	1.62	(0.03)
	Norway	0.12	(0.02)	1.20	(0.01)	-1.44	(0.02)	-0.24	(0.02)	0.49	(0.01)	1.64	(0.04)
	Poland	0.02	(0.02)	0.97	(0.01)	-1.15	(0.03)	-0.32	(0.02)	0.34	(0.02)	1.21	(0.03)
	Portugal	0.32	(0.02)	1.00	(0.01)	-0.96	(0.03)	0.11	(0.02)	0.54	(0.01)	1.57	(0.02)
	Slovak Republic	-0.24	(0.02)	1.01	(0.01)	-1.47	(0.02)	-0.58	(0.02)	0.05	(0.02)	1.02	(0.02)
	Slovenia	-0.36	(0.02)	1.05	(0.01)	-1.68	(0.03)	-0.69	(0.01)	-0.08	(0.03)	0.99	(0.03)
	Spain	0.03	(0.02)	1.13	(0.01)	-1.44	(0.03)	-0.29	(0.03)	0.38	(0.01)	1.47	(0.03)
	Sweden	0.08	(0.03)	1.26	(0.01)	-1.51	(0.03)	-0.36	(0.03)	0.45	(0.02)	1.74	(0.03)
	Switzerland	-0.02	(0.02)	1.15	(0.01)	-1.48	(0.03)	-0.41	(0.03)	0.35	(0.02)	1.48	(0.03)
	Turkey	0.15	(0.02)	1.17	(0.01)	-1.37	(0.03)	-0.17	(0.03)	0.51	(0.01)	1.63	(0.04)
	United Kingdom	0.15	(0.02)	1.06	(0.01)	-1.22	(0.03)	-0.13	(0.02)	0.48	(0.01)	1.46	(0.04)
	United States	0.23	(0.02)	1.06	(0.01)	-1.14	(0.03)	-0.02	(0.03)	0.51	(0.00)	1.56	(0.04)
	OECD average	0.02	(0.00)	1.11	(0.00)	-1.39	(0.00)	-0.31	(0.00)	0.35	(0.00)	1.42	(0.01)
Partners	Albania	0.72	(0.02)	0.94	(0.01)	-0.55	(0.03)	0.51	(0.02)	1.06	(0.01)	1.86	(0.02)
	Algeria	0.46	(0.02)	0.92	(0.01)	-0.76	(0.03)	0.27	(0.02)	0.78	(0.02)	1.57	(0.02)
	Brazil	0.23	(0.01)	0.95	(0.01)	-0.97	(0.02)	-0.01	(0.02)	0.51	(0.00)	1.37	(0.02)
	B-S-J-G (China)	0.37	(0.02)	0.89	(0.02)	-0.75	(0.02)	0.31	(0.02)	0.51	(0.00)	1.41	(0.04)
	Bulgaria	0.28	(0.02)	1.01	(0.01)	-1.01	(0.03)	0.10	(0.03)	0.51	(0.00)	1.52	(0.04)
	CABA (Argentina)	-0.20	(0.04)	0.96	(0.02)	-1.40	(0.05)	-0.47	(0.03)	0.06	(0.05)	1.03	(0.05)
	Colombia	0.32	(0.01)	0.96	(0.01)	-0.88	(0.02)	0.08	(0.02)	0.56	(0.01)	1.53	(0.02)
	Costa Rica	0.35	(0.02)	1.03	(0.01)	-0.97	(0.02)	0.11	(0.02)	0.59	(0.01)	1.66	(0.02)
	Croatia	-0.11	(0.02)	1.08	(0.01)	-1.47	(0.03)	-0.45	(0.02)	0.32	(0.02)	1.17	(0.03)
	Cyprus*	0.15	(0.02)	1.13	(0.01)	-1.29	(0.02)	-0.18	(0.02)	0.49	(0.01)	1.58	(0.03)
	Dominican Republic	0.54	(0.02)	1.10	(0.02)	-0.93	(0.04)	0.37	(0.02)	0.84	(0.03)	1.89	(0.02)
	FYROM	0.48	(0.02)	1.00	(0.01)	-0.83	(0.03)	0.32	(0.02)	0.71	(0.02)	1.72	(0.02)
	Georgia	0.34	(0.02)	0.91	(0.01)	-0.83	(0.02)	0.17	(0.02)	0.53	(0.01)	1.47	(0.02)
	Hong Kong (China)	0.28	(0.02)	1.05	(0.01)	-1.11	(0.03)	0.13	(0.03)	0.51	(0.00)	1.57	(0.03)
	Indonesia	0.65	(0.01)	0.71	(0.01)	-0.18	(0.03)	0.51	(0.00)	0.72	(0.02)	1.55	(0.02)
	Jordan	0.53	(0.02)	1.06	(0.01)	-0.89	(0.03)	0.28	(0.03)	0.86	(0.03)	1.85	(0.02)
	Kosovo	0.92	(0.02)	0.99	(0.01)	-0.33	(0.03)	0.65	(0.01)	1.27	(0.02)	2.10	(0.01)
	Lebanon	0.38	(0.02)	0.97	(0.01)	-0.85	(0.03)	0.06	(0.04)	0.68	(0.03)	1.62	(0.02)
	Lithuania	0.36	(0.02)	1.16	(0.01)	-1.16	(0.03)	0.08	(0.02)	0.67	(0.02)	1.87	(0.02)
	Macao (China)	0.20	(0.01)	0.95	(0.01)	-0.99	(0.02)	-0.02	(0.02)	0.51	(0.00)	1.32	(0.03)
	Malta	0.18	(0.02)	1.13	(0.01)	-1.30	(0.03)	-0.16	(0.02)	0.52	(0.02)	1.63	(0.03)
	Moldova	0.33	(0.01)	0.78	(0.01)	-0.64	(0.02)	0.09	(0.02)	0.57	(0.01)	1.30	(0.02)
	Montenegro	0.09	(0.02)	1.09	(0.01)	-1.33	(0.03)	-0.22	(0.02)	0.50	(0.01)	1.39	(0.03)
	Peru	0.40	(0.01)	0.93	(0.01)	-0.81	(0.03)	0.27	(0.02)	0.59	(0.01)	1.55	(0.02)
	Qatar	0.36	(0.01)	1.09	(0.01)	-1.06	(0.02)	0.19	(0.01)	0.57	(0.01)	1.76	(0.02)
	Romania	-0.03	(0.02)	0.84	(0.01)	-1.07	(0.03)	-0.29	(0.02)	0.24	(0.03)	1.02	(0.02)
	Russia	0.00	(0.02)	0.93	(0.01)	-1.14	(0.03)	-0.29	(0.02)	0.36	(0.02)	1.09	(0.03)
	Singapore	0.59	(0.01)	0.99	(0.01)	-0.66	(0.02)	0.48	(0.01)	0.63	(0.01)	1.92	(0.02)
	Chinese Taipei	-0.06	(0.02)	1.01	(0.01)	-1.26	(0.02)	-0.51	(0.02)	0.37	(0.02)	1.13	(0.03)
	Thailand	0.42	(0.01)	0.75	(0.01)	-0.52	(0.02)	0.42	(0.01)	0.51	(0.00)	1.25	(0.03)
	Trinidad and Tobago	0.19	(0.02)	1.08	(0.01)	-1.20	(0.02)	-0.14	(0.02)	0.53	(0.02)	1.56	(0.02)
	Tunisia	0.52	(0.02)	0.94	(0.01)	-0.68	(0.03)	0.30	(0.02)	0.75	(0.02)	1.71	(0.02)
	United Arab Emirates	0.47	(0.02)	1.08	(0.01)	-0.93	(0.02)	0.30	(0.01)	0.66	(0.01)	1.86	(0.02)
	Uruguay	-0.10	(0.02)	1.07	(0.01)	-1.42	(0.03)	-0.43	(0.02)	0.25	(0.02)	1.22	(0.02)
	Viet Nam	0.65	(0.02)	0.80	(0.01)	-0.38	(0.04)	0.51	(0.00)	0.83	(0.03)	1.62	(0.02)
	Argentina**	-0.09	(0.02)	0.96	(0.01)	-1.30	(0.02)	-0.37	(0.02)	0.21	(0.02)	1.11	(0.02)
	Kazakhstan**	0.85	(0.02)	0.93	(0.01)	-0.27	(0.03)	0.54	(0.01)	1.11	(0.03)	2.05	(0.02)
	Malaysia**	0.52	(0.02)	0.86	(0.01)	-0.57	(0.03)	0.46	(0.02)	0.55	(0.01)	1.62	(0.03)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.1b Index of enjoyment of science and science performance, by national quarters of this index

Results based on students' self-reports

		Performance in science, by national quarters of this index								Difference in science performance between students in the top quarter and students in the bottom quarter of this index		Change in the science score per unit of this index		Increased likelihood of students in the bottom quarter of this index scoring in the bottom quarter of the national science performance distribution		Explained variance in student performance in science (r-squared x 100)	
		Bottom quarter		Second quarter		Third quarter		Top quarter									
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Relative risk	S.E.	%	S.E.
OECD	Australia	463	(2.3)	501	(2.6)	526	(2.5)	568	(2.8)	**105**	(3.4)	**33**	(0.9)	**2.2**	(0.1)	14.6	(0.8)
	Austria	461	(3.7)	487	(3.2)	513	(3.5)	541	(3.8)	**80**	(4.8)	**25**	(1.4)	**1.9**	(0.1)	10.8	(1.1)
	Belgium	470	(3.1)	503	(2.9)	527	(3.0)	550	(3.0)	**80**	(3.2)	**28**	(1.1)	**2.0**	(0.1)	10.3	(0.8)
	Canada	493	(2.8)	525	(2.7)	533	(2.5)	575	(2.7)	**82**	(3.0)	**26**	(0.9)	**2.0**	(0.1)	10.8	(0.7)
	Chile	432	(2.9)	446	(3.6)	452	(3.6)	477	(4.0)	**46**	(4.3)	**15**	(1.3)	**1.4**	(0.1)	3.8	(0.6)
	Czech Republic	464	(3.4)	483	(3.0)	509	(3.5)	530	(3.2)	**65**	(4.4)	**27**	(1.6)	**1.7**	(0.1)	7.8	(0.8)
	Denmark	472	(2.7)	492	(3.7)	509	(2.9)	550	(3.9)	**78**	(4.2)	**26**	(1.3)	**1.8**	(0.1)	11.1	(1.0)
	Estonia	508	(3.0)	526	(3.3)	535	(2.9)	576	(3.7)	**68**	(4.3)	**24**	(1.3)	**1.6**	(0.1)	7.7	(0.8)
	Finland	493	(3.4)	525	(3.5)	547	(3.5)	572	(3.2)	**79**	(3.9)	**30**	(1.4)	**2.0**	(0.1)	10.2	(0.9)
	France	464	(3.1)	492	(3.1)	514	(3.2)	552	(3.6)	**88**	(4.4)	**30**	(1.3)	**1.8**	(0.1)	12.1	(0.9)
	Germany	484	(3.7)	498	(4.3)	530	(4.6)	573	(4.7)	**89**	(4.5)	**29**	(1.3)	**1.7**	(0.1)	12.8	(1.1)
	Greece	422	(4.4)	448	(4.0)	464	(4.4)	504	(5.3)	**82**	(4.7)	**27**	(1.2)	**1.8**	(0.1)	11.1	(0.9)
	Hungary	457	(3.4)	472	(4.0)	493	(4.5)	509	(4.1)	**52**	(5.2)	**20**	(1.6)	**1.5**	(0.1)	4.9	(0.8)
	Iceland	439	(3.1)	465	(3.9)	484	(3.4)	523	(3.6)	**84**	(4.9)	**24**	(1.3)	**1.8**	(0.1)	11.7	(1.1)
	Ireland	458	(3.5)	494	(3.9)	513	(3.3)	553	(3.1)	**95**	(3.8)	**32**	(1.1)	**2.2**	(0.1)	15.5	(1.0)
	Israel	440	(4.3)	468	(4.5)	481	(5.3)	506	(5.0)	**66**	(6.0)	**20**	(1.7)	**1.5**	(0.1)	5.8	(1.0)
	Italy	453	(3.3)	475	(3.6)	497	(3.5)	511	(3.9)	**58**	(4.3)	**22**	(1.5)	**1.7**	(0.1)	6.0	(0.8)
	Japan	503	(3.1)	521	(3.5)	559	(3.3)	581	(4.8)	**78**	(5.0)	**27**	(1.5)	**1.8**	(0.1)	11.2	(1.2)
	Korea	474	(3.4)	498	(4.4)	531	(3.8)	564	(4.3)	**90**	(5.1)	**31**	(1.4)	**2.0**	(0.1)	14.6	(1.2)
	Latvia	472	(3.0)	482	(3.4)	496	(3.3)	517	(2.7)	**45**	(4.1)	**18**	(1.5)	**1.4**	(0.1)	4.1	(0.7)
	Luxembourg	453	(2.6)	476	(3.1)	497	(2.8)	539	(2.9)	**86**	(4.1)	**26**	(1.2)	**1.7**	(0.1)	10.6	(0.9)
	Mexico	405	(3.2)	417	(3.1)	418	(2.8)	438	(3.2)	**33**	(3.6)	**12**	(1.2)	**1.4**	(0.1)	2.7	(0.5)
	Netherlands	480	(3.4)	482	(3.9)	529	(3.1)	560	(3.4)	**80**	(4.2)	**30**	(1.4)	**1.5**	(0.1)	10.4	(1.0)
	New Zealand	474	(3.7)	515	(4.2)	521	(4.1)	573	(3.8)	**99**	(5.5)	**32**	(1.7)	**2.0**	(0.1)	12.0	(1.2)
	Norway	460	(3.0)	492	(3.4)	515	(3.7)	552	(3.6)	**92**	(4.5)	**29**	(1.3)	**2.1**	(0.1)	13.8	(1.1)
	Poland	482	(3.6)	496	(3.8)	506	(4.0)	530	(3.9)	**48**	(4.8)	**18**	(1.7)	**1.4**	(0.1)	4.0	(0.7)
	Portugal	473	(3.0)	502	(4.2)	494	(3.8)	543	(3.6)	**70**	(4.0)	**23**	(1.4)	**1.5**	(0.1)	6.1	(0.7)
	Slovak Republic	438	(3.6)	452	(3.4)	478	(4.1)	502	(3.5)	**64**	(4.3)	**25**	(1.5)	**1.6**	(0.1)	7.1	(0.8)
	Slovenia	491	(2.5)	496	(2.8)	525	(3.5)	549	(3.4)	**58**	(4.4)	**22**	(1.5)	**1.4**	(0.1)	6.3	(0.8)
	Spain	458	(3.0)	478	(3.8)	506	(2.9)	543	(2.7)	**85**	(3.8)	**28**	(1.1)	**1.9**	(0.1)	13.1	(1.0)
	Sweden	456	(3.7)	496	(4.5)	509	(4.3)	552	(4.9)	**96**	(4.9)	**27**	(1.3)	**2.0**	(0.1)	11.9	(1.1)
	Switzerland	465	(3.9)	502	(4.0)	521	(4.6)	559	(4.3)	**93**	(5.1)	**30**	(1.4)	**1.9**	(0.1)	12.4	(1.0)
	Turkey	409	(4.4)	426	(4.5)	427	(4.5)	450	(5.6)	**41**	(5.1)	**12**	(1.5)	**1.4**	(0.1)	3.1	(0.7)
	United Kingdom	471	(3.1)	508	(3.5)	525	(3.5)	554	(4.3)	**83**	(4.1)	**30**	(1.4)	**2.0**	(0.1)	10.4	(1.0)
	United States	465	(3.4)	496	(4.1)	494	(4.0)	544	(4.7)	**79**	(5.1)	**26**	(1.5)	**1.6**	(0.1)	7.8	(0.9)
	OECD average	463	(0.6)	487	(0.6)	505	(0.6)	538	(0.7)	**75**	(0.8)	**25**	(0.2)	**1.8**	(0.0)	9.4	(0.2)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	362	(3.7)	372	(3.0)	379	(3.4)	395	(3.9)	**33**	(3.5)	**14**	(1.5)	**1.4**	(0.1)	3.3	(0.7)
	Brazil	394	(2.8)	409	(3.5)	421	(3.9)	439	(4.3)	**44**	(4.1)	**19**	(1.5)	**1.4**	(0.1)	4.1	(0.6)
	B-S-J-G (China)	490	(6.1)	513	(4.9)	520	(4.6)	552	(6.1)	**62**	(5.2)	**28**	(2.0)	**1.6**	(0.1)	6.0	(0.8)
	Bulgaria	435	(5.4)	465	(4.8)	457	(5.0)	483	(4.7)	**48**	(5.1)	**17**	(1.8)	**1.7**	(0.1)	3.1	(0.6)
	CABA (Argentina)	459	(6.6)	474	(7.3)	481	(8.3)	496	(9.0)	**37**	(7.4)	**15**	(2.6)	**1.4**	(0.2)	2.9	(1.0)
	Colombia	410	(3.1)	423	(3.3)	419	(2.9)	425	(3.5)	**16**	(3.7)	**7**	(1.4)	**1.2**	(0.1)	0.7	(0.3)
	Costa Rica	417	(2.4)	426	(2.7)	416	(2.8)	431	(3.6)	**15**	(3.9)	**4**	(1.3)	1.1	(0.1)	0.4	(0.2)
	Croatia	447	(3.6)	471	(3.1)	487	(3.4)	506	(3.3)	**60**	(3.9)	**22**	(1.4)	**1.7**	(0.1)	7.2	(0.9)
	Cyprus*	398	(2.8)	428	(3.1)	447	(2.8)	485	(3.1)	**87**	(4.2)	**29**	(1.1)	**2.0**	(0.1)	12.5	(0.9)
	Dominican Republic	331	(4.7)	345	(4.1)	349	(3.6)	346	(3.5)	**15**	(5.1)	**6**	(1.6)	**1.4**	(0.2)	0.8	(0.4)
	FYROM	369	(3.5)	382	(2.8)	392	(2.9)	408	(3.2)	**39**	(5.1)	**17**	(1.7)	**1.5**	(0.1)	3.9	(0.8)
	Georgia	391	(3.6)	410	(3.3)	409	(4.0)	446	(3.8)	**55**	(4.8)	**23**	(1.7)	**1.5**	(0.1)	5.6	(0.8)
	Hong Kong (China)	493	(3.6)	528	(3.2)	522	(3.0)	554	(3.4)	**62**	(3.3)	**20**	(1.1)	**1.8**	(0.1)	6.7	(0.7)
	Indonesia	399	(3.3)	401	(3.0)	406	(2.8)	410	(3.7)	**11**	(3.8)	**6**	(1.8)	1.1	(0.1)	0.4	(0.2)
	Jordan	380	(3.6)	404	(3.5)	424	(3.9)	444	(3.7)	**64**	(4.2)	**23**	(1.4)	**1.9**	(0.1)	8.5	(1.0)
	Kosovo	364	(2.8)	379	(3.1)	385	(2.7)	395	(3.2)	**31**	(4.0)	**14**	(1.3)	**1.6**	(0.1)	3.7	(0.7)
	Lebanon	346	(4.2)	377	(5.7)	398	(5.1)	433	(5.4)	**87**	(6.0)	**32**	(2.2)	**2.0**	(0.2)	11.8	(1.4)
	Lithuania	448	(4.0)	472	(3.3)	484	(3.8)	513	(3.4)	**65**	(4.3)	**20**	(1.3)	**1.9**	(0.1)	6.8	(0.9)
	Macao (China)	499	(2.7)	528	(2.7)	535	(2.5)	553	(2.2)	**54**	(3.7)	**21**	(1.2)	**1.7**	(0.1)	5.8	(0.7)
	Malta	400	(3.9)	444	(4.0)	489	(4.2)	546	(4.1)	**146**	(5.9)	**48**	(1.7)	**2.5**	(0.2)	22.5	(1.4)
	Moldova	411	(3.3)	430	(3.1)	430	(3.5)	455	(3.4)	**44**	(4.4)	**22**	(2.1)	**1.5**	(0.1)	4.1	(0.8)
	Montenegro	400	(2.7)	417	(2.5)	423	(2.7)	442	(2.7)	**42**	(4.1)	**14**	(1.3)	**1.5**	(0.1)	3.6	(0.6)
	Peru	402	(3.5)	402	(2.9)	410	(3.4)	421	(2.9)	**19**	(3.6)	**9**	(1.3)	**1.2**	(0.1)	1.2	(0.4)
	Qatar	390	(1.8)	430	(1.9)	438	(2.4)	467	(2.4)	**77**	(3.2)	**25**	(1.0)	**1.9**	(0.1)	8.2	(0.6)
	Romania	415	(4.0)	436	(5.0)	436	(3.8)	454	(4.3)	**39**	(4.6)	**17**	(1.9)	**1.5**	(0.1)	3.4	(0.7)
	Russia	467	(3.3)	490	(3.6)	499	(3.2)	508	(4.4)	**41**	(3.9)	**16**	(1.2)	**1.6**	(0.1)	3.6	(0.5)
	Singapore	509	(2.4)	554	(2.9)	563	(2.7)	602	(3.0)	**92**	(4.3)	**35**	(1.4)	**2.1**	(0.1)	11.1	(0.8)
	Chinese Taipei	500	(2.9)	521	(3.6)	539	(3.4)	570	(4.6)	**69**	(4.6)	**28**	(1.5)	**1.6**	(0.1)	8.1	(0.8)
	Thailand	408	(3.8)	421	(3.3)	421	(3.2)	441	(4.0)	**33**	(4.0)	**18**	(1.7)	**1.4**	(0.1)	3.0	(0.6)
	Trinidad and Tobago	398	(2.6)	414	(3.5)	446	(3.1)	467	(3.0)	**69**	(4.1)	**24**	(1.5)	**1.6**	(0.1)	8.0	(1.0)
	Tunisia	374	(2.8)	387	(3.2)	392	(3.2)	413	(3.0)	**39**	(3.4)	**15**	(1.3)	**1.5**	(0.1)	4.3	(0.7)
	United Arab Emirates	410	(2.9)	438	(3.3)	447	(3.1)	477	(3.4)	**67**	(3.5)	**22**	(1.1)	**1.7**	(0.1)	6.1	(0.6)
	Uruguay	423	(3.0)	441	(3.3)	453	(3.0)	467	(3.7)	**44**	(4.2)	**16**	(1.4)	**1.4**	(0.1)	3.9	(0.6)
	Viet Nam	513	(4.9)	519	(3.9)	523	(4.2)	545	(5.7)	**32**	(4.7)	**14**	(2.0)	**1.3**	(0.1)	2.2	(0.6)
	Argentina**	417	(3.4)	432	(3.1)	438	(4.0)	450	(3.9)	**32**	(3.6)	**12**	(1.4)	**1.4**	(0.1)	2.0	(0.5)
	Kazakhstan**	445	(3.8)	448	(4.6)	461	(4.7)	471	(5.4)	**26**	(5.5)	**11**	(2.1)	**1.3**	(0.1)	1.7	(0.7)
	Malaysia**	412	(4.0)	444	(3.1)	443	(3.8)	476	(3.6)	**64**	(3.6)	**27**	(1.4)	**2.0**	(0.1)	9.2	(0.9)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.2a Index of interest in broad science topics

Percentage of students who reported that they are "interested" or "highly interested" and percentage of students who reported that "[they] don't know what this is"

		Index of interest in broad science topics		Percentage of students who are interested in the following topics:									
				Biosphere (e.g. ecosystem services, sustainability)		Motion and forces (e.g. velocity, friction, magnetic and gravitational forces)		Energy and its transformation (e.g. conservation, chemical reactions)		The Universe and its history		How science can help us prevent disease	
		Mean index	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	0.04	(0.01)	43.3	(0.6)	47.9	(0.6)	53.0	(0.6)	67.1	(0.5)	68.9	(0.5)
	Austria	0.06	(0.02)	49.6	(0.8)	46.5	(0.9)	47.0	(0.9)	66.0	(0.7)	61.4	(0.8)
	Belgium	0.07	(0.01)	41.5	(0.7)	52.0	(0.6)	52.3	(0.7)	65.5	(0.6)	72.8	(0.6)
	Canada	0.26	(0.01)	53.5	(0.6)	55.1	(0.5)	62.9	(0.6)	69.0	(0.6)	73.5	(0.6)
	Chile	0.04	(0.02)	40.8	(0.8)	45.7	(0.8)	47.8	(0.7)	67.6	(0.8)	68.0	(0.8)
	Czech Republic	-0.67	(0.01)	16.4	(0.6)	20.2	(0.6)	23.4	(0.6)	44.4	(0.6)	35.6	(0.8)
	Denmark	0.18	(0.02)	44.9	(0.8)	57.3	(0.8)	54.9	(0.8)	72.9	(0.7)	71.5	(0.7)
	Estonia	0.02	(0.01)	30.1	(0.6)	45.2	(0.8)	49.2	(0.7)	71.1	(0.6)	64.6	(0.7)
	Finland	-0.09	(0.02)	27.2	(0.7)	45.4	(0.9)	44.6	(0.8)	64.8	(1.0)	63.2	(1.0)
	France	-0.06	(0.02)	35.9	(0.7)	43.3	(0.8)	46.5	(0.7)	66.5	(0.8)	69.3	(0.6)
	Germany	0.04	(0.02)	54.4	(0.8)	43.3	(0.8)	41.2	(0.9)	61.3	(0.8)	68.1	(0.8)
	Greece	0.14	(0.02)	34.2	(0.8)	51.0	(0.8)	51.8	(0.9)	66.3	(0.9)	64.6	(1.1)
	Hungary	-0.23	(0.02)	27.8	(0.8)	37.9	(0.7)	37.1	(0.8)	59.1	(0.9)	58.2	(0.9)
	Iceland	0.23	(0.02)	51.4	(0.8)	61.5	(0.9)	58.0	(1.0)	73.5	(0.9)	75.3	(0.7)
	Ireland	0.06	(0.02)	37.0	(0.8)	47.4	(0.8)	54.0	(0.7)	69.3	(0.7)	77.7	(0.7)
	Israel	-0.24	(0.02)	23.4	(0.8)	40.8	(0.8)	42.0	(0.9)	55.1	(0.9)	59.6	(0.8)
	Italy	0.21	(0.02)	48.2	(1.0)	47.9	(1.0)	57.5	(0.9)	74.6	(0.6)	78.4	(0.7)
	Japan	-0.11	(0.02)	54.9	(0.8)	36.5	(1.0)	37.8	(1.0)	72.1	(0.6)	53.6	(0.9)
	Korea	-0.07	(0.02)	55.6	(0.9)	39.0	(0.8)	41.2	(0.8)	64.4	(0.9)	61.4	(0.9)
	Latvia	0.14	(0.01)	36.6	(0.8)	53.1	(0.9)	54.5	(0.8)	73.3	(0.7)	70.3	(0.8)
	Luxembourg	0.21	(0.01)	47.3	(0.7)	53.5	(0.6)	55.9	(0.6)	67.6	(0.7)	70.8	(0.7)
	Mexico	0.43	(0.01)	63.4	(0.9)	61.6	(0.7)	67.9	(0.7)	74.8	(0.7)	80.2	(0.8)
	Netherlands	-0.27	(0.02)	32.0	(0.8)	40.3	(0.7)	38.5	(0.6)	53.7	(0.9)	60.1	(0.7)
	New Zealand	0.09	(0.02)	38.9	(0.8)	53.1	(1.0)	56.6	(0.9)	65.7	(0.7)	65.8	(0.7)
	Norway	0.05	(0.02)	41.1	(0.9)	53.3	(0.8)	54.5	(0.8)	69.3	(0.7)	65.9	(0.8)
	Poland	-0.24	(0.02)	22.0	(0.7)	34.0	(0.8)	36.6	(0.9)	58.9	(0.8)	58.8	(0.8)
	Portugal	0.27	(0.02)	62.5	(0.7)	54.8	(0.9)	57.1	(0.8)	75.5	(0.8)	79.0	(0.6)
	Slovak Republic	-0.32	(0.02)	29.3	(0.8)	38.0	(0.9)	39.6	(0.9)	57.1	(0.9)	52.2	(0.8)
	Slovenia	-0.32	(0.01)	27.1	(0.7)	29.4	(0.7)	33.1	(0.8)	62.7	(0.7)	57.1	(0.8)
	Spain	0.10	(0.01)	49.4	(0.7)	46.4	(0.8)	50.0	(0.7)	72.2	(0.8)	75.4	(0.6)
	Sweden	-0.02	(0.02)	42.0	(1.0)	44.4	(0.9)	45.5	(0.8)	63.5	(0.8)	60.7	(1.0)
	Switzerland	0.15	(0.02)	49.2	(1.0)	49.3	(0.8)	53.4	(0.9)	69.7	(0.8)	70.3	(0.8)
	Turkey	-0.06	(0.02)	37.5	(0.8)	46.8	(0.8)	48.6	(0.8)	53.9	(0.8)	58.3	(0.8)
	United Kingdom	0.01	(0.02)	38.3	(0.8)	44.9	(0.8)	50.4	(0.8)	71.0	(0.7)	72.9	(0.8)
	United States	0.05	(0.02)	44.0	(0.9)	47.5	(0.9)	53.9	(0.8)	66.9	(0.7)	72.7	(0.7)
	OECD average	0.00	(0.00)	40.9	(0.1)	46.1	(0.1)	48.5	(0.1)	65.9	(0.1)	66.2	(0.1)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	0.24	(0.01)	51.5	(0.7)	55.7	(0.6)	60.5	(0.7)	71.3	(0.6)	73.3	(0.6)
	B-S-J-G (China)	0.45	(0.02)	65.0	(1.0)	68.0	(0.8)	62.7	(0.9)	79.9	(0.7)	79.0	(0.7)
	Bulgaria	0.28	(0.02)	56.6	(0.8)	55.9	(0.9)	58.6	(0.9)	75.3	(0.7)	75.1	(0.8)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	0.35	(0.01)	58.9	(0.8)	59.1	(0.7)	62.7	(0.7)	75.8	(0.6)	78.9	(0.6)
	Costa Rica	0.22	(0.02)	52.8	(0.9)	48.6	(0.8)	53.1	(0.8)	71.9	(0.8)	74.5	(0.8)
	Croatia	-0.16	(0.02)	33.1	(0.8)	37.2	(0.9)	40.7	(0.8)	68.9	(0.7)	64.1	(0.9)
	Cyprus*	0.02	(0.02)	32.3	(0.7)	47.9	(0.7)	50.5	(0.7)	59.0	(0.6)	60.7	(0.7)
	Dominican Republic	0.69	(0.02)	70.1	(1.0)	77.6	(0.9)	78.8	(1.0)	86.0	(0.7)	87.0	(0.8)
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	0.25	(0.02)	63.7	(0.9)	56.8	(0.8)	58.8	(0.8)	68.3	(0.6)	69.2	(0.7)
	Indonesia	m	m	m	m	m	m	m	m	m	m	m	m
	Jordan	m	m	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	0.11	(0.01)	34.5	(0.7)	50.3	(0.7)	51.3	(0.8)	73.3	(0.7)	69.8	(0.7)
	Macao (China)	0.06	(0.01)	52.5	(0.7)	48.7	(0.7)	45.3	(0.6)	67.3	(0.7)	61.2	(0.7)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	-0.08	(0.02)	44.3	(0.8)	37.6	(0.8)	44.3	(0.8)	57.9	(0.8)	64.8	(0.7)
	Peru	0.46	(0.01)	60.4	(0.7)	63.0	(0.8)	67.2	(0.7)	81.8	(0.5)	85.1	(0.5)
	Qatar	0.25	(0.01)	54.1	(0.4)	57.7	(0.4)	62.6	(0.5)	71.1	(0.5)	73.1	(0.4)
	Romania	m	m	m	m	m	m	m	m	m	m	m	m
	Russia	0.03	(0.02)	39.0	(0.9)	44.2	(1.1)	46.4	(0.8)	67.4	(1.1)	63.4	(0.8)
	Singapore	0.28	(0.01)	47.9	(0.6)	57.3	(0.6)	61.5	(0.6)	70.5	(0.6)	76.9	(0.6)
	Chinese Taipei	-0.01	(0.01)	59.6	(0.6)	38.1	(0.7)	35.6	(0.7)	64.2	(0.6)	66.2	(0.6)
	Thailand	0.60	(0.01)	90.2	(0.4)	77.2	(0.8)	78.2	(0.8)	78.4	(0.6)	84.6	(0.5)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	0.26	(0.01)	48.4	(0.9)	55.1	(0.9)	56.5	(0.7)	66.5	(0.8)	72.9	(0.8)
	United Arab Emirates	0.19	(0.01)	48.8	(0.8)	52.2	(0.7)	56.1	(0.6)	67.4	(0.5)	70.7	(0.6)
	Uruguay	-0.05	(0.02)	43.7	(0.9)	42.5	(0.9)	49.5	(0.8)	64.3	(0.7)	68.6	(0.7)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	0.49	(0.02)	51.3	(0.9)	74.9	(0.9)	71.1	(0.8)	80.6	(0.9)	85.8	(0.7)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.2a Index of interest in broad science topics

Percentage of students who reported that they are "interested" or "highly interested" and percentage of students who reported that "[they] don't know what this is"

		Percentage of students who do not know what the following topics are:									
		Biosphere (e.g. ecosystem services, sustainability)		Motion and forces (e.g. velocity, friction, magnetic and gravitational forces)		Energy and its transformation (e.g. conservation, chemical reactions)		The Universe and its history		How science can help us prevent disease	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	2.7	(0.1)	1.3	(0.1)	1.5	(0.1)	2.6	(0.2)	2.1	(0.1)
	Austria	2.0	(0.2)	2.3	(0.2)	2.6	(0.2)	5.5	(0.3)	5.1	(0.4)
	Belgium	3.7	(0.2)	1.3	(0.1)	1.8	(0.2)	2.9	(0.2)	2.9	(0.2)
	Canada	2.0	(0.2)	1.5	(0.1)	2.0	(0.1)	3.1	(0.2)	3.2	(0.2)
	Chile	3.5	(0.3)	1.2	(0.2)	1.8	(0.2)	2.5	(0.2)	2.6	(0.2)
	Czech Republic	1.4	(0.2)	0.8	(0.1)	0.8	(0.1)	1.1	(0.2)	2.2	(0.2)
	Denmark	1.9	(0.2)	0.8	(0.1)	1.4	(0.2)	2.0	(0.2)	2.0	(0.2)
	Estonia	3.6	(0.3)	1.2	(0.2)	1.6	(0.2)	2.4	(0.2)	3.0	(0.3)
	Finland	5.5	(0.4)	0.6	(0.1)	0.8	(0.1)	1.9	(0.2)	2.0	(0.2)
	France	2.6	(0.2)	1.7	(0.2)	2.0	(0.2)	2.4	(0.2)	3.2	(0.3)
	Germany	2.2	(0.3)	2.8	(0.3)	2.7	(0.3)	7.1	(0.5)	6.2	(0.4)
	Greece	3.1	(0.3)	1.6	(0.2)	2.0	(0.2)	4.2	(0.3)	5.5	(0.4)
	Hungary	4.4	(0.4)	1.5	(0.2)	1.9	(0.2)	3.6	(0.3)	4.3	(0.3)
	Iceland	3.8	(0.3)	1.7	(0.2)	2.1	(0.3)	4.0	(0.3)	3.8	(0.3)
	Ireland	13.2	(0.5)	1.5	(0.2)	1.5	(0.2)	2.5	(0.2)	2.6	(0.2)
	Israel	9.3	(0.4)	1.9	(0.2)	2.9	(0.3)	2.9	(0.3)	4.8	(0.3)
	Italy	2.8	(0.2)	1.7	(0.2)	2.0	(0.2)	3.0	(0.2)	4.4	(0.3)
	Japan	1.5	(0.2)	0.9	(0.1)	1.2	(0.1)	1.9	(0.2)	2.4	(0.2)
	Korea	1.1	(0.1)	0.7	(0.1)	1.0	(0.2)	1.8	(0.2)	1.7	(0.2)
	Latvia	3.9	(0.3)	0.9	(0.2)	1.3	(0.2)	2.6	(0.2)	3.0	(0.3)
	Luxembourg	4.7	(0.3)	2.8	(0.2)	3.2	(0.2)	5.1	(0.3)	6.1	(0.3)
	Mexico	1.3	(0.1)	1.3	(0.1)	1.7	(0.2)	2.7	(0.2)	2.6	(0.2)
	Netherlands	2.7	(0.3)	0.9	(0.2)	1.1	(0.2)	1.6	(0.2)	1.3	(0.2)
	New Zealand	4.7	(0.3)	1.0	(0.2)	1.3	(0.2)	3.1	(0.3)	2.7	(0.3)
	Norway	3.4	(0.3)	1.4	(0.2)	1.9	(0.2)	3.5	(0.3)	2.7	(0.3)
	Poland	1.6	(0.2)	0.6	(0.1)	0.9	(0.2)	2.1	(0.2)	2.8	(0.3)
	Portugal	0.8	(0.1)	0.8	(0.1)	0.9	(0.1)	1.9	(0.2)	1.9	(0.2)
	Slovak Republic	3.1	(0.3)	1.2	(0.2)	1.5	(0.2)	2.0	(0.2)	3.8	(0.3)
	Slovenia	2.1	(0.2)	0.8	(0.1)	1.4	(0.2)	2.1	(0.2)	2.5	(0.2)
	Spain	0.9	(0.1)	1.0	(0.1)	1.2	(0.1)	1.9	(0.2)	2.5	(0.2)
	Sweden	2.2	(0.3)	1.8	(0.2)	1.9	(0.2)	3.3	(0.3)	3.1	(0.3)
	Switzerland	3.3	(0.3)	2.1	(0.2)	3.0	(0.3)	4.3	(0.3)	4.4	(0.3)
	Turkey	4.8	(0.3)	4.5	(0.3)	4.7	(0.3)	5.7	(0.3)	7.4	(0.3)
	United Kingdom	7.0	(0.4)	1.3	(0.2)	1.3	(0.2)	2.3	(0.2)	1.9	(0.2)
	United States	3.7	(0.3)	1.2	(0.1)	1.2	(0.1)	2.4	(0.2)	2.7	(0.2)
	OECD average	3.4	(0.0)	1.4	(0.0)	1.8	(0.0)	3.0	(0.0)	3.3	(0.0)
Partners	Albania	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m
	Brazil	2.2	(0.2)	2.0	(0.1)	2.0	(0.1)	2.5	(0.2)	3.0	(0.2)
	B-S-J-G (China)	1.7	(0.2)	0.9	(0.1)	2.5	(0.2)	2.7	(0.2)	2.5	(0.2)
	Bulgaria	2.4	(0.3)	1.9	(0.3)	2.3	(0.3)	3.6	(0.3)	4.6	(0.4)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m
	Colombia	1.6	(0.2)	1.3	(0.2)	1.6	(0.2)	1.9	(0.2)	3.2	(0.3)
	Costa Rica	2.0	(0.2)	1.4	(0.2)	1.9	(0.2)	2.8	(0.3)	2.9	(0.2)
	Croatia	1.2	(0.2)	0.8	(0.1)	1.1	(0.1)	2.1	(0.2)	2.6	(0.2)
	Cyprus*	5.8	(0.3)	2.4	(0.2)	3.2	(0.3)	5.6	(0.3)	7.5	(0.4)
	Dominican Republic	3.9	(0.4)	2.3	(0.3)	2.0	(0.3)	2.5	(0.3)	3.2	(0.4)
	FYROM	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	2.8	(0.3)	2.2	(0.2)	3.1	(0.3)	2.8	(0.3)	2.0	(0.3)
	Indonesia	m	m	m	m	m	m	m	m	m	m
	Jordan	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m
	Lithuania	5.8	(0.4)	2.2	(0.2)	2.6	(0.2)	3.6	(0.3)	4.4	(0.3)
	Macao (China)	2.1	(0.2)	0.8	(0.2)	1.3	(0.2)	2.2	(0.3)	1.6	(0.2)
	Malta	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m
	Montenegro	2.3	(0.2)	2.2	(0.2)	2.5	(0.2)	4.4	(0.2)	6.1	(0.3)
	Peru	1.9	(0.2)	1.5	(0.2)	1.4	(0.1)	1.7	(0.2)	1.7	(0.2)
	Qatar	5.9	(0.2)	2.5	(0.2)	2.7	(0.2)	4.0	(0.2)	5.2	(0.2)
	Romania	m	m	m	m	m	m	m	m	m	m
	Russia	2.3	(0.2)	1.9	(0.2)	2.1	(0.2)	3.0	(0.3)	3.4	(0.3)
	Singapore	9.8	(0.4)	1.7	(0.2)	1.8	(0.1)	5.3	(0.3)	3.3	(0.3)
	Chinese Taipei	0.6	(0.1)	0.6	(0.1)	1.0	(0.1)	1.5	(0.2)	1.3	(0.1)
	Thailand	1.0	(0.2)	0.9	(0.1)	1.4	(0.2)	2.9	(0.2)	2.5	(0.2)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m
	Tunisia	3.6	(0.3)	2.8	(0.2)	4.1	(0.4)	4.1	(0.4)	5.4	(0.4)
	United Arab Emirates	5.4	(0.2)	3.4	(0.2)	3.9	(0.2)	4.6	(0.3)	5.8	(0.2)
	Uruguay	3.1	(0.3)	2.3	(0.3)	2.6	(0.3)	3.3	(0.3)	4.2	(0.3)
	Viet Nam	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m
	Malaysia**	9.4	(0.4)	2.6	(0.2)	4.0	(0.3)	3.3	(0.3)	3.4	(0.2)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.2b Index of interest in broad science topics and science performance, by national quarters of this index

Results based on students' self-reports

		Index of interest in broad science topics											
		All students		Variability in this index		Bottom quarter		Second quarter		Third quarter		Top quarter	
		Mean index	S.E.	S.D.	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.
OECD	Australia	0.04	(0.01)	1.04	(0.01)	-1.35	(0.03)	-0.11	(0.01)	0.44	(0.01)	1.18	(0.01)
	Austria	0.06	(0.02)	0.99	(0.01)	-1.21	(0.03)	-0.12	(0.02)	0.39	(0.02)	1.17	(0.02)
	Belgium	0.07	(0.01)	1.02	(0.01)	-1.29	(0.03)	-0.08	(0.01)	0.46	(0.01)	1.19	(0.01)
	Canada	0.26	(0.01)	0.96	(0.01)	-0.96	(0.03)	0.10	(0.01)	0.57	(0.01)	1.33	(0.02)
	Chile	0.04	(0.02)	1.00	(0.01)	-1.20	(0.03)	-0.20	(0.01)	0.36	(0.01)	1.21	(0.02)
	Czech Republic	-0.67	(0.01)	0.97	(0.01)	-1.99	(0.03)	-0.85	(0.02)	-0.31	(0.01)	0.47	(0.02)
	Denmark	0.18	(0.02)	0.94	(0.01)	-1.01	(0.03)	0.03	(0.01)	0.50	(0.02)	1.21	(0.02)
	Estonia	0.02	(0.01)	0.85	(0.01)	-1.06	(0.03)	-0.15	(0.01)	0.29	(0.01)	0.97	(0.02)
	Finland	-0.09	(0.02)	0.97	(0.01)	-1.38	(0.04)	-0.23	(0.01)	0.25	(0.02)	0.99	(0.02)
	France	-0.06	(0.02)	0.98	(0.01)	-1.35	(0.03)	-0.18	(0.01)	0.29	(0.01)	1.02	(0.02)
	Germany	0.04	(0.02)	0.96	(0.02)	-1.14	(0.04)	-0.16	(0.01)	0.32	(0.02)	1.17	(0.03)
	Greece	0.14	(0.02)	0.98	(0.02)	-1.09	(0.04)	-0.07	(0.02)	0.45	(0.02)	1.28	(0.02)
	Hungary	-0.23	(0.02)	0.96	(0.01)	-1.47	(0.04)	-0.39	(0.02)	0.09	(0.01)	0.87	(0.02)
	Iceland	0.23	(0.02)	1.17	(0.02)	-1.34	(0.05)	0.10	(0.03)	0.65	(0.01)	1.53	(0.03)
	Ireland	0.06	(0.02)	0.94	(0.01)	-1.18	(0.04)	-0.08	(0.01)	0.41	(0.01)	1.10	(0.01)
	Israel	-0.24	(0.02)	1.14	(0.01)	-1.79	(0.04)	-0.45	(0.02)	0.20	(0.02)	1.08	(0.02)
	Italy	0.21	(0.02)	0.85	(0.01)	-0.83	(0.03)	0.04	(0.02)	0.46	(0.01)	1.16	(0.02)
	Japan	-0.11	(0.02)	0.92	(0.01)	-1.27	(0.03)	-0.22	(0.01)	0.17	(0.02)	0.90	(0.02)
	Korea	-0.07	(0.02)	0.98	(0.01)	-1.32	(0.04)	-0.22	(0.01)	0.25	(0.02)	1.01	(0.02)
	Latvia	0.14	(0.01)	0.80	(0.01)	-0.85	(0.03)	-0.03	(0.01)	0.39	(0.01)	1.06	(0.02)
	Luxembourg	0.21	(0.01)	1.00	(0.01)	-1.06	(0.03)	0.02	(0.01)	0.53	(0.01)	1.35	(0.02)
	Mexico	0.43	(0.01)	0.82	(0.01)	-0.54	(0.02)	0.26	(0.02)	0.61	(0.01)	1.42	(0.02)
	Netherlands	-0.27	(0.02)	1.00	(0.01)	-1.67	(0.04)	-0.36	(0.02)	0.14	(0.01)	0.83	(0.02)
	New Zealand	0.09	(0.02)	1.01	(0.01)	-1.23	(0.04)	-0.04	(0.02)	0.45	(0.02)	1.20	(0.02)
	Norway	0.05	(0.02)	1.06	(0.01)	-1.38	(0.04)	-0.08	(0.02)	0.46	(0.01)	1.19	(0.02)
	Poland	-0.24	(0.02)	0.86	(0.01)	-1.38	(0.03)	-0.34	(0.01)	0.03	(0.01)	0.72	(0.02)
	Portugal	0.27	(0.02)	0.94	(0.01)	-0.90	(0.03)	0.07	(0.02)	0.56	(0.01)	1.33	(0.02)
	Slovak Republic	-0.32	(0.02)	1.02	(0.01)	-1.75	(0.04)	-0.38	(0.02)	0.08	(0.02)	0.76	(0.02)
	Slovenia	-0.32	(0.01)	0.95	(0.01)	-1.55	(0.02)	-0.51	(0.02)	-0.02	(0.01)	0.79	(0.02)
	Spain	0.10	(0.01)	0.91	(0.01)	-1.05	(0.03)	-0.06	(0.01)	0.42	(0.01)	1.12	(0.01)
	Sweden	-0.02	(0.02)	1.09	(0.01)	-1.44	(0.04)	-0.24	(0.02)	0.36	(0.02)	1.25	(0.02)
	Switzerland	0.15	(0.02)	0.92	(0.02)	-1.02	(0.04)	-0.02	(0.02)	0.46	(0.01)	1.19	(0.02)
	Turkey	-0.06	(0.02)	1.02	(0.01)	-1.37	(0.03)	-0.20	(0.01)	0.30	(0.01)	1.04	(0.02)
	United Kingdom	0.01	(0.02)	0.96	(0.01)	-1.26	(0.04)	-0.14	(0.01)	0.36	(0.01)	1.07	(0.02)
	United States	0.05	(0.02)	0.98	(0.01)	-1.21	(0.03)	-0.10	(0.01)	0.41	(0.01)	1.11	(0.02)
	OECD average	0.00	(0.00)	0.97	(0.00)	-1.25	(0.01)	-0.15	(0.00)	0.34	(0.00)	1.09	(0.00)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	0.24	(0.01)	0.98	(0.01)	-0.96	(0.03)	0.06	(0.02)	0.52	(0.01)	1.36	(0.02)
	B-S-J-G (China)	0.45	(0.02)	0.81	(0.01)	-0.46	(0.02)	0.24	(0.02)	0.59	(0.01)	1.45	(0.03)
	Bulgaria	0.28	(0.02)	1.00	(0.02)	-0.95	(0.04)	0.09	(0.02)	0.57	(0.01)	1.42	(0.03)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	0.35	(0.01)	0.89	(0.01)	-0.73	(0.03)	0.15	(0.01)	0.57	(0.01)	1.39	(0.02)
	Costa Rica	0.22	(0.02)	0.93	(0.01)	-0.89	(0.03)	-0.03	(0.01)	0.48	(0.01)	1.34	(0.03)
	Croatia	-0.16	(0.02)	0.97	(0.01)	-1.47	(0.04)	-0.27	(0.02)	0.17	(0.02)	0.91	(0.02)
	Cyprus*	0.02	(0.02)	1.06	(0.01)	-1.33	(0.04)	-0.18	(0.01)	0.38	(0.01)	1.22	(0.02)
	Dominican Republic	0.69	(0.02)	0.94	(0.02)	-0.40	(0.04)	0.50	(0.01)	0.76	(0.02)	1.91	(0.04)
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	0.25	(0.02)	1.02	(0.01)	-1.05	(0.03)	0.07	(0.02)	0.57	(0.01)	1.39	(0.03)
	Indonesia	m	m	m	m	m	m	m	m	m	m	m	m
	Jordan	m	m	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	0.11	(0.01)	0.86	(0.01)	-0.95	(0.03)	-0.07	(0.01)	0.38	(0.01)	1.08	(0.02)
	Macao (China)	0.06	(0.01)	0.91	(0.01)	-1.06	(0.03)	-0.15	(0.01)	0.34	(0.01)	1.13	(0.02)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	-0.08	(0.02)	1.06	(0.01)	-1.45	(0.03)	-0.25	(0.01)	0.27	(0.02)	1.10	(0.02)
	Peru	0.46	(0.01)	0.81	(0.01)	-0.48	(0.02)	0.26	(0.02)	0.62	(0.01)	1.46	(0.02)
	Qatar	0.25	(0.01)	0.96	(0.01)	-0.96	(0.02)	0.10	(0.01)	0.54	(0.00)	1.31	(0.02)
	Romania	m	m	m	m	m	m	m	m	m	m	m	m
	Russia	0.03	(0.02)	0.91	(0.01)	-1.06	(0.04)	-0.17	(0.02)	0.30	(0.02)	1.04	(0.03)
	Singapore	0.28	(0.01)	0.91	(0.01)	-0.85	(0.02)	0.10	(0.01)	0.57	(0.01)	1.31	(0.02)
	Chinese Taipei	-0.01	(0.01)	0.85	(0.01)	-1.00	(0.02)	-0.19	(0.01)	0.19	(0.02)	0.96	(0.02)
	Thailand	0.60	(0.01)	0.69	(0.01)	-0.16	(0.02)	0.49	(0.01)	0.62	(0.01)	1.45	(0.03)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	0.26	(0.01)	0.87	(0.01)	-0.81	(0.03)	0.05	(0.01)	0.51	(0.01)	1.29	(0.02)
	United Arab Emirates	0.19	(0.01)	0.96	(0.01)	-1.03	(0.03)	0.00	(0.01)	0.50	(0.01)	1.28	(0.02)
	Uruguay	-0.05	(0.02)	0.97	(0.02)	-1.33	(0.04)	-0.18	(0.01)	0.32	(0.01)	0.98	(0.02)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	0.49	(0.02)	0.75	(0.02)	-0.39	(0.03)	0.35	(0.01)	0.62	(0.01)	1.37	(0.02)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.2b Index of interest in broad science topics and science performance, by national quarters of this index

Results based on students' self-reports

		Performance in science, by national quarters of this index								Difference in science performance between students in the top quarter and students in the bottom quarter of this index		Change in the science score per unit of this index		Increased likelihood of students in the bottom quarter of this index scoring in the bottom quarter of the national science performance distribution		Explained variance in student performance in science (r-squared x 100)	
		Bottom quarter		Second quarter		Third quarter		Top quarter									
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Relative risk	S.E.	%	S.E.
OECD	Australia	470	(2.5)	508	(2.6)	521	(2.4)	565	(2.5)	**95**	(3.3)	**33**	(1.0)	**2.0**	(0.1)	11.7	(0.6)
	Austria	461	(3.6)	503	(5.2)	513	(3.9)	532	(3.3)	**71**	(4.6)	**27**	(1.7)	**2.0**	(0.1)	7.7	(1.0)
	Belgium	468	(2.8)	508	(3.8)	528	(3.2)	560	(2.8)	**92**	(3.9)	**33**	(1.2)	**2.2**	(0.1)	13.1	(1.0)
	Canada	494	(2.9)	534	(2.6)	535	(2.4)	567	(2.7)	**73**	(3.3)	**26**	(1.0)	**1.9**	(0.1)	7.7	(0.6)
	Chile	437	(2.8)	445	(3.4)	453	(4.2)	476	(3.7)	**38**	(3.7)	**14**	(1.4)	**1.2**	(0.1)	2.5	(0.5)
	Czech Republic	461	(3.6)	508	(3.3)	509	(3.1)	523	(3.2)	**62**	(4.8)	**25**	(1.7)	**1.9**	(0.1)	6.8	(0.8)
	Denmark	472	(3.0)	504	(3.2)	514	(3.3)	549	(3.2)	**78**	(4.0)	**29**	(1.3)	**2.0**	(0.1)	9.5	(0.8)
	Estonia	506	(3.2)	534	(3.1)	546	(3.9)	561	(3.7)	**55**	(4.5)	**25**	(1.6)	**1.7**	(0.1)	5.8	(0.7)
	Finland	495	(3.5)	526	(3.9)	551	(3.3)	575	(3.3)	**80**	(4.0)	**35**	(1.2)	**2.0**	(0.1)	13.2	(0.9)
	France	460	(2.8)	501	(2.7)	519	(3.3)	549	(3.7)	**89**	(4.1)	**36**	(1.3)	**2.1**	(0.1)	13.5	(1.0)
	Germany	497	(4.3)	521	(4.1)	530	(4.9)	553	(5.0)	**56**	(5.4)	**22**	(1.9)	**1.6**	(0.1)	4.7	(0.9)
	Greece	423	(4.0)	448	(4.6)	472	(4.8)	502	(4.1)	**79**	(4.4)	**28**	(1.6)	**2.0**	(0.1)	9.5	(1.0)
	Hungary	461	(3.7)	480	(4.1)	491	(4.9)	500	(4.6)	**38**	(5.6)	**19**	(2.1)	**1.3**	(0.1)	3.5	(0.8)
	Iceland	437	(3.5)	479	(3.4)	482	(3.5)	518	(3.4)	**81**	(4.5)	**25**	(1.3)	**2.0**	(0.1)	10.6	(1.1)
	Ireland	458	(3.7)	501	(3.1)	510	(3.4)	553	(3.0)	**95**	(4.0)	**37**	(1.1)	**2.3**	(0.1)	15.5	(0.9)
	Israel	449	(4.4)	474	(4.4)	480	(6.1)	499	(5.2)	**50**	(6.1)	**18**	(1.9)	**1.4**	(0.1)	3.9	(0.8)
	Italy	453	(3.4)	484	(3.5)	487	(3.4)	515	(3.6)	**62**	(4.3)	**25**	(1.7)	**1.7**	(0.1)	5.4	(0.7)
	Japan	508	(3.2)	530	(3.9)	562	(3.7)	565	(4.6)	**57**	(4.7)	**29**	(1.7)	**1.7**	(0.1)	8.3	(0.9)
	Korea	491	(3.5)	503	(4.9)	526	(3.4)	548	(5.6)	**57**	(6.2)	**24**	(1.9)	**1.4**	(0.1)	6.1	(0.9)
	Latvia	477	(2.9)	492	(2.8)	488	(3.0)	513	(3.2)	**36**	(4.4)	**15**	(1.8)	**1.3**	(0.1)	2.1	(0.5)
	Luxembourg	449	(2.6)	493	(2.8)	498	(3.3)	532	(3.1)	**82**	(4.4)	**27**	(1.6)	**2.0**	(0.1)	7.9	(0.9)
	Mexico	404	(3.2)	421	(3.1)	415	(2.6)	440	(3.0)	**36**	(3.9)	**14**	(1.5)	**1.5**	(0.1)	2.4	(0.5)
	Netherlands	471	(3.1)	506	(3.5)	535	(3.2)	558	(4.1)	**87**	(4.4)	**35**	(1.6)	**2.0**	(0.1)	13.4	(1.1)
	New Zealand	477	(3.8)	525	(3.5)	526	(4.9)	564	(3.8)	**86**	(5.2)	**31**	(1.8)	**1.9**	(0.1)	9.4	(1.0)
	Norway	463	(3.0)	497	(3.6)	513	(3.6)	550	(3.2)	**87**	(4.2)	**29**	(1.4)	**2.0**	(0.1)	10.6	(0.9)
	Poland	487	(3.6)	492	(3.2)	508	(3.7)	527	(4.1)	**39**	(4.7)	**20**	(1.9)	**1.2**	(0.1)	3.6	(0.7)
	Portugal	474	(3.3)	510	(3.1)	493	(3.5)	540	(4.4)	**66**	(4.2)	**20**	(1.4)	**1.5**	(0.1)	4.3	(0.6)
	Slovak Republic	445	(3.2)	466	(3.5)	483	(3.3)	490	(3.4)	**45**	(3.8)	**19**	(1.4)	**1.4**	(0.1)	4.3	(0.6)
	Slovenia	484	(3.0)	511	(3.2)	532	(3.4)	546	(3.0)	**62**	(4.7)	**27**	(1.6)	**1.7**	(0.1)	7.6	(0.9)
	Spain	467	(3.2)	495	(2.8)	494	(3.1)	531	(2.8)	**65**	(3.5)	**25**	(1.3)	**1.7**	(0.1)	6.9	(0.7)
	Sweden	461	(3.4)	495	(4.2)	513	(4.6)	553	(4.6)	**92**	(4.6)	**31**	(1.6)	**2.0**	(0.1)	11.6	(1.1)
	Switzerland	470	(4.5)	512	(3.6)	521	(3.9)	547	(4.0)	**77**	(5.5)	**30**	(1.7)	**1.9**	(0.1)	8.0	(0.9)
	Turkey	418	(4.0)	430	(4.5)	431	(4.5)	437	(5.3)	**19**	(4.2)	**8**	(1.4)	**1.2**	(0.1)	1.0	(0.3)
	United Kingdom	480	(3.1)	513	(3.9)	518	(3.7)	556	(4.0)	**75**	(4.4)	**30**	(1.6)	**1.8**	(0.1)	8.8	(0.9)
	United States	472	(3.8)	511	(3.5)	490	(5.0)	534	(3.8)	**62**	(4.2)	**19**	(1.5)	**1.6**	(0.1)	3.6	(0.5)
	OECD average	466	(0.6)	496	(0.6)	505	(0.6)	532	(0.6)	**66**	(0.8)	**25**	(0.3)	**1.8**	(0.0)	7.6	(0.1)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	392	(3.3)	421	(3.7)	410	(3.6)	450	(4.3)	**58**	(3.9)	**18**	(1.5)	**1.5**	(0.1)	3.7	(0.6)
	B-S-J-G (China)	497	(5.5)	517	(5.9)	516	(5.2)	549	(5.9)	**52**	(5.5)	**22**	(2.4)	**1.5**	(0.1)	2.9	(0.6)
	Bulgaria	444	(5.1)	468	(4.8)	460	(5.1)	475	(5.3)	**30**	(5.4)	**9**	(1.9)	**1.5**	(0.1)	0.9	(0.4)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	400	(3.5)	424	(3.2)	418	(2.9)	441	(3.1)	**41**	(3.8)	**15**	(1.3)	**1.6**	(0.1)	2.8	(0.5)
	Costa Rica	402	(2.7)	430	(2.7)	423	(3.4)	443	(3.0)	**40**	(2.9)	**12**	(1.2)	**1.7**	(0.1)	2.7	(0.5)
	Croatia	445	(3.7)	472	(3.4)	485	(3.2)	511	(3.5)	**66**	(4.0)	**28**	(1.5)	**1.8**	(0.1)	9.9	(1.0)
	Cyprus*	409	(2.7)	423	(3.0)	444	(3.3)	485	(2.8)	**76**	(4.4)	**25**	(1.3)	**1.6**	(0.1)	8.6	(0.8)
	Dominican Republic	335	(4.4)	330	(4.3)	355	(3.5)	360	(4.1)	**25**	(5.1)	**10**	(1.8)	**1.4**	(0.1)	1.8	(0.6)
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	495	(3.6)	528	(3.9)	526	(3.5)	553	(2.6)	**58**	(3.7)	**20**	(1.2)	**1.7**	(0.1)	6.2	(0.7)
	Indonesia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Jordan	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	457	(3.4)	480	(3.3)	477	(3.9)	506	(3.5)	**49**	(4.4)	**18**	(1.6)	**1.6**	(0.1)	2.9	(0.5)
	Macao (China)	505	(2.3)	525	(2.7)	532	(2.6)	554	(3.1)	**49**	(4.3)	**19**	(1.5)	**1.5**	(0.1)	4.7	(0.7)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	399	(2.3)	418	(3.2)	430	(3.3)	443	(2.7)	**43**	(3.6)	**16**	(1.3)	**1.5**	(0.1)	4.4	(0.7)
	Peru	399	(3.7)	408	(3.5)	403	(3.5)	427	(2.8)	**28**	(3.6)	**11**	(1.4)	**1.3**	(0.1)	1.5	(0.4)
	Qatar	408	(1.9)	446	(2.0)	418	(2.2)	463	(2.6)	**55**	(2.9)	**17**	(1.1)	**1.4**	(0.1)	2.8	(0.4)
	Romania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Russia	467	(3.1)	490	(3.6)	496	(4.2)	513	(3.8)	**46**	(3.6)	**18**	(1.2)	**1.6**	(0.1)	4.2	(0.5)
	Singapore	523	(3.0)	564	(3.4)	556	(2.8)	592	(2.8)	**70**	(3.8)	**28**	(1.6)	**1.8**	(0.1)	6.2	(0.7)
	Chinese Taipei	492	(3.3)	521	(3.6)	555	(3.9)	562	(4.5)	**70**	(5.2)	**35**	(2.1)	**1.9**	(0.1)	9.2	(0.9)
	Thailand	428	(4.4)	404	(3.1)	424	(3.4)	436	(4.0)	7	(4.0)	**6**	(1.8)	0.9	(0.1)	0.3	(0.2)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	380	(2.8)	390	(3.3)	394	(3.4)	407	(3.0)	**27**	(3.3)	**10**	(1.1)	**1.3**	(0.1)	1.9	(0.4)
	United Arab Emirates	421	(3.1)	448	(3.3)	440	(3.2)	469	(3.3)	**48**	(3.5)	**15**	(1.2)	**1.3**	(0.1)	2.2	(0.4)
	Uruguay	427	(3.1)	447	(3.7)	452	(3.4)	472	(4.4)	**45**	(4.6)	**19**	(1.5)	**1.4**	(0.1)	4.9	(0.7)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	424	(4.2)	439	(3.6)	446	(4.8)	473	(3.2)	**49**	(3.7)	**23**	(1.6)	**1.7**	(0.1)	5.4	(0.8)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/1]

Table I.3.3a Index of instrumental motivation to learn science

Percentage of students who reported that they "agree" or "strongly agree"

		Index of instrumental motivation to learn science		Percentage of students who agreed with the following statements: Making an effort in my <school science> subject(s) is worth it because this will help me in the work I want to do later on		What I learn in my <school science> subject(s) is important for me because I need this for what I want to do later on		Studying my <school science> subject(s) is worthwhile for me because what I learn will improve my career prospects		Many things I learn in my <school science> subject(s) will help me to get a job		How science can help us prevent disease	
		Mean index	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	0.16	(0.01)	70.0	(0.5)	61.6	(0.6)	66.7	(0.5)	61.3	(0.5)	68.9	(0.5)
	Austria	-0.22	(0.02)	53.3	(0.8)	47.2	(0.9)	50.0	(0.8)	45.2	(0.9)	61.4	(0.8)
	Belgium	-0.01	(0.01)	65.7	(0.6)	55.7	(0.7)	63.1	(0.7)	52.7	(0.6)	72.8	(0.6)
	Canada	0.46	(0.01)	81.0	(0.5)	73.6	(0.5)	79.5	(0.5)	73.7	(0.5)	73.5	(0.6)
	Chile	0.34	(0.02)	76.4	(0.7)	70.1	(0.8)	75.3	(0.8)	68.1	(0.9)	68.0	(0.8)
	Czech Republic	-0.12	(0.02)	56.6	(0.9)	51.4	(1.1)	51.7	(1.0)	48.2	(0.9)	35.6	(0.8)
	Denmark	0.04	(0.02)	60.0	(0.8)	60.5	(0.7)	62.0	(0.7)	53.2	(0.7)	71.5	(0.7)
	Estonia	0.19	(0.01)	74.1	(0.7)	73.4	(0.7)	71.4	(0.7)	61.0	(0.8)	64.6	(0.7)
	Finland	0.16	(0.02)	65.0	(0.7)	70.7	(0.7)	65.9	(0.7)	64.0	(0.8)	63.2	(1.0)
	France	0.00	(0.02)	63.4	(0.7)	56.8	(0.7)	64.0	(0.7)	50.1	(0.8)	69.3	(0.6)
	Germany	-0.24	(0.02)	54.4	(0.8)	45.7	(0.9)	49.1	(1.0)	43.8	(0.9)	68.1	(0.8)
	Greece	0.27	(0.02)	73.7	(0.7)	72.5	(0.7)	72.4	(0.8)	62.4	(0.9)	64.6	(1.1)
	Hungary	-0.04	(0.02)	68.3	(0.7)	57.5	(1.0)	56.7	(0.8)	53.4	(0.9)	58.2	(0.9)
	Iceland	0.22	(0.02)	69.6	(0.8)	67.3	(0.9)	67.8	(0.8)	66.2	(0.9)	75.3	(0.7)
	Ireland	0.36	(0.02)	78.1	(0.8)	67.8	(0.8)	76.4	(0.9)	71.3	(0.8)	77.7	(0.7)
	Israel	0.28	(0.03)	69.8	(1.0)	63.6	(1.1)	71.4	(0.9)	64.5	(1.1)	59.6	(0.8)
	Italy	0.16	(0.02)	69.4	(1.0)	65.7	(1.2)	72.9	(0.9)	64.0	(1.1)	78.4	(0.7)
	Japan	-0.02	(0.02)	61.4	(0.8)	56.4	(0.9)	56.7	(0.9)	52.1	(0.8)	53.6	(0.9)
	Korea	0.03	(0.02)	66.1	(1.0)	56.9	(1.0)	62.7	(1.0)	63.8	(0.9)	61.4	(0.9)
	Latvia	0.08	(0.01)	68.3	(0.9)	65.3	(0.7)	59.8	(0.8)	59.1	(0.8)	70.3	(0.8)
	Luxembourg	-0.03	(0.02)	60.8	(0.7)	54.7	(0.7)	58.6	(0.6)	52.6	(0.7)	70.8	(0.7)
	Mexico	0.53	(0.01)	85.0	(0.6)	81.0	(0.6)	85.0	(0.5)	79.5	(0.6)	80.2	(0.8)
	Netherlands	-0.21	(0.02)	54.9	(0.9)	48.0	(0.9)	54.7	(0.8)	47.1	(0.9)	60.1	(0.7)
	New Zealand	0.38	(0.02)	78.8	(0.7)	71.2	(0.7)	75.7	(0.7)	72.4	(0.7)	65.8	(0.7)
	Norway	0.11	(0.02)	68.7	(0.8)	64.3	(0.9)	67.1	(0.8)	59.9	(0.7)	65.9	(0.8)
	Poland	0.13	(0.02)	68.4	(0.8)	60.3	(0.9)	70.2	(0.7)	58.4	(0.9)	58.8	(0.8)
	Portugal	0.36	(0.02)	73.2	(0.8)	72.1	(0.7)	75.3	(0.8)	72.0	(0.8)	79.0	(0.6)
	Slovak Republic	0.04	(0.01)	65.0	(0.8)	59.3	(0.8)	63.5	(0.7)	56.9	(0.7)	52.2	(0.8)
	Slovenia	0.07	(0.02)	72.3	(0.7)	66.2	(0.7)	62.6	(0.8)	56.5	(0.8)	57.1	(0.8)
	Spain	0.26	(0.02)	68.2	(0.7)	65.4	(0.7)	70.5	(0.6)	68.2	(0.7)	75.4	(0.6)
	Sweden	0.26	(0.02)	74.0	(0.7)	67.4	(0.7)	74.1	(0.6)	64.8	(0.8)	60.7	(1.0)
	Switzerland	-0.25	(0.02)	54.5	(1.0)	47.8	(0.9)	52.6	(0.8)	42.8	(1.0)	70.3	(0.8)
	Turkey	0.38	(0.01)	80.4	(0.5)	79.0	(0.6)	74.9	(0.6)	70.7	(0.7)	58.3	(0.8)
	United Kingdom	0.38	(0.02)	79.7	(0.6)	67.6	(0.7)	77.0	(0.6)	71.3	(0.8)	72.9	(0.8)
	United States	0.32	(0.02)	80.6	(0.6)	72.2	(0.8)	74.1	(0.7)	70.2	(0.8)	72.7	(0.7)
	OECD average	0.14	(0.00)	68.8	(0.1)	63.3	(0.1)	66.6	(0.1)	60.6	(0.1)	66.2	(0.1)
Partners	Albania	0.88	(0.01)	93.1	(0.4)	91.0	(0.5)	90.1	(0.6)	88.1	(0.6)	m	m
	Algeria	0.43	(0.02)	81.9	(0.7)	81.5	(0.7)	80.2	(0.7)	75.7	(0.8)	m	m
	Brazil	0.45	(0.01)	81.9	(0.5)	78.9	(0.6)	85.3	(0.4)	75.7	(0.6)	73.3	(0.6)
	B-S-J-G (China)	0.53	(0.01)	90.6	(0.4)	86.8	(0.5)	87.8	(0.5)	81.6	(0.7)	79.0	(0.7)
	Bulgaria	0.18	(0.02)	71.2	(0.8)	65.0	(0.9)	71.5	(0.8)	62.3	(1.0)	75.1	(0.8)
	CABA (Argentina)	0.16	(0.03)	70.5	(1.2)	59.7	(1.2)	71.8	(1.6)	58.7	(1.7)	m	m
	Colombia	0.40	(0.01)	82.4	(0.5)	77.4	(0.6)	79.3	(0.5)	72.1	(0.6)	78.9	(0.6)
	Costa Rica	0.44	(0.02)	78.8	(0.7)	74.0	(0.8)	80.4	(0.7)	74.3	(0.8)	74.5	(0.8)
	Croatia	0.14	(0.02)	70.1	(0.8)	66.3	(0.9)	67.3	(0.8)	62.1	(0.8)	64.1	(0.9)
	Cyprus*	0.30	(0.01)	74.7	(0.6)	73.1	(0.7)	71.9	(0.5)	65.8	(0.7)	60.7	(0.7)
	Dominican Republic	0.60	(0.02)	84.3	(0.8)	80.6	(0.8)	84.7	(0.8)	79.0	(0.9)	87.0	(0.8)
	FYROM	0.45	(0.01)	84.6	(0.6)	81.1	(0.7)	79.7	(0.7)	74.6	(0.7)	m	m
	Georgia	0.22	(0.01)	71.3	(0.8)	63.8	(0.9)	75.5	(0.7)	68.1	(0.7)	m	m
	Hong Kong (China)	0.23	(0.02)	72.6	(0.7)	71.9	(0.8)	75.3	(0.7)	69.1	(0.8)	69.2	(0.7)
	Indonesia	0.81	(0.02)	95.4	(0.3)	94.6	(0.3)	93.6	(0.4)	90.7	(0.5)	m	m
	Jordan	0.71	(0.01)	90.5	(0.5)	85.4	(0.5)	84.8	(0.6)	82.8	(0.7)	m	m
	Kosovo	0.80	(0.01)	91.5	(0.4)	89.2	(0.6)	88.4	(0.6)	85.4	(0.6)	m	m
	Lebanon	0.51	(0.02)	83.5	(0.7)	81.5	(0.7)	80.2	(0.7)	77.3	(0.8)	m	m
	Lithuania	0.41	(0.02)	80.8	(0.5)	77.0	(0.6)	70.0	(0.7)	67.9	(0.7)	69.8	(0.7)
	Macao (China)	0.20	(0.01)	75.2	(0.7)	68.9	(0.7)	76.5	(0.7)	65.4	(0.8)	61.2	(0.7)
	Malta	0.20	(0.02)	70.1	(0.6)	60.1	(0.8)	65.1	(0.8)	64.0	(0.8)	m	m
	Moldova	0.36	(0.02)	74.3	(0.8)	77.3	(0.7)	75.0	(0.8)	73.7	(0.7)	m	m
	Montenegro	0.36	(0.01)	82.4	(0.5)	75.3	(0.6)	72.1	(0.6)	68.8	(0.6)	64.8	(0.7)
	Peru	0.51	(0.01)	88.9	(0.5)	85.4	(0.6)	86.7	(0.6)	76.7	(0.8)	85.1	(0.5)
	Qatar	0.53	(0.01)	85.6	(0.3)	81.8	(0.4)	81.6	(0.4)	78.8	(0.4)	73.1	(0.4)
	Romania	0.39	(0.02)	75.9	(1.0)	75.5	(1.0)	76.3	(1.0)	73.9	(0.8)	m	m
	Russia	0.24	(0.01)	76.8	(0.7)	76.5	(0.6)	69.6	(0.7)	66.8	(0.7)	63.4	(0.8)
	Singapore	0.51	(0.01)	88.2	(0.5)	83.2	(0.5)	85.9	(0.5)	79.3	(0.6)	76.9	(0.6)
	Chinese Taipei	0.24	(0.01)	75.5	(0.7)	70.1	(0.7)	76.7	(0.7)	71.9	(0.8)	66.2	(0.6)
	Thailand	0.48	(0.01)	91.8	(0.4)	91.1	(0.4)	90.0	(0.4)	89.7	(0.4)	84.6	(0.5)
	Trinidad and Tobago	0.52	(0.02)	81.1	(0.7)	74.1	(0.8)	78.9	(0.7)	77.9	(0.7)	m	m
	Tunisia	0.60	(0.01)	88.3	(0.6)	86.0	(0.6)	84.2	(0.6)	78.5	(0.7)	72.9	(0.8)
	United Arab Emirates	0.56	(0.01)	86.3	(0.4)	81.8	(0.5)	82.4	(0.4)	79.4	(0.6)	70.7	(0.6)
	Uruguay	0.29	(0.02)	79.6	(0.7)	70.5	(0.8)	71.4	(0.7)	66.3	(0.8)	68.6	(0.7)
	Viet Nam	0.48	(0.01)	91.0	(0.5)	87.9	(0.5)	85.2	(0.7)	72.2	(0.8)	m	m
	Argentina**	0.41	(0.01)	82.1	(0.6)	72.4	(0.7)	79.0	(0.6)	71.9	(0.7)	m	m
	Kazakhstan**	0.54	(0.02)	82.7	(0.6)	82.6	(0.6)	79.6	(0.7)	79.1	(0.7)	m	m
	Malaysia**	0.68	(0.02)	91.3	(0.5)	91.5	(0.5)	89.3	(0.5)	88.6	(0.6)	85.8	(0.7)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.3b Index of instrumental motivation to learn science and science performance, by national quarters of this index

Results based on students' self-reports

		Index of instrumental motivation to learn science											
		All students		Variability in this index		Bottom quarter		Second quarter		Third quarter		Top quarter	
		Mean index	S.E.	S.D.	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.
OECD	Australia	0.16	(0.01)	1.06	(0.01)	-1.20	(0.02)	-0.16	(0.02)	0.45	(0.01)	1.57	(0.01)
	Austria	-0.22	(0.02)	1.11	(0.01)	-1.61	(0.03)	-0.64	(0.02)	0.10	(0.02)	1.26	(0.03)
	Belgium	-0.01	(0.01)	0.98	(0.01)	-1.24	(0.02)	-0.35	(0.02)	0.29	(0.01)	1.26	(0.03)
	Canada	0.46	(0.01)	0.99	(0.01)	-0.84	(0.02)	0.24	(0.01)	0.74	(0.02)	1.72	(0.01)
	Chile	0.34	(0.02)	0.99	(0.01)	-0.97	(0.03)	0.11	(0.02)	0.59	(0.02)	1.62	(0.02)
	Czech Republic	-0.12	(0.02)	0.96	(0.01)	-1.21	(0.02)	-0.54	(0.02)	0.15	(0.03)	1.13	(0.03)
	Denmark	0.04	(0.02)	1.00	(0.01)	-1.18	(0.02)	-0.35	(0.02)	0.29	(0.01)	1.41	(0.02)
	Estonia	0.19	(0.01)	0.81	(0.01)	-0.80	(0.02)	-0.07	(0.02)	0.37	(0.00)	1.25	(0.02)
	Finland	0.16	(0.02)	0.92	(0.01)	-0.99	(0.02)	-0.13	(0.02)	0.37	(0.00)	1.38	(0.03)
	France	0.00	(0.02)	1.06	(0.01)	-1.36	(0.02)	-0.38	(0.02)	0.35	(0.02)	1.40	(0.02)
	Germany	-0.24	(0.02)	1.04	(0.01)	-1.52	(0.03)	-0.63	(0.02)	0.05	(0.02)	1.13	(0.03)
	Greece	0.27	(0.02)	0.94	(0.01)	-0.95	(0.03)	0.02	(0.02)	0.53	(0.02)	1.49	(0.02)
	Hungary	-0.04	(0.02)	0.93	(0.01)	-1.20	(0.02)	-0.37	(0.02)	0.29	(0.02)	1.11	(0.03)
	Iceland	0.22	(0.02)	1.04	(0.01)	-1.13	(0.02)	-0.03	(0.03)	0.44	(0.02)	1.61	(0.02)
	Ireland	0.36	(0.02)	0.98	(0.01)	-0.90	(0.03)	0.09	(0.02)	0.63	(0.03)	1.64	(0.01)
	Israel	0.28	(0.03)	1.08	(0.01)	-1.14	(0.03)	-0.06	(0.04)	0.66	(0.04)	1.67	(0.02)
	Italy	0.16	(0.02)	0.88	(0.01)	-0.95	(0.03)	-0.11	(0.04)	0.37	(0.01)	1.31	(0.03)
	Japan	-0.02	(0.02)	1.03	(0.01)	-1.29	(0.02)	-0.44	(0.02)	0.28	(0.02)	1.34	(0.03)
	Korea	0.03	(0.02)	1.00	(0.01)	-1.23	(0.02)	-0.30	(0.04)	0.37	(0.00)	1.29	(0.04)
	Latvia	0.08	(0.01)	0.86	(0.01)	-0.96	(0.02)	-0.24	(0.02)	0.33	(0.01)	1.21	(0.03)
	Luxembourg	-0.03	(0.02)	1.08	(0.01)	-1.39	(0.02)	-0.45	(0.02)	0.29	(0.02)	1.42	(0.02)
	Mexico	0.53	(0.01)	0.86	(0.01)	-0.59	(0.03)	0.36	(0.01)	0.72	(0.02)	1.63	(0.01)
	Netherlands	-0.21	(0.02)	1.06	(0.01)	-1.54	(0.03)	-0.60	(0.02)	0.17	(0.02)	1.14	(0.03)
	New Zealand	0.38	(0.02)	1.01	(0.01)	-0.96	(0.03)	0.18	(0.02)	0.63	(0.03)	1.67	(0.01)
	Norway	0.11	(0.02)	0.94	(0.01)	-1.07	(0.02)	-0.19	(0.03)	0.37	(0.00)	1.33	(0.03)
	Poland	0.13	(0.02)	0.95	(0.01)	-1.06	(0.02)	-0.22	(0.02)	0.38	(0.01)	1.40	(0.02)
	Portugal	0.36	(0.02)	1.07	(0.01)	-1.10	(0.03)	0.18	(0.02)	0.65	(0.03)	1.71	(0.01)
	Slovak Republic	0.04	(0.01)	0.92	(0.01)	-1.09	(0.02)	-0.30	(0.02)	0.32	(0.01)	1.23	(0.03)
	Slovenia	0.07	(0.02)	0.90	(0.01)	-1.06	(0.02)	-0.22	(0.02)	0.36	(0.01)	1.20	(0.03)
	Spain	0.26	(0.02)	1.11	(0.01)	-1.23	(0.02)	-0.04	(0.02)	0.66	(0.02)	1.65	(0.01)
	Sweden	0.26	(0.02)	0.97	(0.01)	-0.98	(0.02)	0.00	(0.02)	0.47	(0.02)	1.55	(0.02)
	Switzerland	-0.25	(0.02)	1.04	(0.01)	-1.55	(0.03)	-0.61	(0.02)	0.10	(0.02)	1.09	(0.03)
	Turkey	0.38	(0.01)	0.92	(0.01)	-0.83	(0.03)	0.22	(0.02)	0.55	(0.02)	1.58	(0.01)
	United Kingdom	0.38	(0.02)	0.97	(0.01)	-0.86	(0.02)	0.10	(0.02)	0.62	(0.02)	1.65	(0.01)
	United States	0.32	(0.02)	0.93	(0.01)	-0.88	(0.02)	0.15	(0.02)	0.47	(0.02)	1.56	(0.02)
	OECD average	0.14	(0.00)	0.98	(0.00)	-1.11	(0.00)	-0.16	(0.00)	0.41	(0.00)	1.42	(0.00)
Partners	Albania	0.88	(0.01)	0.75	(0.01)	-0.11	(0.03)	0.68	(0.02)	1.22	(0.01)	1.73	(0.01)
	Algeria	0.43	(0.02)	0.86	(0.01)	-0.71	(0.03)	0.27	(0.01)	0.72	(0.02)	1.44	(0.01)
	Brazil	0.45	(0.01)	0.83	(0.01)	-0.59	(0.02)	0.28	(0.01)	0.54	(0.02)	1.58	(0.02)
	B-S-J-G (China)	0.53	(0.01)	0.75	(0.01)	-0.34	(0.03)	0.37	(0.00)	0.52	(0.02)	1.58	(0.02)
	Bulgaria	0.18	(0.02)	0.92	(0.01)	-0.97	(0.02)	-0.09	(0.03)	0.38	(0.01)	1.39	(0.02)
	CABA (Argentina)	0.16	(0.03)	0.95	(0.02)	-1.02	(0.04)	-0.22	(0.03)	0.45	(0.04)	1.42	(0.03)
	Colombia	0.40	(0.01)	0.86	(0.01)	-0.72	(0.02)	0.23	(0.01)	0.57	(0.02)	1.52	(0.01)
	Costa Rica	0.44	(0.02)	0.97	(0.01)	-0.85	(0.03)	0.24	(0.02)	0.70	(0.02)	1.66	(0.01)
	Croatia	0.14	(0.02)	0.94	(0.01)	-1.06	(0.02)	-0.12	(0.03)	0.38	(0.01)	1.38	(0.02)
	Cyprus*	0.30	(0.01)	0.96	(0.01)	-0.93	(0.02)	0.05	(0.02)	0.51	(0.02)	1.56	(0.01)
	Dominican Republic	0.60	(0.02)	0.97	(0.01)	-0.72	(0.04)	0.37	(0.01)	1.00	(0.05)	1.74	(0.00)
	FYROM	0.45	(0.01)	0.82	(0.01)	-0.62	(0.02)	0.27	(0.01)	0.66	(0.02)	1.50	(0.01)
	Georgia	0.22	(0.01)	0.84	(0.01)	-0.83	(0.02)	-0.05	(0.02)	0.43	(0.01)	1.31	(0.02)
	Hong Kong (China)	0.23	(0.02)	0.93	(0.01)	-1.00	(0.03)	0.14	(0.02)	0.37	(0.00)	1.42	(0.03)
	Indonesia	0.81	(0.02)	0.71	(0.01)	0.00	(0.02)	0.46	(0.02)	1.07	(0.02)	1.70	(0.01)
	Jordan	0.71	(0.01)	0.83	(0.01)	-0.37	(0.03)	0.44	(0.01)	1.07	(0.02)	1.71	(0.01)
	Kosovo	0.80	(0.01)	0.81	(0.01)	-0.24	(0.03)	0.57	(0.02)	1.17	(0.01)	1.72	(0.01)
	Lebanon	0.51	(0.02)	0.81	(0.01)	-0.54	(0.02)	0.27	(0.02)	0.78	(0.03)	1.53	(0.02)
	Lithuania	0.41	(0.02)	0.99	(0.01)	-0.90	(0.02)	0.14	(0.02)	0.74	(0.02)	1.66	(0.01)
	Macao (China)	0.20	(0.01)	0.84	(0.01)	-0.86	(0.02)	0.02	(0.02)	0.37	(0.00)	1.27	(0.02)
	Malta	0.20	(0.02)	1.06	(0.01)	-1.16	(0.02)	-0.20	(0.03)	0.58	(0.02)	1.59	(0.02)
	Moldova	0.36	(0.02)	0.80	(0.01)	-0.66	(0.02)	0.13	(0.02)	0.55	(0.02)	1.42	(0.02)
	Montenegro	0.36	(0.01)	0.92	(0.01)	-0.83	(0.02)	0.16	(0.02)	0.54	(0.02)	1.58	(0.02)
	Peru	0.51	(0.01)	0.77	(0.01)	-0.47	(0.03)	0.36	(0.01)	0.63	(0.02)	1.50	(0.01)
	Qatar	0.53	(0.01)	0.89	(0.01)	-0.62	(0.02)	0.34	(0.01)	0.73	(0.02)	1.66	(0.01)
	Romania	0.39	(0.02)	0.85	(0.01)	-0.71	(0.03)	0.16	(0.03)	0.61	(0.03)	1.49	(0.02)
	Russia	0.24	(0.01)	0.84	(0.01)	-0.80	(0.02)	0.07	(0.02)	0.37	(0.00)	1.34	(0.03)
	Singapore	0.51	(0.01)	0.82	(0.01)	-0.52	(0.02)	0.37	(0.00)	0.61	(0.02)	1.59	(0.01)
	Chinese Taipei	0.24	(0.01)	0.88	(0.01)	-0.90	(0.02)	0.15	(0.02)	0.37	(0.00)	1.36	(0.03)
	Thailand	0.48	(0.01)	0.60	(0.01)	-0.13	(0.02)	0.37	(0.00)	0.40	(0.01)	1.29	(0.02)
	Trinidad and Tobago	0.52	(0.02)	1.00	(0.01)	-0.82	(0.03)	0.25	(0.02)	0.94	(0.03)	1.72	(0.01)
	Tunisia	0.60	(0.01)	0.81	(0.01)	-0.46	(0.03)	0.37	(0.00)	0.87	(0.03)	1.62	(0.01)
	United Arab Emirates	0.56	(0.01)	0.90	(0.01)	-0.62	(0.02)	0.35	(0.01)	0.82	(0.02)	1.69	(0.01)
	Uruguay	0.29	(0.02)	0.94	(0.01)	-0.91	(0.02)	0.08	(0.02)	0.48	(0.02)	1.53	(0.02)
	Viet Nam	0.48	(0.01)	0.72	(0.01)	-0.44	(0.02)	0.33	(0.01)	0.70	(0.02)	1.34	(0.01)
	Argentina**	0.41	(0.01)	0.89	(0.01)	-0.74	(0.02)	0.18	(0.02)	0.67	(0.02)	1.53	(0.01)
	Kazakhstan**	0.54	(0.02)	0.97	(0.01)	-0.78	(0.03)	0.33	(0.01)	0.92	(0.03)	1.68	(0.01)
	Malaysia**	0.68	(0.02)	0.74	(0.01)	-0.15	(0.03)	0.37	(0.00)	0.83	(0.04)	1.68	(0.01)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.3b Index of instrumental motivation to learn science and science performance, by national quarters of this index

Results based on students' self-reports

		Performance in science, by national quarters of this index								Difference in science performance between students in the top quarter and students in the bottom quarter of this index		Change in the science score per unit of this index		Increased likelihood of students in the bottom quarter of this index scoring in the bottom quarter of the national science performance distribution		Explained variance in student performance in science (r-squared x 100)	
		Bottom quarter		Second quarter		Third quarter		Top quarter									
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Relative risk	S.E.	%	S.E.
OECD	Australia	495	(2.5)	510	(2.7)	507	(2.6)	550	(2.7)	**55**	(3.6)	**17**	(1.2)	**1.3**	(0.1)	3.3	(0.4)
	Austria	501	(3.2)	508	(3.4)	494	(4.2)	506	(3.3)	5	(3.7)	0	(1.2)	0.9	(0.1)	0.0	(0.0)
	Belgium	509	(2.6)	517	(2.6)	516	(3.3)	522	(3.4)	**13**	(3.5)	**5**	(1.3)	1.0	(0.1)	0.3	(0.1)
	Canada	520	(2.9)	518	(2.7)	533	(2.7)	558	(2.9)	**38**	(3.1)	**15**	(1.1)	**1.2**	(0.1)	2.7	(0.4)
	Chile	462	(3.5)	443	(3.6)	440	(3.3)	465	(3.6)	3	(4.1)	0	(1.4)	**0.7**	(0.1)	0.0	(0.0)
	Czech Republic	506	(2.7)	500	(2.9)	497	(3.1)	500	(3.3)	-6	(3.9)	-2	(1.5)	**0.7**	(0.1)	0.1	(0.1)
	Denmark	499	(3.1)	504	(2.5)	502	(3.0)	534	(3.9)	**35**	(4.4)	**12**	(1.6)	1.1	(0.1)	1.9	(0.5)
	Estonia	535	(2.9)	534	(3.3)	527	(3.0)	549	(3.9)	**14**	(4.4)	**7**	(1.9)	0.9	(0.1)	0.5	(0.2)
	Finland	516	(3.3)	536	(3.1)	527	(3.1)	566	(3.8)	**49**	(4.0)	**18**	(1.4)	**1.3**	(0.1)	3.2	(0.5)
	France	485	(3.0)	503	(2.9)	503	(3.1)	535	(3.5)	**50**	(4.2)	**16**	(1.3)	**1.2**	(0.1)	3.3	(0.5)
	Germany	519	(3.5)	528	(4.1)	513	(5.2)	540	(5.1)	**21**	(4.9)	**8**	(1.6)	0.9	(0.1)	0.6	(0.3)
	Greece	451	(4.4)	448	(4.4)	455	(4.6)	488	(5.0)	**37**	(4.8)	**13**	(1.6)	1.1	(0.1)	2.0	(0.5)
	Hungary	495	(2.9)	484	(4.3)	467	(3.8)	487	(4.7)	-8	(5.2)	-2	(2.0)	**0.7**	(0.1)	0.0	(0.1)
	Iceland	472	(3.1)	466	(3.3)	480	(3.8)	496	(3.5)	**24**	(4.2)	**9**	(1.5)	1.0	(0.1)	1.0	(0.4)
	Ireland	488	(3.5)	495	(2.8)	505	(4.6)	533	(3.0)	**45**	(4.0)	**18**	(1.3)	**1.3**	(0.1)	4.0	(0.6)
	Israel	480	(4.5)	467	(5.6)	473	(5.0)	479	(4.2)	-1	(6.0)	1	(1.9)	**0.8**	(0.1)	0.0	(0.1)
	Italy	474	(3.9)	480	(3.3)	480	(3.8)	505	(3.9)	**32**	(4.9)	**13**	(2.0)	1.2	(0.1)	1.6	(0.5)
	Japan	518	(3.4)	543	(3.0)	542	(3.7)	560	(4.7)	**42**	(4.7)	**14**	(1.5)	**1.4**	(0.1)	2.3	(0.5)
	Korea	493	(3.3)	523	(3.6)	499	(4.5)	553	(5.1)	**60**	(5.4)	**20**	(1.9)	**1.4**	(0.1)	4.7	(0.8)
	Latvia	502	(2.6)	481	(3.3)	487	(3.0)	497	(3.2)	-5	(3.8)	1	(1.7)	**0.7**	(0.1)	0.0	(0.0)
	Luxembourg	488	(2.7)	481	(2.8)	485	(3.2)	520	(3.1)	**33**	(4.7)	**11**	(1.5)	0.9	(0.1)	1.6	(0.4)
	Mexico	427	(3.1)	411	(3.0)	414	(3.0)	427	(2.8)	0	(3.1)	0	(1.4)	0.9	(0.1)	0.0	(0.0)
	Netherlands	506	(3.5)	506	(3.2)	511	(4.0)	543	(4.7)	**37**	(5.5)	**12**	(1.7)	1.0	(0.1)	1.7	(0.5)
	New Zealand	513	(3.7)	503	(4.0)	517	(4.8)	555	(3.4)	**42**	(5.2)	**16**	(1.7)	1.1	(0.1)	2.5	(0.5)
	Norway	489	(3.7)	507	(3.3)	498	(3.8)	525	(3.5)	**36**	(4.9)	**13**	(1.8)	**1.3**	(0.1)	1.8	(0.5)
	Poland	508	(3.5)	502	(3.9)	485	(3.3)	518	(4.2)	**10**	(4.6)	3	(1.8)	0.9	(0.1)	0.1	(0.1)
	Portugal	493	(3.2)	483	(3.7)	500	(4.1)	540	(3.4)	**47**	(4.4)	**15**	(1.4)	1.0	(0.1)	3.0	(0.6)
	Slovak Republic	470	(3.3)	463	(3.7)	474	(3.2)	473	(3.8)	3	(4.2)	2	(1.5)	**0.8**	(0.1)	0.0	(0.1)
	Slovenia	508	(3.1)	514	(3.0)	516	(2.8)	534	(3.8)	**26**	(5.3)	**11**	(1.9)	1.1	(0.1)	1.2	(0.4)
	Spain	487	(2.9)	479	(3.0)	492	(3.2)	530	(3.0)	**43**	(4.0)	**13**	(1.1)	1.0	(0.1)	3.0	(0.5)
	Sweden	491	(3.8)	505	(4.1)	495	(4.4)	528	(4.9)	**37**	(4.9)	**14**	(1.8)	1.1	(0.1)	2.0	(0.5)
	Switzerland	506	(3.3)	520	(4.6)	506	(4.7)	518	(4.6)	**12**	(4.7)	**5**	(1.7)	0.9	(0.1)	0.2	(0.2)
	Turkey	422	(5.0)	425	(3.9)	432	(4.7)	434	(4.6)	**13**	(4.2)	**5**	(1.4)	**1.2**	(0.1)	0.3	(0.2)
	United Kingdom	504	(3.6)	503	(3.7)	513	(3.8)	542	(3.4)	**38**	(4.3)	**17**	(1.4)	**1.2**	(0.1)	2.7	(0.4)
	United States	511	(3.8)	487	(3.9)	487	(3.9)	520	(4.8)	9	(4.8)	4	(1.8)	**0.7**	(0.1)	0.1	(0.1)
	OECD average	493	(0.6)	494	(0.6)	494	(0.6)	518	(0.7)	**25**	(0.8)	**9**	(0.3)	**1.0**	(0.0)	1.5	(0.1)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	371	(3.9)	371	(3.0)	378	(3.1)	389	(3.7)	**18**	(3.4)	**6**	(1.5)	**1.2**	(0.1)	0.6	(0.3)
	Brazil	426	(3.7)	409	(3.0)	407	(3.8)	427	(4.8)	1	(4.2)	2	(1.7)	**0.8**	(0.1)	0.0	(0.0)
	B-S-J-G (China)	531	(6.4)	505	(5.0)	504	(4.4)	535	(6.0)	4	(5.2)	3	(2.4)	**0.8**	(0.1)	0.1	(0.1)
	Bulgaria	485	(5.2)	452	(6.2)	441	(4.9)	462	(5.0)	**-22**	(5.6)	**-7**	(2.0)	**0.7**	(0.1)	0.4	(0.3)
	CABA (Argentina)	486	(7.2)	485	(6.5)	469	(9.1)	470	(8.9)	**-15**	(7.6)	**-7**	(3.0)	0.8	(0.1)	0.7	(0.5)
	Colombia	432	(3.1)	418	(3.2)	412	(2.7)	418	(3.1)	**-15**	(3.4)	**-6**	(1.3)	**0.8**	(0.1)	0.4	(0.2)
	Costa Rica	435	(2.9)	419	(3.0)	421	(2.8)	422	(3.1)	**-13**	(3.4)	**-4**	(1.3)	**0.7**	(0.1)	0.3	(0.2)
	Croatia	485	(3.4)	483	(3.2)	468	(3.7)	478	(3.8)	**-8**	(3.8)	**-3**	(1.5)	**0.8**	(0.1)	0.1	(0.1)
	Cyprus*	432	(3.2)	418	(2.7)	437	(2.8)	473	(3.0)	**40**	(3.9)	**16**	(1.4)	1.1	(0.1)	2.8	(0.5)
	Dominican Republic	354	(5.6)	338	(3.8)	347	(3.5)	337	(3.1)	**-17**	(5.7)	-3	(2.0)	0.9	(0.1)	0.2	(0.2)
	FYROM	399	(3.0)	382	(3.2)	380	(3.0)	390	(3.2)	**-10**	(4.7)	**-5**	(2.0)	**0.8**	(0.1)	0.3	(0.2)
	Georgia	429	(3.2)	412	(3.5)	402	(3.7)	415	(3.9)	**-14**	(4.4)	**-7**	(1.8)	**0.7**	(0.1)	0.4	(0.2)
	Hong Kong (China)	518	(3.5)	521	(3.1)	514	(3.6)	546	(3.2)	**29**	(3.5)	**10**	(1.2)	1.1	(0.1)	1.4	(0.3)
	Indonesia	401	(3.3)	401	(3.3)	406	(3.4)	409	(3.4)	**8**	(3.7)	**5**	(1.8)	1.1	(0.1)	0.2	(0.2)
	Jordan	393	(3.3)	405	(3.6)	422	(3.3)	433	(3.6)	**40**	(3.9)	**17**	(1.7)	**1.6**	(0.1)	3.0	(0.6)
	Kosovo	378	(3.4)	375	(3.6)	385	(3.1)	386	(3.5)	8	(4.6)	2	(2.0)	1.1	(0.1)	0.1	(0.1)
	Lebanon	371	(5.0)	375	(4.3)	381	(5.1)	427	(4.7)	**56**	(6.2)	**20**	(2.7)	**1.4**	(0.1)	3.3	(0.8)
	Lithuania	485	(3.6)	466	(3.9)	475	(3.2)	493	(4.0)	8	(4.1)	2	(1.4)	**0.8**	(0.1)	0.1	(0.1)
	Macao (China)	525	(2.6)	522	(2.5)	518	(2.3)	550	(2.4)	**25**	(3.7)	**10**	(1.4)	1.0	(0.1)	1.1	(0.3)
	Malta	451	(4.0)	450	(4.3)	458	(4.5)	521	(4.2)	**70**	(5.7)	**25**	(2.1)	1.1	(0.1)	5.1	(0.8)
	Moldova	448	(3.3)	426	(3.0)	422	(3.1)	432	(3.4)	**-16**	(4.0)	**-6**	(1.9)	**0.7**	(0.1)	0.3	(0.2)
	Montenegro	437	(2.5)	413	(2.9)	413	(2.7)	421	(3.0)	**-16**	(3.9)	**-6**	(1.4)	**0.7**	(0.1)	0.4	(0.2)
	Peru	424	(4.3)	400	(3.1)	406	(2.9)	409	(3.0)	**-15**	(4.2)	**-5**	(2.0)	**0.8**	(0.1)	0.3	(0.2)
	Qatar	409	(2.2)	417	(2.0)	433	(2.3)	470	(2.1)	**60**	(3.0)	**23**	(1.1)	**1.5**	(0.1)	4.5	(0.4)
	Romania	446	(3.8)	428	(4.3)	429	(4.3)	438	(4.3)	-8	(4.0)	-3	(1.6)	**0.7**	(0.1)	0.1	(0.1)
	Russia	497	(3.9)	485	(3.2)	483	(4.2)	499	(4.3)	2	(4.3)	0	(1.6)	0.9	(0.1)	0.0	(0.0)
	Singapore	562	(2.8)	534	(2.8)	555	(2.9)	577	(3.3)	**15**	(4.4)	**11**	(1.9)	0.9	(0.1)	0.7	(0.3)
	Chinese Taipei	528	(3.4)	535	(3.4)	518	(3.7)	550	(4.0)	**22**	(4.3)	**6**	(1.7)	0.9	(0.1)	0.3	(0.2)
	Thailand	412	(3.6)	418	(3.0)	419	(3.3)	444	(4.5)	**32**	(3.8)	**22**	(2.4)	**1.3**	(0.1)	2.8	(0.6)
	Trinidad and Tobago	424	(3.5)	419	(3.4)	432	(3.5)	451	(3.3)	**27**	(4.6)	**9**	(1.5)	1.0	(0.1)	0.9	(0.3)
	Tunisia	380	(3.2)	388	(3.0)	392	(3.3)	408	(2.8)	**28**	(3.5)	**11**	(1.7)	**1.4**	(0.1)	1.8	(0.6)
	United Arab Emirates	433	(3.3)	425	(3.0)	442	(3.4)	472	(2.9)	**39**	(3.6)	**14**	(1.4)	**1.3**	(0.1)	1.8	(0.3)
	Uruguay	465	(3.5)	442	(4.2)	436	(3.2)	452	(3.1)	**-13**	(4.1)	**-5**	(1.7)	**0.7**	(0.1)	0.3	(0.2)
	Viet Nam	524	(5.0)	521	(4.0)	529	(4.6)	526	(4.7)	2	(4.3)	1	(2.0)	1.1	(0.1)	0.0	(0.1)
	Argentina**	449	(3.7)	430	(3.7)	427	(3.7)	431	(4.1)	**-18**	(4.6)	**-7**	(1.6)	**0.7**	(0.1)	0.6	(0.3)
	Kazakhstan**	456	(4.9)	450	(4.2)	455	(3.9)	466	(4.8)	9	(5.2)	**4**	(1.9)	1.1	(0.1)	0.3	(0.2)
	Malaysia**	419	(4.4)	431	(3.3)	447	(3.3)	479	(3.6)	**60**	(4.3)	**31**	(2.1)	**1.9**	(0.1)	9.1	(1.2)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.4a Index of science self-efficacy

Percentage of students who reported they could do this "easily"

		Index of science self-efficacy		Percentage of students who reported that they could easily perform the following tasks:							
				Recognise the science question that underlies a newspaper report on a health issue		Explain why earthquakes occur more frequently in some areas than in others		Describe the role of antibiotics in the treatment of disease		Identify the science question associated with the disposal of garbage	
		Mean index	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	0.07	(0.01)	21.1	(0.5)	40.9	(0.6)	21.5	(0.4)	12.4	(0.4)
	Austria	-0.17	(0.02)	17.8	(0.7)	37.1	(0.9)	20.8	(0.7)	14.1	(0.6)
	Belgium	-0.10	(0.02)	21.0	(0.6)	33.3	(0.7)	23.5	(0.6)	11.6	(0.4)
	Canada	0.35	(0.02)	27.9	(0.6)	36.1	(0.5)	24.6	(0.5)	22.2	(0.5)
	Chile	-0.10	(0.02)	17.2	(0.7)	31.7	(0.7)	14.6	(0.6)	13.1	(0.5)
	Czech Republic	0.10	(0.02)	28.4	(0.7)	38.4	(0.9)	28.1	(0.7)	13.4	(0.4)
	Denmark	0.08	(0.02)	24.5	(0.6)	46.9	(1.0)	17.0	(0.6)	16.8	(0.6)
	Estonia	-0.04	(0.02)	19.3	(0.6)	31.9	(0.9)	18.3	(0.6)	15.9	(0.5)
	Finland	-0.04	(0.02)	15.2	(0.5)	42.6	(1.0)	18.2	(0.7)	14.3	(0.5)
	France	-0.13	(0.02)	17.8	(0.5)	30.5	(0.7)	26.4	(0.7)	11.2	(0.4)
	Germany	-0.01	(0.02)	20.6	(0.7)	37.5	(1.1)	23.7	(0.9)	12.5	(0.5)
	Greece	-0.04	(0.02)	27.1	(0.7)	33.5	(0.8)	25.5	(0.6)	17.6	(0.7)
	Hungary	-0.05	(0.02)	21.8	(0.7)	22.3	(0.6)	19.8	(0.5)	19.4	(0.6)
	Iceland	0.24	(0.03)	27.8	(0.8)	36.6	(0.8)	23.8	(0.7)	19.5	(0.6)
	Ireland	0.06	(0.02)	16.5	(0.5)	48.8	(0.9)	20.9	(0.7)	20.9	(0.6)
	Israel	0.04	(0.02)	31.8	(0.7)	24.7	(0.6)	20.7	(0.6)	21.5	(0.6)
	Italy	0.13	(0.02)	25.5	(0.6)	32.8	(0.7)	19.2	(0.6)	17.6	(0.6)
	Japan	-0.46	(0.02)	8.4	(0.4)	18.6	(0.6)	6.1	(0.4)	9.8	(0.4)
	Korea	-0.02	(0.03)	12.9	(0.6)	21.3	(0.8)	15.1	(0.6)	18.3	(0.7)
	Latvia	-0.01	(0.02)	19.0	(0.7)	29.2	(0.7)	16.4	(0.6)	16.5	(0.6)
	Luxembourg	-0.03	(0.02)	21.3	(0.6)	37.6	(0.7)	26.3	(0.6)	14.9	(0.6)
	Mexico	0.27	(0.02)	26.3	(0.7)	23.8	(0.6)	19.6	(0.5)	25.5	(0.6)
	Netherlands	-0.08	(0.02)	17.5	(0.7)	40.9	(0.8)	23.6	(0.8)	10.8	(0.5)
	New Zealand	-0.03	(0.02)	17.2	(0.6)	37.1	(0.8)	17.2	(0.8)	11.7	(0.5)
	Norway	0.19	(0.02)	13.9	(0.5)	29.2	(0.8)	23.4	(0.8)	15.3	(0.6)
	Poland	0.16	(0.02)	21.4	(0.7)	30.0	(0.8)	25.5	(0.7)	15.6	(0.7)
	Portugal	0.27	(0.02)	24.6	(0.8)	33.6	(0.7)	20.3	(0.7)	16.4	(0.6)
	Slovak Republic	-0.06	(0.02)	22.6	(0.6)	24.4	(0.7)	21.3	(0.5)	14.1	(0.5)
	Slovenia	0.07	(0.02)	22.1	(0.7)	30.2	(0.7)	17.9	(0.7)	17.7	(0.6)
	Spain	-0.14	(0.02)	16.9	(0.5)	38.6	(0.8)	22.0	(0.6)	12.0	(0.4)
	Sweden	0.05	(0.02)	16.1	(0.7)	33.0	(0.9)	17.1	(0.7)	14.6	(0.6)
	Switzerland	-0.17	(0.02)	18.3	(0.7)	33.0	(0.9)	19.5	(0.7)	11.6	(0.6)
	Turkey	0.35	(0.02)	28.7	(0.7)	29.9	(0.6)	25.7	(0.7)	26.1	(0.7)
	United Kingdom	0.27	(0.02)	25.5	(0.6)	43.0	(0.9)	34.6	(0.8)	13.9	(0.5)
	United States	0.26	(0.02)	28.3	(0.7)	34.7	(0.8)	25.7	(0.8)	18.6	(0.6)
	OECD average	0.04	(0.00)	21.2	(0.1)	33.5	(0.1)	21.3	(0.1)	15.9	(0.1)
Partners	Albania	0.02	(0.02)	25.5	(0.7)	31.8	(1.0)	20.7	(0.8)	17.3	(0.6)
	Algeria	-0.16	(0.02)	29.4	(0.8)	33.0	(0.8)	22.7	(0.5)	31.6	(0.7)
	Brazil	0.17	(0.02)	33.2	(0.7)	30.7	(0.7)	22.9	(0.6)	23.1	(0.4)
	B-S-J-G (China)	-0.01	(0.02)	16.1	(0.6)	20.2	(0.8)	12.4	(0.5)	18.4	(0.7)
	Bulgaria	0.39	(0.02)	32.0	(0.7)	28.7	(0.9)	26.8	(0.7)	27.2	(0.7)
	CABA (Argentina)	-0.04	(0.05)	30.6	(1.8)	35.6	(1.9)	17.1	(1.6)	16.7	(1.0)
	Colombia	-0.05	(0.02)	23.1	(0.6)	19.6	(0.5)	16.7	(0.5)	22.0	(0.7)
	Costa Rica	-0.12	(0.02)	18.4	(0.5)	25.1	(0.6)	17.2	(0.6)	23.9	(0.7)
	Croatia	0.10	(0.02)	20.0	(0.6)	28.0	(0.6)	31.6	(0.7)	18.9	(0.6)
	Cyprus*	-0.05	(0.02)	26.4	(0.7)	19.8	(0.5)	21.1	(0.6)	16.4	(0.5)
	Dominican Republic	0.54	(0.04)	38.1	(1.0)	36.5	(1.2)	28.9	(0.9)	38.4	(1.0)
	FYROM	-0.06	(0.02)	31.7	(0.8)	25.9	(0.6)	24.8	(0.6)	17.0	(0.5)
	Georgia	0.27	(0.02)	25.9	(0.7)	36.0	(0.7)	28.4	(0.7)	34.6	(0.8)
	Hong Kong (China)	-0.07	(0.02)	12.1	(0.5)	20.7	(0.6)	11.5	(0.5)	11.8	(0.5)
	Indonesia	-0.51	(0.02)	12.0	(0.7)	12.3	(0.6)	10.4	(0.6)	19.3	(0.7)
	Jordan	0.56	(0.03)	37.0	(1.1)	35.1	(0.7)	39.7	(0.8)	41.7	(0.8)
	Kosovo	-0.29	(0.02)	24.5	(0.7)	22.8	(0.7)	23.5	(0.7)	16.0	(0.6)
	Lebanon	0.17	(0.03)	38.3	(1.3)	24.4	(1.0)	26.5	(1.0)	25.3	(1.1)
	Lithuania	0.26	(0.02)	23.3	(0.6)	33.9	(0.8)	26.7	(0.7)	19.0	(0.6)
	Macao (China)	-0.03	(0.02)	13.5	(0.6)	27.9	(0.6)	13.9	(0.5)	14.4	(0.5)
	Malta	-0.09	(0.02)	22.7	(0.8)	26.0	(0.7)	17.0	(0.6)	16.0	(0.5)
	Moldova	0.09	(0.02)	19.2	(0.6)	30.0	(0.8)	22.4	(0.6)	27.8	(0.6)
	Montenegro	0.31	(0.02)	32.5	(0.7)	31.8	(0.8)	29.4	(0.6)	26.7	(0.7)
	Peru	0.34	(0.02)	22.7	(0.6)	29.1	(0.7)	18.9	(0.6)	28.5	(0.7)
	Qatar	0.36	(0.02)	31.7	(0.4)	28.0	(0.5)	30.5	(0.5)	28.3	(0.4)
	Romania	-0.20	(0.02)	17.6	(0.9)	19.8	(0.7)	17.9	(0.7)	15.3	(0.7)
	Russia	0.02	(0.03)	24.8	(0.8)	27.1	(0.9)	21.7	(0.7)	23.6	(0.8)
	Singapore	0.11	(0.01)	17.2	(0.5)	32.6	(0.6)	15.3	(0.4)	12.9	(0.4)
	Chinese Taipei	0.19	(0.02)	17.5	(0.5)	28.6	(0.7)	16.0	(0.5)	21.1	(0.6)
	Thailand	0.17	(0.02)	17.1	(0.6)	16.6	(0.5)	13.1	(0.5)	20.2	(0.6)
	Trinidad and Tobago	0.11	(0.02)	23.9	(0.7)	30.8	(0.8)	22.1	(0.7)	27.4	(0.8)
	Tunisia	-0.07	(0.02)	31.0	(0.8)	23.0	(0.8)	18.9	(0.7)	21.1	(0.7)
	United Arab Emirates	0.41	(0.02)	31.8	(0.8)	31.4	(0.6)	32.4	(0.7)	29.0	(0.6)
	Uruguay	0.05	(0.02)	30.3	(0.7)	35.9	(0.8)	20.3	(0.6)	17.9	(0.5)
	Viet Nam	-0.28	(0.03)	16.5	(0.7)	17.4	(0.7)	21.2	(0.8)	24.4	(0.7)
	Argentina**	-0.10	(0.02)	30.6	(0.8)	25.9	(0.9)	16.6	(0.6)	19.2	(0.6)
	Kazakhstan**	0.46	(0.03)	40.4	(0.9)	38.1	(0.9)	33.8	(0.9)	31.4	(0.9)
	Malaysia**	-0.13	(0.02)	13.8	(0.5)	10.3	(0.5)	12.1	(0.5)	17.7	(0.6)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
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[Part 2/2]

Table I.3.4a Index of science self-efficacy

Percentage of students who reported they could do this "easily"

		Percentage of students who reported that they could easily perform the following tasks:							
		Predict how changes to an environment will affect the survival of certain species		Interpret the scientific information provided on the labelling of food items		Discuss how new evidence can lead you to change your understanding about the possibility of life on Mars		Identify the better of two explanations for the formation of acid rain	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	31.7	(0.5)	17.1	(0.4)	16.8	(0.4)	13.3	(0.5)
	Austria	20.7	(0.6)	14.7	(0.6)	15.0	(0.6)	17.6	(0.7)
	Belgium	22.6	(0.6)	21.2	(0.5)	18.2	(0.5)	17.3	(0.5)
	Canada	35.6	(0.6)	25.1	(0.6)	22.0	(0.5)	22.5	(0.5)
	Chile	19.4	(0.6)	17.9	(0.6)	15.0	(0.5)	15.7	(0.5)
	Czech Republic	20.9	(0.5)	21.1	(0.6)	19.1	(0.6)	13.7	(0.6)
	Denmark	26.7	(0.8)	26.2	(0.8)	21.0	(0.6)	15.1	(0.6)
	Estonia	16.5	(0.6)	19.7	(0.5)	14.1	(0.6)	14.6	(0.6)
	Finland	15.3	(0.6)	19.9	(0.6)	17.6	(0.6)	11.2	(0.5)
	France	19.6	(0.7)	20.3	(0.6)	19.7	(0.6)	12.3	(0.5)
	Germany	23.3	(0.8)	16.6	(0.6)	13.4	(0.6)	18.7	(0.8)
	Greece	23.9	(0.7)	17.9	(0.7)	17.4	(0.6)	22.7	(0.7)
	Hungary	17.1	(0.5)	18.1	(0.5)	15.1	(0.6)	19.3	(0.6)
	Iceland	29.8	(0.8)	27.0	(0.8)	23.2	(0.7)	21.2	(0.8)
	Ireland	25.2	(0.6)	20.3	(0.6)	13.9	(0.5)	29.8	(0.8)
	Israel	24.7	(0.6)	34.0	(0.7)	21.5	(0.6)	18.8	(0.7)
	Italy	25.6	(0.7)	25.8	(0.6)	18.7	(0.5)	19.7	(0.6)
	Japan	11.6	(0.4)	7.3	(0.4)	7.2	(0.4)	5.4	(0.3)
	Korea	17.7	(0.6)	9.6	(0.5)	12.0	(0.6)	11.3	(0.5)
	Latvia	19.5	(0.6)	18.5	(0.6)	16.3	(0.6)	16.7	(0.6)
	Luxembourg	24.7	(0.7)	18.9	(0.7)	16.9	(0.6)	16.1	(0.6)
	Mexico	26.7	(0.7)	18.0	(0.5)	17.7	(0.6)	21.3	(0.6)
	Netherlands	19.5	(0.6)	15.5	(0.6)	15.7	(0.6)	17.6	(0.6)
	New Zealand	27.0	(0.8)	15.2	(0.7)	13.9	(0.7)	14.6	(0.7)
	Norway	23.8	(0.7)	16.6	(0.7)	19.5	(0.6)	19.8	(0.7)
	Poland	20.7	(0.7)	30.3	(0.8)	16.6	(0.6)	20.9	(0.8)
	Portugal	31.3	(0.9)	26.5	(0.7)	19.8	(0.7)	24.2	(0.7)
	Slovak Republic	18.1	(0.5)	20.9	(0.5)	16.9	(0.6)	18.2	(0.5)
	Slovenia	17.1	(0.7)	18.3	(0.6)	15.3	(0.6)	24.4	(0.7)
	Spain	22.8	(0.6)	21.2	(0.7)	19.6	(0.5)	20.3	(0.6)
	Sweden	26.4	(1.1)	17.2	(0.6)	16.9	(0.6)	20.1	(0.8)
	Switzerland	20.3	(0.7)	14.2	(0.5)	15.2	(0.5)	13.7	(0.8)
	Turkey	27.2	(0.7)	25.2	(0.7)	21.9	(0.6)	29.4	(0.9)
	United Kingdom	34.0	(0.8)	19.5	(0.5)	19.8	(0.4)	23.5	(0.8)
	United States	33.7	(0.7)	24.9	(0.7)	21.7	(0.6)	16.7	(0.7)
	OECD average	23.5	(0.1)	20.0	(0.1)	17.3	(0.1)	18.2	(0.1)
Partners	Albania	30.2	(0.9)	26.2	(0.8)	16.8	(0.7)	29.0	(0.7)
	Algeria	24.9	(0.6)	24.8	(0.7)	17.4	(0.6)	17.7	(0.7)
	Brazil	26.6	(0.5)	23.0	(0.5)	19.0	(0.5)	20.9	(0.5)
	B-S-J-G (China)	15.1	(0.6)	22.7	(0.8)	9.8	(0.5)	19.7	(0.8)
	Bulgaria	27.6	(0.7)	26.8	(0.7)	22.9	(0.7)	23.1	(0.7)
	CABA (Argentina)	31.0	(1.8)	24.7	(1.6)	17.9	(1.1)	18.6	(1.6)
	Colombia	23.5	(0.5)	16.9	(0.4)	14.4	(0.5)	16.5	(0.4)
	Costa Rica	23.9	(0.6)	16.4	(0.6)	13.6	(0.6)	16.1	(0.6)
	Croatia	21.9	(0.6)	16.2	(0.5)	16.7	(0.5)	23.7	(0.8)
	Cyprus*	20.9	(0.6)	18.8	(0.5)	19.5	(0.6)	19.5	(0.6)
	Dominican Republic	35.9	(1.0)	31.9	(1.0)	26.8	(1.0)	30.5	(1.1)
	FYROM	28.8	(0.7)	22.8	(0.6)	22.3	(0.6)	22.5	(0.6)
	Georgia	34.2	(0.7)	24.7	(0.7)	20.9	(0.6)	22.2	(0.7)
	Hong Kong (China)	15.3	(0.6)	17.6	(0.4)	9.9	(0.5)	17.9	(0.5)
	Indonesia	10.7	(0.5)	10.1	(0.6)	6.9	(0.4)	7.2	(0.5)
	Jordan	34.9	(0.7)	35.8	(0.8)	29.5	(0.9)	38.3	(0.8)
	Kosovo	21.8	(0.8)	23.0	(0.8)	16.1	(0.7)	20.2	(0.7)
	Lebanon	31.3	(1.2)	31.4	(0.9)	22.4	(1.0)	26.7	(1.0)
	Lithuania	22.7	(0.6)	20.4	(0.5)	20.6	(0.6)	18.9	(0.5)
	Macao (China)	18.0	(0.6)	18.1	(0.6)	9.3	(0.5)	21.8	(0.6)
	Malta	33.3	(0.7)	26.5	(0.7)	17.6	(0.7)	25.2	(0.7)
	Moldova	25.9	(0.6)	21.8	(0.6)	15.1	(0.6)	19.3	(0.6)
	Montenegro	28.6	(0.7)	27.3	(0.7)	23.9	(0.6)	26.5	(0.7)
	Peru	29.3	(0.8)	22.5	(0.6)	18.5	(0.5)	19.9	(0.6)
	Qatar	32.6	(0.5)	25.4	(0.5)	21.9	(0.4)	29.6	(0.5)
	Romania	19.1	(0.7)	18.2	(0.7)	15.7	(0.7)	16.2	(0.8)
	Russia	19.0	(0.9)	24.4	(0.8)	16.3	(0.6)	17.0	(0.7)
	Singapore	27.7	(0.8)	16.5	(0.4)	13.4	(0.4)	30.7	(0.6)
	Chinese Taipei	21.6	(0.6)	18.0	(0.6)	14.1	(0.5)	21.8	(0.7)
	Thailand	16.0	(0.5)	15.9	(0.5)	12.6	(0.5)	15.0	(0.6)
	Trinidad and Tobago	36.9	(0.8)	23.7	(0.7)	17.6	(0.7)	22.7	(0.6)
	Tunisia	21.0	(0.8)	23.1	(0.7)	18.0	(0.7)	17.0	(0.6)
	United Arab Emirates	31.5	(0.7)	26.6	(0.5)	24.4	(0.3)	31.6	(0.6)
	Uruguay	23.1	(0.6)	21.6	(0.7)	19.3	(0.6)	18.5	(0.6)
	Viet Nam	25.8	(0.9)	13.1	(0.6)	4.8	(0.3)	14.2	(0.7)
	Argentina**	25.6	(0.7)	21.3	(0.7)	16.7	(0.5)	18.1	(0.7)
	Kazakhstan**	35.8	(0.9)	34.4	(1.0)	24.1	(0.8)	28.6	(0.9)
	Malaysia**	16.0	(0.6)	12.4	(0.5)	7.8	(0.4)	12.3	(0.5)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.4b Index of self-efficacy and science performance, by national quarters of this index

Results based on students' self-reports

		Index of science self-efficacy											
		All students		Variability in this index		Bottom quarter		Second quarter		Third quarter		Top quarter	
		Mean index	S.E.	S.D.	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.
OECD	Australia	0.07	(0.01)	1.27	(0.01)	-1.43	(0.03)	-0.24	(0.02)	0.35	(0.01)	1.59	(0.03)
	Austria	-0.17	(0.02)	1.28	(0.02)	-1.69	(0.04)	-0.47	(0.02)	0.14	(0.02)	1.33	(0.05)
	Belgium	-0.10	(0.02)	1.28	(0.02)	-1.63	(0.04)	-0.40	(0.02)	0.22	(0.01)	1.40	(0.03)
	Canada	0.35	(0.02)	1.29	(0.01)	-1.10	(0.03)	-0.01	(0.02)	0.51	(0.01)	2.02	(0.03)
	Chile	-0.10	(0.02)	1.16	(0.02)	-1.42	(0.03)	-0.46	(0.02)	0.15	(0.02)	1.32	(0.04)
	Czech Republic	0.10	(0.02)	1.14	(0.02)	-1.18	(0.03)	-0.25	(0.02)	0.32	(0.01)	1.51	(0.03)
	Denmark	0.08	(0.02)	1.24	(0.02)	-1.37	(0.04)	-0.26	(0.02)	0.34	(0.02)	1.61	(0.03)
	Estonia	-0.04	(0.02)	1.11	(0.02)	-1.29	(0.03)	-0.37	(0.02)	0.18	(0.02)	1.33	(0.04)
	Finland	-0.04	(0.02)	1.18	(0.02)	-1.42	(0.03)	-0.35	(0.02)	0.23	(0.02)	1.37	(0.04)
	France	-0.13	(0.02)	1.26	(0.02)	-1.63	(0.04)	-0.44	(0.02)	0.19	(0.02)	1.34	(0.04)
	Germany	-0.01	(0.02)	1.19	(0.02)	-1.43	(0.05)	-0.30	(0.02)	0.28	(0.02)	1.39	(0.04)
	Greece	-0.04	(0.02)	1.26	(0.02)	-1.49	(0.03)	-0.39	(0.02)	0.21	(0.02)	1.51	(0.05)
	Hungary	-0.05	(0.02)	1.23	(0.02)	-1.44	(0.03)	-0.38	(0.02)	0.19	(0.01)	1.42	(0.04)
	Iceland	0.24	(0.03)	1.52	(0.03)	-1.59	(0.05)	-0.06	(0.03)	0.49	(0.02)	2.13	(0.05)
	Ireland	0.06	(0.02)	1.20	(0.02)	-1.38	(0.04)	-0.24	(0.02)	0.36	(0.02)	1.50	(0.02)
	Israel	0.04	(0.02)	1.35	(0.02)	-1.54	(0.04)	-0.31	(0.02)	0.31	(0.02)	1.72	(0.04)
	Italy	0.13	(0.02)	1.16	(0.02)	-1.17	(0.03)	-0.22	(0.02)	0.32	(0.01)	1.59	(0.03)
	Japan	-0.46	(0.02)	1.22	(0.02)	-1.96	(0.04)	-0.65	(0.02)	-0.06	(0.02)	0.83	(0.03)
	Korea	-0.02	(0.03)	1.23	(0.02)	-1.46	(0.04)	-0.25	(0.02)	0.30	(0.01)	1.35	(0.05)
	Latvia	-0.01	(0.02)	1.01	(0.02)	-1.13	(0.03)	-0.31	(0.02)	0.19	(0.02)	1.23	(0.03)
	Luxembourg	-0.03	(0.02)	1.32	(0.02)	-1.55	(0.03)	-0.36	(0.02)	0.24	(0.01)	1.57	(0.04)
	Mexico	0.27	(0.02)	1.09	(0.01)	-0.98	(0.02)	-0.06	(0.02)	0.44	(0.01)	1.66	(0.04)
	Netherlands	-0.08	(0.02)	1.27	(0.02)	-1.64	(0.04)	-0.33	(0.02)	0.29	(0.01)	1.37	(0.04)
	New Zealand	-0.03	(0.02)	1.22	(0.02)	-1.46	(0.04)	-0.33	(0.02)	0.27	(0.02)	1.40	(0.04)
	Norway	0.19	(0.02)	1.27	(0.02)	-1.30	(0.05)	0.01	(0.02)	0.39	(0.01)	1.66	(0.04)
	Poland	0.16	(0.02)	1.11	(0.02)	-1.08	(0.04)	-0.17	(0.02)	0.35	(0.02)	1.55	(0.04)
	Portugal	0.27	(0.02)	1.25	(0.02)	-1.19	(0.03)	-0.05	(0.02)	0.48	(0.02)	1.85	(0.03)
	Slovak Republic	-0.06	(0.02)	1.30	(0.02)	-1.58	(0.04)	-0.36	(0.02)	0.21	(0.01)	1.48	(0.04)
	Slovenia	0.07	(0.02)	1.10	(0.02)	-1.17	(0.03)	-0.25	(0.02)	0.28	(0.02)	1.43	(0.04)
	Spain	-0.14	(0.02)	1.30	(0.02)	-1.73	(0.04)	-0.46	(0.02)	0.22	(0.02)	1.40	(0.03)
	Sweden	0.05	(0.02)	1.29	(0.02)	-1.47	(0.04)	-0.26	(0.03)	0.33	(0.01)	1.62	(0.05)
	Switzerland	-0.17	(0.02)	1.22	(0.03)	-1.60	(0.04)	-0.46	(0.02)	0.13	(0.02)	1.25	(0.05)
	Turkey	0.35	(0.02)	1.32	(0.02)	-1.16	(0.04)	0.03	(0.02)	0.48	(0.02)	2.04	(0.05)
	United Kingdom	0.27	(0.02)	1.22	(0.02)	-1.14	(0.03)	-0.06	(0.02)	0.50	(0.02)	1.79	(0.03)
	United States	0.26	(0.02)	1.29	(0.02)	-1.21	(0.03)	-0.10	(0.02)	0.44	(0.02)	1.92	(0.05)
	OECD average	0.04	(0.00)	1.23	(0.00)	-1.40	(0.01)	-0.27	(0.00)	0.29	(0.00)	1.53	(0.01)
Partners	Albania	0.02	(0.02)	1.11	(0.02)	-1.27	(0.03)	-0.35	(0.02)	0.28	(0.03)	1.43	(0.04)
	Algeria	-0.16	(0.02)	1.07	(0.02)	-1.37	(0.04)	-0.47	(0.02)	0.05	(0.02)	1.15	(0.04)
	Brazil	0.17	(0.02)	1.36	(0.02)	-1.41	(0.04)	-0.19	(0.02)	0.41	(0.01)	1.88	(0.03)
	B-S-J-G (China)	-0.01	(0.02)	1.15	(0.02)	-1.32	(0.04)	-0.32	(0.02)	0.25	(0.01)	1.35	(0.04)
	Bulgaria	0.39	(0.02)	1.28	(0.02)	-1.00	(0.03)	0.03	(0.02)	0.45	(0.02)	2.09	(0.04)
	CABA (Argentina)	-0.04	(0.05)	1.09	(0.03)	-1.33	(0.06)	-0.38	(0.04)	0.24	(0.04)	1.31	(0.07)
	Colombia	-0.05	(0.02)	1.17	(0.01)	-1.39	(0.03)	-0.40	(0.02)	0.20	(0.01)	1.40	(0.03)
	Costa Rica	-0.12	(0.02)	1.25	(0.02)	-1.53	(0.03)	-0.50	(0.02)	0.13	(0.02)	1.42	(0.04)
	Croatia	0.10	(0.02)	1.24	(0.02)	-1.33	(0.03)	-0.22	(0.02)	0.32	(0.01)	1.61	(0.04)
	Cyprus*	-0.05	(0.02)	1.35	(0.02)	-1.59	(0.03)	-0.40	(0.02)	0.20	(0.01)	1.61	(0.04)
	Dominican Republic	0.54	(0.04)	1.37	(0.03)	-1.02	(0.06)	0.12	(0.02)	0.72	(0.04)	2.36	(0.06)
	FYROM	-0.06	(0.02)	1.29	(0.02)	-1.59	(0.04)	-0.43	(0.02)	0.23	(0.02)	1.55	(0.03)
	Georgia	0.27	(0.02)	1.15	(0.02)	-1.06	(0.03)	-0.11	(0.02)	0.51	(0.02)	1.73	(0.03)
	Hong Kong (China)	-0.07	(0.02)	1.23	(0.02)	-1.51	(0.04)	-0.29	(0.02)	0.27	(0.01)	1.26	(0.04)
	Indonesia	-0.51	(0.02)	1.02	(0.02)	-1.71	(0.03)	-0.83	(0.02)	-0.21	(0.03)	0.73	(0.03)
	Jordan	0.56	(0.03)	1.25	(0.02)	-0.85	(0.03)	0.10	(0.02)	0.80	(0.03)	2.20	(0.05)
	Kosovo	-0.29	(0.02)	1.25	(0.02)	-1.75	(0.03)	-0.69	(0.02)	-0.02	(0.02)	1.30	(0.04)
	Lebanon	0.17	(0.03)	1.03	(0.03)	-0.97	(0.03)	-0.21	(0.02)	0.33	(0.03)	1.52	(0.06)
	Lithuania	0.26	(0.02)	1.16	(0.02)	-1.03	(0.03)	-0.08	(0.02)	0.41	(0.01)	1.73	(0.03)
	Macao (China)	-0.03	(0.02)	1.12	(0.02)	-1.35	(0.03)	-0.30	(0.01)	0.23	(0.01)	1.28	(0.03)
	Malta	-0.09	(0.02)	1.28	(0.02)	-1.63	(0.04)	-0.41	(0.02)	0.23	(0.02)	1.47	(0.03)
	Moldova	0.09	(0.02)	1.00	(0.02)	-1.07	(0.02)	-0.25	(0.01)	0.31	(0.02)	1.36	(0.03)
	Montenegro	0.31	(0.02)	1.43	(0.02)	-1.30	(0.03)	-0.14	(0.02)	0.47	(0.02)	2.20	(0.05)
	Peru	0.34	(0.02)	1.01	(0.02)	-0.81	(0.02)	0.05	(0.02)	0.50	(0.01)	1.63	(0.03)
	Qatar	0.36	(0.02)	1.35	(0.01)	-1.18	(0.03)	0.01	(0.01)	0.53	(0.01)	2.09	(0.03)
	Romania	-0.20	(0.02)	0.99	(0.02)	-1.34	(0.04)	-0.46	(0.02)	0.02	(0.02)	0.99	(0.03)
	Russia	0.02	(0.03)	1.32	(0.02)	-1.46	(0.03)	-0.42	(0.02)	0.24	(0.02)	1.71	(0.06)
	Singapore	0.11	(0.01)	1.14	(0.02)	-1.21	(0.03)	-0.19	(0.02)	0.33	(0.01)	1.50	(0.03)
	Chinese Taipei	0.19	(0.02)	1.18	(0.02)	-1.21	(0.03)	-0.03	(0.02)	0.41	(0.01)	1.59	(0.04)
	Thailand	0.17	(0.02)	1.05	(0.02)	-0.98	(0.03)	-0.05	(0.02)	0.32	(0.00)	1.40	(0.04)
	Trinidad and Tobago	0.11	(0.02)	1.17	(0.02)	-1.23	(0.03)	-0.24	(0.02)	0.36	(0.02)	1.56	(0.04)
	Tunisia	-0.07	(0.02)	1.16	(0.02)	-1.33	(0.03)	-0.46	(0.02)	0.12	(0.02)	1.37	(0.05)
	United Arab Emirates	0.41	(0.02)	1.31	(0.02)	-1.08	(0.03)	0.04	(0.01)	0.58	(0.01)	2.08	(0.03)
	Uruguay	0.05	(0.02)	1.30	(0.02)	-1.45	(0.03)	-0.31	(0.02)	0.31	(0.02)	1.65	(0.04)
	Viet Nam	-0.28	(0.03)	0.91	(0.01)	-1.37	(0.03)	-0.57	(0.02)	-0.03	(0.03)	0.86	(0.03)
	Argentina**	-0.10	(0.02)	1.16	(0.02)	-1.46	(0.04)	-0.42	(0.02)	0.18	(0.02)	1.31	(0.04)
	Kazakhstan**	0.46	(0.03)	1.24	(0.02)	-0.98	(0.03)	0.02	(0.03)	0.72	(0.03)	2.07	(0.05)
	Malaysia**	-0.13	(0.02)	1.07	(0.02)	-1.40	(0.04)	-0.37	(0.02)	0.21	(0.01)	1.05	(0.03)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.4b Index of self-efficacy and science performance, by national quarters of this index

Results based on students' self-reports

		Performance in science, by national quarters of this index							Difference in science performance between students in the top quarter and students in the bottom quarter of this index		Change in the science score per unit of this index		Increased likelihood of students in the bottom quarter of this index scoring in the bottom quarter of the national science performance distribution		Explained variance in student performance in science (r-squared x 100)	
	Bottom quarter		Second quarter		Third quarter		Top quarter									
	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Relative risk	S.E.	%	S.E.
OECD																
Australia	464	(2.3)	519	(2.4)	513	(2.6)	569	(2.5)	**105**	(3.1)	**27**	(0.9)	**2.2**	(0.1)	11.4	(0.7)
Austria	466	(3.4)	500	(3.0)	503	(4.0)	545	(4.5)	**79**	(5.6)	**20**	(1.5)	**1.7**	(0.1)	7.2	(1.1)
Belgium	477	(2.8)	517	(2.6)	521	(3.2)	555	(3.5)	**78**	(3.8)	**20**	(1.0)	**1.7**	(0.1)	7.0	(0.7)
Canada	495	(2.6)	530	(2.2)	537	(3.5)	569	(2.8)	**74**	(3.3)	**19**	(1.0)	**1.8**	(0.1)	7.6	(0.7)
Chile	436	(3.1)	453	(3.2)	448	(3.8)	475	(4.0)	**40**	(4.0)	**9**	(1.2)	**1.2**	(0.1)	1.4	(0.4)
Czech Republic	470	(3.1)	494	(3.5)	506	(3.2)	531	(3.6)	**61**	(4.3)	**16**	(1.5)	**1.5**	(0.1)	3.9	(0.6)
Denmark	472	(2.6)	504	(3.5)	515	(3.0)	551	(3.7)	**79**	(4.0)	**22**	(1.3)	**1.9**	(0.1)	9.7	(1.1)
Estonia	508	(3.0)	537	(3.5)	534	(3.3)	567	(4.0)	**59**	(4.5)	**16**	(1.5)	**1.6**	(0.1)	4.1	(0.7)
Finland	492	(3.2)	535	(3.3)	544	(3.4)	576	(3.6)	**84**	(4.3)	**23**	(1.4)	**2.0**	(0.1)	8.2	(0.9)
France	465	(2.8)	505	(2.6)	515	(3.5)	547	(3.4)	**82**	(4.2)	**21**	(1.2)	**1.7**	(0.1)	7.3	(0.8)
Germany	485	(4.6)	520	(3.9)	532	(5.2)	569	(5.3)	**84**	(5.9)	**24**	(1.6)	**1.9**	(0.1)	8.6	(1.1)
Greece	433	(3.6)	456	(4.1)	466	(4.8)	489	(5.1)	**56**	(4.8)	**14**	(1.4)	**1.4**	(0.1)	4.0	(0.7)
Hungary	466	(3.7)	487	(4.3)	485	(3.7)	495	(4.3)	**29**	(5.5)	**5**	(1.5)	1.2	(0.1)	0.5	(0.3)
Iceland	444	(3.3)	475	(3.7)	483	(4.1)	515	(3.5)	**71**	(4.7)	**15**	(1.1)	**1.7**	(0.1)	6.9	(0.9)
Ireland	459	(3.2)	499	(3.3)	515	(3.2)	548	(3.2)	**89**	(3.6)	**27**	(1.0)	**2.3**	(0.1)	13.8	(1.0)
Israel	458	(4.3)	472	(4.1)	477	(3.9)	494	(4.5)	**36**	(4.5)	**8**	(1.2)	1.1	(0.1)	1.1	(0.3)
Italy	463	(3.0)	485	(3.7)	485	(3.9)	506	(3.7)	**43**	(3.9)	**11**	(1.3)	**1.3**	(0.1)	2.0	(0.4)
Japan	503	(3.8)	550	(3.3)	560	(3.6)	552	(4.8)	**49**	(4.8)	**17**	(1.3)	**1.8**	(0.1)	5.0	(0.7)
Korea	474	(4.4)	535	(3.1)	496	(4.3)	562	(3.9)	**88**	(4.3)	**21**	(1.2)	**2.0**	(0.1)	7.1	(0.8)
Latvia	471	(2.8)	485	(3.2)	494	(2.8)	520	(3.1)	**49**	(3.9)	**16**	(1.3)	**1.4**	(0.1)	3.9	(0.6)
Luxembourg	457	(2.6)	485	(2.8)	494	(3.2)	537	(3.4)	**80**	(4.5)	**19**	(1.3)	**1.5**	(0.1)	6.2	(0.8)
Mexico	414	(2.5)	418	(2.9)	417	(3.1)	431	(3.2)	**17**	(3.3)	**5**	(1.2)	1.1	(0.1)	0.7	(0.3)
Netherlands	481	(3.1)	523	(3.2)	517	(3.7)	545	(4.3)	**64**	(5.0)	**17**	(1.5)	**1.5**	(0.1)	4.8	(0.9)
New Zealand	477	(3.9)	518	(3.9)	521	(4.4)	576	(3.5)	**100**	(4.9)	**27**	(1.6)	**1.9**	(0.1)	10.7	(1.2)
Norway	459	(3.3)	506	(3.1)	504	(4.0)	554	(3.9)	**95**	(4.7)	**22**	(1.4)	**2.2**	(0.1)	9.2	(1.0)
Poland	472	(3.3)	496	(3.7)	503	(3.9)	542	(4.2)	**69**	(4.6)	**21**	(1.6)	**1.6**	(0.1)	6.6	(1.0)
Portugal	466	(3.0)	507	(3.4)	498	(4.6)	544	(3.5)	**78**	(3.9)	**19**	(1.2)	**1.7**	(0.1)	6.5	(0.7)
Slovak Republic	449	(2.8)	467	(3.3)	474	(3.6)	491	(3.8)	**41**	(3.9)	**9**	(1.0)	**1.3**	(0.1)	1.6	(0.3)
Slovenia	482	(2.7)	511	(2.8)	522	(3.5)	558	(3.2)	**76**	(4.5)	**22**	(1.4)	**1.7**	(0.1)	6.5	(0.8)
Spain	461	(2.3)	491	(3.1)	501	(3.0)	537	(3.1)	**76**	(3.5)	**19**	(1.2)	**1.8**	(0.1)	8.4	(0.9)
Sweden	458	(3.5)	509	(4.4)	498	(4.5)	556	(4.5)	**98**	(4.2)	**21**	(1.4)	**2.0**	(0.1)	7.6	(0.9)
Switzerland	476	(3.3)	509	(3.9)	513	(4.9)	550	(4.7)	**74**	(4.6)	**18**	(1.5)	**1.5**	(0.1)	5.3	(0.8)
Turkey	413	(3.8)	426	(4.8)	433	(4.5)	441	(5.1)	**28**	(4.3)	**7**	(1.2)	**1.3**	(0.1)	1.5	(0.4)
United Kingdom	470	(3.4)	515	(3.2)	521	(3.4)	561	(3.8)	**91**	(4.3)	**26**	(1.3)	**2.0**	(0.1)	10.5	(1.1)
United States	471	(3.2)	505	(3.6)	495	(4.1)	536	(4.8)	**65**	(5.1)	**17**	(1.4)	**1.5**	(0.1)	4.9	(0.8)
OECD average	466	(0.5)	498	(0.6)	501	(0.6)	534	(0.7)	**68**	(0.7)	**18**	(0.2)	**1.7**	(0.0)	6.0	(0.1)
Partners																
Albania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Algeria	376	(3.3)	378	(3.3)	377	(3.8)	379	(3.7)	3	(3.8)	1	(1.3)	1.0	(0.1)	0.0	(0.1)
Brazil	397	(3.0)	415	(3.0)	421	(4.9)	438	(4.7)	**41**	(4.4)	**9**	(1.2)	**1.2**	(0.1)	1.9	(0.5)
B-S-J-G (China)	485	(4.9)	520	(4.6)	515	(6.3)	555	(6.3)	**70**	(6.2)	**19**	(1.9)	**1.6**	(0.1)	4.6	(0.8)
Bulgaria	437	(4.3)	466	(5.4)	465	(4.8)	474	(5.5)	**38**	(4.9)	**7**	(1.2)	**1.4**	(0.1)	0.7	(0.3)
CABA (Argentina)	447	(6.6)	471	(7.9)	484	(7.8)	509	(8.7)	**62**	(8.1)	**20**	(2.7)	**1.8**	(0.2)	6.4	(1.7)
Colombia	415	(2.9)	423	(3.0)	417	(3.2)	426	(3.4)	**11**	(3.4)	2	(1.0)	1.0	(0.1)	0.1	(0.1)
Costa Rica	413	(2.4)	432	(3.1)	424	(3.1)	430	(3.2)	**17**	(3.3)	**2**	(0.9)	1.1	(0.1)	0.2	(0.1)
Croatia	447	(3.1)	478	(4.0)	480	(3.8)	512	(3.3)	**64**	(3.5)	**15**	(1.2)	**1.7**	(0.1)	4.4	(0.6)
Cyprus*	425	(2.6)	431	(3.0)	441	(3.0)	464	(3.0)	**39**	(3.5)	**7**	(1.0)	1.0	(0.1)	1.2	(0.3)
Dominican Republic	341	(4.6)	347	(3.7)	355	(4.2)	336	(4.0)	-5	(5.5)	-2	(1.2)	1.1	(0.1)	0.1	(0.2)
FYROM	367	(2.8)	384	(2.6)	398	(2.8)	405	(3.2)	**38**	(4.2)	**10**	(1.3)	**1.3**	(0.1)	2.2	(0.6)
Georgia	389	(3.5)	408	(3.5)	419	(3.3)	443	(3.4)	**54**	(4.1)	**17**	(1.2)	**1.5**	(0.1)	5.0	(0.7)
Hong Kong (China)	501	(3.0)	535	(3.9)	512	(4.4)	549	(3.2)	**48**	(3.6)	**11**	(1.2)	**1.5**	(0.1)	2.7	(0.6)
Indonesia	395	(3.0)	408	(3.1)	411	(3.5)	403	(3.6)	8	(4.1)	3	(1.5)	1.1	(0.1)	0.2	(0.2)
Jordan	392	(3.7)	405	(3.3)	429	(3.4)	425	(3.7)	**33**	(4.1)	**9**	(1.2)	**1.5**	(0.1)	1.8	(0.5)
Kosovo	373	(2.6)	388	(2.8)	383	(3.1)	380	(2.8)	6	(3.6)	1	(1.1)	1.1	(0.1)	0.0	(0.0)
Lebanon	371	(4.2)	371	(4.1)	389	(6.1)	423	(5.0)	**52**	(5.6)	**18**	(2.3)	**1.2**	(0.1)	4.0	(0.9)
Lithuania	453	(3.0)	476	(3.6)	479	(3.4)	511	(4.1)	**59**	(4.5)	**16**	(1.4)	**1.6**	(0.1)	4.2	(0.7)
Macao (China)	499	(2.5)	529	(2.6)	530	(2.7)	556	(2.4)	**57**	(3.7)	**17**	(1.2)	**1.7**	(0.1)	5.6	(0.8)
Malta	414	(3.4)	457	(4.2)	480	(3.5)	532	(4.1)	**117**	(5.9)	**34**	(1.5)	**2.0**	(0.1)	14.7	(1.3)
Moldova	405	(2.9)	431	(3.0)	443	(2.7)	450	(3.7)	**45**	(4.3)	**16**	(1.5)	**1.5**	(0.1)	3.9	(0.7)
Montenegro	404	(2.5)	423	(2.9)	424	(2.6)	439	(3.0)	**35**	(3.8)	**7**	(1.0)	**1.3**	(0.1)	1.6	(0.4)
Peru	404	(2.8)	404	(3.0)	412	(3.6)	422	(3.4)	**18**	(3.2)	**5**	(1.3)	1.0	(0.1)	0.4	(0.2)
Qatar	398	(2.0)	428	(2.3)	443	(2.6)	460	(2.5)	**62**	(3.3)	**14**	(0.8)	**1.6**	(0.1)	3.7	(0.4)
Romania	420	(4.2)	440	(3.7)	443	(4.3)	439	(4.9)	**19**	(5.1)	**6**	(1.9)	**1.3**	(0.1)	0.6	(0.3)
Russia	470	(3.2)	495	(4.0)	491	(3.6)	509	(3.8)	**39**	(3.7)	**8**	(1.0)	**1.4**	(0.1)	1.9	(0.4)
Singapore	514	(2.4)	562	(2.8)	546	(3.1)	607	(3.0)	**94**	(3.8)	**28**	(1.2)	**1.8**	(0.1)	9.4	(0.8)
Chinese Taipei	490	(3.9)	540	(3.3)	522	(4.1)	579	(3.7)	**89**	(5.0)	**26**	(1.5)	**1.9**	(0.1)	9.2	(0.9)
Thailand	418	(3.2)	428	(3.5)	422	(3.3)	424	(4.5)	7	(4.1)	1	(1.4)	1.1	(0.1)	0.0	(0.1)
Trinidad and Tobago	410	(3.3)	420	(3.6)	441	(3.9)	458	(3.3)	**48**	(5.1)	**14**	(1.5)	**1.2**	(0.1)	3.2	(0.7)
Tunisia	387	(2.6)	393	(3.5)	394	(3.1)	398	(3.6)	**11**	(3.8)	**4**	(1.1)	1.0	(0.1)	0.4	(0.2)
United Arab Emirates	410	(3.2)	436	(2.8)	459	(3.7)	468	(3.0)	**59**	(3.1)	**13**	(0.8)	**1.6**	(0.1)	3.2	(0.4)
Uruguay	433	(3.2)	447	(3.7)	452	(3.9)	465	(4.2)	**32**	(4.8)	**8**	(1.2)	**1.2**	(0.1)	1.3	(0.4)
Viet Nam	497	(4.7)	522	(4.5)	530	(4.5)	550	(5.4)	**53**	(5.1)	**21**	(2.1)	**1.8**	(0.1)	6.2	(1.1)
Argentina**	415	(3.8)	433	(3.5)	438	(3.9)	451	(4.1)	**37**	(4.4)	**10**	(1.2)	**1.4**	(0.1)	2.3	(0.5)
Kazakhstan**	441	(4.2)	457	(4.4)	466	(4.2)	463	(5.3)	**22**	(5.0)	**6**	(1.5)	**1.4**	(0.1)	1.0	(0.5)
Malaysia**	430	(3.3)	447	(3.6)	443	(3.0)	457	(4.6)	**27**	(4.1)	**10**	(1.3)	**1.3**	(0.1)	2.0	(0.5)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.5a Index of science activities

Percentage of students who reported doing these things "very often" or "regularly"

		Index of science activities		Percentage of students who do these things: Watch TV programmes about <broad science>		Borrow or buy books on <broad science> topics		Visit web sites about <broad science> topics		Read <broad science> magazines or science articles in newspapers	
		Mean index	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	-0.30	(0.02)	16.6	(0.4)	7.4	(0.3)	18.8	(0.5)	9.3	(0.3)
	Austria	-0.14	(0.02)	18.0	(0.7)	8.1	(0.5)	14.9	(0.6)	14.4	(0.6)
	Belgium	-0.13	(0.02)	29.2	(0.7)	10.8	(0.5)	16.5	(0.5)	16.3	(0.5)
	Canada	-0.02	(0.01)	22.1	(0.4)	12.1	(0.4)	21.1	(0.5)	15.2	(0.4)
	Chile	0.17	(0.02)	33.6	(0.7)	13.5	(0.5)	27.3	(0.7)	17.1	(0.6)
	Czech Republic	-0.08	(0.02)	17.4	(0.6)	8.9	(0.5)	12.1	(0.5)	13.1	(0.5)
	Denmark	-0.13	(0.02)	21.8	(0.6)	6.2	(0.3)	19.5	(0.6)	14.6	(0.6)
	Estonia	0.29	(0.02)	30.3	(0.7)	11.5	(0.5)	25.4	(0.6)	24.4	(0.6)
	Finland	-0.50	(0.02)	12.1	(0.5)	4.6	(0.3)	7.1	(0.4)	9.9	(0.4)
	France	-0.11	(0.02)	20.8	(0.6)	10.3	(0.5)	22.8	(0.7)	14.5	(0.6)
	Germany	-0.12	(0.02)	17.9	(0.7)	8.9	(0.5)	15.6	(0.7)	12.9	(0.7)
	Greece	0.19	(0.02)	27.2	(0.9)	17.6	(0.8)	26.3	(0.7)	21.8	(0.7)
	Hungary	0.27	(0.03)	30.5	(0.7)	15.9	(0.6)	21.9	(0.7)	18.6	(0.7)
	Iceland	-0.17	(0.02)	18.9	(0.7)	8.1	(0.5)	20.8	(0.7)	15.9	(0.6)
	Ireland	-0.37	(0.02)	16.8	(0.5)	6.3	(0.3)	14.4	(0.5)	8.5	(0.4)
	Israel	0.09	(0.04)	30.4	(1.0)	19.8	(0.9)	25.4	(0.8)	22.0	(0.8)
	Italy	0.27	(0.02)	28.9	(0.9)	13.9	(0.7)	27.7	(0.9)	18.8	(0.7)
	Japan	-0.57	(0.02)	10.9	(0.4)	5.4	(0.4)	10.1	(0.4)	7.1	(0.4)
	Korea	-0.28	(0.03)	7.6	(0.4)	9.0	(0.6)	6.6	(0.5)	10.3	(0.6)
	Latvia	0.22	(0.02)	23.7	(0.6)	11.2	(0.6)	19.1	(0.6)	18.4	(0.6)
	Luxembourg	0.07	(0.02)	23.5	(0.7)	13.0	(0.5)	21.3	(0.6)	17.6	(0.5)
	Mexico	0.53	(0.02)	39.6	(0.8)	22.3	(0.7)	32.9	(0.8)	29.2	(0.9)
	Netherlands	-0.43	(0.02)	25.9	(0.7)	6.2	(0.4)	11.4	(0.5)	11.1	(0.5)
	New Zealand	-0.20	(0.02)	17.5	(0.7)	9.4	(0.5)	17.9	(0.7)	9.7	(0.5)
	Norway	-0.04	(0.02)	21.9	(0.6)	8.3	(0.4)	21.0	(0.6)	14.7	(0.6)
	Poland	0.40	(0.02)	40.3	(0.8)	12.8	(0.6)	23.6	(0.8)	20.0	(0.7)
	Portugal	0.20	(0.02)	34.4	(0.6)	13.2	(0.6)	21.1	(0.6)	21.9	(0.6)
	Slovak Republic	0.14	(0.02)	24.3	(0.7)	15.0	(0.6)	19.3	(0.6)	18.6	(0.7)
	Slovenia	0.07	(0.02)	27.9	(0.7)	9.8	(0.4)	15.6	(0.6)	15.7	(0.6)
	Spain	-0.20	(0.02)	16.4	(0.5)	7.4	(0.4)	14.5	(0.5)	11.6	(0.5)
	Sweden	-0.25	(0.02)	14.2	(0.6)	6.1	(0.4)	13.2	(0.5)	11.5	(0.6)
	Switzerland	-0.12	(0.02)	16.8	(0.7)	8.4	(0.6)	14.4	(0.6)	15.4	(0.7)
	Turkey	0.68	(0.02)	30.3	(1.0)	26.8	(1.0)	31.8	(0.8)	28.6	(0.9)
	United Kingdom	-0.15	(0.02)	17.7	(0.5)	10.9	(0.4)	20.5	(0.6)	10.0	(0.4)
	United States	-0.02	(0.02)	18.6	(0.7)	10.1	(0.6)	18.0	(0.7)	13.5	(0.7)
	OECD average	-0.02	(0.00)	23.0	(0.1)	11.1	(0.1)	19.1	(0.1)	15.8	(0.1)
Partners	Albania	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m
	Brazil	0.50	(0.02)	40.5	(0.7)	26.4	(0.7)	34.8	(0.7)	29.3	(0.7)
	B-S-J-G (China)	0.52	(0.02)	28.7	(0.7)	18.7	(0.6)	16.4	(0.7)	22.7	(0.7)
	Bulgaria	0.82	(0.02)	48.1	(0.8)	25.0	(0.9)	39.1	(0.8)	29.2	(0.9)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m
	Colombia	0.64	(0.02)	52.5	(0.7)	26.1	(0.8)	34.4	(0.7)	30.3	(0.7)
	Costa Rica	0.31	(0.02)	44.1	(0.9)	17.7	(0.7)	25.9	(0.7)	25.2	(0.7)
	Croatia	0.03	(0.02)	26.9	(0.7)	9.9	(0.5)	17.0	(0.6)	15.3	(0.6)
	Cyprus*	0.46	(0.02)	37.9	(0.7)	24.2	(0.6)	31.4	(0.7)	26.0	(0.7)
	Dominican Republic	0.92	(0.03)	48.8	(1.0)	34.5	(1.1)	40.7	(1.2)	37.8	(1.2)
	FYROM	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	0.28	(0.02)	21.3	(0.8)	13.8	(0.6)	15.3	(0.6)	14.7	(0.7)
	Indonesia	m	m	m	m	m	m	m	m	m	m
	Jordan	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m
	Lithuania	0.37	(0.02)	30.5	(0.7)	17.7	(0.6)	31.0	(0.6)	25.9	(0.7)
	Macao (China)	0.17	(0.02)	19.2	(0.6)	9.7	(0.4)	14.3	(0.6)	12.7	(0.6)
	Malta	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m
	Montenegro	0.86	(0.02)	52.2	(0.8)	31.2	(0.7)	38.5	(0.8)	37.8	(0.7)
	Peru	0.70	(0.02)	47.7	(0.8)	29.8	(0.8)	34.4	(0.8)	32.8	(0.8)
	Qatar	0.80	(0.01)	36.7	(0.5)	29.8	(0.4)	36.0	(0.5)	31.0	(0.4)
	Romania	m	m	m	m	m	m	m	m	m	m
	Russia	0.66	(0.02)	33.2	(0.6)	22.4	(0.7)	36.2	(0.8)	24.2	(0.6)
	Singapore	0.20	(0.01)	20.8	(0.5)	11.2	(0.4)	22.2	(0.5)	18.7	(0.5)
	Chinese Taipei	0.20	(0.01)	22.3	(0.5)	9.2	(0.4)	16.7	(0.5)	14.7	(0.5)
	Thailand	0.92	(0.02)	33.2	(0.7)	23.0	(0.8)	26.4	(0.7)	22.6	(0.7)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m
	Tunisia	1.20	(0.02)	52.9	(0.9)	40.0	(1.0)	47.7	(0.9)	42.3	(0.8)
	United Arab Emirates	0.88	(0.02)	39.9	(0.7)	30.6	(0.6)	39.2	(0.6)	34.3	(0.6)
	Uruguay	0.14	(0.02)	29.6	(0.7)	15.9	(0.6)	21.5	(0.6)	17.3	(0.6)
	Viet Nam	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m
	Malaysia**	0.88	(0.02)	33.2	(0.7)	24.4	(0.7)	29.3	(0.7)	33.5	(0.7)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.5a Index of science activities

Percentage of students who reported doing these things "very often" or "regularly"

		Percentage of students who do these things:									
		Attend a <science club>		Simulate natural phenomena in computer programs/virtual labs		Simulate technical processes in computer programs/virtual labs		Visit web sites of ecology organisations		Follow news of science, environmental, or ecology organisations via blogs and microblogging	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	3.5	(0.2)	5.7	(0.3)	5.9	(0.2)	7.2	(0.3)	12.9	(0.4)
	Austria	6.1	(0.5)	8.4	(0.6)	9.1	(0.6)	11.2	(0.6)	17.5	(0.6)
	Belgium	5.7	(0.4)	8.2	(0.4)	8.2	(0.4)	8.7	(0.4)	12.4	(0.4)
	Canada	6.3	(0.3)	9.2	(0.3)	9.6	(0.3)	10.7	(0.4)	17.6	(0.5)
	Chile	8.9	(0.5)	12.3	(0.6)	12.1	(0.5)	14.5	(0.6)	18.1	(0.6)
	Czech Republic	7.5	(0.4)	7.3	(0.4)	7.9	(0.4)	8.2	(0.5)	7.8	(0.4)
	Denmark	3.7	(0.3)	6.4	(0.4)	6.7	(0.4)	7.1	(0.4)	14.1	(0.6)
	Estonia	11.2	(0.5)	10.7	(0.5)	10.7	(0.5)	11.9	(0.5)	12.1	(0.5)
	Finland	2.8	(0.3)	3.6	(0.3)	3.9	(0.4)	4.8	(0.4)	4.7	(0.4)
	France	5.0	(0.3)	7.9	(0.5)	7.7	(0.4)	8.6	(0.4)	13.1	(0.5)
	Germany	5.8	(0.5)	7.9	(0.6)	8.0	(0.6)	11.1	(0.5)	16.6	(0.7)
	Greece	13.8	(0.8)	15.3	(0.9)	15.4	(0.8)	21.0	(0.7)	21.3	(0.6)
	Hungary	15.3	(0.6)	14.4	(0.7)	15.1	(0.7)	14.6	(0.7)	14.5	(0.6)
	Iceland	4.0	(0.4)	5.4	(0.5)	6.1	(0.5)	7.9	(0.5)	16.3	(0.7)
	Ireland	1.6	(0.2)	5.8	(0.3)	6.5	(0.4)	4.8	(0.3)	13.1	(0.5)
	Israel	16.2	(0.6)	16.8	(0.7)	18.0	(0.7)	18.3	(0.8)	21.4	(0.8)
	Italy	11.0	(0.6)	12.7	(0.6)	14.2	(0.7)	16.3	(0.7)	23.3	(0.8)
	Japan	3.3	(0.3)	2.6	(0.2)	3.4	(0.3)	3.0	(0.2)	3.0	(0.2)
	Korea	12.5	(0.7)	4.3	(0.3)	4.3	(0.3)	5.3	(0.3)	10.0	(0.5)
	Latvia	8.8	(0.5)	10.6	(0.5)	11.4	(0.5)	12.6	(0.5)	13.7	(0.6)
	Luxembourg	7.3	(0.4)	10.8	(0.5)	11.2	(0.5)	14.0	(0.5)	14.6	(0.6)
	Mexico	12.6	(0.7)	17.5	(0.7)	17.9	(0.7)	22.5	(0.7)	24.3	(0.7)
	Netherlands	4.4	(0.4)	5.8	(0.4)	6.8	(0.4)	6.1	(0.4)	11.1	(0.5)
	New Zealand	4.7	(0.4)	6.1	(0.4)	6.6	(0.4)	8.1	(0.5)	12.7	(0.6)
	Norway	8.0	(0.5)	9.2	(0.5)	9.5	(0.5)	12.0	(0.5)	14.4	(0.5)
	Poland	14.8	(0.9)	11.2	(0.6)	11.4	(0.6)	14.5	(0.6)	16.7	(0.6)
	Portugal	7.7	(0.4)	12.2	(0.5)	12.2	(0.5)	13.0	(0.5)	16.9	(0.5)
	Slovak Republic	12.0	(0.6)	12.6	(0.6)	13.2	(0.7)	14.0	(0.6)	14.8	(0.6)
	Slovenia	9.6	(0.5)	8.7	(0.5)	8.8	(0.5)	8.2	(0.4)	9.7	(0.4)
	Spain	6.5	(0.4)	8.4	(0.4)	8.7	(0.4)	9.0	(0.5)	12.2	(0.5)
	Sweden	4.6	(0.3)	6.2	(0.4)	7.1	(0.4)	7.7	(0.4)	11.2	(0.5)
	Switzerland	7.9	(0.6)	8.3	(0.6)	8.5	(0.6)	10.7	(0.7)	14.8	(0.6)
	Turkey	21.7	(0.8)	26.0	(0.9)	24.0	(0.8)	25.1	(0.8)	24.3	(0.7)
	United Kingdom	8.1	(0.5)	5.6	(0.3)	5.6	(0.4)	6.3	(0.3)	13.0	(0.5)
	United States	8.1	(0.6)	10.5	(0.7)	10.9	(0.7)	11.6	(0.6)	15.7	(0.7)
	OECD average	8.3	(0.1)	9.6	(0.1)	9.9	(0.1)	11.2	(0.1)	14.6	(0.1)
Partners	Albania	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m
	Brazil	19.0	(0.7)	22.3	(0.7)	21.6	(0.7)	24.2	(0.6)	26.8	(0.6)
	B-S-J-G (China)	9.9	(0.5)	12.3	(0.6)	12.2	(0.6)	12.9	(0.6)	25.9	(0.8)
	Bulgaria	21.1	(0.9)	23.7	(0.9)	24.5	(0.9)	26.4	(1.0)	29.9	(0.7)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m
	Colombia	18.6	(0.7)	21.7	(0.7)	21.6	(0.7)	26.6	(0.8)	31.0	(0.7)
	Costa Rica	12.0	(0.6)	15.2	(0.6)	15.7	(0.6)	20.8	(0.7)	24.9	(0.7)
	Croatia	7.3	(0.4)	9.9	(0.5)	9.7	(0.5)	10.9	(0.5)	10.6	(0.5)
	Cyprus*	21.4	(0.6)	22.7	(0.6)	23.1	(0.6)	24.1	(0.6)	25.2	(0.7)
	Dominican Republic	25.1	(1.0)	31.4	(1.1)	30.8	(1.1)	33.7	(1.2)	36.1	(1.1)
	FYROM	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	11.6	(0.7)	9.6	(0.7)	9.7	(0.7)	11.8	(0.7)	12.9	(0.6)
	Indonesia	m	m	m	m	m	m	m	m	m	m
	Jordan	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m
	Lithuania	13.3	(0.5)	16.7	(0.6)	15.5	(0.6)	15.6	(0.5)	17.5	(0.7)
	Macao (China)	7.3	(0.4)	7.6	(0.4)	7.5	(0.4)	9.3	(0.4)	13.9	(0.6)
	Malta	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m
	Montenegro	21.6	(0.7)	25.1	(0.7)	25.3	(0.7)	28.6	(0.7)	31.3	(0.7)
	Peru	15.4	(0.7)	21.2	(0.7)	21.0	(0.7)	25.9	(0.8)	28.7	(0.7)
	Qatar	22.4	(0.4)	26.6	(0.5)	26.7	(0.4)	28.3	(0.4)	30.0	(0.5)
	Romania	m	m	m	m	m	m	m	m	m	m
	Russia	17.7	(0.7)	18.0	(0.7)	18.6	(0.7)	20.6	(0.7)	25.4	(0.9)
	Singapore	7.0	(0.3)	9.1	(0.4)	9.1	(0.4)	11.3	(0.4)	18.1	(0.5)
	Chinese Taipei	7.2	(0.3)	5.9	(0.3)	5.7	(0.3)	6.8	(0.3)	9.8	(0.3)
	Thailand	27.3	(0.7)	21.1	(0.7)	20.4	(0.7)	24.3	(0.7)	22.8	(0.7)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m
	Tunisia	30.9	(0.9)	31.9	(1.0)	32.7	(1.0)	38.7	(1.0)	40.5	(1.0)
	United Arab Emirates	24.7	(0.6)	28.8	(0.7)	29.2	(0.6)	29.2	(0.7)	34.1	(0.6)
	Uruguay	11.8	(0.6)	13.0	(0.6)	12.6	(0.6)	15.5	(0.6)	20.3	(0.7)
	Viet Nam	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m
	Malaysia**	24.1	(0.8)	23.2	(0.8)	21.0	(0.7)	21.4	(0.7)	28.0	(0.7)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.5b Index of science activities and science performance, by national quarters of this index

Results based on students' self-reports

		Index of science activities											
		All students		Variability in this index		Bottom quarter		Second quarter		Third quarter		Top quarter	
		Mean index	S.E.	S.D.	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.
OECD	Australia	-0.30	(0.02)	1.12	(0.01)	-1.75	(0.00)	-0.72	(0.03)	0.15	(0.02)	1.13	(0.02)
	Austria	-0.14	(0.02)	1.14	(0.01)	-1.68	(0.02)	-0.47	(0.03)	0.31	(0.03)	1.30	(0.03)
	Belgium	-0.13	(0.02)	1.11	(0.01)	-1.59	(0.02)	-0.49	(0.02)	0.28	(0.02)	1.27	(0.03)
	Canada	-0.02	(0.01)	1.17	(0.01)	-1.61	(0.02)	-0.36	(0.02)	0.51	(0.02)	1.40	(0.02)
	Chile	0.17	(0.02)	1.09	(0.01)	-1.29	(0.03)	-0.12	(0.02)	0.60	(0.02)	1.49	(0.02)
	Czech Republic	-0.08	(0.02)	1.07	(0.01)	-1.44	(0.02)	-0.45	(0.03)	0.30	(0.02)	1.27	(0.03)
	Denmark	-0.13	(0.02)	1.02	(0.01)	-1.48	(0.02)	-0.40	(0.03)	0.22	(0.02)	1.13	(0.02)
	Estonia	0.29	(0.02)	0.97	(0.01)	-1.00	(0.03)	0.07	(0.02)	0.67	(0.02)	1.42	(0.02)
	Finland	-0.50	(0.02)	1.04	(0.01)	-1.75	(0.00)	-0.94	(0.03)	-0.19	(0.02)	0.88	(0.03)
	France	-0.11	(0.02)	1.12	(0.01)	-1.61	(0.03)	-0.44	(0.03)	0.32	(0.02)	1.27	(0.03)
	Germany	-0.12	(0.02)	1.13	(0.02)	-1.64	(0.03)	-0.45	(0.03)	0.32	(0.03)	1.29	(0.03)
	Greece	0.19	(0.02)	1.22	(0.01)	-1.50	(0.03)	-0.09	(0.03)	0.70	(0.03)	1.66	(0.03)
	Hungary	0.27	(0.03)	1.17	(0.01)	-1.29	(0.03)	-0.05	(0.03)	0.77	(0.03)	1.66	(0.03)
	Iceland	-0.17	(0.02)	1.11	(0.01)	-1.65	(0.03)	-0.49	(0.02)	0.24	(0.02)	1.20	(0.03)
	Ireland	-0.37	(0.02)	1.07	(0.01)	-1.75	(0.00)	-0.79	(0.04)	0.05	(0.02)	1.02	(0.02)
	Israel	0.09	(0.04)	1.33	(0.01)	-1.62	(0.04)	-0.42	(0.04)	0.63	(0.04)	1.79	(0.04)
	Italy	0.27	(0.02)	1.08	(0.01)	-1.19	(0.04)	0.04	(0.03)	0.69	(0.03)	1.53	(0.03)
	Japan	-0.57	(0.02)	1.01	(0.01)	-1.75	(0.00)	-1.04	(0.03)	-0.24	(0.03)	0.77	(0.03)
	Korea	-0.28	(0.03)	1.18	(0.01)	-1.75	(0.00)	-0.85	(0.05)	0.28	(0.04)	1.20	(0.02)
	Latvia	0.22	(0.02)	1.00	(0.01)	-1.10	(0.03)	-0.01	(0.02)	0.59	(0.02)	1.42	(0.02)
	Luxembourg	0.07	(0.02)	1.16	(0.01)	-1.50	(0.02)	-0.23	(0.02)	0.54	(0.02)	1.46	(0.02)
	Mexico	0.53	(0.02)	1.01	(0.01)	-0.84	(0.03)	0.35	(0.02)	0.93	(0.02)	1.67	(0.02)
	Netherlands	-0.43	(0.02)	1.09	(0.01)	-1.75	(0.00)	-0.93	(0.04)	-0.05	(0.02)	1.02	(0.03)
	New Zealand	-0.20	(0.02)	1.11	(0.01)	-1.68	(0.03)	-0.55	(0.03)	0.25	(0.03)	1.19	(0.03)
	Norway	-0.04	(0.02)	1.15	(0.01)	-1.58	(0.02)	-0.38	(0.03)	0.44	(0.02)	1.36	(0.02)
	Poland	0.40	(0.02)	0.93	(0.01)	-0.82	(0.03)	0.20	(0.02)	0.75	(0.02)	1.48	(0.03)
	Portugal	0.20	(0.02)	1.12	(0.01)	-1.31	(0.03)	-0.07	(0.02)	0.66	(0.02)	1.52	(0.02)
	Slovak Republic	0.14	(0.02)	1.18	(0.01)	-1.41	(0.02)	-0.22	(0.03)	0.62	(0.03)	1.59	(0.03)
	Slovenia	0.07	(0.02)	1.05	(0.01)	-1.36	(0.02)	-0.20	(0.03)	0.50	(0.02)	1.32	(0.02)
	Spain	-0.20	(0.02)	1.14	(0.01)	-1.75	(0.02)	-0.55	(0.04)	0.27	(0.02)	1.23	(0.02)
	Sweden	-0.25	(0.02)	1.16	(0.01)	-1.75	(0.00)	-0.69	(0.05)	0.21	(0.03)	1.22	(0.03)
	Switzerland	-0.12	(0.02)	1.12	(0.02)	-1.62	(0.03)	-0.43	(0.02)	0.29	(0.02)	1.28	(0.04)
	Turkey	0.68	(0.02)	1.16	(0.01)	-0.92	(0.04)	0.61	(0.03)	1.10	(0.02)	1.95	(0.03)
	United Kingdom	-0.15	(0.02)	1.05	(0.01)	-1.54	(0.02)	-0.45	(0.02)	0.24	(0.02)	1.15	(0.02)
	United States	-0.02	(0.02)	1.19	(0.01)	-1.64	(0.02)	-0.37	(0.03)	0.54	(0.03)	1.41	(0.03)
	OECD average	-0.02	(0.00)	1.11	(0.00)	-1.48	(0.00)	-0.35	(0.01)	0.41	(0.00)	1.34	(0.00)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	0.50	(0.02)	1.22	(0.01)	-1.18	(0.03)	0.25	(0.03)	1.01	(0.02)	1.91	(0.02)
	B-S-J-G (China)	0.52	(0.02)	0.96	(0.02)	-0.77	(0.04)	0.38	(0.02)	0.91	(0.02)	1.55	(0.03)
	Bulgaria	0.82	(0.02)	1.05	(0.02)	-0.51	(0.04)	0.61	(0.03)	1.10	(0.02)	2.07	(0.03)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	0.64	(0.02)	1.02	(0.01)	-0.71	(0.03)	0.41	(0.02)	1.03	(0.02)	1.84	(0.02)
	Costa Rica	0.31	(0.02)	1.13	(0.01)	-1.20	(0.02)	0.02	(0.02)	0.74	(0.02)	1.68	(0.03)
	Croatia	0.03	(0.02)	1.11	(0.01)	-1.44	(0.02)	-0.29	(0.03)	0.48	(0.03)	1.38	(0.03)
	Cyprus*	0.46	(0.02)	1.27	(0.01)	-1.35	(0.03)	0.24	(0.03)	1.05	(0.01)	1.89	(0.02)
	Dominican Republic	0.92	(0.03)	1.18	(0.02)	-0.61	(0.04)	0.69	(0.03)	1.26	(0.03)	2.35	(0.05)
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	0.28	(0.02)	1.10	(0.01)	-1.26	(0.03)	0.11	(0.03)	0.81	(0.02)	1.47	(0.03)
	Indonesia	m	m	m	m	m	m	m	m	m	m	m	m
	Jordan	m	m	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	0.37	(0.02)	1.08	(0.01)	-1.04	(0.03)	0.09	(0.02)	0.79	(0.02)	1.66	(0.03)
	Macao (China)	0.17	(0.02)	1.00	(0.01)	-1.23	(0.03)	-0.01	(0.02)	0.61	(0.02)	1.30	(0.02)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	0.86	(0.02)	1.10	(0.01)	-0.52	(0.03)	0.62	(0.02)	1.16	(0.01)	2.20	(0.03)
	Peru	0.70	(0.02)	0.95	(0.01)	-0.53	(0.03)	0.50	(0.02)	1.02	(0.02)	1.82	(0.03)
	Qatar	0.80	(0.01)	1.16	(0.01)	-0.77	(0.02)	0.70	(0.01)	1.17	(0.01)	2.10	(0.02)
	Romania	m	m	m	m	m	m	m	m	m	m	m	m
	Russia	0.66	(0.02)	1.00	(0.02)	-0.64	(0.03)	0.50	(0.02)	1.00	(0.01)	1.79	(0.03)
	Singapore	0.20	(0.01)	1.09	(0.01)	-1.34	(0.02)	0.00	(0.02)	0.73	(0.01)	1.40	(0.02)
	Chinese Taipei	0.20	(0.01)	0.98	(0.01)	-1.14	(0.02)	0.03	(0.02)	0.64	(0.02)	1.28	(0.01)
	Thailand	0.92	(0.02)	0.76	(0.01)	-0.04	(0.03)	0.90	(0.01)	1.11	(0.01)	1.73	(0.02)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	1.20	(0.02)	0.85	(0.01)	0.18	(0.03)	1.01	(0.02)	1.43	(0.02)	2.18	(0.03)
	United Arab Emirates	0.88	(0.02)	1.07	(0.01)	-0.54	(0.03)	0.75	(0.02)	1.22	(0.02)	2.09	(0.02)
	Uruguay	0.14	(0.02)	1.20	(0.01)	-1.49	(0.02)	-0.18	(0.03)	0.64	(0.03)	1.57	(0.03)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	0.88	(0.02)	0.88	(0.02)	-0.26	(0.03)	0.83	(0.01)	1.11	(0.01)	1.84	(0.03)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.5b Index of science activities and science performance, by national quarters of this index

Results based on students' self-reports

		Performance in science, by national quarters of this index								Difference in science performance between students in the top quarter and students in the bottom quarter of this index		Change in the science score per unit of this index		Increased likelihood of students in the bottom quarter of this index scoring in the bottom quarter of the national science performance distribution		Explained variance in student performance in science (r-squared x 100)	
		Bottom quarter		Second quarter		Third quarter		Top quarter									
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Relative risk	S.E.	%	S.E.
OECD	Australia	472	(2.4)	512	(2.6)	546	(2.4)	529	(3.2)	**57**	(3.5)	**18**	(1.2)	**1.9**	(0.1)	4.1	(0.5)
	Austria	471	(3.4)	508	(2.9)	530	(4.2)	492	(5.8)	**21**	(6.0)	**7**	(1.9)	**1.6**	(0.1)	0.7	(0.4)
	Belgium	485	(3.2)	524	(2.6)	547	(2.7)	501	(4.0)	**17**	(4.4)	**6**	(1.4)	**1.5**	(0.1)	0.4	(0.2)
	Canada	503	(2.5)	540	(2.2)	563	(2.9)	521	(3.3)	**18**	(3.4)	**8**	(1.0)	**1.6**	(0.1)	1.0	(0.2)
	Chile	440	(3.1)	471	(3.9)	469	(4.0)	426	(3.5)	**-15**	(4.0)	**-4**	(1.4)	1.0	(0.1)	0.3	(0.2)
	Czech Republic	485	(3.1)	511	(2.6)	527	(3.2)	477	(4.3)	-8	(4.5)	-2	(1.4)	1.1	(0.1)	0.1	(0.1)
	Denmark	481	(2.6)	516	(3.0)	530	(2.8)	512	(4.0)	**32**	(4.2)	**10**	(1.6)	**1.6**	(0.1)	1.4	(0.4)
	Estonia	527	(3.3)	552	(2.8)	556	(3.2)	511	(3.9)	**-16**	(4.3)	**-4**	(1.6)	1.1	(0.1)	0.2	(0.1)
	Finland	508	(3.2)	528	(3.1)	562	(2.9)	544	(4.4)	**36**	(5.2)	**8**	(1.9)	**1.5**	(0.1)	0.8	(0.4)
	France	464	(3.2)	512	(3.0)	539	(3.2)	506	(4.2)	**41**	(5.6)	**14**	(1.7)	**1.8**	(0.1)	2.4	(0.6)
	Germany	494	(4.3)	528	(5.3)	548	(4.2)	517	(6.6)	**22**	(6.3)	**8**	(2.1)	**1.6**	(0.1)	0.8	(0.4)
	Greece	445	(3.5)	480	(3.9)	476	(4.9)	440	(6.3)	-4	(5.7)	-1	(1.6)	1.2	(0.1)	0.0	(0.1)
	Hungary	477	(3.8)	517	(3.3)	490	(5.0)	448	(5.2)	**-29**	(6.5)	**-11**	(1.5)	0.9	(0.1)	1.8	(0.5)
	Iceland	447	(3.0)	478	(3.4)	500	(3.7)	486	(3.9)	**39**	(5.1)	**12**	(1.6)	**1.6**	(0.1)	2.2	(0.6)
	Ireland	460	(3.1)	499	(3.8)	519	(2.9)	539	(3.6)	**78**	(3.7)	**26**	(1.3)	**2.2**	(0.1)	9.8	(1.0)
	Israel	479	(4.6)	502	(3.9)	497	(5.3)	421	(5.7)	**-58**	(6.7)	**-15**	(1.8)	**0.8**	(0.1)	3.9	(0.9)
	Italy	469	(3.6)	504	(4.0)	500	(4.2)	463	(3.6)	-6	(4.8)	1	(1.8)	**1.2**	(0.1)	0.0	(0.1)
	Japan	510	(3.4)	531	(3.3)	565	(3.7)	558	(5.0)	**48**	(4.9)	**15**	(2.1)	**1.6**	(0.1)	2.6	(0.7)
	Korea	483	(3.7)	509	(4.5)	551	(4.1)	524	(4.7)	**41**	(5.1)	**17**	(1.6)	**1.7**	(0.1)	4.6	(0.8)
	Latvia	487	(3.2)	505	(2.8)	509	(3.4)	467	(2.9)	**-20**	(3.9)	**-5**	(1.3)	1.0	(0.1)	0.3	(0.2)
	Luxembourg	471	(2.5)	509	(2.6)	526	(2.9)	462	(3.6)	**-10**	(4.4)	0	(1.3)	**1.2**	(0.1)	0.0	(0.0)
	Mexico	419	(3.1)	436	(2.8)	422	(3.1)	404	(3.6)	**-14**	(4.2)	**-4**	(1.5)	0.9	(0.1)	0.3	(0.2)
	Netherlands	484	(2.9)	509	(3.9)	552	(3.5)	519	(5.0)	**35**	(5.0)	**10**	(1.7)	**1.5**	(0.1)	1.3	(0.4)
	New Zealand	480	(3.5)	528	(4.2)	550	(3.9)	526	(4.4)	**46**	(5.5)	**15**	(1.7)	**1.8**	(0.1)	2.5	(0.6)
	Norway	472	(3.4)	515	(3.4)	542	(3.3)	488	(3.6)	**16**	(4.2)	**8**	(1.4)	**1.7**	(0.1)	0.9	(0.3)
	Poland	496	(3.3)	512	(3.4)	509	(4.2)	495	(4.1)	-1	(5.0)	-2	(1.8)	1.0	(0.1)	0.0	(0.1)
	Portugal	481	(2.8)	513	(3.3)	526	(4.4)	494	(4.4)	**13**	(4.7)	**5**	(1.4)	**1.3**	(0.1)	0.4	(0.2)
	Slovak Republic	460	(3.3)	495	(3.3)	493	(4.5)	433	(3.7)	**-27**	(4.5)	**-8**	(1.4)	1.0	(0.1)	1.0	(0.3)
	Slovenia	492	(2.4)	531	(3.4)	544	(3.2)	504	(3.1)	**13**	(4.1)	**6**	(1.3)	**1.4**	(0.1)	0.4	(0.2)
	Spain	468	(2.5)	502	(3.9)	517	(3.1)	501	(3.6)	**34**	(4.0)	**10**	(1.3)	**1.6**	(0.1)	1.8	(0.4)
	Sweden	465	(3.6)	505	(4.0)	539	(5.3)	500	(6.3)	**35**	(6.0)	**11**	(1.8)	**1.6**	(0.1)	1.5	(0.5)
	Switzerland	482	(3.8)	524	(4.6)	543	(4.3)	491	(5.9)	9	(6.0)	3	(2.0)	**1.4**	(0.1)	0.1	(0.2)
	Turkey	438	(4.0)	444	(6.0)	418	(4.8)	413	(4.9)	**-25**	(4.6)	**-7**	(1.4)	**0.7**	(0.1)	1.0	(0.4)
	United Kingdom	483	(3.4)	512	(2.8)	539	(3.9)	523	(4.2)	**40**	(4.6)	**14**	(1.5)	**1.6**	(0.1)	2.3	(0.5)
	United States	477	(3.1)	511	(3.5)	532	(3.9)	485	(6.0)	8	(5.8)	**5**	(1.6)	**1.4**	(0.1)	0.4	(0.2)
	OECD average	476	(0.6)	508	(0.6)	522	(0.6)	489	(0.8)	**13**	(0.8)	**5**	(0.3)	**1.4**	(0.0)	1.5	(0.1)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	415	(3.1)	445	(4.0)	419	(4.1)	387	(3.8)	**-28**	(3.6)	**-7**	(1.0)	**0.8**	(0.1)	0.9	(0.3)
	B-S-J-G (China)	511	(4.8)	537	(5.9)	511	(5.1)	516	(6.5)	5	(5.4)	1	(1.9)	1.0	(0.1)	0.0	(0.1)
	Bulgaria	480	(4.2)	498	(5.7)	446	(5.3)	417	(5.4)	**-63**	(5.6)	**-19**	(1.7)	**0.6**	(0.1)	4.1	(0.7)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	431	(2.5)	442	(3.2)	420	(3.4)	386	(3.9)	**-45**	(4.1)	**-14**	(1.3)	**0.6**	(0.1)	3.4	(0.6)
	Costa Rica	420	(2.6)	439	(3.0)	431	(3.1)	408	(3.7)	**-12**	(3.6)	**-5**	(1.1)	1.0	(0.1)	0.6	(0.3)
	Croatia	457	(3.6)	489	(3.8)	505	(3.7)	462	(4.0)	4	(4.6)	**4**	(1.5)	**1.4**	(0.1)	0.2	(0.2)
	Cyprus*	435	(2.9)	475	(3.0)	434	(2.9)	415	(2.9)	**-21**	(4.0)	**-5**	(1.1)	0.9	(0.1)	0.5	(0.2)
	Dominican Republic	367	(4.6)	356	(5.7)	340	(4.0)	316	(3.7)	**-51**	(5.4)	**-14**	(1.6)	**0.5**	(0.1)	5.2	(1.0)
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	501	(3.3)	540	(3.3)	530	(3.5)	527	(3.0)	**26**	(3.6)	**8**	(1.1)	**1.5**	(0.1)	1.3	(0.3)
	Indonesia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Jordan	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	479	(3.6)	502	(3.4)	487	(3.6)	450	(4.1)	**-29**	(4.8)	**-10**	(1.4)	0.9	(0.1)	1.4	(0.4)
	Macao (China)	511	(2.6)	538	(2.7)	547	(2.7)	520	(2.9)	**9**	(4.3)	**6**	(1.6)	**1.4**	(0.1)	0.5	(0.3)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	428	(2.2)	439	(2.4)	419	(2.7)	392	(2.6)	**-36**	(3.4)	**-10**	(1.1)	**0.8**	(0.1)	1.8	(0.4)
	Peru	425	(3.5)	429	(3.4)	410	(3.0)	382	(3.5)	**-43**	(4.1)	**-16**	(1.7)	**0.6**	(0.1)	4.3	(0.8)
	Qatar	443	(1.9)	457	(2.2)	430	(2.3)	395	(2.3)	**-47**	(3.0)	**-11**	(0.9)	**0.7**	(0.0)	1.6	(0.3)
	Romania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Russia	493	(3.2)	509	(3.1)	483	(4.2)	476	(3.9)	**-17**	(3.7)	**-6**	(1.3)	0.9	(0.1)	0.5	(0.2)
	Singapore	526	(2.7)	572	(3.2)	573	(3.8)	557	(3.0)	**31**	(4.5)	**11**	(1.4)	**1.6**	(0.1)	1.3	(0.3)
	Chinese Taipei	500	(3.4)	549	(3.4)	556	(3.6)	525	(4.2)	**24**	(4.3)	**12**	(1.6)	**1.6**	(0.1)	1.4	(0.4)
	Thailand	437	(3.9)	415	(3.6)	426	(3.3)	412	(3.7)	**-25**	(3.9)	**-7**	(1.9)	**0.7**	(0.1)	0.4	(0.2)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	416	(3.8)	397	(3.3)	384	(2.8)	373	(2.7)	**-43**	(4.1)	**-15**	(1.8)	**0.5**	(0.1)	3.6	(0.7)
	United Arab Emirates	468	(3.2)	460	(4.4)	436	(2.9)	407	(3.1)	**-61**	(3.8)	**-18**	(1.2)	**0.5**	(0.0)	3.7	(0.5)
	Uruguay	438	(3.4)	464	(3.5)	457	(4.5)	428	(3.1)	**-9**	(4.1)	**-3**	(1.3)	1.0	(0.1)	0.2	(0.2)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	443	(3.8)	451	(4.0)	447	(3.6)	434	(4.2)	**-9**	(4.0)	-1	(1.6)	1.0	(0.1)	0.0	(0.1)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/1]

Table I.3.6 Effect sizes for gender differences in science attitudes and dispositions

Results based on students' self-reports

Effect size in favour of girls:
- from 0.2 to 0.5
- from 0.5 to 0.8
- equal or greater than 0.8

Effect size in favour of boys:
- from -0.2 to -0.5
- from -0.5 to -0.8
- equal or less than -0.8

		Index of epistemic beliefs (valuing scientific approaches to enquiry)		Index of science activities		Index of enjoyment of science		Index of interest in broad science topics		Index of instrumental motivation to learn science		Index of science self-efficacy	
		Effect size	S.E.	Effect size	S.E.	Effect size	S.E.	Effect size	S.E.	Effect size	S.E.	Effect size	S.E.
OECD	Australia	0.03	(0.02)	**-0.30**	(0.02)	**-0.14**	(0.02)	**-0.25**	(0.02)	**-0.05**	(0.02)	**-0.20**	(0.02)
	Austria	-0.01	(0.04)	**-0.34**	(0.03)	**-0.18**	(0.04)	**-0.35**	(0.03)	**-0.12**	(0.03)	**-0.22**	(0.04)
	Belgium	-0.01	(0.02)	**-0.45**	(0.02)	**-0.18**	(0.03)	**-0.19**	(0.03)	**-0.05**	(0.02)	**-0.22**	(0.02)
	Canada	0.01	(0.02)	**-0.33**	(0.02)	**-0.13**	(0.02)	**-0.25**	(0.02)	**0.05**	(0.02)	**-0.21**	(0.02)
	Chile	-0.02	(0.03)	**-0.20**	(0.03)	**0.08**	(0.03)	**-0.19**	(0.03)	**0.09**	(0.03)	-0.03	(0.03)
	Czech Republic	**0.07**	(0.03)	**-0.26**	(0.03)	**0.06**	(0.03)	**-0.21**	(0.03)	**-0.07**	(0.03)	**-0.15**	(0.03)
	Denmark	**0.06**	(0.03)	**-0.31**	(0.03)	**-0.08**	(0.03)	**-0.21**	(0.03)	0.03	(0.03)	**-0.30**	(0.03)
	Estonia	**0.12**	(0.03)	**-0.30**	(0.03)	-0.05	(0.03)	**-0.23**	(0.03)	-0.01	(0.03)	**-0.08**	(0.03)
	Finland	**0.08**	(0.03)	**-0.30**	(0.03)	-0.04	(0.03)	**-0.28**	(0.03)	0.05	(0.03)	**-0.22**	(0.03)
	France	-0.04	(0.03)	**-0.39**	(0.03)	**-0.28**	(0.03)	**-0.30**	(0.02)	**-0.15**	(0.03)	**-0.27**	(0.03)
	Germany	**-0.07**	(0.03)	**-0.35**	(0.04)	**-0.36**	(0.03)	**-0.44**	(0.03)	**-0.27**	(0.04)	**-0.31**	(0.03)
	Greece	**0.06**	(0.03)	**-0.32**	(0.03)	**-0.11**	(0.03)	**-0.10**	(0.03)	**-0.11**	(0.02)	**-0.15**	(0.03)
	Hungary	0.04	(0.03)	**-0.34**	(0.04)	0.02	(0.03)	**-0.24**	(0.03)	**-0.11**	(0.03)	**-0.09**	(0.03)
	Iceland	-0.03	(0.03)	**-0.47**	(0.04)	**-0.21**	(0.03)	**-0.23**	(0.03)	-0.03	(0.03)	**-0.33**	(0.03)
	Ireland	-0.03	(0.03)	**-0.33**	(0.03)	**-0.09**	(0.03)	**-0.22**	(0.03)	0.05	(0.03)	**-0.20**	(0.03)
	Israel	**0.14**	(0.03)	**-0.29**	(0.05)	-0.05	(0.03)	**-0.12**	(0.03)	**-0.12**	(0.04)	**-0.13**	(0.03)
	Italy	-0.04	(0.03)	**-0.46**	(0.03)	**-0.24**	(0.03)	**-0.28**	(0.03)	**-0.18**	(0.03)	**-0.15**	(0.03)
	Japan	**-0.12**	(0.03)	**-0.48**	(0.03)	**-0.45**	(0.03)	**-0.33**	(0.03)	**-0.24**	(0.03)	**-0.21**	(0.03)
	Korea	**0.13**	(0.03)	**-0.37**	(0.03)	**-0.27**	(0.03)	**-0.32**	(0.03)	**-0.21**	(0.03)	0.03	(0.03)
	Latvia	**0.09**	(0.03)	**-0.28**	(0.03)	-0.03	(0.03)	**-0.31**	(0.03)	**-0.10**	(0.03)	-0.04	(0.03)
	Luxembourg	0.01	(0.03)	**-0.34**	(0.03)	**-0.12**	(0.03)	**-0.28**	(0.03)	0.00	(0.03)	**-0.18**	(0.03)
	Mexico	-0.02	(0.03)	**-0.32**	(0.03)	-0.01	(0.03)	**-0.16**	(0.03)	0.03	(0.03)	-0.01	(0.02)
	Netherlands	0.00	(0.03)	**-0.57**	(0.03)	**-0.23**	(0.03)	**-0.31**	(0.03)	**-0.13**	(0.03)	**-0.21**	(0.03)
	New Zealand	0.01	(0.03)	**-0.30**	(0.04)	-0.03	(0.04)	**-0.18**	(0.03)	0.06	(0.04)	**-0.21**	(0.03)
	Norway	0.06	(0.03)	**-0.42**	(0.03)	**-0.22**	(0.03)	**-0.22**	(0.04)	0.05	(0.03)	**-0.18**	(0.03)
	Poland	**0.16**	(0.03)	**-0.25**	(0.03)	**0.10**	(0.03)	**-0.17**	(0.03)	**0.11**	(0.03)	0.01	(0.04)
	Portugal	0.02	(0.03)	**-0.37**	(0.03)	**-0.08**	(0.03)	**-0.27**	(0.03)	**-0.08**	(0.03)	**-0.12**	(0.03)
	Slovak Republic	**0.10**	(0.03)	**-0.39**	(0.03)	0.02	(0.03)	**-0.17**	(0.03)	-0.04	(0.03)	**-0.14**	(0.03)
	Slovenia	**0.25**	(0.03)	**-0.31**	(0.03)	0.03	(0.03)	**-0.28**	(0.03)	0.06	(0.03)	**-0.09**	(0.03)
	Spain	**0.08**	(0.03)	**-0.37**	(0.03)	**-0.10**	(0.02)	**-0.18**	(0.03)	**-0.07**	(0.03)	**-0.21**	(0.02)
	Sweden	0.00	(0.03)	**-0.35**	(0.03)	**-0.17**	(0.03)	**-0.25**	(0.03)	-0.04	(0.03)	**-0.30**	(0.03)
	Switzerland	0.05	(0.03)	**-0.25**	(0.03)	**-0.15**	(0.03)	**-0.28**	(0.04)	0.03	(0.03)	**-0.20**	(0.03)
	Turkey	**0.06**	(0.03)	**-0.28**	(0.03)	-0.01	(0.03)	**-0.15**	(0.03)	**0.16**	(0.03)	**0.10**	(0.03)
	United Kingdom	-0.01	(0.03)	**-0.26**	(0.02)	**-0.17**	(0.02)	**-0.29**	(0.02)	-0.04	(0.03)	**-0.21**	(0.03)
	United States	**0.06**	(0.02)	**-0.24**	(0.03)	**-0.20**	(0.03)	**-0.29**	(0.03)	**0.08**	(0.03)	**-0.19**	(0.02)
	OECD average	**0.04**	(0.01)	**-0.34**	(0.01)	**-0.12**	(0.00)	**-0.24**	(0.01)	**-0.04**	(0.01)	**-0.16**	(0.00)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	**0.15**	(0.03)	m	m	**0.13**	(0.03)	m	m	**0.13**	(0.03)	-0.04	(0.03)
	Brazil	0.03	(0.03)	**-0.32**	(0.02)	**0.04**	(0.02)	**-0.13**	(0.02)	**0.10**	(0.02)	**-0.06**	(0.03)
	B-S-J-G (China)	-0.03	(0.03)	**-0.22**	(0.03)	**-0.16**	(0.03)	**-0.33**	(0.03)	0.02	(0.03)	-0.05	(0.03)
	Bulgaria	**0.17**	(0.03)	**-0.32**	(0.03)	**0.16**	(0.03)	-0.06	(0.03)	-0.05	(0.03)	**0.08**	(0.03)
	CABA (Argentina)	-0.03	(0.06)	m	m	**0.14**	(0.06)	m	m	-0.01	(0.06)	-0.05	(0.06)
	Colombia	**0.08**	(0.03)	**-0.23**	(0.03)	0.02	(0.03)	**-0.09**	(0.03)	**0.08**	(0.02)	-0.03	(0.03)
	Costa Rica	**-0.07**	(0.03)	**-0.26**	(0.03)	0.03	(0.03)	**-0.21**	(0.03)	**0.11**	(0.03)	-0.01	(0.03)
	Croatia	**0.10**	(0.03)	**-0.38**	(0.03)	-0.05	(0.03)	**-0.19**	(0.03)	-0.02	(0.03)	**-0.15**	(0.03)
	Cyprus*	**0.14**	(0.03)	**-0.43**	(0.02)	-0.05	(0.03)	**-0.11**	(0.03)	-0.03	(0.03)	**-0.18**	(0.03)
	Dominican Republic	**0.08**	(0.04)	**-0.34**	(0.04)	0.04	(0.04)	0.02	(0.04)	**0.11**	(0.04)	**0.16**	(0.04)
	FYROM	**0.24**	(0.03)	m	m	**0.30**	(0.03)	m	m	0.04	(0.03)	-0.01	(0.03)
	Georgia	**0.25**	(0.03)	m	m	**0.14**	(0.03)	m	m	-0.06	(0.03)	**0.14**	(0.03)
	Hong Kong (China)	0.00	(0.03)	**-0.37**	(0.03)	**-0.25**	(0.03)	**-0.38**	(0.02)	**-0.15**	(0.03)	**-0.14**	(0.03)
	Indonesia	**0.07**	(0.03)	m	m	**0.09**	(0.03)	m	m	**0.09**	(0.03)	0.01	(0.03)
	Jordan	**0.39**	(0.04)	m	m	**0.23**	(0.04)	m	m	**0.19**	(0.03)	**0.08**	(0.04)
	Kosovo	**0.15**	(0.04)	m	m	**0.16**	(0.04)	m	m	**0.14**	(0.04)	**-0.07**	(0.03)
	Lebanon	0.03	(0.04)	m	m	0.04	(0.03)	m	m	0.02	(0.03)	-0.04	(0.04)
	Lithuania	**0.18**	(0.03)	**-0.35**	(0.03)	**0.12**	(0.04)	**-0.25**	(0.03)	**0.06**	(0.03)	**-0.08**	(0.03)
	Macao (China)	0.02	(0.03)	**-0.29**	(0.03)	**-0.16**	(0.03)	**-0.34**	(0.03)	**-0.10**	(0.03)	**-0.09**	(0.03)
	Malta	**0.09**	(0.03)	m	m	**-0.10**	(0.03)	m	m	**-0.08**	(0.03)	**-0.21**	(0.04)
	Moldova	**0.18**	(0.03)	m	m	**0.21**	(0.03)	m	m	0.03	(0.02)	0.06	(0.03)
	Montenegro	**0.16**	(0.03)	**-0.28**	(0.03)	**0.07**	(0.03)	-0.05	(0.03)	0.05	(0.03)	-0.03	(0.03)
	Peru	0.02	(0.03)	**-0.26**	(0.03)	-0.01	(0.02)	**-0.11**	(0.03)	**0.11**	(0.03)	-0.04	(0.03)
	Qatar	**0.13**	(0.02)	**-0.36**	(0.02)	0.00	(0.02)	**-0.22**	(0.02)	**0.05**	(0.02)	-0.03	(0.02)
	Romania	**0.11**	(0.03)	m	m	0.07	(0.03)	m	m	0.05	(0.03)	0.00	(0.03)
	Russia	0.02	(0.03)	**-0.34**	(0.03)	-0.07	(0.04)	**-0.26**	(0.04)	**-0.10**	(0.03)	**-0.14**	(0.03)
	Singapore	**-0.10**	(0.02)	**-0.31**	(0.02)	**-0.17**	(0.03)	**-0.34**	(0.02)	-0.03	(0.03)	**-0.19**	(0.02)
	Chinese Taipei	-0.01	(0.03)	**-0.34**	(0.03)	**-0.38**	(0.03)	**-0.39**	(0.03)	**-0.16**	(0.03)	-0.05	(0.03)
	Thailand	**0.19**	(0.03)	**-0.15**	(0.03)	0.06	(0.03)	**-0.09**	(0.03)	**0.16**	(0.03)	-0.01	(0.03)
	Trinidad and Tobago	**0.13**	(0.03)	m	m	0.01	(0.03)	m	m	-0.03	(0.03)	-0.01	(0.03)
	Tunisia	0.01	(0.03)	**-0.15**	(0.03)	**0.12**	(0.03)	**-0.09**	(0.04)	**0.16**	(0.03)	**-0.07**	(0.03)
	United Arab Emirates	**0.17**	(0.03)	**-0.30**	(0.03)	0.02	(0.03)	**-0.20**	(0.02)	**0.07**	(0.03)	0.00	(0.03)
	Uruguay	0.05	(0.03)	**-0.23**	(0.03)	**0.06**	(0.03)	-0.05	(0.03)	**0.08**	(0.03)	**-0.05**	(0.03)
	Viet Nam	0.04	(0.03)	m	m	**-0.07**	(0.03)	m	m	-0.03	(0.04)	**0.06**	(0.03)
	Argentina**	**0.07**	(0.03)	m	m	**0.11**	(0.03)	m	m	0.05	(0.03)	**-0.07**	(0.03)
	Kazakhstan**	**0.16**	(0.03)	m	m	**0.12**	(0.03)	m	m	0.01	(0.03)	**0.09**	(0.03)
	Malaysia**	**0.14**	(0.03)	**-0.19**	(0.03)	0.04	(0.03)	**-0.11**	(0.03)	**0.22**	(0.03)	0.04	(0.03)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/1]

Table I.3.7 Relationship among students' career expectations, science performance, and attitudes towards science

Country-level correlations

	A. All countries/economies							
	Mean performance in science	Students who expect to work in science-related occupations[1] at age 30	Index of epistemic beliefs (valuing scientific approaches to enquiry)	Index of science activities	Index of enjoyment of science	Index of interest in broad science topics	Index of instrumental motivation to learn science	Index of science self-efficacy
	Corr.	Corr.	Corr.	Corr.	Corr.	Corr.	Corr.	Corr.
Mean performance in science		**-0.49**	**0.48**	**-0.73**	**-0.50**	**-0.40**	**-0.58**	-0.22
Students who expect to work in science-related occupations at age 30	**-0.49**		0.05	**0.47**	**0.40**	**0.46**	**0.51**	**0.48**
Index of epistemic beliefs (valuing scientific approaches to enquiry)	**0.48**	0.05		**-0.43**	0.05	0.09	0.01	0.25
Index of science activities	**-0.73**	**0.47**	**-0.43**		**0.61**	**0.48**	**0.62**	**0.50**
Index of enjoyment of science	**-0.50**	**0.40**	0.05	**0.61**		**0.79**	**0.86**	0.19
Index of interest in broad science topics	**-0.40**	**0.46**	0.09	**0.48**	**0.79**		**0.59**	0.33
Index of instrumental motivation to learn science	**-0.58**	**0.51**	0.01	**0.62**	**0.86**	**0.59**		0.23
Index of science self-efficacy	-0.22	**0.48**	0.25	**0.50**	0.19	0.33	0.23	

	B. OECD countries							
	Mean performance in science	Students who expect to work in science-related occupations at age 30	Index of epistemic beliefs (valuing scientific approaches to enquiry)	Index of science activities	Index of enjoyment of science	Index of interest in broad science topics	Index of instrumental motivation to learn science	Index of science self-efficacy
	Corr.	Corr.	Corr.	Corr.	Corr.	Corr.	Corr.	Corr.
Mean performance in science		-0.39	0.38	**-0.67**	-0.25	-0.14	-0.31	-0.29
Students who expect to work in science-related occupations at age 30	-0.39		0.36	0.38	**0.61**	0.38	**0.74**	**0.49**
Index of epistemic beliefs (valuing scientific approaches to enquiry)	0.38	0.36		-0.35	**0.52**	0.34	**0.49**	0.38
Index of science activities	**-0.67**	0.38	-0.35		0.35	0.13	0.32	**0.46**
Index of enjoyment of science	-0.25	**0.61**	**0.52**	0.35		**0.72**	**0.80**	**0.60**
Index of interest in broad science topics	-0.14	0.38	0.34	0.13	**0.72**		0.40	0.22
Index of instrumental motivation to learn science	-0.31	**0.74**	**0.49**	0.32	**0.80**	0.40		**0.59**
Index of science self-efficacy	-0.29	**0.49**	0.38	**0.46**	**0.60**	0.22	**0.59**	

1. See Annex A1 for the list of science-related occupations.
Note: Correlations that are larger than 0.40 or smaller than -0.40 are highlighted in bold. Results for Argentina, Kazakhstan and Malaysia are not included in the correlations (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/1]

Table I.3.8 Relationship among changes between 2006 and 2015 in students' career expectations, science performance, and attitudes towards science

Country-level correlations

	A. All countries/economies					
	Change between 2006 and 2015 in mean performance in science	Change between 2006 and 2015 in the percentage of students who expect to work in science-related occupations[1] at age 30	Change between 2006 and 2015 in the mean index of science activities	Change between 2006 and 2015 in the mean index of enjoyment of science	Change between 2006 and 2015 in the mean index of instrumental motivation to learn science	Change between 2006 and 2015 in the mean index of science self-efficacy
Change between 2006 and 2015 in…	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**
…mean performance in science		-0.23	0.12	-0.04	-0.29	0.37
…the percentage of students who expect to work in science-related occupations at age 30	-0.23		0.35	0.12	0.36	0.07
…the mean index of science activities	0.12	0.35		**0.41**	0.24	**0.48**
…the mean index of enjoyment of science	-0.04	0.12	**0.41**		**0.47**	0.00
…the mean index of instrumental motivation to learn science	-0.29	0.36	0.24	**0.47**		-0.15
…the mean index of science self-efficacy	0.37	0.07	**0.48**	0.00	-0.15	

	B. OECD countries					
	Change between 2006 and 2015 in mean performance in science	Change between 2006 and 2015 in the percentage of students who expect to work in science-related occupations at age 30	Change between 2006 and 2015 in the mean index of science activities	Change between 2006 and 2015 in the mean index of enjoyment of science	Change between 2006 and 2015 in the mean index of instrumental motivation to learn science	Change between 2006 and 2015 in the mean index of science self-efficacy
Change between 2006 and 2015 in…	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**
…mean performance in science		-0.12	0.05	0.28	-0.16	0.27
…the percentage of students who expect to work in science-related occupations at age 30	-0.12		0.32	-0.01	**0.42**	0.01
…the mean index of science activities	0.05	0.32		**0.50**	0.37	**0.41**
…the mean index of enjoyment of science	0.28	-0.01	**0.50**		0.22	0.05
…the mean index of instrumental motivation to learn science	-0.16	**0.42**	0.37	0.22		0.04
…the mean index of science self-efficacy	0.27	0.01	**0.41**	0.05	0.04	

1. See Annex A1 for the list of science-related occupations.
Note: Correlations that are larger than 0.40 or smaller than -0.40 are highlighted in bold. Results for Argentina are not included in the correlations (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/1]

Table I.3.9 Relationship among gender gaps in students' career expectations, science performance, and attitudes towards science

Country-level correlations

	A. All countries/economies								
	Gender gap in mean performance in science	Gender gap in 90th percentile of performance in science	Gender gap in students who expect to work in science-related occupations[1] at age 30	Gender gap in index of epistemic beliefs (valuing scientific approaches to enquiry)	Gender gap in index of science activities	Gender gap in index of enjoyment of science	Gender gap in index of interest in broad science topics	Gender gap in index of instrumental motivation to learn science	Gender gap in index of science self-efficacy
Gender gap in…	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**
…mean performance in science		**0.89**	0.18	**0.74**	-0.02	0.38	0.14	0.21	0.33
...90th percentile of performance in science	**0.89**		0.26	**0.64**	0.17	**0.43**	0.17	0.31	**0.43**
…students who expect to work in science-related occupations at age 30	0.18	0.26		0.22	0.30	0.37	0.39	**0.44**	0.11
…index of epistemic beliefs (valuing scientific approaches to enquiry)	**0.74**	**0.64**	0.22		0.15	**0.64**	**0.46**	0.39	**0.51**
…index of science activities	-0.02	0.17	0.30	0.15		**0.50**	0.33	**0.56**	**0.46**
…index of enjoyment of science	0.38	**0.43**	0.37	**0.64**	**0.50**		**0.74**	**0.70**	**0.65**
…index of interest in broad science topics	0.14	0.17	0.39	**0.46**	0.33	**0.74**		**0.62**	**0.56**
…index of instrumental motivation to learn science	0.21	0.31	**0.44**	0.39	**0.56**	**0.70**	**0.62**		**0.44**
…index of science self-efficacy	0.33	**0.43**	0.11	**0.51**	**0.46**	**0.65**	**0.56**	**0.44**	

	B. OECD countries								
	Gender gap in mean performance in science	Gender gap in 90th percentile of performance in science	Gender gap in students who expect to work in science-related occupations at age 30	Gender gap in index of epistemic beliefs (valuing scientific approaches to enquiry)	Gender gap in index of science activities	Gender gap in index of enjoyment of science	Gender gap in index of interest in broad science topics	Gender gap in index of instrumental motivation to learn science	Gender gap in index of science self-efficacy
Gender gap in…	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**	**Corr.**
…mean performance in science		**0.89**	0.10	**0.48**	0.09	0.18	0.08	0.17	0.15
...90th percentile of performance in science	**0.89**		0.05	0.34	0.13	0.16	0.05	0.28	0.17
…students who expect to work in science-related occupations at age 30	0.10	0.05		0.13	0.19	0.14	0.26	0.39	-0.22
…index of epistemic beliefs (valuing scientific approaches to enquiry)	**0.48**	0.34	0.13		0.33	**0.58**	0.38	0.36	**0.48**
…index of science activities	0.09	0.13	0.19	0.33		**0.59**	0.27	**0.54**	**0.40**
…index of enjoyment of science	0.18	0.16	0.14	**0.58**	**0.59**		**0.67**	**0.65**	**0.53**
…index of interest in broad science topics	0.08	0.05	0.26	0.38	0.27	**0.67**		**0.49**	**0.44**
…index of instrumental motivation to learn science	0.17	0.28	0.39	0.36	**0.54**	**0.65**	**0.49**		0.26
…index of science self-efficacy	0.15	0.17	-0.22	**0.48**	**0.40**	**0.53**	**0.44**	0.26	

1. See Annex A1 for the list of science-related occupations.
Note: Correlations that are larger than 0.40 or smaller than -0.40 are highlighted in bold.
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/3]

Table I.3.10a Students' career expectations, PISA 2006 and PISA 2015

Results based on students' self-reports

		PISA 2015											
		Students who expect to work in science-related occupations[1] at age 30								Students who expect to work in other occupations at age 30		Students with vague career expectations or whose answer is missing or invalid (undecided, does not know...)[2]	
		Science and engineering professionals		Health professionals		Information and communication technology professionals		Science-related technicians and associate professionals					
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	10.0	(0.4)	15.4	(0.4)	2.6	(0.1)	1.3	(0.1)	55.4	(0.6)	15.4	(0.5)
	Austria	9.0	(0.6)	8.3	(0.5)	3.1	(0.5)	2.0	(0.2)	55.1	(1.0)	22.5	(0.7)
	Belgium	8.6	(0.6)	12.4	(0.8)	3.0	(0.3)	0.4	(0.1)	60.0	(1.4)	15.6	(0.7)
	Canada	12.1	(0.4)	19.2	(0.5)	2.0	(0.1)	0.6	(0.1)	45.4	(0.6)	20.8	(0.6)
	Chile	17.8	(0.6)	18.3	(0.7)	0.4	(0.1)	1.4	(0.2)	43.9	(0.7)	18.1	(0.6)
	Czech Republic	4.1	(0.3)	7.3	(0.5)	3.2	(0.3)	2.3	(0.3)	61.0	(0.8)	22.1	(0.7)
	Denmark	4.0	(0.3)	8.9	(0.4)	1.3	(0.2)	0.7	(0.1)	36.9	(0.8)	48.3	(0.7)
	Estonia	7.7	(0.5)	8.1	(0.4)	8.1	(0.4)	0.8	(0.1)	59.9	(0.7)	15.4	(0.5)
	Finland	3.9	(0.3)	10.8	(0.5)	1.7	(0.2)	0.7	(0.1)	58.5	(0.7)	24.5	(0.6)
	France	8.2	(0.5)	9.3	(0.4)	2.8	(0.2)	0.9	(0.1)	58.3	(0.8)	20.6	(0.7)
	Germany	6.8	(0.3)	4.6	(0.3)	2.8	(0.2)	1.2	(0.2)	51.7	(0.8)	32.9	(0.9)
	Greece	9.4	(0.4)	12.0	(0.6)	3.0	(0.3)	0.9	(0.2)	63.1	(0.9)	11.6	(0.5)
	Hungary	7.5	(0.6)	5.4	(0.4)	4.3	(0.5)	1.1	(0.2)	59.7	(1.0)	21.9	(0.7)
	Iceland	6.6	(0.5)	13.1	(0.6)	4.1	(0.4)	0.1	(0.0)	54.4	(0.8)	21.8	(0.7)
	Ireland	8.8	(0.4)	13.8	(0.6)	3.4	(0.3)	1.3	(0.2)	59.7	(0.8)	13.1	(0.6)
	Israel	8.8	(0.4)	15.8	(0.6)	2.8	(0.2)	0.5	(0.1)	47.4	(0.8)	24.7	(0.7)
	Italy	9.0	(0.6)	10.1	(0.6)	1.6	(0.2)	1.9	(0.2)	60.0	(1.1)	17.4	(0.8)
	Japan	4.8	(0.4)	9.9	(0.5)	2.4	(0.3)	0.9	(0.1)	63.7	(1.0)	18.3	(0.8)
	Korea	6.3	(0.4)	8.3	(0.4)	2.5	(0.2)	2.3	(0.3)	73.2	(0.8)	7.5	(0.4)
	Latvia	7.2	(0.4)	9.4	(0.4)	3.9	(0.3)	0.8	(0.1)	60.1	(0.9)	18.6	(0.7)
	Luxembourg	8.5	(0.4)	8.4	(0.4)	2.9	(0.2)	1.4	(0.2)	60.9	(0.7)	18.0	(0.5)
	Mexico	18.3	(0.7)	19.2	(0.6)	2.3	(0.2)	1.0	(0.1)	53.1	(0.7)	6.2	(0.4)
	Netherlands	5.3	(0.3)	7.8	(0.4)	1.8	(0.2)	1.4	(0.1)	64.8	(0.8)	18.9	(0.7)
	New Zealand	8.3	(0.4)	13.4	(0.5)	2.5	(0.2)	0.6	(0.1)	51.1	(0.8)	24.1	(0.6)
	Norway	11.3	(0.6)	11.9	(0.4)	1.1	(0.1)	4.3	(0.3)	50.3	(0.8)	21.0	(0.9)
	Poland	6.4	(0.4)	12.3	(0.7)	1.4	(0.2)	1.0	(0.2)	65.7	(1.0)	13.4	(0.6)
	Portugal	11.8	(0.4)	13.7	(0.6)	1.6	(0.2)	0.4	(0.1)	54.5	(0.9)	18.0	(0.7)
	Slovak Republic	3.7	(0.4)	9.5	(0.5)	2.8	(0.2)	2.3	(0.3)	58.0	(1.1)	23.6	(0.9)
	Slovenia	7.2	(0.4)	12.3	(0.5)	2.9	(0.2)	8.5	(0.4)	53.0	(0.8)	16.1	(0.5)
	Spain	11.1	(0.4)	13.3	(0.4)	3.6	(0.2)	0.6	(0.1)	60.6	(0.7)	10.8	(0.5)
	Sweden	5.6	(0.4)	8.8	(0.5)	2.7	(0.3)	3.1	(0.2)	58.6	(0.8)	21.2	(0.6)
	Switzerland	6.2	(0.5)	7.9	(0.5)	2.4	(0.2)	3.0	(0.3)	58.5	(1.1)	22.0	(0.7)
	Turkey	17.1	(1.1)	11.8	(0.7)	0.4	(0.1)	0.5	(0.1)	64.2	(1.3)	6.1	(0.5)
	United Kingdom	12.7	(0.5)	13.5	(0.5)	2.6	(0.2)	0.3	(0.1)	53.4	(0.8)	17.5	(0.8)
	United States	13.0	(0.6)	22.1	(0.7)	2.1	(0.2)	0.7	(0.1)	48.9	(0.8)	13.1	(0.7)
	OECD average	8.8	(0.1)	11.6	(0.1)	2.6	(0.0)	1.5	(0.0)	56.7	(0.1)	18.8	(0.1)
Partners	Albania	10.9	(0.5)	11.5	(0.5)	1.4	(0.1)	1.0	(0.1)	46.1	(1.0)	29.2	(1.1)
	Algeria	8.9	(0.4)	16.6	(0.7)	0.2	(0.1)	0.2	(0.1)	61.9	(0.9)	12.2	(0.6)
	Brazil	16.3	(0.5)	20.9	(0.4)	1.1	(0.1)	0.4	(0.1)	42.4	(0.6)	18.9	(0.8)
	B-S-J-G (China)	6.7	(0.3)	7.5	(0.4)	2.1	(0.2)	0.4	(0.1)	51.7	(1.0)	31.5	(1.1)
	Bulgaria	5.4	(0.6)	11.7	(0.7)	8.3	(0.9)	2.0	(0.3)	47.4	(1.2)	25.1	(1.0)
	CABA (Argentina)	12.2	(1.3)	13.6	(1.2)	1.6	(0.4)	0.4	(0.2)	53.2	(2.0)	19.0	(2.5)
	Colombia	12.2	(0.4)	22.5	(0.7)	4.0	(0.3)	1.1	(0.1)	51.9	(0.8)	8.4	(0.6)
	Costa Rica	17.4	(0.6)	20.6	(0.6)	3.6	(0.3)	2.4	(0.2)	44.7	(0.9)	11.3	(0.5)
	Croatia	6.2	(0.6)	10.8	(0.8)	3.0	(0.3)	4.1	(0.4)	59.3	(1.1)	16.6	(0.6)
	Cyprus*	10.2	(0.5)	15.5	(0.5)	4.0	(0.3)	0.2	(0.1)	59.3	(0.6)	10.9	(0.4)
	Dominican Republic	21.5	(0.7)	21.1	(0.8)	2.1	(0.2)	1.0	(0.2)	42.5	(1.0)	11.8	(0.6)
	FYROM	4.2	(0.3)	14.1	(0.5)	3.8	(0.3)	2.0	(0.2)	55.8	(0.7)	20.1	(0.5)
	Georgia	4.0	(0.3)	10.3	(0.5)	2.7	(0.3)	0.1	(0.0)	56.2	(0.9)	26.8	(0.7)
	Hong Kong (China)	8.5	(0.4)	13.0	(0.6)	1.7	(0.2)	0.3	(0.1)	56.6	(0.8)	19.8	(0.9)
	Indonesia	1.9	(0.2)	12.7	(0.7)	0.6	(0.1)	0.1	(0.0)	65.3	(1.1)	19.4	(0.8)
	Jordan	21.1	(0.7)	21.5	(0.8)	0.2	(0.1)	0.9	(0.2)	50.1	(1.1)	6.2	(0.4)
	Kosovo	9.2	(0.5)	16.1	(0.5)	0.7	(0.1)	0.4	(0.1)	66.3	(0.7)	7.3	(0.4)
	Lebanon	16.5	(0.9)	22.1	(0.9)	0.6	(0.1)	0.5	(0.1)	45.5	(1.1)	14.8	(0.7)
	Lithuania	8.3	(0.4)	10.4	(0.4)	4.9	(0.3)	0.3	(0.1)	54.7	(0.7)	21.4	(0.7)
	Macao (China)	5.4	(0.3)	12.4	(0.5)	2.6	(0.2)	0.5	(0.1)	69.0	(0.8)	10.2	(0.5)
	Malta	9.1	(0.5)	10.3	(0.5)	5.0	(0.3)	1.0	(0.2)	63.8	(0.8)	10.8	(0.5)
	Moldova	5.4	(0.4)	10.9	(0.6)	5.1	(0.4)	0.6	(0.1)	71.5	(0.9)	6.6	(0.4)
	Montenegro	6.9	(0.3)	10.0	(0.4)	2.1	(0.2)	2.3	(0.2)	61.0	(0.6)	17.8	(0.5)
	Peru	21.4	(0.7)	13.1	(0.6)	3.7	(0.2)	0.5	(0.1)	53.9	(0.7)	7.4	(0.4)
	Qatar	16.8	(0.4)	19.0	(0.4)	1.4	(0.1)	0.9	(0.1)	43.2	(0.5)	18.7	(0.4)
	Romania	6.0	(0.5)	11.5	(0.6)	5.1	(0.4)	0.5	(0.2)	56.8	(1.3)	20.0	(1.0)
	Russia	8.3	(0.3)	9.8	(0.5)	4.1	(0.2)	1.3	(0.1)	57.1	(1.1)	19.4	(1.1)
	Singapore	14.1	(0.5)	11.7	(0.5)	1.7	(0.2)	0.5	(0.1)	57.9	(0.7)	14.1	(0.5)
	Chinese Taipei	7.9	(0.5)	7.2	(0.4)	3.4	(0.2)	2.4	(0.2)	58.3	(0.9)	20.8	(0.6)
	Thailand	4.0	(0.3)	14.0	(0.5)	1.4	(0.2)	0.2	(0.1)	53.8	(0.8)	26.6	(0.9)
	Trinidad and Tobago	12.2	(0.5)	14.0	(0.5)	1.4	(0.2)	0.3	(0.1)	59.3	(0.7)	12.9	(0.5)
	Tunisia	10.6	(0.6)	22.2	(0.8)	1.5	(0.2)	0.1	(0.0)	46.4	(0.9)	19.3	(1.1)
	United Arab Emirates	21.4	(0.5)	17.8	(0.5)	1.4	(0.1)	0.7	(0.1)	48.1	(0.5)	10.6	(0.4)
	Uruguay	8.9	(0.3)	16.4	(0.5)	2.0	(0.4)	0.7	(0.1)	54.9	(0.8)	17.0	(0.6)
	Viet Nam	4.8	(0.4)	13.4	(0.6)	1.0	(0.1)	0.4	(0.1)	67.3	(0.8)	13.1	(0.6)
	Argentina**	9.8	(0.6)	12.2	(0.6)	0.7	(0.1)	0.9	(0.2)	64.0	(1.0)	12.4	(0.6)
	Kazakhstan**	8.3	(0.4)	17.0	(1.0)	1.9	(0.2)	1.7	(0.2)	56.7	(1.2)	14.3	(0.8)
	Malaysia**	13.2	(0.5)	14.0	(0.6)	1.3	(0.2)	0.6	(0.1)	67.0	(0.9)	4.0	(0.4)

1. See Annex A1 for the list of science-related occupations.
2. Students who did not reach this question in their questionnaire are not included here.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/3]

Table I.3.10a Students' career expectations, PISA 2006 and PISA 2015

Results based on students' self-reports

	PISA 2006											
	Students who expect to work in science-related occupations[1] at age 30								Students who expect to work in other occupations at age 30		Students with vague career expectations or whose answer is missing or invalid (undecided, does not know...)[2]	
	Science and engineering professionals		Health professionals		Information and communication technology professionals		Science-related technicians and associate professionals					
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD												
Australia	9.8	(0.3)	9.4	(0.3)	2.2	(0.2)	0.8	(0.1)	60.4	(0.5)	17.4	(0.4)
Austria	4.5	(0.6)	4.4	(0.3)	1.3	(0.2)	3.1	(0.5)	54.9	(1.2)	32.0	(0.9)
Belgium	8.5	(0.6)	10.0	(0.7)	3.3	(0.3)	1.2	(0.2)	57.8	(1.2)	19.3	(0.8)
Canada	10.6	(0.4)	15.7	(0.4)	2.6	(0.2)	0.7	(0.1)	53.5	(0.6)	16.9	(0.5)
Chile	14.3	(0.8)	16.8	(0.8)	1.9	(0.2)	2.0	(0.2)	45.8	(1.2)	19.2	(0.9)
Czech Republic	5.3	(0.6)	3.2	(0.3)	3.7	(0.5)	1.9	(0.3)	53.1	(1.2)	32.9	(0.9)
Denmark	7.0	(0.4)	7.3	(0.4)	0.5	(0.1)	1.4	(0.1)	61.2	(0.8)	22.7	(0.9)
Estonia	8.2	(0.4)	4.2	(0.3)	4.3	(0.4)	0.2	(0.1)	57.1	(0.8)	26.0	(0.8)
Finland	4.5	(0.3)	6.2	(0.4)	1.3	(0.1)	1.2	(0.2)	61.8	(0.8)	25.1	(0.7)
France	6.4	(0.5)	7.0	(0.4)	1.7	(0.2)	3.3	(0.3)	57.9	(1.1)	23.7	(0.9)
Germany	5.3	(0.3)	3.7	(0.3)	1.7	(0.2)	2.5	(0.2)	54.8	(0.8)	32.0	(0.8)
Greece	11.6	(0.5)	6.3	(0.4)	2.2	(0.2)	1.4	(0.2)	51.7	(0.8)	26.8	(0.8)
Hungary	5.1	(0.4)	4.5	(0.3)	3.8	(0.5)	0.7	(0.1)	53.9	(1.1)	31.9	(0.7)
Iceland	9.2	(0.4)	11.3	(0.5)	1.6	(0.2)	0.3	(0.1)	54.2	(0.7)	23.4	(0.7)
Ireland	9.8	(0.5)	11.9	(0.5)	1.4	(0.2)	0.6	(0.1)	59.2	(0.9)	17.1	(0.8)
Israel	4.4	(0.3)	9.4	(0.7)	3.3	(0.3)	0.6	(0.1)	31.6	(0.8)	50.7	(1.1)
Italy	12.0	(0.8)	10.0	(0.5)	1.7	(0.2)	1.5	(0.2)	60.6	(0.9)	14.1	(0.5)
Japan	5.2	(0.5)	7.8	(0.9)	0.0	c	0.0	c	55.0	(1.0)	32.0	(1.1)
Korea	7.8	(0.7)	6.6	(0.4)	2.3	(0.3)	0.5	(0.1)	76.8	(0.8)	6.0	(0.4)
Latvia	8.5	(0.4)	3.9	(0.3)	3.3	(0.3)	0.9	(0.1)	57.2	(1.1)	26.1	(1.0)
Luxembourg	8.2	(0.4)	8.1	(0.4)	2.2	(0.2)	1.3	(0.2)	59.6	(0.7)	20.6	(0.5)
Mexico	15.5	(0.5)	11.9	(0.5)	3.5	(0.2)	0.5	(0.1)	45.4	(0.6)	23.1	(0.7)
Netherlands	3.8	(0.3)	7.6	(0.5)	1.1	(0.2)	1.2	(0.2)	73.6	(0.7)	12.7	(0.5)
New Zealand	7.2	(0.4)	11.1	(0.5)	1.5	(0.2)	0.3	(0.1)	56.8	(0.8)	23.2	(0.6)
Norway	9.3	(0.5)	8.5	(0.4)	1.8	(0.2)	0.3	(0.1)	51.3	(0.8)	28.8	(0.8)
Poland	5.9	(0.3)	8.2	(0.4)	6.3	(0.4)	5.9	(0.4)	52.9	(0.8)	20.9	(0.7)
Portugal	12.0	(0.5)	15.6	(0.6)	3.6	(0.3)	2.5	(0.3)	45.8	(0.9)	20.5	(0.7)
Slovak Republic	5.1	(0.6)	4.4	(0.5)	5.0	(0.6)	1.7	(0.3)	58.9	(1.3)	24.8	(1.0)
Slovenia	8.9	(0.4)	9.6	(0.5)	3.5	(0.3)	4.2	(0.3)	51.7	(0.7)	22.0	(0.6)
Spain	9.7	(0.5)	10.0	(0.4)	3.3	(0.2)	1.0	(0.1)	50.0	(0.6)	26.1	(0.7)
Sweden	4.9	(0.4)	6.7	(0.4)	1.7	(0.2)	2.7	(0.3)	65.0	(0.9)	18.9	(0.8)
Switzerland	6.0	(0.3)	4.4	(0.3)	2.7	(0.2)	2.7	(0.2)	64.7	(0.7)	19.4	(0.6)
Turkey	11.6	(0.8)	8.8	(0.6)	0.6	(0.2)	0.7	(0.2)	58.1	(1.5)	20.3	(1.0)
United Kingdom	7.0	(0.3)	9.1	(0.4)	1.8	(0.2)	0.3	(0.1)	67.2	(0.7)	14.6	(0.6)
United States	9.3	(0.5)	19.3	(0.6)	1.7	(0.2)	1.8	(0.2)	52.0	(0.8)	15.9	(0.7)
OECD average	8.1	(0.1)	8.7	(0.1)	2.4	(0.0)	1.5	(0.0)	56.3	(0.2)	23.1	(0.1)
Partners												
Albania	m	m	m	m	m	m	m	m	m	m	m	m
Algeria	m	m	m	m	m	m	m	m	m	m	m	m
Brazil	8.2	(0.4)	18.2	(0.6)	1.2	(0.2)	5.9	(0.4)	48.3	(0.8)	18.2	(0.7)
B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
Bulgaria	4.0	(0.3)	13.0	(0.5)	6.0	(0.4)	0.4	(0.1)	46.5	(0.7)	30.3	(0.7)
CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
Colombia	18.0	(0.8)	21.1	(0.7)	4.5	(0.7)	0.6	(0.1)	46.7	(1.0)	9.2	(0.7)
Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m
Croatia	3.7	(0.3)	4.8	(0.8)	1.0	(0.2)	4.6	(0.6)	51.6	(1.1)	34.3	(0.9)
Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m
Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
FYROM	m	m	m	m	m	m	m	m	m	m	m	m
Georgia	m	m	m	m	m	m	m	m	m	m	m	m
Hong Kong (China)	6.2	(0.3)	9.7	(0.5)	2.1	(0.3)	0.5	(0.1)	65.2	(0.9)	16.3	(0.8)
Indonesia	8.0	(1.3)	13.2	(1.1)	0.6	(0.3)	2.0	(0.8)	51.5	(1.7)	24.6	(1.5)
Jordan	16.6	(0.8)	19.1	(0.6)	2.4	(0.2)	0.4	(0.1)	34.4	(0.9)	27.2	(1.2)
Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
Lithuania	9.0	(0.5)	5.3	(0.4)	4.1	(0.3)	0.5	(0.1)	54.9	(0.7)	26.1	(0.8)
Macao (China)	5.5	(0.4)	7.9	(0.4)	1.9	(0.2)	0.1	(0.0)	62.6	(0.7)	22.0	(0.6)
Malta	m	m	m	m	m	m	m	m	m	m	m	m
Moldova	m	m	m	m	m	m	m	m	m	m	m	m
Montenegro	3.0	(0.3)	4.2	(0.3)	0.6	(0.1)	2.0	(0.3)	61.6	(0.9)	28.6	(0.7)
Peru	m	m	m	m	m	m	m	m	m	m	m	m
Qatar	m	m	m	m	m	m	m	m	m	m	m	m
Romania	6.4	(0.6)	6.6	(0.5)	4.3	(0.6)	0.3	(0.1)	72.1	(1.6)	10.3	(1.1)
Russia	5.3	(0.5)	6.7	(0.4)	5.3	(0.5)	1.1	(0.3)	56.6	(1.0)	25.1	(0.8)
Singapore	m	m	m	m	m	m	m	m	m	m	m	m
Chinese Taipei	6.5	(0.3)	7.6	(1.1)	6.9	(0.4)	1.2	(0.2)	59.6	(1.0)	18.3	(0.8)
Thailand	12.0	(0.6)	14.2	(0.6)	1.9	(0.2)	0.7	(0.1)	35.5	(0.9)	35.8	(1.0)
Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
Tunisia	10.4	(0.6)	17.5	(0.6)	2.7	(0.4)	0.8	(0.2)	53.8	(1.1)	14.8	(0.9)
United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
Uruguay	10.3	(0.7)	13.8	(0.7)	2.1	(0.2)	1.3	(0.3)	53.5	(1.1)	19.2	(0.6)
Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
Argentina**	11.5	(0.8)	11.0	(0.7)	2.0	(0.2)	1.3	(0.2)	59.6	(1.0)	14.7	(1.0)
Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m

1. See Annex A1 for the list of science-related occupations.
2. Students who did not reach this question in their questionnaire are not included here.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 3/3]

Table I.3.10a Students' career expectations, PISA 2006 and PISA 2015

Results based on students' self-reports

		Change in the percentage of students (PISA 2015 - PISA 2006)											
		Students who expect to work in science-related occupations[1] at age 30								Students who expect to work in other occupations at age 30		Students with vague career expectations or whose answer is missing or invalid (undecided, does not know...)[2]	
		Science and engineering professionals		Health professionals		Information and communication technology professionals		Science-related technicians and associate professionals					
		% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	0.2	(0.5)	**6.0**	(0.5)	0.4	(0.2)	**0.6**	(0.1)	**-5.1**	(0.7)	**-2.1**	(0.6)
	Austria	**4.5**	(0.8)	**3.9**	(0.6)	**1.8**	(0.6)	**-1.1**	(0.5)	0.3	(1.6)	**-9.4**	(1.1)
	Belgium	0.1	(0.8)	**2.4**	(1.0)	-0.3	(0.4)	**-0.7**	(0.3)	2.2	(1.9)	**-3.8**	(1.1)
	Canada	**1.4**	(0.5)	**3.5**	(0.6)	-0.6	(0.3)	-0.1	(0.1)	**-8.1**	(0.9)	**3.8**	(0.8)
	Chile	**3.4**	(1.0)	1.6	(1.1)	**-1.4**	(0.2)	-0.6	(0.3)	-1.9	(1.3)	-1.1	(1.1)
	Czech Republic	-1.2	(0.7)	**4.1**	(0.6)	-0.5	(0.5)	0.4	(0.4)	**8.0**	(1.4)	**-10.8**	(1.2)
	Denmark	**-3.1**	(0.5)	**1.7**	(0.6)	**0.8**	(0.2)	**-0.7**	(0.2)	**-24.3**	(1.1)	**25.7**	(1.2)
	Estonia	-0.5	(0.7)	**3.9**	(0.5)	**3.8**	(0.5)	**0.6**	(0.1)	**2.8**	(1.0)	**-10.6**	(0.9)
	Finland	-0.6	(0.4)	**4.6**	(0.6)	0.4	(0.2)	**-0.4**	(0.2)	**-3.3**	(1.0)	-0.6	(0.9)
	France	**1.8**	(0.7)	**2.3**	(0.6)	**1.0**	(0.3)	**-2.4**	(0.4)	0.4	(1.4)	**-3.1**	(1.1)
	Germany	**1.4**	(0.5)	**0.8**	(0.4)	**1.1**	(0.3)	**-1.3**	(0.3)	**-3.1**	(1.2)	0.9	(1.2)
	Greece	**-2.2**	(0.6)	**5.7**	(0.8)	**0.8**	(0.4)	-0.5	(0.3)	**11.4**	(1.2)	**-15.2**	(1.0)
	Hungary	**2.4**	(0.8)	**1.0**	(0.5)	0.5	(0.8)	0.3	(0.2)	**5.8**	(1.5)	**-10.0**	(1.0)
	Iceland	**-2.6**	(0.6)	**1.8**	(0.8)	**2.4**	(0.4)	**-0.2**	(0.1)	0.2	(1.1)	-1.7	(1.0)
	Ireland	-1.1	(0.7)	**1.9**	(0.8)	**2.0**	(0.3)	**0.7**	(0.2)	0.5	(1.2)	**-4.0**	(1.0)
	Israel	**4.3**	(0.6)	**6.4**	(0.9)	-0.5	(0.4)	-0.1	(0.2)	**15.9**	(1.1)	**-26.0**	(1.3)
	Italy	**-3.0**	(1.0)	0.1	(0.8)	-0.1	(0.3)	0.4	(0.3)	-0.6	(1.4)	**3.3**	(0.9)
	Japan	-0.4	(0.6)	2.1	(1.1)	**2.4**	(0.3)	**0.9**	(0.1)	**8.7**	(1.4)	**-13.7**	(1.3)
	Korea	**-1.6**	(0.8)	**1.7**	(0.6)	0.2	(0.4)	**1.8**	(0.3)	**-3.6**	(1.2)	**1.5**	(0.6)
	Latvia	**-1.3**	(0.6)	**5.4**	(0.5)	0.5	(0.4)	-0.2	(0.2)	**2.9**	(1.4)	**-7.4**	(1.2)
	Luxembourg	0.3	(0.5)	0.3	(0.6)	**0.7**	(0.3)	0.1	(0.2)	1.2	(1.0)	**-2.6**	(0.8)
	Mexico	**2.7**	(0.8)	**7.2**	(0.8)	**-1.2**	(0.3)	**0.5**	(0.1)	**7.8**	(0.9)	**-16.9**	(0.8)
	Netherlands	**1.5**	(0.4)	0.3	(0.6)	**0.7**	(0.3)	0.2	(0.2)	**-8.9**	(1.1)	**6.2**	(0.8)
	New Zealand	**1.1**	(0.6)	**2.3**	(0.7)	**1.0**	(0.3)	**0.3**	(0.1)	**-5.7**	(1.1)	1.0	(0.8)
	Norway	**2.1**	(0.8)	**3.4**	(0.6)	**-0.6**	(0.3)	**3.9**	(0.3)	-1.0	(1.2)	**-7.8**	(1.2)
	Poland	0.5	(0.5)	**4.1**	(0.8)	**-4.9**	(0.4)	**-4.9**	(0.4)	**12.8**	(1.3)	**-7.5**	(0.9)
	Portugal	-0.1	(0.7)	**-1.9**	(0.8)	**-2.0**	(0.4)	**-2.1**	(0.3)	**8.7**	(1.3)	**-2.5**	(1.0)
	Slovak Republic	**-1.4**	(0.7)	**5.0**	(0.7)	**-2.2**	(0.7)	0.6	(0.4)	-0.8	(1.7)	-1.2	(1.4)
	Slovenia	**-1.7**	(0.6)	**2.7**	(0.7)	-0.6	(0.3)	**4.3**	(0.5)	1.3	(1.1)	**-5.9**	(0.8)
	Spain	**1.4**	(0.7)	**3.3**	(0.6)	0.3	(0.3)	**-0.3**	(0.1)	**10.6**	(0.9)	**-15.3**	(0.8)
	Sweden	0.8	(0.5)	**2.1**	(0.7)	**1.0**	(0.3)	0.3	(0.4)	**-6.4**	(1.2)	**2.3**	(1.0)
	Switzerland	0.2	(0.6)	**3.4**	(0.6)	-0.3	(0.3)	0.4	(0.3)	**-6.2**	(1.3)	**2.6**	(1.0)
	Turkey	**5.5**	(1.4)	**3.0**	(1.0)	-0.2	(0.2)	-0.2	(0.2)	**6.2**	(2.0)	**-14.2**	(1.1)
	United Kingdom	**5.7**	(0.6)	**4.4**	(0.6)	**0.8**	(0.3)	0.0	(0.1)	**-13.8**	(1.1)	**2.8**	(1.0)
	United States	**3.7**	(0.8)	**2.8**	(0.9)	0.4	(0.3)	**-1.1**	(0.2)	**-3.1**	(1.2)	**-2.7**	(1.0)
	OECD average	**0.7**	(0.1)	**3.0**	(0.1)	**0.2**	(0.1)	0.0	(0.0)	0.4	(0.2)	**-4.2**	(0.2)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	**8.1**	(0.7)	**2.7**	(0.7)	-0.1	(0.2)	**-5.5**	(0.4)	**-5.9**	(1.0)	0.7	(1.1)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	**1.5**	(0.6)	-1.3	(0.9)	**2.4**	(1.0)	**1.6**	(0.3)	0.9	(1.4)	**-5.1**	(1.3)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	**-5.8**	(0.9)	1.4	(1.0)	-0.4	(0.7)	**0.5**	(0.2)	**5.2**	(1.3)	-0.9	(0.9)
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	**2.4**	(0.7)	**6.1**	(1.1)	**2.0**	(0.4)	-0.5	(0.7)	**7.6**	(1.6)	**-17.7**	(1.1)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	**2.3**	(0.5)	**3.3**	(0.8)	-0.4	(0.3)	-0.2	(0.1)	**-8.6**	(1.2)	**3.6**	(1.2)
	Indonesia	**-6.1**	(1.3)	-0.5	(1.3)	0.0	(0.3)	**-1.9**	(0.8)	**13.8**	(2.0)	**-5.2**	(1.8)
	Jordan	**4.5**	(1.0)	**2.5**	(1.1)	**-2.2**	(0.2)	**0.5**	(0.2)	**15.7**	(1.4)	**-21.0**	(1.2)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	-0.7	(0.7)	**5.1**	(0.5)	0.7	(0.4)	-0.2	(0.1)	-0.2	(1.0)	**-4.8**	(1.1)
	Macao (China)	-0.1	(0.5)	**4.4**	(0.7)	**0.6**	(0.3)	**0.4**	(0.1)	**6.4**	(1.1)	**-11.8**	(0.7)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	**3.9**	(0.4)	**5.8**	(0.5)	**1.5**	(0.2)	0.3	(0.3)	-0.5	(1.1)	**-10.9**	(0.9)
	Peru	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	m	m	m	m	m	m	m	m	m	m	m	m
	Romania	-0.4	(0.8)	**4.9**	(0.8)	0.8	(0.7)	0.3	(0.2)	**-15.3**	(2.0)	**9.8**	(1.5)
	Russia	**3.1**	(0.6)	**3.1**	(0.7)	**-1.3**	(0.5)	0.2	(0.3)	0.5	(1.5)	**-5.7**	(1.4)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	**1.4**	(0.6)	-0.4	(1.2)	**-3.5**	(0.4)	**1.2**	(0.3)	-1.3	(1.3)	**2.5**	(1.0)
	Thailand	**-8.0**	(0.6)	-0.1	(0.8)	-0.5	(0.3)	**-0.4**	(0.2)	**18.3**	(1.2)	**-9.2**	(1.3)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	0.3	(0.8)	**4.7**	(1.0)	**-1.2**	(0.5)	**-0.8**	(0.2)	**-7.4**	(1.4)	**4.4**	(1.4)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	-1.4	(0.8)	**2.7**	(0.8)	0.0	(0.5)	-0.5	(0.3)	1.4	(1.4)	**-2.2**	(0.8)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	-1.7	(1.0)	1.2	(0.9)	**-1.2**	(0.3)	-0.4	(0.3)	**4.5**	(1.5)	**-2.3**	(1.1)
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m

1. See Annex A1 for the list of science-related occupations.
2. Students who did not reach this question in their questionnaire are not included here.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.10b Students expecting to work in science-related occupations,[1] by gender and performance in science

Results based on students' self-reports

		Students who expect to work in science-related occupations at age 30													
		All students		Boys		Girls		Increased likelihood of boys expecting that they will work in science-related occupations		Low achievers in science (students performing below Level 2)		Moderate performers in science (students performing at Level 2 or 3)		Strong performers in science (students performing at Level 4)	
		%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	29.2	(0.6)	30.3	(0.8)	28.2	(0.7)	**1.1**	(0.0)	13.6	(1.0)	26.6	(0.7)	38.0	(1.5)
	Austria	22.3	(1.0)	26.6	(1.7)	18.0	(1.0)	**1.5**	(0.1)	12.2	(1.5)	21.9	(1.2)	28.9	(2.2)
	Belgium	24.5	(1.0)	25.3	(1.5)	23.6	(1.2)	1.1	(0.1)	9.6	(1.3)	23.5	(1.2)	37.0	(2.2)
	Canada	33.9	(0.6)	31.2	(0.8)	36.5	(0.8)	**0.9**	(0.0)	17.8	(1.3)	29.8	(0.8)	41.1	(1.1)
	Chile	37.9	(0.8)	36.9	(1.0)	39.0	(1.2)	0.9	(0.0)	28.9	(1.4)	40.9	(1.1)	52.3	(2.3)
	Czech Republic	16.9	(0.7)	18.6	(0.9)	15.0	(0.9)	**1.2**	(0.1)	4.1	(0.8)	15.3	(0.9)	27.1	(1.9)
	Denmark	14.8	(0.6)	11.8	(0.7)	17.7	(0.7)	**0.7**	(0.0)	9.1	(1.3)	13.8	(0.8)	18.2	(1.5)
	Estonia	24.7	(0.6)	28.9	(0.9)	20.3	(0.8)	**1.4**	(0.1)	13.7	(2.0)	20.8	(0.9)	28.8	(1.4)
	Finland	17.0	(0.6)	15.4	(0.7)	18.7	(0.8)	**0.8**	(0.0)	4.7	(1.1)	12.5	(0.7)	22.5	(1.4)
	France	21.2	(0.6)	23.6	(0.9)	18.7	(0.8)	**1.3**	(0.1)	7.5	(0.9)	17.3	(0.9)	34.1	(1.4)
	Germany	15.3	(0.5)	17.4	(0.8)	13.2	(0.6)	**1.3**	(0.1)	6.0	(1.0)	11.9	(0.7)	21.5	(1.4)
	Greece	25.3	(0.8)	25.7	(1.0)	24.9	(1.0)	1.0	(0.1)	15.7	(1.3)	26.6	(1.0)	40.8	(2.7)
	Hungary	18.3	(0.9)	23.9	(1.4)	12.8	(0.8)	**1.9**	(0.2)	6.4	(1.0)	17.6	(1.0)	32.0	(2.0)
	Iceland	23.8	(0.8)	20.1	(1.0)	27.3	(1.1)	**0.7**	(0.0)	15.6	(1.4)	23.2	(1.2)	34.2	(2.7)
	Ireland	27.3	(0.7)	28.0	(0.9)	26.6	(1.0)	1.1	(0.0)	14.1	(1.5)	25.0	(0.9)	37.4	(1.8)
	Israel	27.8	(0.7)	26.1	(0.9)	29.5	(1.0)	**0.9**	(0.0)	22.3	(1.3)	29.2	(1.1)	32.1	(2.1)
	Italy	22.6	(1.0)	24.7	(1.1)	20.6	(1.2)	**1.2**	(0.1)	11.1	(1.1)	22.5	(1.2)	34.6	(2.6)
	Japan	18.0	(0.7)	18.5	(1.0)	17.5	(0.7)	1.1	(0.1)	8.3	(1.5)	14.9	(0.9)	22.0	(1.3)
	Korea	19.3	(0.7)	21.7	(1.0)	16.7	(1.0)	**1.3**	(0.1)	9.7	(1.3)	15.8	(0.9)	23.2	(1.6)
	Latvia	21.3	(0.6)	21.1	(0.9)	21.5	(0.9)	1.0	(0.1)	11.9	(1.4)	19.9	(0.8)	30.5	(1.9)
	Luxembourg	21.1	(0.6)	24.3	(0.9)	18.0	(0.7)	**1.4**	(0.1)	9.5	(1.0)	19.6	(0.7)	33.2	(1.8)
	Mexico	40.7	(0.8)	45.4	(1.1)	35.8	(1.0)	**1.3**	(0.0)	36.4	(1.1)	44.1	(1.1)	55.4	(4.9)
	Netherlands	16.3	(0.6)	16.9	(0.8)	15.7	(0.7)	1.1	(0.1)	6.1	(1.1)	12.7	(0.7)	24.5	(1.5)
	New Zealand	24.8	(0.8)	21.7	(0.8)	27.9	(1.1)	**0.8**	(0.0)	11.2	(1.4)	22.3	(1.0)	32.5	(1.8)
	Norway	28.6	(0.8)	28.9	(1.1)	28.4	(0.9)	1.0	(0.0)	19.1	(1.4)	27.1	(1.0)	36.6	(2.1)
	Poland	21.0	(0.8)	15.4	(0.9)	26.8	(1.1)	**0.6**	(0.0)	7.4	(1.1)	19.2	(1.0)	31.3	(2.2)
	Portugal	27.5	(0.8)	26.7	(0.9)	28.3	(1.1)	0.9	(0.0)	10.9	(1.3)	23.2	(1.0)	42.2	(1.9)
	Slovak Republic	18.8	(0.8)	18.5	(0.8)	19.0	(1.1)	1.0	(0.1)	7.5	(0.8)	19.8	(1.0)	32.6	(2.1)
	Slovenia	30.8	(0.7)	34.6	(1.0)	26.8	(0.9)	**1.3**	(0.1)	15.8	(1.4)	30.1	(1.0)	37.4	(2.0)
	Spain	28.6	(0.7)	29.5	(0.9)	27.8	(0.9)	1.1	(0.0)	14.0	(1.1)	25.7	(0.9)	44.4	(1.6)
	Sweden	20.2	(0.6)	21.8	(0.9)	18.5	(0.9)	**1.2**	(0.1)	11.0	(1.2)	17.8	(0.8)	29.4	(1.9)
	Switzerland	19.5	(0.7)	19.8	(1.1)	19.1	(0.9)	1.0	(0.1)	8.4	(1.2)	18.1	(1.0)	26.7	(1.7)
	Turkey	29.7	(1.3)	34.5	(1.8)	24.9	(1.2)	**1.4**	(0.1)	20.8	(1.5)	35.6	(1.6)	48.4	(3.9)
	United Kingdom	29.1	(0.7)	28.7	(1.1)	29.6	(1.1)	1.0	(0.1)	18.4	(1.3)	26.9	(1.1)	35.5	(1.5)
	United States	38.0	(0.8)	33.0	(1.1)	43.0	(1.1)	**0.8**	(0.0)	28.1	(1.5)	36.7	(1.0)	45.8	(2.3)
	OECD average	24.5	(0.1)	25.0	(0.2)	23.9	(0.2)	**1.1**	(0.0)	13.3	(0.2)	23.1	(0.2)	34.1	(0.4)
Partners	Albania	24.8	(0.8)	25.3	(1.1)	24.3	(0.8)	1.0	(0.0)	m	m	m	m	m	m
	Algeria	26.0	(0.8)	23.1	(0.9)	29.2	(1.2)	**0.8**	(0.0)	22.9	(0.8)	32.4	(1.9)	60.9	(9.6)
	Brazil	38.8	(0.7)	34.4	(1.0)	42.8	(0.6)	**0.8**	(0.0)	33.3	(0.7)	44.9	(1.2)	53.9	(2.9)
	B-S-J-G (China)	16.8	(0.7)	17.1	(0.9)	16.5	(0.8)	1.0	(0.1)	9.6	(1.0)	13.7	(0.8)	20.9	(1.5)
	Bulgaria	27.5	(1.4)	28.8	(1.7)	25.9	(1.6)	1.1	(0.1)	14.3	(1.1)	32.5	(1.6)	44.5	(3.2)
	CABA (Argentina)	27.8	(1.5)	26.2	(2.1)	29.3	(1.7)	0.9	(0.1)	23.4	(2.9)	27.3	(1.9)	35.3	(4.5)
	Colombia	39.7	(0.8)	37.1	(1.0)	42.0	(1.0)	**0.9**	(0.0)	37.3	(1.1)	41.9	(1.0)	42.4	(3.8)
	Costa Rica	44.0	(0.9)	43.8	(1.1)	44.2	(1.1)	1.0	(0.0)	40.7	(1.2)	46.3	(1.1)	54.7	(4.6)
	Croatia	24.2	(1.1)	26.8	(1.3)	21.8	(1.4)	**1.2**	(0.1)	8.8	(1.1)	24.6	(1.5)	41.0	(2.1)
	Cyprus*	29.9	(0.7)	29.3	(0.8)	30.5	(1.0)	1.0	(0.0)	18.0	(0.9)	36.2	(1.0)	49.2	(3.8)
	Dominican Republic	45.7	(1.0)	44.7	(1.2)	46.8	(1.4)	1.0	(0.0)	44.7	(1.1)	51.7	(2.5)	c	c
	FYROM	24.2	(0.6)	20.0	(0.7)	28.8	(0.9)	**0.7**	(0.0)	19.5	(0.7)	31.3	(1.2)	44.1	(6.0)
	Georgia	17.0	(0.6)	16.4	(0.8)	17.7	(0.9)	0.9	(0.1)	14.5	(0.8)	18.6	(0.9)	25.9	(4.0)
	Hong Kong (China)	23.6	(0.7)	22.9	(0.9)	24.2	(1.0)	0.9	(0.1)	10.9	(1.6)	20.1	(1.0)	30.3	(1.5)
	Indonesia	15.3	(0.7)	8.6	(0.9)	22.1	(1.1)	**0.4**	(0.0)	13.1	(0.9)	17.7	(1.1)	30.9	(5.9)
	Jordan	43.7	(1.2)	44.6	(1.4)	42.8	(1.9)	1.0	(0.1)	30.5	(1.3)	55.6	(1.3)	74.0	(3.8)
	Kosovo	26.4	(0.7)	24.7	(0.9)	28.1	(1.1)	**0.9**	(0.0)	20.5	(0.8)	38.2	(1.6)	c	c
	Lebanon	39.7	(1.0)	41.0	(1.3)	38.5	(1.4)	1.1	(0.0)	30.7	(1.4)	53.5	(1.7)	65.0	(5.6)
	Lithuania	23.9	(0.7)	22.5	(1.0)	25.4	(0.7)	**0.9**	(0.0)	11.5	(1.1)	23.7	(0.9)	38.9	(2.1)
	Macao (China)	20.8	(0.6)	22.0	(0.8)	19.6	(0.9)	**1.1**	(0.1)	8.6	(1.8)	17.1	(0.8)	26.8	(1.5)
	Malta	25.4	(0.7)	30.2	(1.0)	20.4	(0.9)	**1.5**	(0.1)	10.6	(1.0)	23.7	(1.2)	43.9	(2.5)
	Moldova	22.0	(0.8)	22.5	(1.1)	21.3	(0.9)	1.1	(0.1)	13.1	(0.9)	27.3	(1.3)	37.4	(3.4)
	Montenegro	21.2	(0.5)	20.1	(0.6)	22.4	(0.7)	**0.9**	(0.0)	15.3	(0.7)	25.9	(0.9)	39.0	(3.6)
	Peru	38.7	(0.8)	42.7	(1.1)	34.6	(0.9)	**1.2**	(0.0)	33.1	(0.9)	46.3	(1.2)	50.6	(7.5)
	Qatar	38.0	(0.5)	36.3	(0.7)	39.9	(0.7)	**0.9**	(0.0)	26.1	(0.7)	48.5	(0.9)	55.7	(2.1)
	Romania	23.1	(1.0)	23.3	(1.4)	23.0	(1.2)	1.0	(0.1)	11.7	(1.1)	27.9	(1.4)	48.9	(3.9)
	Russia	23.5	(0.6)	23.2	(1.0)	23.8	(0.8)	1.0	(0.1)	17.0	(1.2)	22.7	(0.9)	30.8	(1.7)
	Singapore	28.0	(0.6)	31.8	(1.0)	23.9	(0.9)	**1.3**	(0.1)	18.1	(1.9)	23.6	(1.0)	29.0	(1.2)
	Chinese Taipei	20.9	(0.8)	25.6	(0.9)	16.0	(1.0)	**1.6**	(0.1)	8.0	(1.1)	16.3	(0.9)	25.4	(1.5)
	Thailand	19.7	(0.7)	12.4	(1.0)	25.2	(0.9)	**0.5**	(0.0)	11.5	(0.8)	24.5	(0.9)	48.5	(3.5)
	Trinidad and Tobago	27.8	(0.6)	24.6	(0.7)	31.0	(0.9)	**0.8**	(0.0)	18.2	(0.9)	32.1	(1.2)	54.3	(4.1)
	Tunisia	34.4	(0.9)	28.5	(1.0)	39.5	(1.1)	**0.7**	(0.0)	27.6	(1.1)	47.0	(1.6)	63.9	(10.9)
	United Arab Emirates	41.3	(0.5)	39.9	(0.8)	42.6	(0.8)	**0.9**	(0.0)	30.9	(0.9)	47.0	(1.0)	54.1	(2.2)
	Uruguay	28.1	(0.7)	23.8	(0.8)	31.9	(1.0)	**0.7**	(0.0)	20.5	(1.0)	31.3	(0.9)	42.9	(3.0)
	Viet Nam	19.6	(0.8)	21.2	(1.1)	18.1	(0.9)	**1.2**	(0.1)	13.7	(3.7)	16.6	(0.9)	24.4	(1.5)
	Argentina**	23.6	(0.9)	23.4	(1.1)	23.8	(1.0)	1.0	(0.0)	17.4	(1.1)	26.7	(1.2)	35.1	(4.1)
	Kazakhstan**	28.9	(1.0)	28.4	(1.2)	29.6	(1.4)	1.0	(0.1)	25.7	(1.7)	29.2	(1.2)	36.0	(3.2)
	Malaysia**	29.0	(0.9)	29.4	(1.2)	28.8	(1.0)	1.0	(0.0)	16.6	(1.2)	33.7	(1.0)	50.7	(2.9)

1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.10b Students expecting to work in science-related occupations,[1] by gender and performance in science

Results based on students' self-reports

		Students who expect to work in science-related occupations at age 30											
		Top performers in science (students performing at Level 5 or above)		Increased likelihood of top performers in science expecting that they will work in science-related occupations		Students whose parents have not completed secondary education		Students whose parents attained secondary education as their highest level of education		Students whose father or mother completed tertiary education		Increased likelihood of students with at least one tertiary-educated parent expecting that they will work in science-related occupations	
		%	S.E.	Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.
OECD	Australia	47.9	(1.7)	**1.8**	(0.1)	21.9	(1.7)	23.6	(0.8)	34.2	(0.8)	**1.5**	(0.1)
	Austria	35.2	(3.2)	**1.7**	(0.2)	17.7	(3.0)	20.3	(1.2)	24.8	(1.3)	**1.2**	(0.1)
	Belgium	46.0	(4.5)	**2.0**	(0.2)	23.1	(2.6)	19.5	(1.6)	27.0	(1.2)	**1.3**	(0.1)
	Canada	49.7	(1.4)	**1.6**	(0.1)	21.8	(2.6)	26.1	(1.0)	37.1	(0.7)	**1.5**	(0.1)
	Chile	55.7	(6.5)	**1.5**	(0.2)	32.5	(1.8)	37.3	(1.2)	42.5	(1.1)	**1.2**	(0.0)
	Czech Republic	35.2	(2.6)	**2.3**	(0.2)	12.7	(2.0)	15.0	(0.8)	21.9	(1.0)	**1.5**	(0.1)
	Denmark	24.9	(2.8)	**1.8**	(0.2)	11.8	(1.3)	15.2	(1.3)	15.4	(0.7)	1.1	(0.1)
	Estonia	38.4	(2.0)	**1.7**	(0.1)	16.2	(3.3)	21.8	(1.0)	27.2	(0.8)	**1.3**	(0.1)
	Finland	31.5	(2.0)	**2.2**	(0.2)	9.4	(2.8)	8.3	(1.0)	19.3	(0.7)	**2.3**	(0.3)
	France	47.8	(2.4)	**2.5**	(0.2)	15.7	(1.7)	16.7	(1.0)	25.2	(0.8)	**1.5**	(0.1)
	Germany	32.4	(2.0)	**2.4**	(0.2)	11.8	(0.9)	15.3	(1.2)	20.8	(0.8)	**1.5**	(0.1)
	Greece	58.0	(5.5)	**2.4**	(0.2)	17.3	(2.4)	21.6	(1.2)	28.9	(1.0)	**1.4**	(0.1)
	Hungary	45.0	(4.0)	**2.6**	(0.3)	5.5	(1.7)	15.9	(1.1)	22.4	(1.1)	**1.5**	(0.1)
	Iceland	48.1	(5.4)	**2.1**	(0.3)	19.9	(3.2)	20.4	(1.8)	25.7	(0.9)	**1.3**	(0.1)
	Ireland	45.7	(3.3)	**1.8**	(0.1)	16.8	(1.9)	24.1	(1.1)	30.1	(0.9)	**1.3**	(0.1)
	Israel	35.7	(2.8)	**1.3**	(0.1)	23.0	(2.9)	26.0	(1.2)	29.7	(0.8)	**1.2**	(0.1)
	Italy	39.3	(3.9)	**1.8**	(0.2)	17.0	(1.3)	23.6	(1.4)	25.3	(1.3)	**1.2**	(0.1)
	Japan	26.1	(1.9)	**1.6**	(0.1)	12.4	(3.4)	15.4	(1.0)	20.2	(0.8)	**1.3**	(0.1)
	Korea	40.5	(2.7)	**2.4**	(0.2)	14.1	(2.8)	17.4	(0.9)	21.0	(1.0)	**1.2**	(0.1)
	Latvia	43.9	(4.9)	**2.2**	(0.3)	17.0	(4.5)	16.1	(1.0)	24.7	(0.8)	**1.5**	(0.1)
	Luxembourg	45.1	(3.1)	**2.3**	(0.2)	14.4	(1.3)	19.3	(1.2)	24.4	(0.8)	**1.4**	(0.1)
	Mexico	c	c	1.5	(0.5)	38.1	(1.0)	40.8	(1.6)	44.9	(1.2)	**1.2**	(0.0)
	Netherlands	30.5	(2.0)	**2.1**	(0.2)	14.7	(2.4)	13.7	(1.0)	17.9	(0.7)	**1.3**	(0.1)
	New Zealand	39.6	(2.4)	**1.8**	(0.1)	16.1	(2.6)	21.4	(1.2)	30.1	(1.1)	**1.5**	(0.1)
	Norway	41.7	(3.0)	**1.5**	(0.1)	20.8	(3.9)	23.9	(1.4)	31.7	(0.9)	**1.3**	(0.1)
	Poland	36.6	(3.6)	**1.9**	(0.2)	14.1	(2.2)	18.6	(1.0)	31.2	(1.6)	**1.7**	(0.1)
	Portugal	56.0	(2.9)	**2.2**	(0.1)	21.1	(0.9)	29.2	(1.3)	35.0	(1.2)	**1.4**	(0.1)
	Slovak Republic	41.0	(4.3)	**2.3**	(0.3)	3.4	(1.6)	17.4	(1.0)	22.4	(1.0)	**1.3**	(0.1)
	Slovenia	40.8	(3.4)	**1.4**	(0.1)	24.3	(5.7)	29.7	(1.0)	32.6	(1.0)	1.1	(0.1)
	Spain	56.0	(3.4)	**2.1**	(0.1)	22.3	(1.3)	27.9	(1.4)	32.3	(0.9)	**1.3**	(0.1)
	Sweden	37.3	(3.4)	**2.0**	(0.2)	16.1	(2.4)	16.5	(1.1)	22.3	(0.8)	**1.4**	(0.1)
	Switzerland	30.7	(2.5)	**1.7**	(0.1)	16.5	(1.3)	16.2	(1.1)	21.7	(1.0)	**1.3**	(0.1)
	Turkey	c	c	**1.8**	(0.5)	27.8	(1.5)	29.9	(1.9)	33.1	(1.7)	**1.2**	(0.1)
	United Kingdom	43.8	(2.2)	**1.6**	(0.1)	33.7	(3.5)	26.5	(0.9)	32.0	(1.0)	**1.2**	(0.1)
	United States	51.2	(3.3)	**1.4**	(0.1)	34.9	(2.1)	34.4	(1.2)	40.7	(1.0)	**1.2**	(0.0)
	OECD average	41.7	(0.6)	**1.9**	(0.0)	18.7	(0.4)	21.9	(0.2)	27.9	(0.2)	**1.4**	(0.0)
Partners	Albania	m	m	m	m	17.4	(1.3)	23.1	(0.8)	32.5	(1.4)	**1.5**	(0.1)
	Algeria	c	c	m	m	23.1	(1.2)	26.5	(1.0)	29.5	(1.9)	**1.2**	(0.1)
	Brazil	53.2	(7.5)	**1.4**	(0.2)	36.5	(0.9)	42.7	(0.7)	43.4	(1.0)	**1.1**	(0.0)
	B-S-J-G (China)	28.9	(2.1)	**1.9**	(0.2)	15.0	(0.7)	16.9	(1.2)	21.4	(1.2)	**1.4**	(0.1)
	Bulgaria	48.7	(6.5)	**1.8**	(0.2)	13.7	(2.9)	23.2	(1.4)	32.6	(1.7)	**1.5**	(0.1)
	CABA (Argentina)	34.2	(10.0)	1.2	(0.4)	29.3	(2.4)	23.6	(2.7)	29.8	(1.3)	1.1	(0.1)
	Colombia	47.0	(10.5)	1.2	(0.3)	38.5	(1.7)	39.7	(1.4)	41.3	(0.8)	1.1	(0.0)
	Costa Rica	c	c	1.4	(0.5)	40.2	(1.4)	46.2	(1.7)	47.2	(1.0)	**1.1**	(0.0)
	Croatia	52.1	(3.8)	**2.3**	(0.2)	10.6	(2.3)	21.4	(1.2)	27.8	(1.4)	**1.3**	(0.1)
	Cyprus*	54.2	(7.0)	**1.8**	(0.2)	20.1	(2.9)	28.1	(1.0)	32.6	(0.9)	**1.2**	(0.1)
	Dominican Republic	c	c	m	m	46.3	(1.8)	46.5	(1.4)	45.8	(1.4)	1.0	(0.0)
	FYROM	c	c	1.9	(1.0)	19.7	(1.7)	22.8	(1.0)	26.2	(0.9)	**1.2**	(0.1)
	Georgia	33.4	(8.4)	**2.0**	(0.5)	9.3	(3.3)	15.4	(0.8)	18.6	(0.8)	**1.2**	(0.1)
	Hong Kong (China)	41.3	(2.7)	**1.9**	(0.1)	20.6	(1.5)	22.1	(0.9)	31.2	(1.5)	**1.4**	(0.1)
	Indonesia	c	c	1.8	(1.4)	11.7	(0.8)	18.8	(1.0)	20.3	(1.3)	**1.4**	(0.1)
	Jordan	c	c	**1.8**	(0.4)	28.2	(2.2)	37.3	(1.7)	52.3	(1.1)	**1.5**	(0.1)
	Kosovo	c	c	m	m	18.4	(2.5)	22.3	(1.1)	30.7	(1.0)	**1.4**	(0.1)
	Lebanon	c	c	**1.7**	(0.4)	34.6	(2.3)	39.1	(1.5)	43.3	(1.8)	**1.2**	(0.1)
	Lithuania	45.4	(4.0)	**2.0**	(0.2)	6.8	(3.4)	16.9	(0.9)	28.2	(0.8)	**1.7**	(0.1)
	Macao (China)	35.5	(2.6)	**1.8**	(0.2)	19.8	(1.0)	18.6	(0.9)	24.8	(1.3)	**1.3**	(0.1)
	Malta	61.6	(3.1)	**2.8**	(0.2)	17.8	(1.1)	24.6	(1.2)	32.0	(1.2)	**1.5**	(0.1)
	Moldova	38.5	(10.4)	**1.8**	(0.5)	9.4	(1.5)	21.4	(1.1)	25.6	(1.0)	**1.3**	(0.1)
	Montenegro	c	c	**2.5**	(0.6)	16.2	(3.2)	19.4	(0.9)	22.7	(0.7)	**1.2**	(0.1)
	Peru	c	c	1.4	(0.6)	31.8	(1.6)	36.0	(1.0)	43.5	(1.1)	**1.3**	(0.0)
	Qatar	58.5	(5.0)	**1.6**	(0.1)	28.6	(1.7)	33.9	(1.3)	40.1	(0.5)	**1.2**	(0.0)
	Romania	62.8	(10.3)	**2.7**	(0.5)	13.3	(2.4)	18.1	(1.2)	28.7	(1.4)	**1.6**	(0.1)
	Russia	37.6	(4.7)	**1.6**	(0.2)	22.0	(5.8)	22.1	(3.9)	24.6	(0.7)	1.1	(0.2)
	Singapore	37.8	(1.6)	**1.5**	(0.1)	23.2	(2.0)	26.0	(1.0)	30.1	(0.9)	**1.2**	(0.1)
	Chinese Taipei	36.8	(1.9)	**2.0**	(0.1)	14.7	(1.4)	18.3	(1.1)	23.3	(1.0)	**1.3**	(0.1)
	Thailand	58.2	(11.0)	**3.0**	(0.6)	17.0	(0.9)	20.0	(0.9)	26.0	(1.6)	**1.4**	(0.1)
	Trinidad and Tobago	65.2	(8.6)	**2.4**	(0.3)	25.7	(2.2)	27.2	(0.9)	31.2	(1.0)	**1.2**	(0.1)
	Tunisia	c	c	m	m	26.7	(1.6)	35.6	(1.0)	40.9	(1.2)	**1.2**	(0.0)
	United Arab Emirates	58.3	(3.5)	**1.4**	(0.1)	32.7	(2.1)	37.5	(1.1)	44.1	(0.6)	**1.2**	(0.0)
	Uruguay	55.6	(7.4)	**2.0**	(0.3)	22.3	(1.0)	30.5	(1.0)	33.9	(1.2)	**1.3**	(0.1)
	Viet Nam	32.9	(2.9)	**1.8**	(0.2)	18.3	(1.0)	20.8	(1.3)	27.1	(2.2)	**1.4**	(0.1)
	Argentina**	52.0	(10.9)	**2.2**	(0.5)	19.2	(1.0)	22.9	(1.8)	27.6	(1.1)	**1.3**	(0.1)
	Kazakhstan**	37.3	(6.4)	1.3	(0.2)	22.4	(5.3)	27.7	(2.1)	29.2	(1.1)	1.1	(0.1)
	Malaysia**	55.5	(10.6)	**1.9**	(0.4)	19.6	(1.6)	30.0	(1.0)	33.7	(1.5)	**1.2**	(0.1)

1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.11a Students expecting to work as science and engineering professionals,[1] by gender and performance in science

Results based on students' self-reports

	Students who expect to work as science and engineering professionals at age 30													
	All students		Boys		Girls		Increased likelihood of boys expecting that they will work in science-related occupations		Low achievers in science (students performing below Level 2)		Moderate performers in science (students performing at Level 2 or 3)		Strong performers in science (students performing at Level 4)	
	%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD														
Australia	10.0	(0.4)	14.8	(0.6)	5.1	(0.3)	**2.9**	(0.2)	3.5	(0.5)	7.6	(0.4)	14.0	(0.9)
Austria	9.0	(0.6)	14.0	(1.2)	3.9	(0.4)	**3.6**	(0.4)	5.4	(1.1)	8.4	(0.8)	12.2	(1.4)
Belgium	8.6	(0.6)	12.3	(1.0)	4.8	(0.6)	**2.6**	(0.4)	2.6	(0.7)	7.0	(0.7)	14.5	(1.6)
Canada	12.1	(0.4)	17.5	(0.6)	6.6	(0.3)	**2.7**	(0.1)	5.3	(0.8)	9.5	(0.5)	15.6	(0.8)
Chile	17.8	(0.6)	24.7	(0.9)	10.8	(0.7)	**2.3**	(0.2)	11.4	(1.0)	20.3	(0.9)	25.6	(2.2)
Czech Republic	4.1	(0.3)	5.2	(0.5)	2.9	(0.3)	**1.8**	(0.2)	0.9	(0.4)	3.6	(0.5)	6.3	(0.9)
Denmark	4.0	(0.3)	4.8	(0.5)	3.1	(0.4)	**1.6**	(0.2)	1.1	(0.3)	3.3	(0.4)	6.0	(0.9)
Estonia	7.7	(0.5)	9.4	(0.7)	5.9	(0.6)	**1.6**	(0.2)	2.3	(0.8)	5.5	(0.6)	9.8	(1.0)
Finland	3.9	(0.3)	6.2	(0.4)	1.4	(0.3)	**4.5**	(0.9)	0.8	(0.4)	2.6	(0.3)	4.9	(0.6)
France	8.2	(0.5)	11.9	(0.8)	4.5	(0.5)	**2.6**	(0.3)	3.0	(0.6)	6.0	(0.6)	13.5	(1.2)
Germany	6.8	(0.3)	8.9	(0.6)	4.6	(0.4)	**1.9**	(0.2)	2.1	(0.6)	4.6	(0.4)	10.2	(1.0)
Greece	9.4	(0.4)	11.1	(0.6)	7.7	(0.5)	**1.4**	(0.1)	6.2	(0.7)	9.6	(0.5)	14.9	(1.9)
Hungary	7.5	(0.6)	11.6	(1.1)	3.4	(0.4)	**3.4**	(0.5)	2.2	(0.6)	6.3	(0.7)	14.9	(1.5)
Iceland	6.6	(0.5)	7.6	(0.6)	5.6	(0.6)	**1.4**	(0.2)	3.4	(0.7)	5.6	(0.7)	11.6	(1.8)
Ireland	8.8	(0.4)	12.5	(0.7)	4.8	(0.4)	**2.6**	(0.3)	3.7	(0.8)	7.6	(0.5)	12.7	(1.2)
Israel	8.8	(0.4)	11.2	(0.7)	6.5	(0.6)	**1.7**	(0.2)	5.7	(0.7)	9.4	(0.7)	11.0	(1.5)
Italy	9.0	(0.6)	12.4	(0.7)	5.7	(0.6)	**2.2**	(0.2)	3.8	(0.7)	8.1	(0.7)	15.7	(1.5)
Japan	4.8	(0.4)	7.8	(0.6)	1.8	(0.3)	**4.3**	(0.6)	3.2	(0.8)	4.5	(0.6)	5.6	(0.7)
Korea	6.3	(0.4)	8.5	(0.6)	3.8	(0.5)	**2.2**	(0.3)	1.8	(0.6)	4.0	(0.4)	8.5	(0.8)
Latvia	7.2	(0.4)	9.6	(0.7)	4.8	(0.5)	**2.0**	(0.3)	3.6	(0.8)	6.3	(0.5)	11.8	(1.5)
Luxembourg	8.5	(0.4)	11.4	(0.5)	5.6	(0.4)	**2.0**	(0.2)	3.1	(0.5)	7.4	(0.5)	12.3	(1.3)
Mexico	18.3	(0.7)	27.5	(1.0)	8.8	(0.6)	**3.1**	(0.2)	15.5	(0.8)	20.4	(0.9)	28.2	(4.5)
Netherlands	5.3	(0.3)	7.4	(0.6)	3.2	(0.3)	**2.3**	(0.3)	2.1	(0.6)	3.8	(0.4)	8.1	(0.9)
New Zealand	8.3	(0.4)	10.8	(0.6)	5.8	(0.5)	**1.9**	(0.2)	2.4	(0.6)	6.4	(0.6)	11.5	(1.1)
Norway	11.3	(0.6)	16.2	(0.9)	6.4	(0.5)	**2.5**	(0.2)	3.9	(0.8)	9.0	(0.6)	18.1	(1.7)
Poland	6.4	(0.4)	6.7	(0.6)	6.0	(0.6)	1.1	(0.1)	1.8	(0.5)	5.4	(0.5)	10.3	(1.4)
Portugal	11.8	(0.4)	17.1	(0.8)	6.5	(0.4)	**2.6**	(0.2)	3.6	(0.7)	9.0	(0.6)	19.8	(1.3)
Slovak Republic	3.8	(0.4)	4.6	(0.5)	2.9	(0.4)	**1.6**	(0.2)	1.4	(0.3)	4.0	(0.5)	6.5	(1.3)
Slovenia	7.2	(0.4)	9.8	(0.6)	4.4	(0.4)	**2.3**	(0.2)	2.6	(0.6)	5.5	(0.5)	10.2	(1.3)
Spain	11.1	(0.4)	15.3	(0.7)	6.8	(0.5)	**2.3**	(0.2)	2.0	(0.5)	8.5	(0.5)	21.3	(1.4)
Sweden	5.6	(0.4)	7.7	(0.5)	3.5	(0.4)	**2.2**	(0.3)	1.5	(0.4)	4.6	(0.4)	9.8	(1.1)
Switzerland	6.2	(0.5)	8.3	(0.8)	3.9	(0.4)	**2.2**	(0.3)	1.1	(0.5)	5.1	(0.6)	9.3	(1.2)
Turkey	17.1	(1.1)	25.3	(1.5)	8.9	(0.7)	**2.8**	(0.2)	12.4	(1.4)	20.2	(1.3)	26.7	(2.9)
United Kingdom	12.7	(0.5)	17.0	(0.7)	8.4	(0.5)	**2.0**	(0.1)	6.4	(0.9)	11.0	(0.6)	16.3	(1.3)
United States	13.0	(0.6)	20.0	(0.9)	6.1	(0.6)	**3.3**	(0.3)	5.8	(0.9)	11.1	(0.7)	19.6	(1.7)
OECD average	8.8	(0.1)	12.2	(0.1)	5.3	(0.1)	**2.4**	(0.1)	3.9	(0.1)	7.8	(0.1)	13.4	(0.3)
Partners														
Albania	10.9	(0.5)	12.1	(0.8)	9.7	(0.6)	**1.2**	(0.1)	m	m	m	m	m	m
Algeria	8.9	(0.4)	12.3	(0.7)	5.2	(0.6)	**2.4**	(0.3)	8.4	(0.5)	10.3	(1.0)	14.0	(6.2)
Brazil	16.3	(0.5)	20.7	(0.8)	12.2	(0.5)	**1.7**	(0.1)	12.0	(0.5)	21.0	(0.8)	30.1	(2.8)
B-S-J-G (China)	6.7	(0.3)	7.7	(0.5)	5.6	(0.4)	**1.4**	(0.1)	3.1	(0.6)	5.4	(0.5)	8.7	(1.0)
Bulgaria	5.4	(0.6)	5.7	(0.6)	5.1	(0.7)	1.1	(0.1)	3.3	(0.5)	6.1	(0.9)	8.6	(1.4)
CABA (Argentina)	12.2	(1.3)	15.9	(2.1)	8.8	(1.1)	**1.8**	(0.3)	6.0	(1.6)	11.4	(1.6)	22.1	(4.0)
Colombia	12.2	(0.4)	16.2	(0.6)	8.5	(0.4)	**1.9**	(0.1)	8.6	(0.6)	15.0	(0.7)	20.3	(2.7)
Costa Rica	17.4	(0.6)	24.0	(1.0)	11.2	(0.6)	**2.1**	(0.1)	12.6	(0.8)	21.0	(0.9)	30.3	(4.0)
Croatia	6.2	(0.6)	7.9	(0.7)	4.6	(0.6)	**1.7**	(0.2)	1.8	(0.5)	5.7	(0.9)	11.7	(1.5)
Cyprus*	10.2	(0.5)	11.9	(0.6)	8.5	(0.7)	**1.4**	(0.1)	5.6	(0.5)	12.6	(0.8)	17.7	(2.7)
Dominican Republic	21.5	(0.7)	31.2	(1.2)	12.2	(0.7)	**2.6**	(0.2)	21.2	(0.8)	23.3	(2.4)	c	c
FYROM	4.2	(0.3)	4.0	(0.4)	4.5	(0.4)	0.9	(0.1)	2.9	(0.4)	6.1	(0.7)	11.8	(3.8)
Georgia	4.0	(0.3)	5.3	(0.5)	2.5	(0.3)	**2.2**	(0.3)	2.7	(0.4)	4.7	(0.5)	9.0	(2.7)
Hong Kong (China)	8.5	(0.4)	11.9	(0.7)	5.1	(0.4)	**2.3**	(0.2)	4.4	(1.1)	7.0	(0.6)	11.1	(1.0)
Indonesia	1.9	(0.2)	2.3	(0.3)	1.4	(0.3)	**1.7**	(0.3)	1.0	(0.2)	2.8	(0.4)	6.1	(2.9)
Jordan	21.1	(0.7)	29.5	(1.1)	12.9	(0.7)	**2.3**	(0.2)	16.3	(0.9)	25.7	(1.0)	27.9	(4.4)
Kosovo	9.2	(0.5)	11.8	(0.8)	6.5	(0.6)	**1.8**	(0.2)	6.7	(0.5)	14.1	(1.2)	c	c
Lebanon	16.5	(0.9)	22.5	(1.2)	11.3	(0.8)	**2.0**	(0.1)	10.9	(0.8)	25.7	(1.7)	26.9	(4.4)
Lithuania	8.3	(0.4)	9.4	(0.6)	7.2	(0.5)	**1.3**	(0.1)	4.1	(0.7)	8.1	(0.6)	13.3	(1.5)
Macao (China)	5.4	(0.3)	8.2	(0.6)	2.6	(0.3)	**3.2**	(0.5)	2.2	(1.1)	3.9	(0.4)	7.5	(0.9)
Malta	9.1	(0.5)	13.0	(0.8)	5.1	(0.6)	**2.5**	(0.3)	3.3	(0.6)	9.6	(0.9)	15.2	(2.4)
Moldova	5.4	(0.4)	5.9	(0.6)	4.9	(0.5)	1.2	(0.2)	2.9	(0.4)	6.5	(0.7)	12.7	(2.5)
Montenegro	6.9	(0.3)	7.6	(0.5)	6.1	(0.5)	**1.2**	(0.1)	3.8	(0.5)	9.1	(0.6)	17.0	(2.7)
Peru	21.4	(0.7)	28.7	(1.1)	14.0	(0.6)	**2.1**	(0.1)	17.6	(0.7)	26.7	(1.1)	26.9	(5.0)
Qatar	16.8	(0.4)	21.9	(0.6)	11.5	(0.4)	**1.9**	(0.1)	12.1	(0.5)	20.2	(0.7)	26.3	(2.0)
Romania	6.0	(0.5)	7.9	(0.7)	4.3	(0.5)	**1.8**	(0.2)	3.4	(0.5)	6.9	(0.6)	13.5	(2.6)
Russia	8.3	(0.3)	9.3	(0.6)	7.3	(0.5)	**1.3**	(0.1)	4.6	(0.8)	7.7	(0.5)	13.1	(1.4)
Singapore	14.1	(0.5)	20.2	(0.8)	7.5	(0.5)	**2.7**	(0.2)	8.5	(1.5)	12.2	(0.7)	14.3	(0.9)
Chinese Taipei	7.9	(0.5)	12.7	(0.7)	3.0	(0.5)	**4.3**	(0.7)	1.7	(0.6)	5.2	(0.5)	10.2	(1.1)
Thailand	4.0	(0.3)	5.0	(0.5)	3.2	(0.4)	**1.6**	(0.2)	1.8	(0.4)	5.4	(0.5)	10.8	(2.2)
Trinidad and Tobago	12.2	(0.5)	16.4	(0.8)	8.0	(0.6)	**2.0**	(0.2)	6.2	(0.6)	15.1	(0.9)	26.7	(3.0)
Tunisia	10.6	(0.6)	12.7	(0.9)	8.8	(0.6)	**1.4**	(0.1)	7.3	(0.6)	16.8	(1.1)	22.3	(9.5)
United Arab Emirates	21.4	(0.5)	25.8	(0.7)	17.0	(0.7)	**1.5**	(0.1)	18.2	(0.8)	22.7	(0.8)	25.4	(1.9)
Uruguay	8.9	(0.3)	11.1	(0.6)	6.9	(0.5)	**1.6**	(0.1)	3.8	(0.4)	10.7	(0.5)	20.6	(2.2)
Viet Nam	4.8	(0.4)	7.6	(0.7)	2.1	(0.3)	**3.6**	(0.6)	1.4	(0.9)	3.8	(0.4)	6.7	(0.8)
Argentina**	9.8	(0.6)	13.5	(0.8)	6.4	(0.6)	**2.1**	(0.2)	5.2	(0.7)	11.9	(0.8)	20.2	(3.2)
Kazakhstan**	8.3	(0.4)	11.2	(0.6)	5.2	(0.5)	**2.2**	(0.2)	6.4	(0.8)	8.6	(0.5)	12.4	(2.1)
Malaysia**	13.2	(0.5)	18.9	(0.8)	8.1	(0.6)	**2.3**	(0.2)	6.4	(0.7)	15.9	(0.7)	23.4	(2.7)

1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.11a Students expecting to work as science and engineering professionals,[1] by gender and performance in science

Results based on students' self-reports

		Students who expect to work as science and engineering professionals at age 30											
		Top performers in science (students performing at Level 5 or above)		Increased likelihood of top performers in science expecting that they will work in science-related occupations		Students whose parents have not completed secondary education		Students whose parents attained secondary education as their highest level of education		Students whose father or mother completed tertiary education		Increased likelihood of students with at least one tertiary-educated parent expecting that they will work in science-related occupations	
		%	S.E.	Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.
OECD	Australia	22.5	(1.5)	**2.7**	(0.2)	5.5	(0.9)	8.3	(0.6)	11.8	(0.5)	**1.5**	(0.1)
	Austria	14.3	(1.9)	**1.7**	(0.3)	7.5	(2.4)	8.9	(0.9)	9.4	(0.7)	1.1	(0.1)
	Belgium	25.6	(3.6)	**3.4**	(0.5)	5.7	(2.0)	7.0	(0.7)	9.7	(0.7)	**1.5**	(0.1)
	Canada	21.3	(1.3)	**2.0**	(0.2)	9.4	(2.0)	8.3	(0.6)	13.4	(0.4)	**1.6**	(0.1)
	Chile	26.4	(6.4)	1.5	(0.4)	13.5	(1.5)	18.4	(1.0)	19.8	(0.7)	**1.2**	(0.1)
	Czech Republic	9.7	(1.6)	**2.7**	(0.5)	5.0	(1.3)	3.6	(0.4)	4.9	(0.6)	1.3	(0.2)
	Denmark	9.2	(1.8)	**2.6**	(0.5)	2.6	(1.0)	3.3	(0.7)	4.3	(0.4)	1.4	(0.3)
	Estonia	15.2	(1.7)	**2.3**	(0.3)	4.5	(1.3)	5.7	(0.7)	9.0	(0.6)	**1.6**	(0.2)
	Finland	8.5	(1.2)	**2.8**	(0.5)	3.9	(1.8)	2.3	(0.5)	4.3	(0.3)	**1.7**	(0.4)
	France	21.5	(1.8)	**3.1**	(0.3)	5.6	(1.2)	5.7	(0.6)	10.2	(0.6)	**1.8**	(0.2)
	Germany	16.6	(1.6)	**3.0**	(0.3)	4.1	(0.6)	6.2	(0.7)	10.1	(0.6)	**1.9**	(0.2)
	Greece	25.6	(4.5)	**2.8**	(0.5)	6.3	(1.2)	7.7	(0.8)	11.0	(0.5)	**1.5**	(0.2)
	Hungary	24.8	(3.2)	**3.7**	(0.5)	2.5	(1.0)	6.8	(0.7)	9.0	(0.8)	**1.4**	(0.1)
	Iceland	23.6	(4.3)	**4.0**	(0.8)	5.8	(1.8)	4.1	(0.8)	7.6	(0.6)	**1.7**	(0.3)
	Ireland	18.7	(2.3)	**2.3**	(0.3)	5.3	(1.2)	6.8	(0.7)	10.2	(0.5)	**1.5**	(0.1)
	Israel	14.3	(2.4)	**1.7**	(0.3)	5.8	(1.9)	7.3	(0.8)	9.9	(0.5)	**1.4**	(0.2)
	Italy	22.6	(3.2)	**2.7**	(0.4)	6.6	(0.7)	9.2	(0.9)	10.4	(0.9)	**1.2**	(0.1)
	Japan	5.4	(0.9)	1.2	(0.2)	4.0	(1.8)	4.8	(0.6)	5.0	(0.4)	1.0	(0.1)
	Korea	17.9	(1.8)	**3.7**	(0.4)	3.3	(1.4)	4.8	(0.4)	7.4	(0.5)	**1.6**	(0.2)
	Latvia	17.6	(3.9)	**2.6**	(0.6)	10.0	(3.9)	5.1	(0.5)	8.5	(0.6)	**1.6**	(0.2)
	Luxembourg	27.0	(2.7)	**3.8**	(0.4)	5.8	(0.8)	6.5	(0.7)	10.4	(0.6)	**1.7**	(0.2)
	Mexico	c	c	1.1	(1.0)	18.5	(0.9)	18.1	(1.2)	18.3	(0.9)	1.0	(0.1)
	Netherlands	10.7	(1.5)	**2.3**	(0.4)	3.7	(1.1)	4.2	(0.5)	6.1	(0.5)	**1.5**	(0.2)
	New Zealand	18.0	(1.9)	**2.6**	(0.3)	5.4	(1.6)	6.5	(0.7)	10.5	(0.7)	**1.7**	(0.2)
	Norway	28.1	(2.9)	**2.8**	(0.3)	6.2	(2.2)	6.8	(0.7)	13.6	(0.7)	**2.0**	(0.2)
	Poland	12.9	(2.6)	**2.2**	(0.5)	5.5	(1.5)	5.6	(0.4)	9.3	(0.9)	**1.7**	(0.2)
	Portugal	29.6	(2.6)	**2.8**	(0.3)	8.4	(0.5)	12.3	(0.9)	16.1	(0.9)	**1.6**	(0.1)
	Slovak Republic	8.3	(2.2)	**2.3**	(0.6)	1.3	(1.3)	3.9	(0.4)	3.9	(0.5)	1.0	(0.1)
	Slovenia	15.0	(2.4)	**2.4**	(0.4)	3.0	(1.4)	5.6	(0.5)	8.7	(0.6)	**1.6**	(0.2)
	Spain	35.2	(3.2)	**3.6**	(0.4)	6.0	(0.6)	10.3	(0.8)	13.8	(0.6)	**1.7**	(0.1)
	Sweden	12.7	(1.9)	**2.6**	(0.4)	1.1	(0.7)	4.4	(0.7)	6.5	(0.4)	**1.7**	(0.3)
	Switzerland	13.7	(2.0)	**2.6**	(0.4)	3.3	(1.1)	4.6	(0.5)	7.5	(0.6)	**1.8**	(0.2)
	Turkey	c	c	1.5	(0.8)	15.4	(1.4)	18.4	(1.6)	19.4	(1.2)	**1.2**	(0.1)
	United Kingdom	23.5	(2.0)	**2.1**	(0.2)	14.6	(2.6)	11.7	(0.7)	13.8	(0.7)	1.2	(0.1)
	United States	27.1	(2.6)	**2.3**	(0.2)	12.3	(1.5)	11.5	(0.9)	14.1	(0.7)	**1.2**	(0.1)
	OECD average	18.9	(0.5)	**2.6**	(0.1)	6.5	(0.3)	7.6	(0.1)	10.2	(0.1)	**1.5**	(0.0)
Partners	Albania	m	m	m	m	6.4	(0.9)	10.6	(0.7)	14.4	(1.0)	**1.5**	(0.2)
	Algeria	c	c	m	m	7.4	(0.6)	9.3	(0.6)	10.7	(0.8)	**1.3**	(0.1)
	Brazil	29.9	(6.5)	**1.8**	(0.4)	14.2	(0.6)	19.0	(0.8)	18.5	(0.8)	**1.1**	(0.0)
	B-S-J-G (China)	12.3	(1.5)	**2.1**	(0.3)	6.0	(0.5)	5.7	(0.6)	9.6	(0.8)	**1.6**	(0.2)
	Bulgaria	9.6	(3.2)	1.8	(0.6)	2.3	(0.9)	4.7	(0.6)	6.4	(0.7)	**1.4**	(0.2)
	CABA (Argentina)	28.5	(10.3)	**2.4**	(0.9)	7.3	(1.6)	10.1	(2.2)	14.6	(1.4)	**1.7**	(0.3)
	Colombia	30.2	(9.5)	**2.5**	(0.8)	10.6	(0.9)	11.3	(0.7)	13.4	(0.6)	**1.2**	(0.1)
	Costa Rica	c	c	2.4	(1.6)	14.3	(1.2)	18.5	(1.2)	19.5	(0.8)	**1.2**	(0.1)
	Croatia	19.2	(2.8)	**3.4**	(0.6)	2.1	(1.1)	5.2	(0.7)	7.3	(0.7)	**1.5**	(0.2)
	Cyprus*	20.7	(6.0)	**2.1**	(0.6)	4.5	(1.4)	9.0	(0.7)	11.6	(0.6)	**1.4**	(0.1)
	Dominican Republic	c	c	m	m	22.4	(1.8)	21.5	(1.0)	21.7	(1.1)	1.0	(0.1)
	FYROM	c	c	1.3	(2.3)	3.0	(0.7)	3.9	(0.5)	4.7	(0.5)	1.3	(0.2)
	Georgia	11.4	(5.6)	**2.9**	(1.5)	1.6	(1.6)	3.5	(0.4)	4.4	(0.4)	1.3	(0.2)
	Hong Kong (China)	16.3	(2.1)	**2.1**	(0.3)	7.7	(0.7)	7.6	(0.5)	11.7	(0.9)	**1.5**	(0.2)
	Indonesia	c	c	7.4	(10.7)	1.1	(0.2)	2.9	(0.3)	2.2	(0.4)	1.2	(0.3)
	Jordan	c	c	1.0	(0.7)	11.9	(1.5)	17.5	(1.1)	26.0	(0.8)	**1.6**	(0.1)
	Kosovo	c	c	m	m	4.9	(1.2)	7.2	(0.7)	11.4	(0.8)	**1.7**	(0.2)
	Lebanon	c	c	2.2	(0.9)	12.5	(1.3)	15.8	(1.2)	19.4	(1.4)	**1.3**	(0.1)
	Lithuania	18.2	(2.8)	**2.3**	(0.4)	0.0	c	6.1	(0.6)	9.8	(0.6)	**1.7**	(0.2)
	Macao (China)	11.1	(2.2)	**2.3**	(0.5)	4.4	(0.5)	4.1	(0.5)	8.2	(0.8)	**1.9**	(0.2)
	Malta	18.6	(3.0)	**2.2**	(0.4)	5.5	(0.8)	9.7	(0.9)	11.4	(0.9)	**1.5**	(0.2)
	Moldova	15.8	(8.8)	3.0	(1.7)	3.4	(0.8)	5.0	(0.6)	6.3	(0.5)	**1.3**	(0.2)
	Montenegro	c	c	**4.4**	(1.7)	0.9	(0.9)	5.2	(0.5)	7.9	(0.4)	**1.6**	(0.2)
	Peru	c	c	1.4	(0.9)	17.0	(1.3)	20.7	(0.9)	23.6	(0.9)	**1.2**	(0.1)
	Qatar	28.0	(3.7)	**1.7**	(0.2)	9.6	(1.0)	13.8	(0.8)	18.2	(0.4)	**1.5**	(0.1)
	Romania	18.6	(8.5)	**3.1**	(1.5)	3.0	(1.0)	4.6	(0.6)	7.6	(0.7)	**1.7**	(0.2)
	Russia	16.3	(3.1)	**2.0**	(0.4)	5.8	(3.2)	6.5	(4.0)	8.8	(0.4)	1.4	(0.9)
	Singapore	19.0	(1.2)	**1.5**	(0.1)	11.7	(1.6)	13.4	(0.8)	14.9	(0.7)	1.1	(0.1)
	Chinese Taipei	16.8	(1.5)	**2.7**	(0.3)	5.3	(0.9)	6.1	(0.6)	9.3	(0.7)	**1.6**	(0.2)
	Thailand	8.3	(7.3)	2.1	(1.9)	2.8	(0.3)	4.5	(0.5)	5.7	(0.6)	**1.6**	(0.2)
	Trinidad and Tobago	35.5	(8.2)	**3.0**	(0.7)	9.2	(1.6)	12.0	(0.7)	14.2	(0.8)	**1.2**	(0.1)
	Tunisia	c	c	m	m	6.8	(0.9)	10.4	(0.8)	14.2	(1.0)	**1.5**	(0.1)
	United Arab Emirates	33.5	(3.5)	**1.6**	(0.2)	19.9	(1.6)	20.4	(1.0)	22.3	(0.6)	**1.1**	(0.0)
	Uruguay	30.8	(6.4)	**3.6**	(0.8)	5.2	(0.5)	9.7	(0.7)	13.1	(0.7)	**1.8**	(0.1)
	Viet Nam	9.2	(1.6)	**2.1**	(0.4)	4.8	(0.4)	4.7	(0.5)	5.6	(1.1)	1.2	(0.2)
	Argentina**	32.1	(10.0)	**3.3**	(1.1)	6.5	(0.7)	9.3	(1.2)	12.7	(0.8)	**1.7**	(0.1)
	Kazakhstan**	11.7	(4.3)	1.4	(0.5)	2.8	(2.0)	4.7	(0.9)	8.8	(0.4)	**2.0**	(0.4)
	Malaysia**	28.8	(8.5)	**2.2**	(0.7)	8.2	(1.1)	13.9	(0.6)	15.0	(1.1)	1.2	(0.1)

1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.11b Students expecting to work as health professionals,[1] by gender and performance in science

Results based on students' self-reports

		Students who expect to work as health professionals at age 30													
		All students		Boys		Girls		Increased likelihood of boys expecting that they will work in science-related occupations		Low achievers in science (students performing below Level 2)		Moderate performers in science (students performing at Level 2 or 3)		Strong performers in science (students performing at Level 4)	
		%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	15.4	(0.4)	9.2	(0.4)	21.6	(0.5)	**0.4**	(0.0)	8.3	(0.7)	15.3	(0.5)	19.1	(1.1)
	Austria	8.3	(0.5)	4.3	(0.4)	12.4	(0.8)	**0.3**	(0.0)	4.8	(0.6)	8.7	(0.6)	9.8	(1.4)
	Belgium	12.4	(0.8)	7.2	(0.9)	17.7	(0.9)	**0.4**	(0.0)	4.9	(0.9)	13.2	(1.0)	18.1	(1.6)
	Canada	19.2	(0.5)	9.6	(0.5)	28.8	(0.7)	**0.3**	(0.0)	11.8	(1.0)	18.0	(0.6)	22.5	(1.0)
	Chile	18.3	(0.7)	9.1	(0.7)	27.6	(1.1)	**0.3**	(0.0)	15.5	(1.2)	18.8	(0.9)	24.9	(1.9)
	Czech Republic	7.3	(0.5)	3.9	(0.5)	10.8	(0.7)	**0.4**	(0.0)	1.8	(0.5)	6.3	(0.6)	12.2	(1.3)
	Denmark	8.9	(0.4)	3.9	(0.4)	13.9	(0.7)	**0.3**	(0.0)	7.2	(1.1)	8.9	(0.6)	9.3	(0.9)
	Estonia	8.1	(0.4)	3.4	(0.4)	13.1	(0.6)	**0.3**	(0.0)	5.0	(1.4)	7.5	(0.5)	9.2	(0.9)
	Finland	10.8	(0.5)	5.3	(0.5)	16.6	(0.7)	**0.3**	(0.0)	2.8	(0.8)	7.6	(0.7)	15.2	(1.2)
	France	9.3	(0.4)	5.3	(0.4)	13.2	(0.5)	**0.4**	(0.0)	2.4	(0.5)	7.9	(0.5)	15.9	(1.1)
	Germany	4.6	(0.3)	2.3	(0.3)	6.8	(0.4)	**0.3**	(0.0)	2.3	(0.6)	4.0	(0.4)	5.9	(0.8)
	Greece	12.0	(0.6)	7.9	(0.7)	16.4	(0.9)	**0.5**	(0.0)	5.9	(0.8)	13.3	(0.8)	21.0	(1.9)
	Hungary	5.4	(0.4)	2.6	(0.3)	8.3	(0.7)	**0.3**	(0.1)	2.5	(0.6)	5.4	(0.5)	9.1	(1.2)
	Iceland	13.1	(0.6)	4.7	(0.6)	20.9	(1.0)	**0.2**	(0.0)	8.2	(1.0)	13.6	(0.9)	18.0	(2.3)
	Ireland	13.8	(0.6)	7.9	(0.5)	20.0	(0.9)	**0.4**	(0.0)	8.0	(1.1)	13.5	(0.7)	16.9	(1.4)
	Israel	15.8	(0.6)	9.9	(0.5)	21.5	(0.8)	**0.5**	(0.0)	15.4	(1.3)	16.7	(0.8)	14.9	(1.3)
	Italy	10.1	(0.6)	6.0	(0.5)	14.1	(1.0)	**0.4**	(0.0)	5.3	(0.9)	10.8	(0.8)	14.3	(1.5)
	Japan	9.9	(0.5)	5.1	(0.5)	14.8	(0.7)	**0.3**	(0.0)	4.3	(1.2)	7.9	(0.6)	12.6	(1.1)
	Korea	8.3	(0.4)	5.3	(0.5)	11.6	(0.7)	**0.5**	(0.1)	4.8	(1.0)	7.6	(0.6)	9.4	(1.1)
	Latvia	9.4	(0.4)	3.0	(0.4)	15.8	(0.8)	**0.2**	(0.0)	5.4	(0.9)	9.5	(0.6)	11.5	(1.3)
	Luxembourg	8.4	(0.4)	5.2	(0.4)	11.5	(0.6)	**0.5**	(0.0)	2.8	(0.5)	7.9	(0.6)	15.9	(1.4)
	Mexico	19.2	(0.6)	13.0	(0.7)	25.5	(0.9)	**0.5**	(0.0)	18.3	(0.9)	19.9	(0.8)	19.1	(3.0)
	Netherlands	7.8	(0.4)	4.5	(0.5)	11.1	(0.7)	**0.4**	(0.0)	2.6	(0.7)	6.1	(0.6)	11.9	(1.3)
	New Zealand	13.4	(0.5)	6.6	(0.5)	20.4	(0.9)	**0.3**	(0.0)	8.3	(1.2)	13.5	(0.8)	16.5	(1.3)
	Norway	11.9	(0.4)	2.9	(0.3)	21.1	(0.8)	**0.1**	(0.0)	10.4	(1.1)	12.4	(0.6)	12.8	(1.3)
	Poland	12.3	(0.7)	4.7	(0.5)	20.2	(1.2)	**0.2**	(0.0)	4.5	(0.9)	11.9	(0.8)	17.6	(1.7)
	Portugal	13.7	(0.6)	6.4	(0.6)	21.1	(1.0)	**0.3**	(0.0)	6.8	(1.0)	12.2	(0.8)	19.7	(1.5)
	Slovak Republic	9.7	(0.5)	4.6	(0.5)	15.1	(0.9)	**0.3**	(0.0)	3.1	(0.6)	10.3	(0.8)	18.3	(1.9)
	Slovenia	12.3	(0.5)	5.7	(0.5)	19.2	(1.0)	**0.3**	(0.0)	4.4	(1.0)	11.8	(0.8)	16.2	(1.5)
	Spain	13.3	(0.4)	6.9	(0.5)	19.8	(0.8)	**0.3**	(0.0)	8.1	(0.9)	13.0	(0.6)	18.5	(1.3)
	Sweden	8.8	(0.5)	4.0	(0.5)	13.6	(0.8)	**0.3**	(0.0)	6.7	(1.0)	8.1	(0.6)	11.5	(1.5)
	Switzerland	7.9	(0.5)	3.6	(0.5)	12.6	(0.8)	**0.3**	(0.0)	3.3	(0.8)	7.2	(0.6)	11.5	(1.4)
	Turkey	11.8	(0.7)	7.9	(0.7)	15.7	(1.0)	**0.5**	(0.1)	7.3	(0.6)	14.7	(1.1)	21.6	(2.8)
	United Kingdom	13.5	(0.5)	6.8	(0.6)	20.4	(0.9)	**0.3**	(0.0)	10.4	(0.9)	13.0	(0.8)	16.0	(1.1)
	United States	22.1	(0.7)	8.9	(0.6)	35.3	(1.1)	**0.3**	(0.0)	20.3	(1.3)	23.2	(0.9)	22.4	(1.8)
	OECD average	11.6	(0.1)	5.9	(0.1)	17.4	(0.1)	**0.3**	(0.0)	7.0	(0.2)	11.4	(0.1)	15.4	(0.3)
Partners	Albania	11.5	(0.5)	10.7	(0.7)	12.3	(0.6)	0.9	(0.1)	m	m	m	m	m	m
	Algeria	16.6	(0.7)	10.2	(0.6)	23.7	(1.2)	**0.4**	(0.0)	14.2	(0.7)	21.6	(1.5)	45.5	(9.3)
	Brazil	20.9	(0.4)	11.2	(0.6)	30.1	(0.6)	**0.4**	(0.0)	20.5	(0.5)	21.6	(0.8)	20.7	(2.2)
	B-S-J-G (China)	7.5	(0.4)	5.4	(0.5)	9.9	(0.6)	**0.5**	(0.1)	5.6	(0.8)	6.4	(0.5)	8.5	(0.9)
	Bulgaria	11.7	(0.7)	6.4	(0.6)	17.7	(1.1)	**0.4**	(0.0)	6.3	(0.8)	14.6	(1.1)	16.5	(1.9)
	CABA (Argentina)	13.6	(1.2)	6.4	(1.0)	20.2	(1.5)	**0.3**	(0.0)	16.4	(2.3)	13.7	(1.5)	10.4	(2.5)
	Colombia	22.5	(0.7)	11.5	(0.7)	32.3	(0.9)	**0.4**	(0.0)	24.0	(1.0)	21.5	(0.8)	15.6	(2.6)
	Costa Rica	20.6	(0.6)	12.2	(0.7)	28.5	(0.9)	**0.4**	(0.0)	23.7	(0.9)	18.2	(0.8)	12.9	(3.2)
	Croatia	10.8	(0.8)	6.2	(0.7)	15.2	(1.1)	**0.4**	(0.0)	3.0	(0.6)	11.5	(1.0)	19.2	(1.6)
	Cyprus*	15.5	(0.5)	9.6	(0.6)	21.2	(0.8)	**0.5**	(0.0)	9.7	(0.7)	18.5	(0.8)	25.4	(2.7)
	Dominican Republic	21.1	(0.8)	8.9	(0.7)	32.9	(1.3)	**0.3**	(0.0)	20.8	(0.9)	23.3	(2.4)	c	c
	FYROM	14.1	(0.5)	7.0	(0.4)	22.0	(0.8)	**0.3**	(0.0)	12.3	(0.6)	17.4	(1.0)	15.3	(4.5)
	Georgia	10.3	(0.5)	6.1	(0.6)	14.9	(0.9)	**0.4**	(0.0)	9.5	(0.7)	10.8	(0.8)	11.8	(2.3)
	Hong Kong (China)	13.0	(0.6)	8.0	(0.5)	18.2	(0.9)	**0.4**	(0.0)	5.9	(1.4)	11.3	(0.8)	16.7	(1.5)
	Indonesia	12.7	(0.7)	5.3	(0.8)	20.2	(1.1)	**0.3**	(0.0)	11.6	(0.8)	13.9	(1.1)	21.7	(5.7)
	Jordan	21.5	(0.8)	13.9	(0.9)	29.0	(1.3)	**0.5**	(0.0)	13.2	(0.8)	28.6	(1.1)	45.0	(4.6)
	Kosovo	16.1	(0.5)	11.3	(0.5)	21.2	(0.9)	**0.5**	(0.0)	13.2	(0.7)	22.3	(1.3)	c	c
	Lebanon	22.1	(0.9)	16.9	(1.0)	26.6	(1.2)	**0.6**	(0.0)	19.2	(1.2)	26.0	(1.5)	36.1	(4.8)
	Lithuania	10.4	(0.4)	3.9	(0.4)	17.1	(0.7)	**0.2**	(0.0)	5.2	(0.8)	10.3	(0.6)	16.7	(1.5)
	Macao (China)	12.4	(0.5)	8.3	(0.6)	16.4	(0.8)	**0.5**	(0.0)	5.3	(1.7)	10.9	(0.6)	15.4	(1.2)
	Malta	10.3	(0.5)	7.2	(0.6)	13.4	(0.7)	**0.5**	(0.1)	3.1	(0.5)	7.8	(0.8)	20.1	(2.4)
	Moldova	10.9	(0.6)	6.4	(0.6)	15.5	(0.9)	**0.4**	(0.0)	6.5	(0.6)	14.1	(0.9)	15.0	(2.6)
	Montenegro	10.0	(0.4)	5.7	(0.4)	14.5	(0.6)	**0.4**	(0.0)	8.7	(0.5)	11.5	(0.7)	10.6	(2.6)
	Peru	13.1	(0.6)	6.8	(0.5)	19.5	(0.9)	**0.3**	(0.0)	12.7	(0.6)	13.6	(1.0)	16.4	(4.5)
	Qatar	19.0	(0.4)	11.5	(0.4)	26.9	(0.6)	**0.4**	(0.0)	13.0	(0.5)	25.3	(0.7)	23.8	(1.7)
	Romania	11.5	(0.6)	6.9	(0.6)	16.0	(1.0)	**0.4**	(0.0)	6.6	(0.9)	13.6	(0.9)	21.7	(3.1)
	Russia	9.8	(0.5)	5.0	(0.6)	14.5	(0.7)	**0.3**	(0.0)	7.9	(0.9)	10.0	(0.7)	11.1	(1.2)
	Singapore	11.7	(0.5)	8.1	(0.6)	15.6	(0.7)	**0.5**	(0.0)	8.1	(1.3)	9.5	(0.8)	12.6	(1.0)
	Chinese Taipei	7.2	(0.4)	3.8	(0.4)	10.6	(0.7)	**0.4**	(0.0)	3.8	(0.8)	6.3	(0.5)	8.1	(0.9)
	Thailand	14.0	(0.5)	4.1	(0.4)	21.6	(0.8)	**0.2**	(0.0)	9.0	(0.6)	16.7	(0.9)	34.5	(3.0)
	Trinidad and Tobago	14.0	(0.5)	5.5	(0.5)	22.2	(0.8)	**0.2**	(0.0)	11.0	(0.7)	14.9	(1.0)	24.0	(3.1)
	Tunisia	22.2	(0.8)	12.9	(0.7)	30.2	(1.1)	**0.4**	(0.0)	19.4	(1.0)	27.5	(1.4)	32.5	(8.5)
	United Arab Emirates	17.8	(0.5)	11.1	(0.6)	24.2	(0.8)	**0.5**	(0.0)	11.7	(0.7)	21.7	(0.9)	24.9	(1.9)
	Uruguay	16.4	(0.5)	8.0	(0.5)	24.1	(0.9)	**0.3**	(0.0)	15.2	(0.9)	17.7	(0.8)	15.3	(2.2)
	Viet Nam	13.4	(0.6)	11.0	(0.7)	15.7	(0.8)	**0.7**	(0.1)	12.1	(3.6)	11.8	(0.7)	15.2	(1.2)
	Argentina**	12.2	(0.6)	7.0	(0.6)	17.0	(0.8)	**0.4**	(0.0)	11.1	(0.7)	12.9	(0.9)	11.9	(2.6)
	Kazakhstan**	17.0	(1.0)	11.0	(0.9)	23.4	(1.4)	**0.5**	(0.0)	15.5	(1.7)	17.3	(1.1)	18.9	(2.6)
	Malaysia**	14.0	(0.6)	7.3	(0.6)	20.0	(0.8)	**0.4**	(0.0)	8.8	(0.9)	15.8	(0.7)	24.3	(2.9)

1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.11b Students expecting to work as health professionals,[1] by gender and performance in science

Results based on students' self-reports

		Students who expect to work as health professionals at age 30											
		Top performers in science (students performing at Level 5 or above)		Increased likelihood of top performers in science expecting that they will work in science-related occupations		Students whose parents have not completed secondary education		Students whose parents attained secondary education as their highest level of education		Students whose father or mother completed tertiary education		Increased likelihood of students with at least one tertiary-educated parent expecting that they will work in science-related occupations	
		%	S.E.	Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.
OECD	Australia	19.4	(1.6)	**1.3**	(0.1)	13.3	(1.3)	11.9	(0.5)	18.1	(0.6)	**1.5**	(0.1)
	Austria	10.8	(2.0)	1.3	(0.2)	5.9	(2.1)	6.2	(0.6)	10.4	(0.7)	**1.7**	(0.1)
	Belgium	13.8	(2.6)	1.1	(0.2)	12.1	(2.4)	8.5	(1.2)	14.2	(0.9)	**1.5**	(0.2)
	Canada	23.8	(1.5)	**1.3**	(0.1)	11.0	(1.8)	15.3	(0.8)	21.0	(0.5)	**1.4**	(0.1)
	Chile	26.6	(6.3)	1.5	(0.4)	17.0	(1.9)	16.8	(0.8)	21.1	(1.0)	**1.3**	(0.1)
	Czech Republic	16.4	(2.1)	**2.5**	(0.4)	3.7	(1.0)	5.8	(0.5)	11.0	(0.8)	**2.0**	(0.2)
	Denmark	11.2	(1.8)	1.3	(0.2)	7.2	(1.2)	8.8	(1.0)	9.4	(0.5)	1.2	(0.1)
	Estonia	10.4	(1.5)	1.3	(0.2)	3.2	(1.4)	6.3	(0.6)	9.5	(0.5)	**1.6**	(0.2)
	Finland	19.4	(1.6)	**2.1**	(0.2)	4.4	(2.1)	4.0	(0.6)	12.5	(0.5)	**3.1**	(0.4)
	France	19.1	(2.0)	**2.3**	(0.3)	6.1	(1.1)	6.8	(0.6)	11.5	(0.5)	**1.7**	(0.2)
	Germany	7.6	(1.1)	**1.8**	(0.3)	3.8	(0.5)	4.4	(0.7)	6.0	(0.4)	**1.5**	(0.2)
	Greece	24.7	(5.3)	**2.1**	(0.5)	6.7	(1.1)	10.2	(0.8)	13.9	(0.8)	**1.4**	(0.1)
	Hungary	9.3	(2.4)	**1.8**	(0.5)	1.4	(0.9)	3.9	(0.5)	7.4	(0.6)	**2.1**	(0.3)
	Iceland	18.0	(4.0)	1.4	(0.3)	8.1	(1.8)	13.7	(1.3)	13.6	(0.7)	1.1	(0.1)
	Ireland	19.5	(2.3)	**1.5**	(0.2)	6.1	(1.2)	12.7	(0.8)	15.1	(0.7)	**1.3**	(0.1)
	Israel	13.3	(1.9)	0.8	(0.1)	16.2	(2.9)	16.2	(0.9)	16.0	(0.6)	1.0	(0.1)
	Italy	10.5	(2.2)	1.0	(0.2)	6.6	(1.0)	10.3	(0.8)	12.0	(0.9)	**1.3**	(0.1)
	Japan	14.5	(1.9)	**1.6**	(0.2)	7.7	(2.8)	7.1	(0.7)	11.7	(0.7)	**1.7**	(0.2)
	Korea	14.5	(1.8)	**1.9**	(0.3)	5.7	(2.2)	7.9	(0.6)	8.8	(0.6)	1.1	(0.1)
	Latvia	16.3	(3.9)	**1.8**	(0.5)	2.9	(1.7)	6.9	(0.6)	11.3	(0.6)	**1.7**	(0.2)
	Luxembourg	14.0	(2.0)	**1.8**	(0.3)	4.8	(0.9)	7.0	(0.7)	10.3	(0.6)	**1.7**	(0.2)
	Mexico	c	c	1.6	(1.0)	17.0	(0.9)	18.4	(1.2)	22.9	(1.0)	**1.3**	(0.1)
	Netherlands	14.6	(1.5)	**2.1**	(0.3)	7.3	(1.6)	7.0	(0.8)	8.5	(0.5)	1.2	(0.1)
	New Zealand	14.9	(1.6)	1.1	(0.1)	8.7	(1.8)	11.8	(0.9)	16.2	(0.7)	**1.4**	(0.1)
	Norway	10.0	(1.8)	0.8	(0.2)	12.8	(3.3)	9.5	(1.0)	13.3	(0.5)	**1.4**	(0.2)
	Poland	18.2	(2.2)	**1.5**	(0.2)	7.2	(1.6)	10.6	(0.8)	19.5	(1.3)	**1.9**	(0.2)
	Portugal	23.1	(2.8)	**1.8**	(0.2)	11.3	(0.8)	14.9	(1.0)	16.4	(0.9)	**1.3**	(0.1)
	Slovak Republic	20.6	(3.4)	**2.2**	(0.4)	1.6	(1.0)	8.2	(0.7)	12.7	(0.7)	**1.6**	(0.1)
	Slovenia	17.1	(2.5)	**1.5**	(0.2)	13.8	(3.6)	10.9	(0.9)	13.5	(0.7)	**1.2**	(0.1)
	Spain	16.3	(2.5)	1.2	(0.2)	11.6	(0.9)	12.8	(0.9)	14.6	(0.5)	**1.2**	(0.1)
	Sweden	12.2	(2.2)	1.4	(0.3)	10.1	(2.1)	7.7	(0.8)	9.4	(0.6)	1.2	(0.1)
	Switzerland	11.5	(1.7)	**1.5**	(0.2)	5.9	(0.9)	6.7	(0.8)	8.8	(0.6)	**1.4**	(0.2)
	Turkey	c	c	2.4	(1.1)	11.7	(0.9)	10.6	(1.2)	12.8	(1.2)	1.1	(0.1)
	United Kingdom	16.1	(1.4)	**1.2**	(0.1)	14.6	(3.0)	11.8	(0.7)	15.5	(0.7)	**1.3**	(0.1)
	United States	18.9	(2.2)	0.8	(0.1)	21.1	(1.7)	19.5	(1.1)	23.7	(0.9)	**1.2**	(0.1)
	OECD average	16.0	(0.5)	**1.6**	(0.1)	8.8	(0.3)	10.0	(0.1)	13.5	(0.1)	**1.5**	(0.0)
Partners	Albania	m	m	m	m	8.8	(1.2)	10.7	(0.6)	14.8	(0.9)	**1.5**	(0.1)
	Algeria	c	c	m	m	15.3	(1.0)	16.7	(0.8)	18.3	(1.6)	1.1	(0.1)
	Brazil	21.9	(6.5)	1.0	(0.3)	21.1	(0.6)	22.4	(0.6)	22.8	(0.8)	1.0	(0.0)
	B-S-J-G (China)	11.6	(1.4)	**1.7**	(0.2)	6.9	(0.5)	7.9	(0.7)	8.6	(1.0)	1.2	(0.1)
	Bulgaria	16.6	(4.2)	1.4	(0.4)	6.6	(1.6)	9.3	(0.8)	14.2	(1.0)	**1.6**	(0.1)
	CABA (Argentina)	4.0	(4.5)	0.3	(0.3)	20.3	(2.9)	12.3	(2.1)	12.8	(1.1)	0.8	(0.1)
	Colombia	9.5	(5.6)	0.4	(0.2)	22.9	(1.4)	22.7	(1.1)	22.9	(0.8)	1.0	(0.1)
	Costa Rica	c	c	0.3	(0.6)	21.6	(1.1)	21.6	(1.1)	20.6	(0.8)	1.0	(0.1)
	Croatia	19.6	(3.4)	**1.9**	(0.4)	3.7	(1.7)	9.4	(0.9)	12.7	(0.9)	**1.4**	(0.1)
	Cyprus*	23.8	(6.2)	1.6	(0.4)	11.9	(2.1)	15.4	(0.7)	16.3	(0.8)	1.1	(0.1)
	Dominican Republic	c	c	m	m	20.5	(1.6)	22.1	(1.3)	21.1	(1.1)	1.0	(0.1)
	FYROM	c	c	1.1	(1.2)	13.4	(1.4)	13.1	(0.8)	15.1	(0.8)	1.1	(0.1)
	Georgia	16.2	(6.5)	1.6	(0.7)	7.7	(3.0)	9.1	(0.6)	11.3	(0.6)	**1.2**	(0.1)
	Hong Kong (China)	21.2	(2.3)	**1.7**	(0.2)	10.6	(1.1)	12.9	(0.7)	16.8	(1.2)	**1.4**	(0.1)
	Indonesia	c	c	1.0	(1.2)	10.3	(0.8)	14.8	(1.0)	16.7	(1.2)	**1.4**	(0.1)
	Jordan	c	c	**2.5**	(0.9)	15.1	(1.6)	18.6	(1.2)	25.3	(1.0)	**1.4**	(0.1)
	Kosovo	c	c	m	m	13.4	(2.0)	14.4	(0.9)	17.9	(0.7)	**1.3**	(0.1)
	Lebanon	c	c	1.4	(0.7)	21.2	(1.8)	22.3	(1.2)	22.9	(1.3)	1.0	(0.1)
	Lithuania	19.0	(2.8)	**1.9**	(0.3)	4.9	(2.5)	7.5	(0.6)	12.1	(0.5)	**1.6**	(0.1)
	Macao (China)	17.8	(2.4)	**1.5**	(0.2)	12.3	(0.8)	11.0	(0.9)	14.2	(1.1)	**1.2**	(0.1)
	Malta	35.7	(3.2)	**4.4**	(0.5)	7.0	(0.8)	9.3	(0.8)	13.8	(0.9)	**1.7**	(0.2)
	Moldova	12.7	(6.3)	1.2	(0.6)	3.9	(0.7)	11.0	(0.8)	12.6	(0.8)	**1.3**	(0.1)
	Montenegro	c	c	0.9	(0.6)	11.3	(2.9)	9.2	(0.7)	10.5	(0.5)	1.1	(0.1)
	Peru	c	c	0.9	(1.1)	12.9	(1.0)	10.8	(0.7)	15.1	(0.8)	**1.3**	(0.1)
	Qatar	23.5	(3.9)	1.2	(0.2)	18.1	(1.4)	19.0	(1.0)	19.3	(0.4)	1.0	(0.0)
	Romania	27.0	(11.6)	**2.4**	(1.0)	7.9	(1.9)	9.3	(0.8)	13.9	(0.9)	**1.5**	(0.2)
	Russia	11.9	(2.9)	1.2	(0.3)	8.5	(4.0)	9.8	(2.6)	10.3	(0.5)	1.1	(0.3)
	Singapore	15.7	(1.2)	**1.5**	(0.1)	8.7	(1.2)	10.4	(0.8)	13.1	(0.7)	**1.3**	(0.1)
	Chinese Taipei	10.9	(1.2)	**1.7**	(0.2)	4.1	(0.6)	6.3	(0.6)	8.2	(0.6)	**1.4**	(0.1)
	Thailand	47.6	(13.0)	**3.4**	(1.0)	13.0	(0.8)	14.3	(0.8)	16.9	(1.3)	**1.2**	(0.1)
	Trinidad and Tobago	24.5	(7.7)	1.8	(0.6)	15.1	(1.8)	13.5	(0.7)	14.9	(0.7)	1.1	(0.1)
	Tunisia	c	c	m	m	19.6	(1.4)	24.1	(1.1)	23.8	(1.1)	1.1	(0.1)
	United Arab Emirates	20.2	(2.9)	1.1	(0.2)	12.4	(1.6)	16.0	(0.9)	19.1	(0.5)	**1.3**	(0.1)
	Uruguay	13.5	(5.6)	0.8	(0.3)	15.1	(0.9)	17.8	(0.9)	17.3	(1.2)	1.1	(0.1)
	Viet Nam	21.1	(2.3)	**1.7**	(0.2)	12.6	(0.9)	14.2	(0.9)	18.1	(1.6)	**1.4**	(0.2)
	Argentina**	18.9	(10.6)	1.6	(0.9)	11.6	(0.7)	11.8	(1.2)	13.0	(0.8)	1.1	(0.1)
	Kazakhstan**	22.0	(5.0)	1.3	(0.3)	14.7	(4.4)	20.1	(2.0)	16.7	(1.0)	0.9	(0.1)
	Malaysia**	21.4	(8.0)	1.5	(0.6)	9.7	(1.2)	14.3	(0.7)	16.4	(1.0)	**1.2**	(0.1)

1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.11c Students expecting to work as ICT professionals,1 by gender and performance in science

Results based on students' self-reports

		Students who expect to work as information and communications technology (ICT) professionals at age 30													
		All students		Boys		Girls		Increased likelihood of boys expecting that they will work in science-related occupations		Low achievers in science (students performing below Level 2)		Moderate performers in science (students performing at Level 2 or 3)		Strong performers in science (students performing at Level 4)	
		%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	2.6	(0.1)	4.7	(0.3)	0.4	(0.1)	**11.0**	(2.5)	1.3	(0.3)	2.5	(0.2)	3.1	(0.4)
	Austria	3.1	(0.5)	5.7	(1.0)	0.4	(0.1)	**14.3**	(4.8)	0.7	(0.4)	2.5	(0.4)	5.2	(1.2)
	Belgium	3.0	(0.3)	5.5	(0.5)	0.5	(0.2)	**10.9**	(5.1)	1.9	(0.5)	2.8	(0.5)	3.9	(0.9)
	Canada	2.0	(0.1)	3.7	(0.3)	0.3	(0.1)	**10.9**	(2.8)	0.5	(0.2)	1.6	(0.2)	2.5	(0.4)
	Chile	0.4	(0.1)	0.8	(0.2)	0.1	(0.1)	12.6	(19.3)	0.2	(0.1)	0.4	(0.1)	1.3	(0.6)
	Czech Republic	3.2	(0.3)	6.0	(0.5)	0.4	(0.1)	**17.0**	(6.5)	0.6	(0.3)	2.9	(0.5)	5.7	(1.0)
	Denmark	1.3	(0.2)	2.5	(0.3)	0.0	(0.0)	**133.0**	(203.9)	0.3	(0.2)	1.0	(0.2)	2.0	(0.5)
	Estonia	8.1	(0.4)	14.7	(0.7)	1.2	(0.2)	**12.2**	(2.5)	4.5	(1.3)	6.9	(0.6)	9.3	(0.9)
	Finland	1.7	(0.2)	3.1	(0.4)	0.2	(0.1)	**15.6**	(9.4)	0.7	(0.4)	1.5	(0.3)	1.7	(0.4)
	France	2.8	(0.2)	5.4	(0.4)	0.2	(0.1)	**31.7**	(17.4)	1.1	(0.3)	2.4	(0.3)	3.9	(0.6)
	Germany	2.8	(0.2)	5.1	(0.4)	0.4	(0.1)	**11.7**	(3.2)	0.8	(0.3)	2.0	(0.3)	3.9	(0.7)
	Greece	3.0	(0.3)	5.3	(0.5)	0.6	(0.2)	**9.0**	(2.9)	2.5	(0.6)	3.0	(0.4)	4.1	(0.9)
	Hungary	4.3	(0.5)	7.9	(1.1)	0.7	(0.2)	**10.7**	(2.8)	0.8	(0.3)	4.6	(0.7)	7.2	(1.1)
	Iceland	4.1	(0.4)	7.7	(0.7)	0.7	(0.2)	**11.2**	(3.6)	4.0	(0.7)	3.8	(0.5)	4.5	(1.3)
	Ireland	3.4	(0.3)	5.9	(0.4)	0.7	(0.2)	**8.2**	(2.1)	1.8	(0.6)	2.9	(0.3)	5.2	(0.9)
	Israel	2.8	(0.2)	4.4	(0.4)	1.2	(0.2)	**3.6**	(0.7)	0.9	(0.3)	2.6	(0.3)	5.5	(1.1)
	Italy	1.6	(0.2)	3.0	(0.4)	0.2	(0.1)	**13.4**	(7.2)	0.4	(0.2)	1.6	(0.3)	2.6	(0.7)
	Japan	2.4	(0.3)	4.4	(0.5)	0.4	(0.1)	**10.3**	(3.5)	0.7	(0.4)	2.0	(0.4)	2.6	(0.5)
	Korea	2.5	(0.2)	4.0	(0.4)	0.8	(0.1)	**5.0**	(1.1)	1.0	(0.4)	2.2	(0.3)	2.8	(0.5)
	Latvia	3.9	(0.3)	7.3	(0.6)	0.4	(0.1)	**16.7**	(6.0)	1.9	(0.5)	3.4	(0.4)	6.5	(0.9)
	Luxembourg	2.9	(0.2)	5.7	(0.5)	0.2	(0.1)	**31.3**	(12.6)	1.6	(0.4)	3.1	(0.3)	4.2	(0.7)
	Mexico	2.3	(0.2)	3.5	(0.4)	1.0	(0.2)	**3.4**	(0.7)	1.6	(0.3)	2.7	(0.4)	6.0	(2.3)
	Netherlands	1.8	(0.2)	3.5	(0.4)	0.0	(0.0)	**113.9**	(168.4)	0.4	(0.3)	1.7	(0.3)	2.4	(0.6)
	New Zealand	2.5	(0.2)	4.1	(0.4)	0.9	(0.2)	**4.7**	(1.1)	0.4	(0.2)	1.9	(0.3)	3.5	(0.8)
	Norway	1.1	(0.1)	2.1	(0.3)	0.1	(0.0)	**30.6**	(31.3)	1.0	(0.3)	1.0	(0.2)	1.6	(0.4)
	Poland	1.4	(0.2)	2.6	(0.3)	0.0	(0.0)	**67.3**	(103.8)	0.7	(0.3)	0.8	(0.2)	2.1	(0.6)
	Portugal	1.6	(0.2)	2.9	(0.3)	0.2	(0.1)	**14.3**	(5.6)	0.2	(0.2)	1.5	(0.2)	2.4	(0.6)
	Slovak Republic	2.9	(0.2)	5.2	(0.4)	0.5	(0.1)	**11.3**	(4.4)	1.1	(0.3)	2.7	(0.3)	5.7	(0.9)
	Slovenia	2.9	(0.2)	5.5	(0.5)	0.1	(0.0)	**72.8**	(42.1)	1.2	(0.5)	2.1	(0.3)	4.6	(0.7)
	Spain	3.6	(0.2)	6.5	(0.4)	0.7	(0.1)	**9.2**	(2.0)	3.4	(0.7)	3.6	(0.3)	4.0	(0.7)
	Sweden	2.7	(0.3)	5.0	(0.5)	0.3	(0.1)	**16.7**	(6.0)	1.2	(0.5)	2.5	(0.3)	3.5	(0.7)
	Switzerland	2.4	(0.2)	4.3	(0.5)	0.3	(0.1)	**13.6**	(5.6)	0.6	(0.3)	2.5	(0.4)	3.2	(0.7)
	Turkey	0.4	(0.1)	0.5	(0.2)	0.2	(0.1)	2.6	(1.4)	0.4	(0.1)	0.4	(0.1)	0.0	c
	United Kingdom	2.6	(0.2)	4.7	(0.4)	0.5	(0.1)	**9.1**	(1.9)	1.4	(0.4)	2.6	(0.4)	3.1	(0.6)
	United States	2.1	(0.2)	3.7	(0.4)	0.5	(0.1)	**7.0**	(2.2)	1.3	(0.4)	1.7	(0.3)	3.1	(0.7)
	OECD average	2.6	(0.0)	4.8	(0.1)	0.4	(0.0)	**22.2**	(8.3)	1.2	(0.1)	2.4	(0.1)	3.8	(0.1)
Partners	Albania	1.4	(0.1)	1.4	(0.2)	1.4	(0.2)	1.0	(0.2)	m	m	m	m	m	m
	Algeria	0.2	(0.1)	0.3	(0.1)	0.1	(0.1)	2.6	(2.2)	0.1	(0.1)	0.3	(0.2)	1.5	(2.3)
	Brazil	1.1	(0.1)	2.0	(0.2)	0.2	(0.1)	**8.9**	(3.3)	0.4	(0.1)	1.9	(0.2)	3.0	(0.9)
	B-S-J-G (China)	2.1	(0.2)	3.5	(0.3)	0.6	(0.2)	**5.9**	(2.1)	0.5	(0.2)	1.5	(0.3)	3.1	(0.6)
	Bulgaria	8.3	(0.9)	13.4	(1.5)	2.7	(0.4)	**4.9**	(0.7)	2.4	(0.4)	9.7	(1.0)	18.5	(3.1)
	CABA (Argentina)	1.6	(0.4)	3.2	(0.8)	0.1	(0.1)	**25.1**	(38.3)	0.7	(0.5)	1.7	(0.6)	2.6	(1.5)
	Colombia	4.0	(0.3)	7.4	(0.5)	0.9	(0.2)	**8.0**	(1.5)	3.3	(0.4)	4.6	(0.4)	6.3	(1.3)
	Costa Rica	3.6	(0.3)	6.2	(0.5)	1.1	(0.2)	**5.4**	(1.2)	1.9	(0.4)	4.9	(0.5)	7.9	(2.5)
	Croatia	3.0	(0.3)	5.8	(0.6)	0.5	(0.1)	**11.2**	(3.5)	0.4	(0.2)	2.5	(0.4)	7.3	(1.2)
	Cyprus*	4.0	(0.3)	7.2	(0.6)	0.8	(0.2)	**9.0**	(2.3)	2.6	(0.4)	4.8	(0.5)	5.7	(1.5)
	Dominican Republic	2.1	(0.2)	3.8	(0.5)	0.5	(0.2)	**8.3**	(3.8)	1.7	(0.3)	4.5	(0.9)	c	c
	FYROM	3.8	(0.3)	6.5	(0.5)	0.9	(0.2)	**7.5**	(1.6)	2.3	(0.3)	6.2	(0.7)	11.8	(4.6)
	Georgia	2.7	(0.3)	4.8	(0.5)	0.4	(0.1)	**11.9**	(4.0)	2.2	(0.3)	3.0	(0.4)	5.0	(1.9)
	Hong Kong (China)	1.7	(0.2)	2.7	(0.4)	0.7	(0.2)	**4.0**	(1.4)	0.5	(0.4)	1.6	(0.2)	2.1	(0.4)
	Indonesia	0.6	(0.1)	0.8	(0.2)	0.4	(0.2)	2.0	(0.9)	0.4	(0.1)	0.8	(0.2)	2.5	(1.9)
	Jordan	0.2	(0.1)	0.3	(0.1)	0.1	(0.0)	**3.7**	(1.6)	0.1	(0.0)	0.3	(0.1)	0.6	(0.9)
	Kosovo	0.7	(0.1)	1.2	(0.3)	0.1	(0.1)	**9.8**	(11.2)	0.3	(0.1)	1.3	(0.4)	c	c
	Lebanon	0.6	(0.1)	1.0	(0.2)	0.2	(0.1)	**5.1**	(3.3)	0.2	(0.1)	1.0	(0.3)	1.5	(1.1)
	Lithuania	4.9	(0.3)	8.9	(0.6)	0.7	(0.2)	**12.3**	(3.2)	1.8	(0.5)	5.0	(0.4)	8.7	(1.2)
	Macao (China)	2.6	(0.2)	4.7	(0.4)	0.4	(0.1)	**10.4**	(2.9)	0.7	(0.6)	2.0	(0.3)	3.3	(0.6)
	Malta	5.0	(0.3)	8.5	(0.7)	1.5	(0.3)	**5.5**	(1.2)	2.9	(0.6)	5.4	(0.7)	7.9	(1.4)
	Moldova	5.1	(0.4)	9.3	(0.7)	0.9	(0.2)	**10.8**	(2.4)	3.0	(0.5)	6.2	(0.6)	9.7	(2.3)
	Montenegro	2.1	(0.2)	3.9	(0.3)	0.3	(0.1)	**13.0**	(6.1)	0.6	(0.2)	3.0	(0.4)	9.9	(2.1)
	Peru	3.7	(0.2)	6.4	(0.4)	1.0	(0.2)	**6.6**	(1.4)	2.2	(0.3)	5.6	(0.5)	7.2	(2.9)
	Qatar	1.4	(0.1)	1.7	(0.2)	1.0	(0.1)	**1.8**	(0.3)	0.6	(0.1)	1.8	(0.2)	3.4	(0.7)
	Romania	5.1	(0.4)	7.7	(0.8)	2.5	(0.3)	**3.1**	(0.5)	1.2	(0.3)	6.8	(0.6)	13.4	(2.7)
	Russia	4.1	(0.2)	7.2	(0.5)	1.0	(0.2)	**7.3**	(1.7)	2.2	(0.5)	3.7	(0.3)	6.3	(0.9)
	Singapore	1.7	(0.2)	2.9	(0.3)	0.3	(0.1)	**8.9**	(3.1)	0.9	(0.5)	1.4	(0.3)	1.5	(0.3)
	Chinese Taipei	3.4	(0.2)	6.1	(0.3)	0.6	(0.2)	**9.4**	(2.6)	1.2	(0.4)	2.7	(0.3)	4.3	(0.6)
	Thailand	1.4	(0.2)	2.7	(0.4)	0.4	(0.1)	**6.5**	(2.2)	0.5	(0.1)	2.1	(0.3)	3.2	(1.3)
	Trinidad and Tobago	1.4	(0.2)	2.4	(0.3)	0.5	(0.2)	**4.9**	(2.1)	0.8	(0.2)	1.7	(0.3)	3.1	(1.3)
	Tunisia	1.5	(0.2)	2.7	(0.4)	0.4	(0.1)	**6.3**	(2.0)	0.8	(0.2)	2.6	(0.5)	9.2	(6.7)
	United Arab Emirates	1.4	(0.1)	2.3	(0.2)	0.6	(0.1)	**3.9**	(1.0)	0.4	(0.1)	1.8	(0.2)	3.3	(0.7)
	Uruguay	2.0	(0.4)	3.9	(0.7)	0.3	(0.1)	**12.2**	(4.9)	0.7	(0.2)	2.2	(0.5)	6.4	(1.8)
	Viet Nam	1.0	(0.1)	1.9	(0.3)	0.2	(0.1)	**10.7**	(7.4)	0.0	(0.1)	0.6	(0.2)	1.9	(0.4)
	Argentina**	0.7	(0.1)	1.3	(0.2)	0.2	(0.1)	**7.5**	(5.6)	0.4	(0.2)	0.9	(0.2)	1.7	(0.8)
	Kazakhstan**	1.9	(0.2)	3.1	(0.4)	0.5	(0.1)	**5.7**	(1.5)	1.4	(0.4)	1.9	(0.3)	3.1	(1.1)
	Malaysia**	1.3	(0.2)	2.4	(0.3)	0.4	(0.1)	**6.6**	(2.3)	1.0	(0.3)	1.4	(0.2)	2.6	(1.0)

1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.11c Students expecting to work as ICT professionals,1 by gender and performance in science

Results based on students' self-reports

		Students who expect to work as information and communications technology (ICT) professionals at age 30											
		Top performers in science (students performing at Level 5 or above)		Increased likelihood of top performers in science expecting that they will work in science-related occupations		Students whose parents have not completed secondary education		Students whose parents attained secondary education as their highest level of education		Students whose father or mother completed tertiary education		Increased likelihood of students with at least one tertiary-educated parent expecting that they will work in science-related occupations	
		%	S.E.	Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.
OECD	Australia	3.7	(0.7)	**1.5**	(0.3)	2.6	(0.5)	2.1	(0.3)	2.8	(0.2)	1.3	(0.2)
	Austria	7.8	(2.0)	**2.9**	(0.7)	2.1	(0.9)	3.0	(0.5)	3.3	(0.7)	1.1	(0.2)
	Belgium	5.8	(1.7)	**2.0**	(0.7)	4.8	(1.6)	3.8	(0.9)	2.6	(0.3)	0.7	(0.2)
	Canada	4.0	(0.7)	**2.3**	(0.4)	0.1	(0.1)	1.9	(0.3)	2.2	(0.2)	1.3	(0.3)
	Chile	2.3	(1.7)	**5.8**	(4.6)	0.0	c	0.6	(0.2)	0.4	(0.1)	0.9	(0.4)
	Czech Republic	6.3	(1.5)	**2.1**	(0.6)	2.0	(1.0)	3.2	(0.4)	3.7	(0.4)	1.2	(0.2)
	Denmark	3.2	(1.0)	**2.9**	(1.1)	1.4	(0.6)	1.4	(0.4)	1.2	(0.2)	0.9	(0.2)
	Estonia	12.5	(1.4)	**1.7**	(0.2)	8.0	(2.5)	8.7	(0.7)	8.0	(0.5)	0.9	(0.1)
	Finland	2.9	(0.7)	**1.9**	(0.6)	0.0	c	1.8	(0.5)	1.7	(0.2)	1.1	(0.3)
	France	6.3	(1.4)	**2.6**	(0.6)	2.8	(0.7)	2.9	(0.4)	2.8	(0.3)	1.0	(0.2)
	Germany	6.9	(1.1)	**3.0**	(0.6)	2.5	(0.5)	3.1	(0.5)	3.4	(0.4)	1.2	(0.2)
	Greece	6.8	(2.8)	**2.3**	(1.0)	3.1	(1.4)	2.4	(0.5)	3.4	(0.4)	1.3	(0.3)
	Hungary	10.1	(2.3)	**2.5**	(0.6)	1.3	(0.6)	4.1	(0.7)	5.0	(0.7)	**1.3**	(0.2)
	Iceland	6.5	(2.6)	1.6	(0.7)	6.0	(1.8)	2.7	(0.7)	4.4	(0.4)	1.3	(0.3)
	Ireland	5.7	(1.4)	**1.8**	(0.5)	5.1	(1.4)	3.8	(0.4)	3.2	(0.3)	0.8	(0.1)
	Israel	7.6	(1.8)	**3.1**	(0.8)	1.1	(0.6)	1.9	(0.3)	3.4	(0.3)	**1.8**	(0.3)
	Italy	4.6	(1.5)	**3.1**	(1.1)	1.3	(0.3)	2.0	(0.4)	1.4	(0.3)	0.8	(0.1)
	Japan	4.6	(0.8)	**2.3**	(0.4)	0.7	(0.7)	2.7	(0.4)	2.4	(0.3)	0.9	(0.1)
	Korea	5.0	(1.1)	**2.3**	(0.6)	2.5	(1.2)	1.7	(0.3)	3.0	(0.3)	**1.7**	(0.3)
	Latvia	9.0	(2.6)	**2.5**	(0.8)	4.1	(2.3)	3.5	(0.5)	4.1	(0.4)	1.2	(0.2)
	Luxembourg	3.6	(1.2)	1.3	(0.4)	2.9	(0.5)	3.6	(0.5)	2.6	(0.3)	0.8	(0.1)
	Mexico	c	c	5.3	(6.8)	1.8	(0.3)	3.3	(0.5)	2.4	(0.3)	1.1	(0.2)
	Netherlands	2.9	(0.8)	1.8	(0.6)	1.4	(0.7)	1.3	(0.3)	1.9	(0.3)	1.5	(0.4)
	New Zealand	5.8	(1.1)	**3.0**	(0.7)	2.1	(0.9)	2.3	(0.4)	2.8	(0.3)	1.2	(0.2)
	Norway	1.0	(0.5)	0.9	(0.5)	0.0	c	1.4	(0.3)	1.0	(0.2)	0.8	(0.2)
	Poland	4.8	(1.3)	**4.4**	(1.4)	0.7	(0.5)	1.3	(0.2)	1.7	(0.4)	1.4	(0.4)
	Portugal	3.2	(0.9)	**2.2**	(0.7)	1.1	(0.2)	1.6	(0.3)	2.2	(0.4)	**1.7**	(0.4)
	Slovak Republic	10.2	(2.2)	**3.9**	(0.9)	0.5	(0.5)	2.8	(0.3)	3.3	(0.4)	1.2	(0.2)
	Slovenia	5.2	(1.3)	**2.0**	(0.6)	0.3	(0.3)	2.3	(0.3)	3.5	(0.4)	**1.6**	(0.3)
	Spain	3.3	(1.4)	0.9	(0.4)	3.9	(0.6)	4.0	(0.6)	3.4	(0.3)	0.9	(0.1)
	Sweden	6.1	(1.4)	**2.6**	(0.7)	1.5	(0.8)	2.0	(0.4)	3.0	(0.3)	**1.6**	(0.3)
	Switzerland	3.6	(1.2)	1.6	(0.6)	2.2	(0.9)	2.0	(0.4)	2.7	(0.4)	1.3	(0.4)
	Turkey	c	c	0.0	c	0.4	(0.1)	0.4	(0.1)	0.4	(0.2)	1.0	(0.6)
	United Kingdom	3.9	(0.8)	1.6	(0.4)	4.0	(1.5)	2.7	(0.4)	2.4	(0.3)	0.9	(0.2)
	United States	4.9	(1.2)	**2.7**	(0.8)	1.3	(0.5)	2.6	(0.5)	2.1	(0.3)	0.9	(0.2)
	OECD average	5.5	(0.3)	**2.4**	(0.3)	2.2	(0.2)	2.6	(0.1)	2.8	(0.1)	**1.2**	(0.0)
Partners	Albania	m	m	m	m	0.9	(0.4)	1.0	(0.2)	2.3	(0.4)	**2.3**	(0.6)
	Algeria	c	c	m	m	0.1	(0.1)	0.2	(0.1)	0.4	(0.2)	2.8	(2.2)
	Brazil	1.3	(1.5)	1.1	(1.3)	0.8	(0.2)	1.0	(0.1)	1.7	(0.2)	**1.9**	(0.3)
	B-S-J-G (China)	4.7	(0.9)	**2.7**	(0.7)	1.7	(0.2)	2.8	(0.5)	2.6	(0.5)	1.3	(0.3)
	Bulgaria	22.2	(7.4)	**2.8**	(0.8)	2.1	(0.9)	6.6	(0.8)	10.3	(1.3)	**1.7**	(0.2)
	CABA (Argentina)	1.7	(2.5)	1.0	(1.8)	1.2	(0.7)	0.8	(0.6)	2.0	(0.5)	2.1	(1.0)
	Colombia	7.3	(5.3)	1.8	(1.3)	3.7	(0.6)	4.4	(0.5)	4.0	(0.4)	1.0	(0.1)
	Costa Rica	c	c	2.9	(4.1)	2.0	(0.4)	3.7	(0.6)	4.7	(0.4)	**1.7**	(0.3)
	Croatia	12.5	(2.4)	**4.7**	(1.1)	1.0	(0.7)	2.4	(0.4)	3.8	(0.4)	**1.7**	(0.3)
	Cyprus*	9.7	(3.9)	**2.5**	(1.0)	3.5	(1.2)	3.4	(0.4)	4.5	(0.4)	**1.3**	(0.2)
	Dominican Republic	c	c	m	m	2.0	(0.6)	1.8	(0.4)	2.4	(0.3)	1.3	(0.3)
	FYROM	c	c	2.3	(4.3)	1.5	(0.5)	3.7	(0.4)	4.5	(0.5)	**1.4**	(0.2)
	Georgia	5.8	(4.7)	2.2	(1.8)	0.0	c	2.6	(0.3)	2.9	(0.4)	1.2	(0.2)
	Hong Kong (China)	3.0	(1.0)	1.8	(0.7)	2.0	(0.4)	1.3	(0.3)	2.3	(0.5)	1.5	(0.3)
	Indonesia	c	c	2.8	(10.8)	0.3	(0.1)	0.8	(0.2)	1.4	(0.4)	**2.8**	(1.1)
	Jordan	c	c	1.9	(7.2)	0.0	c	0.1	(0.0)	0.3	(0.1)	**7.1**	(6.6)
	Kosovo	c	c	m	m	0.2	(0.2)	0.2	(0.1)	1.0	(0.2)	**4.6**	(2.9)
	Lebanon	c	c	0.0	c	0.3	(0.2)	0.5	(0.2)	0.7	(0.2)	1.6	(0.7)
	Lithuania	7.4	(2.3)	1.6	(0.5)	2.0	(1.4)	2.7	(0.4)	6.0	(0.4)	**2.2**	(0.4)
	Macao (China)	5.3	(1.4)	**2.3**	(0.7)	2.5	(0.4)	3.1	(0.5)	1.9	(0.4)	0.7	(0.2)
	Malta	6.1	(1.7)	1.2	(0.4)	4.1	(0.6)	4.6	(0.6)	6.0	(0.6)	**1.4**	(0.2)
	Moldova	10.0	(6.3)	2.0	(1.3)	1.5	(0.5)	4.8	(0.5)	6.3	(0.5)	**1.5**	(0.2)
	Montenegro	c	c	**6.9**	(4.3)	1.3	(1.3)	2.0	(0.3)	2.2	(0.2)	1.1	(0.2)
	Peru	c	c	3.1	(4.3)	1.6	(0.4)	3.9	(0.4)	4.3	(0.4)	**1.3**	(0.2)
	Qatar	5.2	(2.1)	**4.0**	(1.7)	0.9	(0.3)	0.6	(0.2)	1.6	(0.1)	**2.3**	(0.6)
	Romania	16.8	(8.7)	**3.4**	(1.8)	2.1	(0.9)	3.7	(0.5)	6.6	(0.6)	**1.9**	(0.3)
	Russia	8.9	(2.5)	**2.3**	(0.7)	5.7	(3.3)	3.8	(1.1)	4.2	(0.2)	1.0	(0.3)
	Singapore	2.7	(0.5)	**2.0**	(0.5)	1.8	(0.6)	1.6	(0.3)	1.7	(0.3)	1.1	(0.2)
	Chinese Taipei	5.6	(0.7)	**1.9**	(0.3)	3.3	(0.6)	3.4	(0.4)	3.4	(0.3)	1.0	(0.1)
	Thailand	2.4	(3.7)	1.8	(2.7)	0.9	(0.1)	1.1	(0.2)	3.0	(0.6)	**3.1**	(0.8)
	Trinidad and Tobago	4.8	(3.4)	3.5	(2.5)	1.2	(0.5)	1.3	(0.3)	1.8	(0.3)	1.4	(0.4)
	Tunisia	c	c	m	m	0.3	(0.2)	1.1	(0.3)	2.7	(0.4)	**3.3**	(0.8)
	United Arab Emirates	4.5	(1.4)	**3.4**	(1.0)	0.1	(0.1)	0.7	(0.2)	1.8	(0.2)	**3.0**	(0.9)
	Uruguay	10.9	(5.0)	**5.7**	(2.4)	1.2	(0.2)	2.3	(0.5)	2.9	(0.7)	**1.8**	(0.3)
	Viet Nam	2.1	(0.8)	2.3	(1.0)	0.6	(0.1)	1.6	(0.3)	2.3	(0.9)	**2.5**	(1.1)
	Argentina**	1.1	(1.9)	1.5	(2.8)	0.4	(0.2)	0.7	(0.3)	1.0	(0.2)	1.9	(0.9)
	Kazakhstan**	2.8	(2.2)	1.5	(1.3)	0.0	c	0.9	(0.5)	2.0	(0.2)	2.3	(1.5)
	Malaysia**	2.0	(3.2)	1.5	(2.6)	1.3	(0.5)	1.2	(0.2)	1.8	(0.3)	1.5	(0.3)

1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 1/2]

Table I.3.11d Students expecting to work as science-related technicians or associate professionals,[1] by gender and performance in science

Results based on students' self-reports

		Students expecting that they will work as science-related technicians or associate professionals at age 30													
		All students		Boys		Girls		Increased likelihood of boys expecting that they will work in science-related occupations		Low achievers in science (students performing below Level 2)		Moderate performers in science (students performing at Level 2 or 3)		Strong performers in science (students performing at Level 4)	
		%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	1.3	(0.1)	1.5	(0.2)	1.1	(0.1)	1.4	(0.2)	0.4	(0.2)	1.2	(0.2)	1.8	(0.3)
	Austria	2.0	(0.2)	2.6	(0.4)	1.3	(0.3)	**2.0**	(0.6)	1.3	(0.4)	2.3	(0.4)	1.8	(0.5)
	Belgium	0.4	(0.1)	0.3	(0.1)	0.6	(0.2)	0.5	(0.3)	0.2	(0.2)	0.4	(0.2)	0.6	(0.4)
	Canada	0.6	(0.1)	0.4	(0.1)	0.8	(0.1)	**0.5**	(0.1)	0.3	(0.2)	0.7	(0.1)	0.5	(0.1)
	Chile	1.4	(0.2)	2.2	(0.4)	0.6	(0.2)	**3.8**	(1.4)	1.8	(0.5)	1.3	(0.3)	0.5	(0.4)
	Czech Republic	2.3	(0.3)	3.5	(0.4)	0.9	(0.4)	**3.8**	(1.8)	0.6	(0.3)	2.5	(0.4)	3.0	(0.7)
	Denmark	0.7	(0.1)	0.5	(0.1)	0.8	(0.1)	0.7	(0.2)	0.5	(0.2)	0.5	(0.1)	0.9	(0.3)
	Estonia	0.8	(0.1)	1.3	(0.2)	0.2	(0.1)	**6.5**	(4.5)	1.9	(0.8)	0.8	(0.2)	0.6	(0.2)
	Finland	0.7	(0.1)	0.9	(0.2)	0.6	(0.1)	1.5	(0.5)	0.4	(0.3)	0.7	(0.2)	0.7	(0.3)
	France	0.9	(0.1)	1.0	(0.2)	0.8	(0.2)	1.2	(0.4)	0.9	(0.3)	1.0	(0.2)	0.8	(0.3)
	Germany	1.2	(0.2)	1.1	(0.2)	1.3	(0.2)	0.8	(0.2)	0.8	(0.3)	1.2	(0.2)	1.5	(0.4)
	Greece	0.9	(0.2)	1.4	(0.3)	0.3	(0.1)	**4.3**	(2.5)	1.1	(0.4)	0.8	(0.2)	0.8	(0.4)
	Hungary	1.1	(0.2)	1.7	(0.3)	0.4	(0.1)	**3.8**	(1.5)	0.9	(0.4)	1.3	(0.2)	0.7	(0.3)
	Iceland	0.1	(0.0)	0.1	(0.1)	0.1	(0.1)	2.1	(3.9)	0.0	c	0.1	(0.1)	0.1	(0.2)
	Ireland	1.3	(0.2)	1.6	(0.3)	1.0	(0.2)	1.6	(0.5)	0.5	(0.3)	1.1	(0.2)	2.5	(0.5)
	Israel	0.5	(0.1)	0.6	(0.2)	0.3	(0.1)	1.9	(0.7)	0.2	(0.1)	0.5	(0.2)	0.8	(0.3)
	Italy	1.9	(0.2)	3.3	(0.4)	0.5	(0.1)	**6.7**	(2.0)	1.5	(0.4)	2.0	(0.3)	1.9	(0.4)
	Japan	0.9	(0.1)	1.3	(0.2)	0.5	(0.1)	**2.7**	(1.0)	0.1	(0.1)	0.6	(0.2)	1.3	(0.3)
	Korea	2.3	(0.3)	3.9	(0.5)	0.4	(0.1)	**9.0**	(3.1)	2.1	(0.6)	2.0	(0.4)	2.4	(0.6)
	Latvia	0.8	(0.1)	1.1	(0.2)	0.4	(0.1)	**2.5**	(1.0)	0.9	(0.5)	0.8	(0.2)	0.6	(0.3)
	Luxembourg	1.4	(0.2)	2.0	(0.3)	0.7	(0.2)	**2.8**	(0.8)	2.0	(0.5)	1.3	(0.3)	0.8	(0.3)
	Mexico	1.0	(0.1)	1.4	(0.2)	0.5	(0.1)	**3.0**	(0.8)	0.9	(0.2)	1.0	(0.2)	2.2	(1.5)
	Netherlands	1.4	(0.1)	1.4	(0.2)	1.4	(0.2)	1.0	(0.2)	1.0	(0.4)	1.0	(0.2)	2.0	(0.4)
	New Zealand	0.6	(0.1)	0.3	(0.1)	0.9	(0.2)	**0.4**	(0.2)	0.2	(0.2)	0.5	(0.2)	1.0	(0.4)
	Norway	4.3	(0.3)	7.6	(0.6)	0.8	(0.2)	**9.5**	(2.0)	3.9	(0.8)	4.7	(0.5)	4.1	(0.9)
	Poland	1.0	(0.2)	1.4	(0.3)	0.5	(0.1)	**2.8**	(1.0)	0.4	(0.3)	1.0	(0.2)	1.3	(0.4)
	Portugal	0.4	(0.1)	0.3	(0.1)	0.4	(0.1)	0.7	(0.3)	0.3	(0.2)	0.5	(0.1)	0.3	(0.2)
	Slovak Republic	2.4	(0.3)	4.1	(0.5)	0.6	(0.2)	**7.4**	(2.7)	1.9	(0.4)	2.8	(0.4)	2.1	(0.6)
	Slovenia	8.5	(0.4)	13.6	(0.6)	3.2	(0.4)	**4.3**	(0.5)	7.6	(1.1)	10.7	(0.6)	6.3	(0.8)
	Spain	0.6	(0.1)	0.8	(0.2)	0.5	(0.1)	1.6	(0.6)	0.6	(0.3)	0.6	(0.1)	0.6	(0.3)
	Sweden	3.1	(0.2)	5.1	(0.4)	1.1	(0.2)	**4.7**	(0.9)	1.6	(0.4)	2.6	(0.3)	4.6	(0.8)
	Switzerland	3.0	(0.3)	3.6	(0.4)	2.4	(0.4)	**1.5**	(0.3)	3.5	(0.7)	3.3	(0.4)	2.6	(0.6)
	Turkey	0.5	(0.1)	0.8	(0.2)	0.2	(0.1)	**4.0**	(2.6)	0.7	(0.2)	0.4	(0.2)	0.1	(0.3)
	United Kingdom	0.3	(0.1)	0.3	(0.1)	0.3	(0.1)	1.1	(0.5)	0.2	(0.1)	0.4	(0.1)	0.2	(0.1)
	United States	0.7	(0.1)	0.4	(0.1)	1.0	(0.2)	**0.4**	(0.2)	0.7	(0.3)	0.8	(0.2)	0.8	(0.3)
	OECD average	1.5	(0.0)	2.1	(0.1)	0.8	(0.0)	**2.9**	(0.3)	1.2	(0.1)	1.5	(0.0)	1.5	(0.1)
Partners	Albania	1.0	(0.1)	1.2	(0.2)	0.8	(0.2)	1.4	(0.5)	m	m	m	m	m	m
	Algeria	0.2	(0.1)	0.3	(0.1)	0.2	(0.1)	1.8	(2.3)	0.3	(0.1)	0.1	(0.2)	0.0	c
	Brazil	0.4	(0.1)	0.5	(0.1)	0.2	(0.1)	2.0	(0.8)	0.4	(0.1)	0.4	(0.1)	0.1	(0.2)
	B-S-J-G (China)	0.4	(0.1)	0.5	(0.1)	0.3	(0.1)	1.7	(0.8)	0.5	(0.2)	0.4	(0.1)	0.6	(0.2)
	Bulgaria	2.0	(0.3)	3.4	(0.5)	0.5	(0.2)	**7.1**	(3.0)	2.4	(0.5)	2.1	(0.4)	0.8	(0.4)
	CABA (Argentina)	0.4	(0.2)	0.6	(0.3)	0.1	(0.1)	4.1	(5.2)	0.3	(0.5)	0.4	(0.3)	0.1	(0.3)
	Colombia	1.1	(0.1)	2.0	(0.2)	0.3	(0.1)	**6.5**	(2.5)	1.4	(0.2)	0.9	(0.2)	0.3	(0.4)
	Costa Rica	2.4	(0.2)	1.3	(0.2)	3.4	(0.4)	**0.4**	(0.1)	2.5	(0.4)	2.2	(0.3)	3.6	(1.8)
	Croatia	4.1	(0.4)	7.0	(0.6)	1.4	(0.4)	**4.8**	(1.3)	3.5	(0.8)	4.9	(0.6)	2.8	(0.8)
	Cyprus*	0.2	(0.1)	0.5	(0.1)	0.0	c	m	m	0.2	(0.1)	0.3	(0.1)	0.4	(0.3)
	Dominican Republic	1.0	(0.2)	0.8	(0.1)	1.2	(0.3)	0.6	(0.2)	1.0	(0.2)	0.6	(0.3)	c	c
	FYROM	2.0	(0.2)	2.5	(0.3)	1.4	(0.3)	**1.7**	(0.3)	2.0	(0.3)	1.6	(0.3)	5.1	(2.8)
	Georgia	0.1	(0.0)	0.1	(0.1)	0.0	c	m	m	0.1	(0.1)	0.0	(0.0)	0.0	c
	Hong Kong (China)	0.3	(0.1)	0.3	(0.1)	0.3	(0.1)	1.4	(0.7)	0.1	(0.2)	0.1	(0.1)	0.5	(0.2)
	Indonesia	0.1	(0.0)	0.2	(0.1)	0.0	(0.0)	5.7	(9.2)	0.1	(0.1)	0.1	(0.1)	0.7	(1.1)
	Jordan	0.9	(0.2)	1.0	(0.2)	0.8	(0.3)	1.1	(0.5)	0.9	(0.3)	0.9	(0.2)	0.5	(0.7)
	Kosovo	0.4	(0.1)	0.4	(0.2)	0.3	(0.1)	1.2	(0.8)	0.3	(0.1)	0.5	(0.3)	c	c
	Lebanon	0.5	(0.1)	0.5	(0.2)	0.4	(0.1)	1.3	(0.6)	0.3	(0.1)	0.7	(0.3)	0.5	(0.7)
	Lithuania	0.3	(0.1)	0.3	(0.1)	0.3	(0.1)	1.0	(0.5)	0.3	(0.2)	0.3	(0.1)	0.2	(0.2)
	Macao (China)	0.5	(0.1)	0.8	(0.2)	0.1	(0.0)	**6.2**	(2.1)	0.4	(0.4)	0.3	(0.1)	0.6	(0.2)
	Malta	1.0	(0.2)	1.5	(0.3)	0.4	(0.1)	**3.7**	(1.3)	1.2	(0.3)	0.9	(0.3)	0.7	(0.4)
	Moldova	0.6	(0.1)	1.0	(0.2)	0.1	(0.1)	**10.3**	(8.7)	0.7	(0.2)	0.5	(0.2)	0.0	(0.2)
	Montenegro	2.3	(0.2)	3.0	(0.3)	1.5	(0.2)	**2.0**	(0.3)	2.3	(0.3)	2.3	(0.3)	1.5	(0.9)
	Peru	0.5	(0.1)	0.8	(0.2)	0.2	(0.1)	**3.7**	(1.3)	0.6	(0.1)	0.4	(0.2)	0.0	c
	Qatar	0.9	(0.1)	1.2	(0.1)	0.5	(0.1)	**2.4**	(0.5)	0.4	(0.1)	1.2	(0.2)	2.3	(0.5)
	Romania	0.5	(0.2)	0.9	(0.3)	0.2	(0.1)	**3.6**	(2.1)	0.5	(0.1)	0.6	(0.3)	0.4	(0.5)
	Russia	1.3	(0.1)	1.7	(0.2)	1.0	(0.2)	**1.7**	(0.4)	2.4	(0.5)	1.3	(0.2)	0.3	(0.2)
	Singapore	0.5	(0.1)	0.6	(0.1)	0.5	(0.1)	1.2	(0.4)	0.6	(0.4)	0.5	(0.2)	0.6	(0.2)
	Chinese Taipei	2.4	(0.2)	3.0	(0.4)	1.8	(0.3)	**1.6**	(0.3)	1.3	(0.5)	2.1	(0.3)	2.8	(0.5)
	Thailand	0.2	(0.1)	0.6	(0.2)	0.0	(0.0)	**39.2**	(57.3)	0.3	(0.1)	0.2	(0.1)	0.0	c
	Trinidad and Tobago	0.3	(0.1)	0.3	(0.1)	0.3	(0.2)	1.1	(0.8)	0.2	(0.2)	0.4	(0.1)	0.4	(0.4)
	Tunisia	0.1	(0.0)	0.2	(0.1)	0.0	c	m	m	0.1	(0.0)	0.2	(0.1)	0.0	c
	United Arab Emirates	0.7	(0.1)	0.7	(0.1)	0.8	(0.1)	0.9	(0.2)	0.6	(0.2)	0.9	(0.2)	0.6	(0.3)
	Uruguay	0.7	(0.1)	0.8	(0.2)	0.6	(0.1)	1.3	(0.4)	0.7	(0.2)	0.7	(0.2)	0.6	(0.4)
	Viet Nam	0.4	(0.1)	0.6	(0.2)	0.1	(0.1)	**5.1**	(3.4)	0.1	(0.3)	0.3	(0.1)	0.6	(0.2)
	Argentina**	0.9	(0.2)	1.5	(0.3)	0.3	(0.1)	**5.8**	(2.4)	0.6	(0.2)	1.0	(0.2)	1.3	(1.0)
	Kazakhstan**	1.7	(0.2)	3.0	(0.3)	0.3	(0.1)	**8.8**	(4.3)	2.5	(0.5)	1.4	(0.2)	1.6	(0.7)
	Malaysia**	0.6	(0.1)	0.8	(0.2)	0.4	(0.1)	2.3	(1.1)	0.5	(0.2)	0.6	(0.1)	0.4	(0.4)

1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433183

[Part 2/2]

Table I.3.11d Students expecting to work as science-related technicians or associate professionals,[1] by gender and performance in science

Results based on students' self-reports

		Students expecting that they will work as science-related technicians or associate professionals at age 30											
		Top performers in science (students performing at Level 5 or above)		Increased likelihood of top performers in science expecting that they will work in science-related occupations		Students whose parents have not completed secondary education		Students whose parents attained secondary education as their highest level of education		Students whose father or mother completed tertiary education		Increased likelihood of students with at least one tertiary-educated parent expecting that they will work in science-related occupations	
		%	S.E.	Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.
OECD	Australia	2.3	(0.5)	**1.9**	(0.4)	0.5	(0.2)	1.4	(0.2)	1.5	(0.2)	1.2	(0.2)
	Austria	2.3	(0.8)	1.2	(0.4)	2.2	(1.2)	2.2	(0.3)	1.8	(0.3)	0.8	(0.2)
	Belgium	0.8	(0.7)	2.0	(1.9)	0.5	(0.5)	0.2	(0.1)	0.5	(0.2)	1.9	(1.6)
	Canada	0.5	(0.2)	0.8	(0.3)	1.3	(0.7)	0.6	(0.2)	0.6	(0.1)	0.9	(0.3)
	Chile	0.3	(1.3)	0.2	(0.9)	2.0	(0.6)	1.5	(0.3)	1.1	(0.3)	0.7	(0.2)
	Czech Republic	2.8	(1.0)	1.3	(0.5)	2.0	(0.9)	2.4	(0.4)	2.2	(0.4)	1.0	(0.2)
	Denmark	1.3	(0.8)	2.2	(1.4)	0.6	(0.2)	1.7	(0.5)	0.5	(0.1)	**0.4**	(0.1)
	Estonia	0.3	(0.2)	0.3	(0.3)	0.5	(0.5)	1.1	(0.3)	0.7	(0.1)	0.7	(0.2)
	Finland	0.8	(0.4)	1.1	(0.6)	1.1	(1.0)	0.2	(0.1)	0.8	(0.1)	2.9	(2.3)
	France	0.9	(0.5)	1.0	(0.6)	1.3	(0.7)	1.3	(0.3)	0.7	(0.2)	**0.5**	(0.2)
	Germany	1.3	(0.5)	1.1	(0.5)	1.5	(0.3)	1.5	(0.4)	1.2	(0.2)	0.8	(0.2)
	Greece	0.9	(1.1)	1.0	(1.3)	1.2	(0.7)	1.2	(0.4)	0.7	(0.2)	0.5	(0.2)
	Hungary	0.8	(0.6)	0.8	(0.6)	0.3	(0.3)	1.1	(0.2)	1.1	(0.3)	1.1	(0.3)
	Iceland	0.0	c	0.0	c	0.0	c	0.0	c	0.1	(0.1)	m	m
	Ireland	1.7	(0.9)	1.3	(0.7)	0.3	(0.3)	0.8	(0.2)	1.7	(0.2)	**2.2**	(0.7)
	Israel	0.5	(0.5)	1.2	(1.3)	0.0	c	0.6	(0.2)	0.4	(0.1)	0.8	(0.3)
	Italy	1.6	(0.9)	0.9	(0.5)	2.5	(0.6)	2.0	(0.3)	1.5	(0.2)	0.7	(0.1)
	Japan	1.6	(0.5)	**2.1**	(0.8)	0.0	c	0.7	(0.2)	1.1	(0.2)	1.6	(0.6)
	Korea	3.1	(0.8)	1.4	(0.4)	2.6	(1.5)	2.9	(0.5)	1.8	(0.2)	**0.6**	(0.1)
	Latvia	0.9	(1.1)	1.2	(1.5)	0.0	c	0.6	(0.2)	0.9	(0.2)	1.5	(0.5)
	Luxembourg	0.5	(0.4)	0.3	(0.3)	0.8	(0.3)	2.2	(0.4)	1.1	(0.2)	0.7	(0.2)
	Mexico	c	c	0.0	c	0.8	(0.2)	1.0	(0.3)	1.2	(0.2)	1.4	(0.3)
	Netherlands	2.3	(0.6)	1.8	(0.6)	2.3	(0.8)	1.3	(0.3)	1.4	(0.2)	1.0	(0.2)
	New Zealand	0.9	(0.4)	1.6	(0.8)	0.0	c	0.7	(0.2)	0.7	(0.2)	1.1	(0.4)
	Norway	2.5	(1.0)	0.6	(0.2)	1.8	(1.2)	6.1	(0.8)	3.7	(0.3)	**0.6**	(0.1)
	Poland	0.8	(0.7)	0.8	(0.7)	0.6	(0.5)	1.1	(0.2)	0.8	(0.3)	0.7	(0.3)
	Portugal	0.2	(0.2)	0.4	(0.5)	0.4	(0.1)	0.5	(0.2)	0.3	(0.1)	0.8	(0.4)
	Slovak Republic	1.9	(0.9)	0.8	(0.4)	0.0	c	2.5	(0.3)	2.4	(0.3)	1.0	(0.1)
	Slovenia	3.5	(1.1)	**0.4**	(0.1)	7.2	(3.0)	10.8	(0.7)	6.9	(0.5)	**0.7**	(0.1)
	Spain	1.2	(0.7)	2.0	(1.2)	0.7	(0.2)	0.9	(0.3)	0.5	(0.1)	0.7	(0.2)
	Sweden	6.4	(1.4)	**2.3**	(0.6)	3.3	(1.0)	2.5	(0.5)	3.4	(0.3)	1.3	(0.2)
	Switzerland	1.8	(0.7)	0.6	(0.2)	5.1	(1.0)	2.9	(0.6)	2.7	(0.3)	0.7	(0.1)
	Turkey	c	c	0.0	c	0.4	(0.1)	0.6	(0.2)	0.5	(0.2)	1.1	(0.7)
	United Kingdom	0.2	(0.2)	0.9	(0.7)	0.6	(0.5)	0.3	(0.1)	0.2	(0.1)	0.6	(0.3)
	United States	0.3	(0.4)	0.4	(0.5)	0.3	(0.2)	0.8	(0.2)	0.8	(0.1)	1.1	(0.3)
	OECD average	1.4	(0.1)	1.0	(0.1)	1.3	(0.1)	1.7	(0.1)	1.4	(0.0)	1.0	(0.1)
Partners	Albania	m	m	m	m	1.2	(0.4)	0.9	(0.2)	1.1	(0.2)	1.1	(0.3)
	Algeria	c	c	m	m	0.3	(0.2)	0.3	(0.2)	0.1	(0.0)	0.2	(0.2)
	Brazil	0.1	(0.2)	0.3	(0.5)	0.4	(0.1)	0.4	(0.1)	0.5	(0.1)	1.3	(0.5)
	B-S-J-G (China)	0.2	(0.2)	0.5	(0.4)	0.4	(0.1)	0.4	(0.2)	0.6	(0.1)	1.5	(0.7)
	Bulgaria	0.3	(0.5)	0.1	(0.3)	2.6	(1.3)	2.5	(0.5)	1.6	(0.3)	**0.6**	(0.1)
	CABA (Argentina)	0.0	c	0.0	c	0.5	(0.4)	0.4	(0.4)	0.3	(0.2)	0.8	(0.5)
	Colombia	0.0	(0.1)	0.0	(0.1)	1.3	(0.3)	1.3	(0.3)	0.9	(0.2)	0.7	(0.2)
	Costa Rica	c	c	1.0	(3.1)	2.3	(0.4)	2.5	(0.5)	2.5	(0.3)	1.1	(0.2)
	Croatia	0.7	(0.9)	0.2	(0.2)	3.8	(1.5)	4.4	(0.6)	4.0	(0.4)	0.9	(0.1)
	Cyprus*	0.0	c	0.0	c	0.3	(0.3)	0.3	(0.1)	0.2	(0.1)	0.7	(0.5)
	Dominican Republic	c	c	m	m	1.5	(0.7)	1.1	(0.3)	0.7	(0.2)	0.5	(0.2)
	FYROM	c	c	7.8	(9.8)	1.8	(0.5)	2.1	(0.3)	1.9	(0.3)	1.0	(0.2)
	Georgia	0.0	c	0.0	c	0.0	c	0.2	(0.1)	0.0	c	0.0	c
	Hong Kong (China)	0.9	(0.5)	3.5	(2.5)	0.3	(0.2)	0.3	(0.1)	0.4	(0.1)	1.7	(0.8)
	Indonesia	c	c	0.0	c	0.1	(0.1)	0.2	(0.1)	0.1	(0.1)	0.6	(0.7)
	Jordan	c	c	3.0	(7.9)	1.1	(0.4)	1.2	(0.3)	0.7	(0.2)	0.6	(0.2)
	Kosovo	c	c	m	m	0.0	c	0.5	(0.2)	0.3	(0.1)	0.8	(0.5)
	Lebanon	c	c	0.0	c	0.6	(0.3)	0.5	(0.2)	0.4	(0.1)	0.7	(0.3)
	Lithuania	0.8	(0.7)	2.5	(2.5)	0.0	c	0.5	(0.2)	0.3	(0.1)	0.5	(0.3)
	Macao (China)	1.4	(0.6)	**3.4**	(2.0)	0.5	(0.2)	0.4	(0.2)	0.5	(0.2)	1.0	(0.5)
	Malta	1.2	(0.8)	1.2	(1.0)	1.3	(0.3)	1.0	(0.3)	0.8	(0.2)	0.7	(0.3)
	Moldova	0.0	c	0.0	c	0.6	(0.4)	0.6	(0.1)	0.5	(0.1)	0.8	(0.2)
	Montenegro	c	c	0.3	(0.8)	2.8	(1.6)	2.9	(0.4)	2.0	(0.2)	**0.7**	(0.1)
	Peru	c	c	0.0	c	0.3	(0.2)	0.6	(0.2)	0.5	(0.1)	0.9	(0.4)
	Qatar	1.8	(1.2)	2.1	(1.5)	0.0	c	0.5	(0.2)	1.0	(0.1)	**3.2**	(1.4)
	Romania	0.3	(1.5)	0.6	(2.5)	0.4	(0.3)	0.5	(0.2)	0.6	(0.1)	1.3	(0.7)
	Russia	0.5	(0.4)	0.4	(0.3)	2.0	(2.0)	2.1	(0.8)	1.3	(0.1)	0.6	(0.3)
	Singapore	0.4	(0.2)	0.8	(0.4)	1.0	(0.5)	0.6	(0.2)	0.4	(0.1)	0.5	(0.2)
	Chinese Taipei	3.5	(0.7)	1.6	(0.4)	2.0	(0.6)	2.4	(0.4)	2.5	(0.3)	1.1	(0.2)
	Thailand	0.0	c	0.0	c	0.3	(0.1)	0.1	(0.1)	0.3	(0.2)	1.5	(0.8)
	Trinidad and Tobago	0.4	(0.9)	1.2	(3.3)	0.2	(0.2)	0.3	(0.2)	0.3	(0.1)	0.9	(0.6)
	Tunisia	c	c	m	m	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	1.0	(1.4)
	United Arab Emirates	0.1	(0.3)	0.2	(0.4)	0.2	(0.2)	0.4	(0.2)	0.8	(0.1)	**2.1**	(0.7)
	Uruguay	0.4	(1.0)	0.5	(1.4)	0.8	(0.2)	0.7	(0.2)	0.6	(0.2)	0.7	(0.3)
	Viet Nam	0.5	(0.4)	1.4	(1.0)	0.3	(0.1)	0.3	(0.1)	1.0	(0.5)	**3.0**	(1.6)
	Argentina**	0.0	c	0.0	c	0.7	(0.2)	1.1	(0.4)	0.9	(0.2)	1.1	(0.3)
	Kazakhstan**	0.9	(1.0)	0.5	(0.6)	5.0	(2.8)	2.0	(0.6)	1.7	(0.2)	0.7	(0.2)
	Malaysia**	3.3	(2.9)	**6.1**	(5.5)	0.5	(0.2)	0.6	(0.1)	0.6	(0.2)	1.0	(0.4)

1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Belgium in this table refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
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[Part 1/1]

Table I.3.12 Socio-economic indicators and student expectations of a science-related career

		Economic, science and education indicators					
		Per capita GDP (in equivalent USD converted using PPPs) 2014[1,2]	Per capita gross expenditure on research and development (GERD, in equivalent USD converted using PPPs)[2,3]	Percentage of 35-44 year-olds with tertiary education[4]	Entry rates in tertiary science-related programmes[4] (%)	First age of selection in the education system[5] (years)	Proportion of students who expect to work in science-related occupations[6] at age 30, expressed as a percentage of all 15-year-olds[7] (%)
		(1)	(2)	(3)	(4)	(5)	(6)
OECD	Australia	45 925	m	46	m	16.0	26.5
	Austria	47 682	1 383	33	27.4	10.0	18.6
	Belgium	43 435	1 049	42	m	12.0	22.7
	Canada	45 066	709	61	m	16.0	28.3
	Chile	22 071	85	24	41.5	16.0	30.3
	Czech Republic	31 186	605	21	30.1	11.0	15.8
	Denmark	45 537	1 384	41	34.0	16.0	13.2
	Estonia	28 140	386	39	m	16.0	22.9
	Finland	40 676	1 265	50	30.1	16.0	16.6
	France	39 328	905	39	m	15.0	19.3
	Germany	46 401	1 318	29	26.7	10.0	14.7
	Greece	26 851	216	27	m	15.0	23.1
	Hungary	25 069	338	25	m	11.0	16.4
	Iceland	43 993	819	42	29.6	16.0	22.2
	Ireland	49 393	731	49	m	15.0	26.3
	Israel	33 703	1 413	53	26.8	15.0	26.1
	Italy	35 463	458	19	17.8	14.0	18.1
	Japan	36 619	1 309	29	30.9	15.0	17.1
	Korea	33 395	1 485	56	m	15.0	17.7
	Latvia	23 548	158	31	m	16.0	18.9
	Luxembourg	98 460	1 226	56	8.8	13.0	18.5
	Mexico	17 315	92	17	16.8	15.0	25.1
	Netherlands	48 253	940	38	23.7	12.0	15.5
	New Zealand	37 679	m	41	35.2	16.0	22.4
	Norway	65 614	1 107	49	m	16.0	26.1
	Poland	25 262	229	32	28.5	16.0	19.1
	Portugal	28 760	365	26	25.9	15.0	24.1
	Slovak Republic	28 327	245	21	24.8	11.0	16.7
	Slovenia	30 403	714	35	31.7	14.0	28.6
	Spain	33 629	410	43	m	16.0	26.0
	Sweden	45 297	1 426	46	25.4	16.0	18.9
	Switzerland	59 540	m	45	29.9	12.0	18.7
	Turkey	19 788	189	16	24.7	11.0	20.8
	United Kingdom	40 233	678	46	25.3	16.0	24.5
	United States	54 630	m	47	m	16.0	31.7
Partners	Albania	11 108	m	m	m	15.0	20.9
	Algeria	14 244	m	m	m	m	20.5
	Brazil	15 893	m	14	m	15.0	27.4
	B-S-J-G (China)	m	m	m	m	15.0	10.7
	Bulgaria	17 260	133	m	m	13.0	22.1
	Colombia	13 357	26	23	22.5	15.0	29.6
	Costa Rica	14 885	m	18	m	15.0	27.9
	Croatia	20 939	167	m	m	14.0	21.9
	Cyprus*	29 790	108	m	m	15.0	28.4
	Dominican Republic	13 964	m	m	m	16.0	31.3
	FYROM	13 523	m	m	m	15.0	22.9
	Georgia	6 666	8	m	m	15.0	13.4
	Hong Kong (China)	55 196	m	m	m	15.0	20.9
	Indonesia	10 517	m	9	m	15.0	10.5
	Jordan	12 050	m	m	m	16.0	37.6
	Kosovo	9 114	m	m	m	m	18.7
	Lebanon	17 462	m	m	m	m	26.2
	Lithuania	27 581	273	38	m	16.0	21.6
	Macao (China)	127 051	121	m	m	15.0	18.4
	Malta	31 661	266	m	m	16.0	24.8
	Moldova	4 983	16	m	m	m	20.4
	Montenegro	14 656	52	m	m	15.0	19.1
	Peru	12 043	m	m	m	16.0	28.8
	Qatar	138 050	m	m	m	16.0	35.5
	Romania	20 348	75	m	m	14.0	21.6
	Russia	22 990	310	55	m	15.5	22.4
	Singapore	82 515	1 797	m	m	12.0	26.8
	Chinese Taipei	22 648	m	m	m	15.0	17.8
	Thailand	16 804	76	m	m	15.0	13.9
	Trinidad and Tobago	31 967	25	m	m	m	21.2
	Tunisia	11 436	72	m	m	m	32.0
	United Arab Emirates	67 674	474	m	m	15.0	37.5
	Uruguay	20 881	70	m	m	15.0	20.1
	Viet Nam	5 629	m	m	m	15.0	9.5
	Argentina**	21 795	m	m	m	14.0	13.0
	Kazakhstan**	23 429	m	m	m	15.0	26.4
	Malaysia**	25 639	324	m	m	15.0	22.2
	Correlation, among all countries/ economies, with column (6)	0.14	-0.06	0.17	0.12	0.33	
	Correlation, among OECD countries, with column (6)	-0.06	-0.32	0.25	0.20	0.48	

1. Source: OECD, PISA 2015 Database, Table II.6.59.
2. The natural logarithm is used to compute the correlation with column 6.
3. Source: UIS, *Science Technology and Innovation database* (Extracted on 30 August 2016 from http://data.uis.unesco.org/). Data refer to 2014 or latest available year after 2012.
4. Source: OECD, *Education at a Glance 2015*: OECD Indicators.
5. Source: OECD, PISA 2015 Database, Table II.5.27.
6. See Annex A1 for the list of science-related occupations.
7. Source: Tables I.3.10b and I.6.1 (Coverage index 3).
Note: Results for Belgium in column (6) refer to the French and German-speaking communities only.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

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[Part 1/1]

Table I.4.1a Percentage of students at each proficiency level in reading

		All students															
		Below Level 1b (below 262.04 score points)		Level 1b (from 262.04 to less than 334.75 score points)		Level 1a (from 334.75 to less than 407.47 score points)		Level 2 (from 407.47 to less than 480.18 score points)		Level 3 (from 480.18 to less than 552.89 score points)		Level 4 (from 552.89 to less than 625.61 score points)		Level 5 (from 625.61 to less than 698.32 score points)		Level 6 (above 698.32 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	1.2	(0.2)	4.8	(0.2)	12.0	(0.5)	21.4	(0.6)	27.5	(0.6)	22.0	(0.6)	9.0	(0.5)	2.0	(0.2)
	Austria	1.7	(0.3)	6.5	(0.7)	14.3	(0.8)	23.5	(0.9)	27.0	(1.1)	19.7	(0.7)	6.4	(0.5)	0.8	(0.2)
	Belgium	1.0	(0.2)	5.3	(0.4)	13.2	(0.6)	21.1	(0.7)	26.8	(0.8)	23.2	(0.7)	8.4	(0.5)	1.0	(0.2)
	Canada	0.4	(0.1)	2.1	(0.3)	8.2	(0.5)	19.0	(0.6)	29.7	(0.7)	26.6	(0.7)	11.6	(0.6)	2.4	(0.3)
	Chile	1.3	(0.3)	7.4	(0.6)	19.8	(0.9)	29.9	(1.2)	27.0	(0.9)	12.4	(0.8)	2.2	(0.3)	0.1	(0.0)
	Czech Republic	1.3	(0.3)	6.0	(0.6)	14.7	(0.7)	23.3	(0.8)	27.5	(1.0)	19.3	(0.9)	6.9	(0.5)	1.0	(0.2)
	Denmark	0.5	(0.1)	3.3	(0.3)	11.2	(0.6)	24.1	(0.8)	32.4	(0.8)	22.0	(0.8)	5.9	(0.6)	0.6	(0.2)
	Estonia	0.2	(0.1)	2.1	(0.3)	8.4	(0.7)	21.6	(0.7)	31.4	(0.9)	25.4	(0.9)	9.7	(0.6)	1.4	(0.2)
	Finland	0.6	(0.1)	2.6	(0.3)	7.8	(0.5)	17.6	(0.8)	29.7	(0.9)	27.9	(1.0)	11.7	(0.6)	2.0	(0.3)
	France	2.3	(0.4)	6.5	(0.6)	12.7	(0.5)	19.0	(0.8)	24.5	(0.9)	22.5	(0.8)	10.5	(0.7)	2.0	(0.2)
	Germany	0.9	(0.2)	4.1	(0.5)	11.2	(0.7)	21.0	(1.0)	27.6	(0.9)	23.5	(0.9)	9.7	(0.7)	1.9	(0.3)
	Greece	2.3	(0.5)	7.8	(1.0)	17.2	(1.0)	25.3	(1.0)	27.2	(1.1)	16.1	(0.9)	3.8	(0.4)	0.3	(0.1)
	Hungary	1.4	(0.3)	8.1	(0.8)	18.0	(0.9)	24.5	(0.8)	27.0	(1.0)	16.8	(0.8)	3.9	(0.4)	0.4	(0.1)
	Iceland	1.8	(0.3)	6.0	(0.5)	14.3	(0.9)	26.0	(1.1)	27.3	(0.9)	18.0	(0.7)	5.8	(0.5)	0.8	(0.2)
	Ireland	0.2	(0.1)	1.7	(0.3)	8.3	(0.7)	21.0	(0.9)	31.8	(1.1)	26.4	(0.8)	9.4	(0.6)	1.3	(0.2)
	Israel	3.3	(0.5)	8.1	(0.7)	15.2	(0.8)	21.7	(1.0)	24.0	(0.9)	18.5	(0.9)	7.7	(0.6)	1.4	(0.3)
	Italy	1.0	(0.2)	5.4	(0.4)	14.5	(0.8)	25.4	(1.0)	28.8	(0.8)	19.2	(0.9)	5.1	(0.4)	0.6	(0.1)
	Japan	0.6	(0.2)	3.0	(0.4)	9.2	(0.7)	19.8	(0.9)	30.5	(0.9)	26.0	(1.0)	9.5	(0.8)	1.3	(0.3)
	Korea	0.7	(0.2)	3.4	(0.5)	9.5	(0.7)	19.3	(1.0)	28.9	(1.0)	25.5	(1.2)	10.8	(0.8)	1.9	(0.3)
	Latvia	0.4	(0.2)	3.8	(0.4)	13.4	(0.8)	27.2	(0.8)	32.1	(0.9)	18.7	(0.8)	4.0	(0.4)	0.3	(0.1)
	Luxembourg	1.9	(0.3)	7.8	(0.5)	15.9	(0.7)	22.0	(0.8)	24.7	(0.7)	19.4	(0.7)	7.0	(0.4)	1.2	(0.2)
	Mexico	2.0	(0.3)	11.4	(0.8)	28.4	(0.9)	34.2	(1.0)	19.5	(0.9)	4.2	(0.5)	0.3	(0.1)	0.0	(0.0)
	Netherlands	1.1	(0.2)	4.4	(0.4)	12.6	(0.8)	21.8	(0.9)	26.6	(1.1)	22.7	(0.8)	9.5	(0.6)	1.4	(0.3)
	New Zealand	1.0	(0.2)	4.8	(0.5)	11.5	(0.7)	20.6	(0.7)	26.5	(0.9)	22.0	(0.9)	11.0	(0.7)	2.6	(0.4)
	Norway	0.8	(0.2)	3.6	(0.4)	10.6	(0.6)	20.4	(0.7)	28.5	(0.8)	23.9	(0.8)	10.1	(0.6)	2.1	(0.4)
	Poland	0.5	(0.2)	3.2	(0.4)	10.8	(0.6)	22.5	(0.8)	31.4	(0.8)	23.5	(0.9)	7.5	(0.6)	0.7	(0.2)
	Portugal	0.6	(0.1)	3.9	(0.4)	12.7	(0.7)	23.2	(0.8)	30.2	(0.9)	21.9	(1.0)	6.9	(0.6)	0.6	(0.2)
	Slovak Republic	4.4	(0.5)	9.4	(0.6)	18.3	(0.8)	25.7	(0.8)	24.8	(0.9)	14.0	(0.7)	3.2	(0.4)	0.2	(0.1)
	Slovenia	0.5	(0.1)	3.4	(0.3)	11.2	(0.5)	22.5	(0.9)	30.3	(0.9)	23.1	(0.8)	8.0	(0.7)	1.0	(0.4)
	Spain	0.7	(0.2)	3.5	(0.4)	12.0	(0.7)	24.4	(0.8)	32.3	(1.0)	21.6	(0.8)	5.1	(0.5)	0.4	(0.1)
	Sweden	1.5	(0.3)	4.8	(0.5)	12.2	(0.8)	21.7	(0.8)	27.5	(0.8)	22.5	(1.0)	8.5	(0.7)	1.5	(0.3)
	Switzerland	1.2	(0.3)	5.2	(0.6)	13.5	(0.7)	23.2	(0.9)	28.1	(1.0)	20.9	(0.9)	6.9	(0.6)	0.9	(0.2)
	Turkey	2.3	(0.3)	10.9	(1.0)	26.8	(1.4)	32.6	(1.5)	21.1	(1.4)	5.7	(0.9)	0.6	(0.2)	0.0	(0.0)
	United Kingdom	0.8	(0.2)	4.0	(0.4)	13.1	(0.7)	24.3	(0.9)	28.4	(0.7)	20.3	(0.8)	7.7	(0.5)	1.5	(0.2)
	United States	1.1	(0.2)	4.8	(0.5)	13.0	(0.8)	22.9	(0.9)	28.0	(0.9)	20.5	(0.9)	8.2	(0.6)	1.4	(0.2)
	EU total	1.4	(0.1)	5.1	(0.1)	13.2	(0.2)	22.8	(0.3)	27.8	(0.3)	21.0	(0.2)	7.5	(0.2)	1.2	(0.1)
	OECD total	1.3	(0.1)	5.7	(0.2)	15.0	(0.3)	24.2	(0.3)	26.9	(0.3)	18.9	(0.3)	7.0	(0.2)	1.1	(0.1)
	OECD average	1.3	(0.0)	5.2	(0.1)	13.6	(0.1)	23.2	(0.2)	27.9	(0.2)	20.5	(0.1)	7.2	(0.1)	1.1	(0.0)
Partners	Albania	7.4	(0.7)	15.9	(1.1)	27.0	(1.2)	27.3	(1.1)	16.3	(1.0)	5.1	(0.7)	0.9	(0.2)	0.1	(0.1)
	Algeria	11.0	(1.0)	31.2	(1.2)	36.8	(1.2)	17.0	(1.2)	3.7	(0.6)	0.3	(0.1)	0.0	(0.0)	0.0	c
	Brazil	7.1	(0.5)	17.4	(0.7)	26.5	(0.6)	25.0	(0.7)	16.2	(0.6)	6.4	(0.5)	1.3	(0.2)	0.1	(0.1)
	B-S-J-G (China)	2.1	(0.4)	6.2	(0.6)	13.5	(0.8)	20.9	(1.1)	25.4	(1.1)	20.9	(1.2)	9.1	(1.0)	1.8	(0.4)
	Bulgaria	7.7	(0.9)	14.3	(1.2)	19.5	(1.0)	22.0	(1.0)	21.2	(1.3)	11.7	(1.0)	3.2	(0.4)	0.4	(0.1)
	CABA (Argentina)	1.5	(0.5)	5.8	(1.1)	14.5	(1.7)	28.2	(2.1)	30.1	(2.0)	16.2	(2.0)	3.5	(1.0)	0.3	(0.2)
	Colombia	3.2	(0.5)	13.6	(1.0)	26.1	(1.0)	29.2	(0.9)	19.9	(0.9)	7.0	(0.5)	0.9	(0.2)	0.0	(0.0)
	Costa Rica	1.7	(0.3)	10.3	(0.7)	28.3	(1.0)	34.6	(1.0)	19.2	(1.1)	5.2	(0.6)	0.6	(0.2)	0.0	(0.0)
	Croatia	0.6	(0.1)	4.5	(0.4)	14.8	(0.9)	26.6	(0.9)	28.6	(1.0)	19.0	(0.9)	5.4	(0.5)	0.5	(0.1)
	Cyprus*	4.4	(0.4)	11.4	(0.6)	19.8	(1.0)	27.0	(0.7)	23.0	(0.8)	11.3	(0.6)	2.8	(0.3)	0.2	(0.1)
	Dominican Republic	13.1	(1.1)	28.2	(1.2)	30.8	(1.2)	19.5	(1.1)	7.0	(0.7)	1.3	(0.3)	0.1	(0.1)	0.0	c
	FYROM	18.8	(0.7)	24.1	(0.8)	27.7	(0.9)	19.3	(0.8)	8.1	(0.6)	1.7	(0.2)	0.2	(0.1)	0.0	(0.0)
	Georgia	9.5	(0.7)	16.4	(0.8)	25.8	(0.8)	25.4	(0.9)	16.1	(0.8)	5.7	(0.5)	1.1	(0.2)	0.1	(0.1)
	Hong Kong (China)	0.3	(0.1)	2.0	(0.3)	7.0	(0.6)	18.1	(0.9)	32.1	(1.1)	29.0	(1.0)	10.4	(0.8)	1.1	(0.2)
	Indonesia	3.8	(0.7)	16.8	(1.1)	34.8	(1.0)	30.9	(1.1)	11.7	(0.8)	1.9	(0.3)	0.1	(0.1)	0.0	(0.0)
	Jordan	7.4	(0.7)	13.7	(0.8)	25.2	(0.9)	30.7	(0.8)	18.7	(0.9)	4.1	(0.4)	0.3	(0.1)	0.0	(0.0)
	Kosovo	14.6	(0.7)	28.0	(1.0)	34.2	(1.1)	19.4	(0.9)	3.6	(0.4)	0.2	(0.1)	0.0	c	0.0	c
	Lebanon	24.1	(1.5)	24.5	(1.3)	21.7	(1.1)	15.8	(1.0)	9.4	(0.8)	3.6	(0.5)	0.7	(0.2)	0.1	(0.1)
	Lithuania	1.3	(0.2)	6.7	(0.5)	17.1	(0.7)	27.1	(0.8)	26.7	(0.9)	16.7	(0.9)	4.1	(0.5)	0.4	(0.1)
	Macao (China)	0.3	(0.1)	2.1	(0.3)	9.3	(0.5)	23.1	(0.8)	34.2	(0.9)	24.4	(0.9)	6.2	(0.5)	0.5	(0.1)
	Malta	7.5	(0.5)	11.1	(0.8)	17.0	(0.9)	22.5	(0.8)	22.5	(0.8)	13.9	(0.7)	4.7	(0.4)	0.9	(0.2)
	Moldova	5.9	(0.5)	14.7	(0.7)	25.1	(0.9)	27.7	(0.9)	18.7	(0.8)	6.6	(0.6)	1.1	(0.2)	0.1	(0.1)
	Montenegro	4.1	(0.3)	13.0	(0.7)	24.9	(0.8)	28.6	(0.7)	20.2	(0.6)	7.9	(0.5)	1.3	(0.3)	0.1	(0.1)
	Peru	6.4	(0.6)	19.2	(1.0)	28.3	(1.1)	27.3	(0.9)	15.0	(0.8)	3.5	(0.5)	0.3	(0.1)	0.0	(0.0)
	Qatar	11.1	(0.3)	17.7	(0.4)	22.8	(0.6)	22.7	(0.5)	16.8	(0.5)	7.4	(0.3)	1.4	(0.2)	0.1	(0.0)
	Romania	3.7	(0.5)	11.6	(0.9)	23.4	(1.2)	29.5	(1.2)	21.3	(1.2)	8.4	(0.8)	1.8	(0.4)	0.2	(0.1)
	Russia	0.3	(0.1)	3.2	(0.4)	12.8	(1.0)	27.1	(1.0)	30.7	(1.1)	19.3	(1.0)	5.9	(0.6)	0.8	(0.2)
	Singapore	0.3	(0.1)	2.5	(0.2)	8.3	(0.4)	16.9	(0.5)	26.2	(0.7)	27.4	(0.7)	14.7	(0.7)	3.6	(0.4)
	Chinese Taipei	1.0	(0.2)	4.4	(0.4)	11.8	(0.6)	22.4	(0.8)	31.3	(1.0)	22.1	(0.9)	6.3	(0.7)	0.6	(0.2)
	Thailand	2.8	(0.4)	15.1	(1.1)	32.1	(1.0)	31.1	(1.0)	15.0	(1.0)	3.7	(0.5)	0.3	(0.1)	0.0	(0.0)
	Trinidad and Tobago	5.7	(0.5)	14.3	(0.7)	22.5	(0.9)	25.6	(1.0)	20.3	(0.9)	9.2	(0.6)	2.2	(0.3)	0.2	(0.1)
	Tunisia	11.1	(1.1)	26.6	(1.1)	33.9	(1.2)	21.0	(1.1)	6.5	(0.6)	0.8	(0.2)	0.1	(0.1)	0.0	c
	United Arab Emirates	5.4	(0.4)	13.2	(0.6)	21.8	(0.7)	25.4	(0.6)	20.5	(0.8)	10.7	(0.6)	2.7	(0.3)	0.3	(0.1)
	Uruguay	3.0	(0.3)	12.5	(0.7)	23.5	(0.8)	27.8	(0.8)	21.3	(0.8)	9.3	(0.6)	2.3	(0.4)	0.2	(0.1)
	Viet Nam	0.1	(0.1)	1.7	(0.4)	12.1	(1.3)	32.5	(1.5)	35.2	(1.3)	15.8	(1.2)	2.5	(0.7)	0.1	(0.1)
	Argentina**	3.3	(0.4)	12.7	(0.9)	25.7	(1.0)	30.7	(1.0)	20.2	(1.0)	6.4	(0.6)	0.9	(0.2)	0.1	(0.0)
	Kazakhstan**	1.7	(0.4)	10.6	(0.8)	29.0	(1.6)	33.4	(1.2)	18.8	(1.3)	5.6	(0.8)	0.8	(0.3)	0.0	(0.0)
	Malaysia**	2.5	(0.4)	10.3	(0.8)	24.5	(1.1)	34.2	(1.0)	23.2	(1.2)	5.0	(0.6)	0.4	(0.1)	0.0	(0.0)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433195

[Part 1/2]

Table I.4.2a Percentage of low achievers and top performers in reading, 2009 through 2015

		Proficiency levels in PISA 2009				Proficiency levels in PISA 2012				Proficiency levels in PISA 2015			
		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	14.2	(0.6)	12.8	(0.8)	14.2	(0.5)	11.7	(0.5)	18.1	(0.5)	11.0	(0.5)
	Austria	m	m	m	m	19.5	(1.1)	5.5	(0.6)	22.5	(1.0)	7.2	(0.6)
	Belgium	17.7	(0.9)	11.2	(0.6)	16.1	(0.8)	11.8	(0.6)	19.5	(0.9)	9.3	(0.6)
	Canada	10.3	(0.5)	12.8	(0.5)	10.9	(0.5)	12.9	(0.6)	10.7	(0.6)	14.0	(0.7)
	Chile	30.6	(1.5)	1.3	(0.3)	33.0	(1.7)	0.6	(0.1)	28.4	(1.2)	2.3	(0.3)
	Czech Republic	23.1	(1.3)	5.1	(0.5)	16.9	(1.2)	6.1	(0.5)	22.0	(1.1)	7.9	(0.6)
	Denmark	15.2	(0.9)	4.7	(0.5)	14.6	(1.1)	5.4	(0.6)	15.0	(0.8)	6.5	(0.6)
	Estonia	13.3	(1.0)	6.1	(0.6)	9.1	(0.6)	8.3	(0.7)	10.6	(0.7)	11.0	(0.7)
	Finland	8.1	(0.5)	14.5	(0.8)	11.3	(0.7)	13.5	(0.6)	11.1	(0.8)	13.7	(0.7)
	France	19.8	(1.2)	9.6	(1.0)	18.9	(1.0)	12.9	(0.8)	21.5	(0.9)	12.5	(0.7)
	Germany	18.5	(1.1)	7.6	(0.6)	14.5	(0.9)	8.9	(0.7)	16.2	(0.9)	11.7	(0.7)
	Greece	21.3	(1.8)	5.6	(0.5)	22.6	(1.2)	5.1	(0.6)	27.3	(1.8)	4.0	(0.5)
	Hungary	17.6	(1.4)	6.1	(0.7)	19.7	(1.2)	5.6	(0.8)	27.5	(1.1)	4.3	(0.4)
	Iceland	16.8	(0.6)	8.5	(0.6)	21.0	(0.7)	5.8	(0.5)	22.1	(1.0)	6.6	(0.6)
	Ireland	17.2	(1.0)	7.0	(0.5)	9.6	(0.9)	11.4	(0.7)	10.2	(0.8)	10.7	(0.7)
	Israel	26.5	(1.2)	7.4	(0.6)	23.6	(1.6)	9.6	(0.8)	26.6	(1.3)	9.2	(0.7)
	Italy	21.0	(0.6)	5.8	(0.3)	19.5	(0.7)	6.7	(0.3)	21.0	(1.0)	5.7	(0.5)
	Japan	13.6	(1.1)	13.4	(0.9)	9.8	(0.9)	18.5	(1.3)	12.9	(1.0)	10.8	(0.9)
	Korea	5.8	(0.8)	12.9	(1.1)	7.6	(0.9)	14.1	(1.2)	13.7	(1.0)	12.7	(1.0)
	Latvia	17.6	(1.2)	2.9	(0.4)	17.0	(1.1)	4.2	(0.6)	17.7	(0.9)	4.3	(0.5)
	Luxembourg	26.0	(0.6)	5.7	(0.5)	22.2	(0.7)	8.9	(0.4)	25.6	(0.6)	8.1	(0.4)
	Mexico	40.1	(1.0)	0.4	(0.1)	41.1	(0.9)	0.4	(0.1)	41.7	(1.3)	0.3	(0.1)
	Netherlands	14.3	(1.5)	9.8	(1.1)	14.0	(1.2)	9.8	(0.8)	18.1	(1.0)	10.9	(0.6)
	New Zealand	14.3	(0.7)	15.7	(0.8)	16.3	(0.8)	14.0	(0.8)	17.3	(0.8)	13.6	(0.9)
	Norway	15.0	(0.8)	8.4	(0.9)	16.2	(1.0)	10.2	(0.7)	14.9	(0.8)	12.2	(0.7)
	Poland	15.0	(0.8)	7.2	(0.6)	10.6	(0.8)	10.0	(0.9)	14.4	(0.8)	8.2	(0.7)
	Portugal	17.6	(1.2)	4.8	(0.5)	18.8	(1.4)	5.8	(0.6)	17.2	(0.9)	7.5	(0.6)
	Slovak Republic	22.2	(1.2)	4.5	(0.5)	28.2	(1.8)	4.4	(0.7)	32.1	(1.1)	3.5	(0.4)
	Slovenia	21.2	(0.6)	4.6	(0.5)	21.1	(0.7)	5.0	(0.4)	15.1	(0.6)	8.9	(0.7)
	Spain	19.6	(0.9)	3.3	(0.3)	18.3	(0.8)	5.5	(0.3)	16.2	(0.9)	5.5	(0.5)
	Sweden	17.4	(0.9)	9.0	(0.7)	22.7	(1.2)	7.9	(0.6)	18.4	(1.1)	10.0	(0.8)
	Switzerland	16.8	(0.9)	8.1	(0.7)	13.7	(0.8)	9.1	(0.7)	20.0	(1.1)	7.8	(0.6)
	Turkey	24.5	(1.4)	1.9	(0.4)	21.6	(1.4)	4.3	(0.9)	40.0	(2.0)	0.6	(0.2)
	United Kingdom	18.4	(0.8)	8.0	(0.5)	16.6	(1.3)	8.8	(0.7)	17.9	(0.9)	9.2	(0.6)
	United States	17.6	(1.1)	9.9	(0.9)	16.6	(1.3)	7.9	(0.7)	19.0	(1.1)	9.6	(0.7)
	OECD average-34	18.5	(0.2)	7.5	(0.1)	17.9	(0.2)	8.4	(0.1)	20.0	(0.2)	8.4	(0.1)
	OECD average-35	m	m	m	m	17.9	(0.2)	8.3	(0.1)	20.1	(0.2)	8.3	(0.1)
Partners	Albania	56.7	(1.9)	0.2	(0.1)	52.3	(1.3)	1.2	(0.2)	50.3	(1.9)	1.0	(0.2)
	Algeria	m	m	m	m	m	m	m	m	79.0	(1.6)	0.0	(0.0)
	Brazil	49.6	(1.3)	1.3	(0.2)	50.8	(1.1)	0.5	(0.1)	51.0	(1.1)	1.4	(0.2)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	21.9	(1.5)	10.9	(1.3)
	Bulgaria	41.0	(2.6)	2.8	(0.5)	39.4	(2.2)	4.3	(0.6)	41.5	(2.0)	3.6	(0.5)
	CABA (Argentina)	m	m	m	m	37.1	(2.9)	2.6	(0.7)	21.8	(2.3)	3.8	(1.1)
	Colombia	47.1	(1.9)	0.6	(0.2)	51.4	(1.8)	0.3	(0.1)	42.8	(1.5)	1.0	(0.2)
	Costa Rica	32.6	(1.5)	0.8	(0.3)	32.4	(1.8)	0.6	(0.2)	40.3	(1.4)	0.7	(0.2)
	Croatia	22.4	(1.3)	3.2	(0.4)	18.7	(1.3)	4.4	(0.7)	19.9	(1.1)	5.9	(0.5)
	Cyprus*	m	m	m	m	32.8	(0.7)	4.0	(0.3)	35.6	(0.8)	3.1	(0.3)
	Dominican Republic	m	m	m	m	m	m	m	m	72.1	(1.5)	0.1	(0.1)
	FYROM	m	m	m	m	m	m	m	m	70.7	(0.7)	0.2	(0.1)
	Georgia	62.0	(1.3)	0.3	(0.1)	m	m	m	m	51.7	(1.3)	1.1	(0.2)
	Hong Kong (China)	8.3	(0.7)	12.4	(0.8)	6.8	(0.7)	16.8	(1.2)	9.3	(0.8)	11.6	(0.9)
	Indonesia	53.4	(2.3)	0.0	(0.0)	55.2	(2.2)	0.1	(0.1)	55.4	(1.5)	0.2	(0.1)
	Jordan	48.0	(1.6)	0.2	(0.1)	50.7	(1.6)	0.1	(0.1)	46.3	(1.4)	0.3	(0.1)
	Kosovo	m	m	m	m	m	m	m	m	76.9	(0.9)	0.0	c
	Lebanon	m	m	m	m	m	m	m	m	70.4	(1.6)	0.8	(0.2)
	Lithuania	24.4	(1.2)	2.9	(0.4)	21.2	(1.2)	3.3	(0.4)	25.1	(0.9)	4.4	(0.5)
	Macao (China)	14.9	(0.5)	2.9	(0.2)	11.5	(0.4)	7.0	(0.4)	11.7	(0.5)	6.7	(0.5)
	Malta	36.3	(0.7)	4.4	(0.4)	m	m	m	m	35.6	(0.8)	5.6	(0.4)
	Moldova	57.2	(1.5)	0.1	(0.1)	m	m	m	m	45.8	(1.1)	1.2	(0.2)
	Montenegro	49.5	(1.0)	0.6	(0.2)	43.3	(0.7)	1.0	(0.2)	41.9	(0.7)	1.4	(0.3)
	Peru	64.8	(1.7)	0.5	(0.2)	59.9	(2.0)	0.5	(0.2)	53.9	(1.5)	0.3	(0.1)
	Qatar	63.5	(0.5)	1.7	(0.2)	57.1	(0.4)	1.6	(0.1)	51.6	(0.5)	1.6	(0.2)
	Romania	40.4	(2.0)	0.7	(0.2)	37.3	(1.9)	1.6	(0.4)	38.7	(1.9)	2.0	(0.4)
	Russia	27.4	(1.3)	3.2	(0.5)	22.3	(1.3)	4.6	(0.6)	16.2	(1.2)	6.6	(0.6)
	Singapore	12.5	(0.5)	15.7	(0.5)	9.9	(0.4)	21.2	(0.6)	11.1	(0.5)	18.4	(0.7)
	Chinese Taipei	15.6	(0.9)	5.2	(0.8)	11.5	(0.9)	11.8	(0.8)	17.2	(0.8)	6.9	(0.8)
	Thailand	42.9	(1.5)	0.3	(0.2)	33.0	(1.4)	0.8	(0.2)	50.0	(1.8)	0.3	(0.1)
	Trinidad and Tobago	44.8	(0.7)	2.3	(0.3)	m	m	m	m	42.5	(0.9)	2.4	(0.3)
	Tunisia	50.2	(1.6)	0.2	(0.1)	49.3	(2.2)	0.2	(0.2)	71.6	(1.3)	0.1	(0.1)
	United Arab Emirates	m	m	m	m	35.5	(1.1)	2.2	(0.3)	40.4	(1.2)	3.0	(0.3)
	Uruguay	41.9	(1.2)	1.8	(0.3)	47.0	(1.4)	0.9	(0.3)	39.0	(1.1)	2.5	(0.4)
	Viet Nam	m	m	m	m	9.4	(1.4)	4.5	(0.8)	13.8	(1.4)	2.7	(0.7)
	Argentina**	51.6	(1.9)	1.0	(0.2)	53.6	(1.7)	0.5	(0.1)	41.8	(1.6)	1.0	(0.2)
	Kazakhstan**	58.7	(1.5)	0.4	(0.1)	57.1	(1.6)	0.0	(0.0)	41.3	(1.9)	0.8	(0.3)
	Malaysia**	44.0	(1.6)	0.1	(0.1)	52.7	(1.7)	0.1	(0.1)	37.2	(1.7)	0.4	(0.2)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Costa Rica, Georgia, Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433195

[Part 2/2]

Table I.4.2a Percentage of low achievers and top performers in reading, 2009 through 2015

		Change between 2009 and 2015 (PISA 2015 – PISA 2009)				Change between 2012 and 2015 (PISA 2015 – PISA 2012)			
		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)	
		% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	**3.8**	(1.1)	-1.7	(1.1)	**3.9**	(1.8)	-0.7	(1.6)
	Austria	m	m	m	m	3.0	(2.1)	1.7	(1.3)
	Belgium	1.8	(1.4)	-1.8	(1.0)	3.5	(2.0)	-2.4	(1.6)
	Canada	0.4	(0.9)	1.3	(1.3)	-0.2	(1.1)	1.2	(2.4)
	Chile	-2.2	(2.5)	**1.0**	(0.4)	-4.6	(4.3)	**1.7**	(0.3)
	Czech Republic	-1.0	(2.0)	**2.8**	(0.9)	5.2	(2.8)	1.8	(1.3)
	Denmark	-0.2	(1.4)	**1.8**	(0.9)	0.4	(2.2)	1.1	(1.2)
	Estonia	**-2.7**	(1.3)	**5.0**	(1.1)	1.5	(1.5)	2.7	(1.8)
	Finland	**3.0**	(1.0)	-0.8	(1.4)	-0.3	(1.3)	0.2	(2.5)
	France	1.7	(1.6)	**2.9**	(1.4)	2.6	(1.9)	-0.4	(2.0)
	Germany	-2.2	(1.5)	**4.0**	(1.1)	1.7	(2.0)	2.7	(1.7)
	Greece	**6.0**	(2.9)	**-1.6**	(0.7)	4.7	(3.9)	-1.1	(0.8)
	Hungary	**9.9**	(2.2)	**-1.8**	(0.8)	**7.8**	(3.4)	-1.4	(1.0)
	Iceland	**5.3**	(1.7)	**-1.9**	(0.9)	1.1	(3.1)	0.8	(1.2)
	Ireland	**-7.1**	(1.4)	**3.7**	(1.2)	0.6	(1.7)	-0.7	(2.1)
	Israel	0.0	(1.9)	1.8	(1.0)	3.0	(2.8)	-0.5	(1.5)
	Italy	-0.1	(1.5)	-0.2	(0.6)	1.5	(2.4)	-1.0	(0.9)
	Japan	-0.7	(1.6)	-2.6	(1.5)	3.1	(1.7)	**-7.7**	(2.5)
	Korea	**7.9**	(1.4)	-0.2	(1.7)	**6.0**	(1.8)	-1.5	(2.5)
	Latvia	0.1	(1.8)	**1.4**	(0.7)	0.7	(2.5)	0.2	(0.9)
	Luxembourg	-0.4	(1.4)	**2.5**	(0.8)	3.5	(2.7)	-0.8	(1.1)
	Mexico	1.7	(2.9)	-0.1	(0.1)	0.7	(6.3)	-0.1	(0.1)
	Netherlands	3.7	(2.0)	1.1	(1.3)	4.1	(2.4)	1.1	(1.6)
	New Zealand	**3.0**	(1.3)	-2.1	(1.4)	1.0	(1.7)	-0.3	(2.1)
	Norway	-0.1	(1.2)	**3.8**	(1.3)	-1.3	(1.7)	2.0	(1.9)
	Poland	-0.6	(1.3)	1.0	(1.1)	**3.8**	(1.9)	-1.8	(1.6)
	Portugal	-0.4	(1.6)	**2.7**	(0.9)	-1.6	(2.3)	1.7	(1.3)
	Slovak Republic	**9.9**	(2.0)	-1.0	(0.7)	3.9	(3.3)	-0.9	(0.8)
	Slovenia	**-6.1**	(1.0)	**4.3**	(0.9)	**-6.0**	(1.5)	**3.9**	(1.3)
	Spain	**-3.3**	(1.5)	**2.2**	(0.7)	-2.1	(2.1)	0.0	(0.9)
	Sweden	1.0	(1.6)	0.9	(1.3)	-4.3	(2.3)	2.0	(1.8)
	Switzerland	3.2	(1.7)	-0.3	(1.0)	**6.3**	(2.6)	-1.3	(1.3)
	Turkey	**15.5**	(3.5)	**-1.3**	(0.4)	**18.3**	(6.3)	**-3.8**	(0.9)
	United Kingdom	-0.6	(1.4)	1.1	(0.9)	1.3	(2.5)	0.4	(1.4)
	United States	1.4	(1.7)	-0.3	(1.3)	2.4	(2.4)	1.7	(1.4)
	OECD average-34	1.5	(0.9)	0.8	(0.4)	2.1	(1.9)	0.0	(1.0)
	OECD average-35	m	m	m	m	2.1	(1.9)	0.0	(1.0)
Partners	Albania	**-6.4**	(3.1)	**0.8**	(0.3)	-2.1	(4.9)	-0.2	(0.3)
	Algeria	m	m	m	m	m	m	m	m
	Brazil	1.4	(2.7)	0.1	(0.3)	0.2	(4.9)	**1.0**	(0.3)
	B-S-J-G (China)	m	m	m	m	m	m	m	m
	Bulgaria	0.5	(3.4)	0.8	(0.7)	2.1	(3.8)	-0.8	(0.8)
	CABA (Argentina)	m	m	m	m	**-15.3**	(4.4)	1.2	(1.4)
	Colombia	-4.3	(3.3)	0.4	(0.2)	-8.6	(5.5)	**0.7**	(0.2)
	Costa Rica	7.7	(4.0)	-0.1	(0.3)	7.9	(8.3)	0.1	(0.3)
	Croatia	-2.6	(2.0)	**2.7**	(0.7)	1.2	(2.9)	1.5	(1.0)
	Cyprus*	m	m	m	m	2.9	(3.2)	-0.9	(0.6)
	Dominican Republic	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m
	Georgia	**-10.3**	(2.5)	**0.8**	(0.3)	m	m	m	m
	Hong Kong (China)	1.0	(1.1)	-0.9	(1.4)	**2.5**	(1.2)	**-5.3**	(2.6)
	Indonesia	2.0	(4.6)	0.1	(0.1)	0.1	(8.7)	0.1	(0.1)
	Jordan	-1.7	(3.0)	0.0	(0.1)	-4.4	(5.2)	0.1	(0.2)
	Kosovo	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m
	Lithuania	0.7	(1.9)	**1.5**	(0.7)	3.9	(3.2)	1.2	(0.8)
	Macao (China)	**-3.2**	(0.9)	**3.8**	(0.7)	0.2	(1.6)	-0.3	(1.2)
	Malta	-0.8	(1.3)	**1.2**	(0.6)	m	m	m	m
	Moldova	**-11.4**	(3.0)	**1.1**	(0.2)	m	m	m	m
	Montenegro	**-7.7**	(2.6)	**0.8**	(0.3)	-1.4	(5.2)	0.4	(0.4)
	Peru	**-10.9**	(2.9)	-0.2	(0.2)	-6.0	(5.2)	-0.2	(0.2)
	Qatar	**-11.9**	(1.4)	-0.2	(0.2)	-5.6	(3.1)	-0.1	(0.2)
	Romania	-1.7	(3.4)	**1.3**	(0.4)	1.5	(5.2)	0.4	(0.6)
	Russia	**-11.1**	(2.1)	**3.5**	(0.8)	-6.1	(3.1)	2.0	(1.0)
	Singapore	-1.3	(0.8)	**2.7**	(1.3)	1.3	(0.9)	-2.8	(2.6)
	Chinese Taipei	1.6	(1.4)	1.8	(1.2)	**5.7**	(2.1)	**-4.9**	(1.4)
	Thailand	7.1	(3.8)	0.0	(0.2)	**17.0**	(7.7)	**-0.5**	(0.3)
	Trinidad and Tobago	-2.3	(1.9)	0.2	(0.4)	m	m	m	m
	Tunisia	**21.4**	(3.0)	-0.2	(0.1)	**22.3**	(5.8)	-0.2	(0.2)
	United Arab Emirates	m	m	m	m	4.9	(3.9)	0.8	(0.5)
	Uruguay	-2.9	(2.3)	0.8	(0.5)	-8.0	(4.2)	**1.6**	(0.5)
	Viet Nam	m	m	m	m	4.4	(2.9)	-1.9	(1.1)
	Argentina**	**-9.8**	(3.1)	0.0	(0.3)	**-11.8**	(4.9)	0.4	(0.2)
	Kazakhstan**	**-17.4**	(3.9)	0.5	(0.3)	**-15.8**	(7.4)	**0.8**	(0.3)
	Malaysia**	**-6.7**	(3.1)	0.3	(0.2)	**-15.5**	(5.7)	0.3	(0.2)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433195

[Part 1/1]

Table I.4.3 Mean score and variation in reading performance

	Mean score		Standard deviation		Percentiles													
					5th		10th		25th		Median (50th)		75th		90th		95th	
	Mean	S.E.	S.D.	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
OECD																		
Australia	503	(1.7)	103	(1.1)	324	(3.0)	365	(2.7)	435	(2.4)	509	(2.0)	576	(2.0)	631	(2.2)	662	(2.6)
Austria	485	(2.8)	101	(1.5)	308	(5.1)	347	(5.1)	417	(4.0)	491	(3.3)	559	(3.1)	611	(3.0)	641	(3.5)
Belgium	499	(2.4)	100	(1.5)	323	(3.8)	360	(3.9)	429	(3.8)	507	(3.0)	573	(2.2)	623	(2.5)	650	(2.9)
Canada	527	(2.3)	93	(1.3)	366	(4.3)	404	(3.6)	466	(2.8)	531	(2.4)	591	(2.4)	642	(2.7)	671	(2.8)
Chile	459	(2.6)	88	(1.7)	310	(4.9)	342	(3.7)	398	(3.3)	461	(3.1)	521	(3.2)	572	(3.5)	599	(3.7)
Czech Republic	487	(2.6)	100	(1.7)	315	(5.7)	352	(4.8)	418	(4.0)	492	(3.1)	559	(2.8)	614	(3.5)	645	(3.6)
Denmark	500	(2.5)	87	(1.2)	347	(4.1)	383	(4.3)	443	(3.2)	505	(2.8)	561	(2.6)	608	(3.4)	635	(3.6)
Estonia	519	(2.2)	87	(1.2)	369	(4.2)	404	(4.0)	460	(2.8)	523	(2.7)	581	(2.6)	630	(2.9)	659	(3.2)
Finland	526	(2.5)	94	(1.5)	359	(5.4)	401	(4.7)	469	(3.7)	534	(2.7)	592	(2.7)	640	(2.6)	668	(3.8)
France	499	(2.5)	112	(2.0)	299	(6.6)	344	(5.7)	423	(3.7)	510	(2.9)	583	(3.1)	637	(3.0)	666	(3.6)
Germany	509	(3.0)	100	(1.6)	334	(5.2)	375	(5.3)	442	(3.8)	516	(3.7)	581	(3.1)	634	(3.4)	664	(3.2)
Greece	467	(4.3)	98	(2.4)	296	(7.6)	334	(8.2)	400	(6.1)	473	(4.6)	539	(3.6)	590	(3.7)	618	(3.8)
Hungary	470	(2.7)	97	(1.7)	306	(5.3)	338	(4.2)	399	(3.9)	475	(3.6)	541	(3.1)	593	(3.2)	620	(3.4)
Iceland	482	(2.0)	99	(1.7)	310	(4.9)	350	(4.3)	417	(3.2)	485	(2.5)	552	(2.6)	607	(4.0)	638	(5.0)
Ireland	521	(2.5)	86	(1.5)	373	(4.6)	406	(4.1)	463	(3.1)	524	(2.7)	582	(2.7)	629	(2.8)	657	(4.1)
Israel	479	(3.8)	113	(2.0)	284	(7.1)	326	(5.8)	401	(5.1)	485	(4.6)	562	(4.3)	621	(4.3)	655	(5.1)
Italy	485	(2.7)	94	(1.6)	323	(4.8)	359	(4.2)	421	(3.7)	489	(3.3)	552	(3.1)	602	(2.9)	631	(3.5)
Japan	516	(3.2)	92	(1.8)	352	(7.0)	391	(5.8)	457	(4.2)	523	(3.5)	581	(3.4)	629	(3.7)	656	(3.8)
Korea	517	(3.5)	97	(1.7)	345	(7.3)	386	(5.6)	455	(4.4)	524	(3.9)	586	(3.9)	637	(4.3)	666	(4.1)
Latvia	488	(1.8)	85	(1.5)	341	(3.8)	374	(3.4)	431	(3.0)	491	(2.3)	548	(2.0)	595	(2.5)	621	(3.6)
Luxembourg	481	(1.4)	107	(1.0)	299	(3.3)	336	(2.9)	405	(2.1)	487	(2.4)	561	(2.1)	616	(2.5)	647	(3.8)
Mexico	423	(2.6)	78	(1.5)	292	(3.8)	321	(3.6)	370	(3.0)	425	(2.8)	478	(3.2)	523	(3.9)	549	(4.2)
Netherlands	503	(2.4)	101	(1.6)	330	(5.3)	368	(4.6)	434	(4.0)	509	(3.0)	577	(2.8)	630	(3.1)	658	(3.5)
New Zealand	509	(2.4)	105	(1.7)	327	(4.8)	368	(4.5)	439	(3.6)	514	(3.3)	584	(3.3)	643	(4.3)	674	(4.4)
Norway	513	(2.5)	99	(1.7)	342	(5.2)	381	(4.0)	449	(3.3)	518	(2.8)	583	(2.9)	636	(3.0)	666	(3.7)
Poland	506	(2.5)	90	(1.3)	349	(5.1)	386	(3.7)	446	(3.5)	511	(3.0)	570	(2.8)	617	(3.5)	644	(4.6)
Portugal	498	(2.7)	92	(1.1)	339	(4.7)	374	(3.7)	436	(4.2)	504	(3.5)	564	(2.8)	614	(3.1)	641	(3.3)
Slovak Republic	453	(2.8)	104	(1.8)	269	(6.5)	312	(4.6)	382	(4.1)	459	(3.3)	528	(3.1)	583	(3.2)	613	(4.1)
Slovenia	505	(1.5)	92	(1.3)	346	(4.1)	382	(2.7)	444	(2.3)	510	(2.0)	570	(2.1)	621	(3.4)	648	(3.9)
Spain	496	(2.4)	87	(1.4)	343	(4.5)	379	(3.9)	438	(3.3)	502	(2.6)	558	(2.7)	603	(2.9)	629	(3.5)
Sweden	500	(3.5)	102	(1.5)	321	(6.0)	364	(4.6)	433	(4.4)	507	(4.1)	573	(3.8)	625	(3.6)	655	(4.4)
Switzerland	492	(3.0)	98	(1.7)	322	(5.6)	360	(5.0)	426	(4.0)	499	(3.6)	563	(3.6)	614	(3.6)	643	(3.7)
Turkey	428	(4.0)	82	(2.0)	291	(4.8)	322	(4.9)	372	(4.4)	429	(4.5)	487	(5.2)	535	(5.9)	561	(6.1)
United Kingdom	498	(2.8)	97	(1.1)	336	(4.4)	372	(4.0)	432	(3.2)	500	(3.1)	565	(3.0)	621	(3.6)	653	(4.1)
United States	497	(3.4)	100	(1.6)	326	(6.0)	364	(5.4)	430	(4.7)	501	(3.7)	568	(3.9)	624	(3.8)	655	(3.7)
EU total	494	(0.9)	100	(0.5)	321	(1.7)	360	(1.5)	427	(1.1)	500	(0.9)	566	(1.0)	619	(1.1)	649	(1.3)
OECD total	487	(1.2)	100	(0.5)	318	(1.9)	355	(1.6)	418	(1.5)	490	(1.4)	559	(1.4)	615	(1.5)	647	(1.5)
OECD average	493	(0.5)	96	(0.3)	326	(0.9)	364	(0.8)	428	(0.6)	498	(0.5)	561	(0.5)	613	(0.6)	642	(0.7)
Partners																		
Albania	405	(4.1)	97	(1.8)	244	(5.1)	279	(5.2)	340	(4.7)	407	(4.7)	472	(4.7)	528	(5.2)	561	(5.6)
Algeria	350	(3.0)	73	(1.6)	232	(4.1)	258	(4.1)	301	(2.6)	349	(3.0)	397	(3.8)	443	(4.8)	472	(5.4)
Brazil	407	(2.8)	100	(1.5)	247	(3.4)	279	(2.8)	336	(3.0)	405	(3.1)	477	(3.2)	539	(3.9)	576	(4.6)
B-S-J-G (China)	494	(5.1)	109	(2.9)	304	(8.7)	346	(7.2)	420	(6.1)	501	(6.0)	573	(5.7)	630	(6.3)	661	(7.3)
Bulgaria	432	(5.0)	115	(2.6)	241	(6.2)	277	(6.6)	347	(7.0)	437	(6.5)	517	(5.5)	578	(5.0)	611	(5.4)
CABA (Argentina)	475	(7.2)	90	(3.4)	313	(12.6)	354	(8.6)	418	(7.8)	480	(8.2)	539	(8.2)	588	(9.1)	615	(9.8)
Colombia	425	(2.9)	90	(1.5)	278	(4.9)	308	(4.4)	361	(4.0)	425	(3.5)	489	(3.3)	542	(3.1)	572	(3.0)
Costa Rica	427	(2.6)	79	(1.6)	298	(4.0)	326	(3.5)	374	(3.0)	427	(3.0)	480	(3.2)	530	(3.8)	560	(4.8)
Croatia	487	(2.7)	91	(1.6)	334	(4.6)	367	(4.2)	424	(3.8)	489	(3.4)	553	(3.1)	603	(3.3)	632	(3.6)
Cyprus*	443	(1.7)	102	(1.3)	268	(3.7)	305	(2.7)	372	(2.8)	447	(2.2)	516	(2.7)	573	(3.4)	606	(4.2)
Dominican Republic	358	(3.1)	85	(1.9)	226	(4.5)	250	(3.8)	297	(3.5)	354	(3.4)	416	(4.1)	471	(5.1)	503	(5.8)
FYROM	352	(1.4)	99	(1.2)	187	(3.7)	222	(3.3)	284	(2.4)	353	(2.5)	421	(2.2)	480	(3.3)	513	(4.3)
Georgia	401	(3.0)	104	(1.8)	226	(5.7)	266	(4.2)	332	(3.9)	403	(3.2)	474	(3.3)	533	(4.5)	568	(4.9)
Hong Kong (China)	527	(2.7)	86	(1.5)	372	(5.6)	412	(4.5)	473	(3.7)	533	(2.9)	587	(2.5)	632	(3.1)	656	(3.5)
Indonesia	397	(2.9)	76	(1.8)	272	(5.9)	300	(5.1)	346	(3.7)	397	(3.1)	448	(3.0)	495	(3.3)	522	(4.0)
Jordan	408	(2.9)	94	(1.8)	241	(6.3)	281	(5.4)	348	(3.7)	416	(3.3)	475	(3.1)	522	(2.9)	549	(3.1)
Kosovo	347	(1.6)	78	(1.1)	215	(4.3)	243	(2.8)	294	(2.5)	350	(2.0)	403	(2.3)	447	(2.6)	471	(3.0)
Lebanon	347	(4.4)	115	(2.6)	167	(5.5)	203	(5.8)	265	(4.9)	339	(5.4)	426	(6.2)	503	(7.0)	546	(7.6)
Lithuania	472	(2.7)	94	(1.5)	312	(4.6)	347	(3.5)	407	(3.0)	475	(3.1)	541	(3.6)	593	(4.4)	622	(3.7)
Macao (China)	509	(1.3)	82	(1.1)	365	(3.7)	399	(2.6)	456	(2.0)	514	(1.8)	566	(2.0)	610	(2.8)	635	(3.4)
Malta	447	(1.8)	121	(1.5)	236	(5.6)	284	(4.9)	366	(3.7)	456	(2.5)	533	(2.7)	595	(3.1)	631	(3.8)
Moldova	416	(2.5)	98	(1.5)	253	(4.2)	289	(3.7)	349	(3.1)	418	(3.1)	485	(3.3)	541	(4.1)	574	(5.0)
Montenegro	427	(1.6)	94	(1.2)	271	(3.5)	304	(2.5)	361	(2.5)	427	(2.3)	493	(2.4)	549	(2.8)	581	(3.0)
Peru	398	(2.9)	89	(1.6)	253	(3.3)	281	(3.2)	333	(3.2)	398	(3.6)	462	(3.9)	514	(4.5)	543	(5.1)
Qatar	402	(1.0)	111	(1.0)	221	(2.2)	256	(1.8)	321	(1.8)	403	(1.5)	483	(2.2)	547	(2.2)	581	(2.7)
Romania	434	(4.1)	95	(2.1)	276	(6.3)	310	(5.4)	370	(5.0)	435	(4.6)	499	(4.7)	555	(5.4)	588	(6.1)
Russia	495	(3.1)	87	(1.4)	350	(4.4)	381	(3.9)	434	(3.9)	495	(3.6)	556	(3.5)	608	(3.5)	637	(3.7)
Singapore	535	(1.6)	99	(1.1)	362	(4.4)	400	(3.7)	470	(2.6)	542	(1.8)	607	(2.0)	657	(2.6)	686	(3.3)
Chinese Taipei	497	(2.5)	93	(1.7)	331	(4.5)	371	(4.2)	437	(3.4)	505	(2.7)	563	(3.0)	611	(3.8)	638	(4.8)
Thailand	409	(3.3)	80	(1.7)	281	(4.0)	308	(3.3)	354	(3.7)	407	(3.5)	463	(4.2)	514	(4.9)	543	(5.9)
Trinidad and Tobago	427	(1.5)	104	(1.3)	256	(4.4)	291	(3.2)	353	(2.8)	428	(2.6)	502	(2.3)	561	(3.5)	596	(4.6)
Tunisia	361	(3.1)	82	(1.9)	228	(6.0)	257	(4.7)	305	(3.6)	361	(3.6)	416	(3.2)	467	(3.6)	496	(5.1)
United Arab Emirates	434	(2.9)	106	(1.4)	258	(3.9)	295	(3.9)	359	(3.5)	435	(3.5)	509	(3.4)	572	(3.1)	605	(3.2)
Uruguay	437	(2.5)	97	(1.6)	280	(3.7)	311	(3.1)	368	(3.3)	436	(3.0)	504	(3.1)	563	(4.6)	597	(5.5)
Viet Nam	487	(3.7)	73	(2.0)	367	(5.2)	393	(4.9)	438	(4.3)	487	(3.8)	537	(4.2)	580	(5.3)	605	(6.2)
Argentina**	425	(3.2)	89	(1.7)	277	(5.5)	309	(4.3)	364	(4.2)	428	(3.8)	487	(3.6)	538	(3.9)	569	(4.7)
Kazakhstan**	427	(3.4)	80	(2.3)	299	(4.4)	325	(4.1)	372	(3.4)	425	(3.9)	481	(4.7)	533	(5.3)	563	(6.6)
Malaysia**	431	(3.5)	81	(1.9)	290	(5.7)	322	(5.0)	377	(4.1)	435	(3.9)	488	(3.7)	531	(3.9)	556	(5.3)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
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[Part 1/3]

Table I.4.4a Mean reading performance, 2000 through 2015

	PISA 2000		PISA 2003		PISA 2006		PISA 2009		PISA 2012		PISA 2015	
	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.
OECD												
Australia	528	(3.5)	525	(2.1)	513	(2.1)	515	(2.3)	512	(1.6)	503	(1.7)
Austria	492	(2.7)	491	(3.8)	490	(4.1)	m	m	490	(2.8)	485	(2.8)
Belgium	507	(3.6)	507	(2.6)	501	(3.0)	506	(2.3)	509	(2.3)	499	(2.4)
Canada	534	(1.6)	528	(1.7)	527	(2.4)	524	(1.5)	523	(1.9)	527	(2.3)
Chile	410	(3.6)	m	m	442	(5.0)	449	(3.1)	441	(2.9)	459	(2.6)
Czech Republic	492	(2.4)	489	(3.5)	483	(4.2)	478	(2.9)	493	(2.9)	487	(2.6)
Denmark	497	(2.4)	492	(2.8)	494	(3.2)	495	(2.1)	496	(2.6)	500	(2.5)
Estonia	m	m	m	m	501	(2.9)	501	(2.6)	516	(2.0)	519	(2.2)
Finland	546	(2.6)	543	(1.6)	547	(2.1)	536	(2.3)	524	(2.4)	526	(2.5)
France	505	(2.7)	496	(2.7)	488	(4.1)	496	(3.4)	505	(2.8)	499	(2.5)
Germany	484	(2.5)	491	(3.4)	495	(4.4)	497	(2.7)	508	(2.8)	509	(3.0)
Greece	474	(5.0)	472	(4.1)	460	(4.0)	483	(4.3)	477	(3.3)	467	(4.3)
Hungary	480	(4.0)	482	(2.5)	482	(3.3)	494	(3.2)	488	(3.2)	470	(2.7)
Iceland	507	(1.5)	492	(1.6)	484	(1.9)	500	(1.4)	483	(1.8)	482	(2.0)
Ireland	527	(3.2)	515	(2.6)	517	(3.5)	496	(3.0)	523	(2.6)	521	(2.5)
Israel	452	(8.5)	m	m	439	(4.6)	474	(3.6)	486	(5.0)	479	(3.8)
Italy	487	(2.9)	476	(3.0)	469	(2.4)	486	(1.6)	490	(2.0)	485	(2.7)
Japan	522	(5.2)	498	(3.9)	498	(3.6)	520	(3.5)	538	(3.7)	516	(3.2)
Korea	525	(2.4)	534	(3.1)	556	(3.8)	539	(3.5)	536	(3.9)	517	(3.5)
Latvia	458	(5.3)	491	(3.7)	479	(3.7)	484	(3.0)	489	(2.4)	488	(1.8)
Luxembourg	m	m	479	(1.5)	479	(1.3)	472	(1.3)	488	(1.5)	481	(1.4)
Mexico	422	(3.3)	400	(4.1)	410	(3.1)	425	(2.0)	424	(1.5)	423	(2.6)
Netherlands	m	m	513	(2.9)	507	(2.9)	508	(5.1)	511	(3.5)	503	(2.4)
New Zealand	529	(2.8)	522	(2.5)	521	(3.0)	521	(2.4)	512	(2.4)	509	(2.4)
Norway	505	(2.8)	500	(2.8)	484	(3.2)	503	(2.6)	504	(3.2)	513	(2.5)
Poland	479	(4.5)	497	(2.9)	508	(2.8)	500	(2.6)	518	(3.1)	506	(2.5)
Portugal	470	(4.5)	478	(3.7)	472	(3.6)	489	(3.1)	488	(3.8)	498	(2.7)
Slovak Republic	m	m	469	(3.1)	466	(3.1)	477	(2.5)	463	(4.2)	453	(2.8)
Slovenia	m	m	m	m	494	(1.0)	483	(1.0)	481	(1.2)	505	(1.5)
Spain	493	(2.7)	481	(2.6)	461	(2.2)	481	(2.0)	488	(1.9)	496	(2.4)
Sweden	516	(2.2)	514	(2.4)	507	(3.4)	497	(2.9)	483	(3.0)	500	(3.5)
Switzerland	494	(4.2)	499	(3.3)	499	(3.1)	501	(2.4)	509	(2.6)	492	(3.0)
Turkey	m	m	441	(5.8)	447	(4.2)	464	(3.5)	475	(4.2)	428	(4.0)
United Kingdom	m	m	m	m	495	(2.3)	494	(2.3)	499	(3.5)	498	(2.8)
United States	504	(7.0)	495	(3.2)	m	m	500	(3.7)	498	(3.7)	497	(3.4)
OECD average-24	501	(0.7)	497	(0.6)	495	(0.7)	499	(0.6)	501	(0.6)	498	(0.6)
OECD average-28	496	(0.7)	m	m	m	m	m	m	498	(0.6)	495	(0.5)
OECD average-30	m	m	494	(0.6)	m	m	m	m	498	(0.5)	493	(0.5)
OECD average-34-R	m	m	m	m	489	(0.6)	m	m	496	(0.5)	493	(0.5)
OECD average-34	m	m	m	m	m	m	494	(0.5)	497	(0.5)	493	(0.5)
OECD average-35	m	m	m	m	m	m	m	m	496	(0.5)	493	(0.5)
Partners												
Albania	349	(3.3)	m	m	m	m	385	(4.0)	394	(3.2)	405	(4.1)
Algeria	m	m	m	m	m	m	m	m	m	m	350	(3.0)
Brazil	396	(3.1)	403	(4.6)	393	(3.7)	412	(2.7)	407	(2.0)	407	(2.8)
B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	494	(5.1)
Bulgaria	430	(4.9)	m	m	402	(6.9)	429	(6.7)	436	(6.0)	432	(5.0)
CABA (Argentina)	m	m	m	m	m	m	m	m	429	(9.0)	475	(7.2)
Colombia	m	m	m	m	385	(5.1)	413	(3.7)	403	(3.4)	425	(2.9)
Costa Rica	m	m	m	m	m	m	443	(3.2)	441	(3.5)	427	(2.6)
Croatia	m	m	m	m	477	(2.8)	476	(2.9)	485	(3.3)	487	(2.7)
Cyprus*	m	m	m	m	m	m	m	m	449	(1.2)	443	(1.7)
Dominican Republic	m	m	m	m	m	m	m	m	m	m	358	(3.1)
FYROM	373	(1.9)	m	m	m	m	m	m	m	m	352	(1.4)
Georgia	m	m	m	m	m	m	374	(2.9)	m	m	401	(3.0)
Hong Kong (China)	525	(2.9)	510	(3.7)	536	(2.4)	533	(2.1)	545	(2.8)	527	(2.7)
Indonesia	371	(4.0)	382	(3.4)	393	(5.9)	402	(3.7)	396	(4.2)	397	(2.9)
Jordan	m	m	m	m	401	(3.3)	405	(3.3)	399	(3.6)	408	(2.9)
Kosovo	m	m	m	m	m	m	m	m	m	m	347	(1.6)
Lebanon	m	m	m	m	m	m	m	m	m	m	347	(4.4)
Lithuania	m	m	m	m	470	(3.0)	468	(2.4)	477	(2.5)	472	(2.7)
Macao (China)	m	m	498	(2.2)	492	(1.1)	487	(0.9)	509	(0.9)	509	(1.3)
Malta	m	m	m	m	m	m	442	(1.6)	m	m	447	(1.8)
Moldova	m	m	m	m	m	m	388	(2.8)	m	m	416	(2.5)
Montenegro	m	m	m	m	392	(1.2)	408	(1.7)	422	(1.2)	427	(1.6)
Peru	327	(4.4)	m	m	m	m	370	(4.0)	384	(4.3)	398	(2.9)
Qatar	m	m	m	m	312	(1.2)	372	(0.8)	388	(0.8)	402	(1.0)
Romania	428	(3.5)	m	m	396	(4.7)	424	(4.1)	438	(4.0)	434	(4.1)
Russia	462	(4.2)	442	(3.9)	440	(4.3)	459	(3.3)	475	(3.0)	495	(3.1)
Singapore	m	m	m	m	m	m	526	(1.1)	542	(1.4)	535	(1.6)
Chinese Taipei	m	m	m	m	496	(3.4)	495	(2.6)	523	(3.0)	497	(2.5)
Thailand	431	(3.2)	420	(2.8)	417	(2.6)	421	(2.6)	441	(3.1)	409	(3.3)
Trinidad and Tobago	m	m	m	m	m	m	416	(1.2)	m	m	427	(1.5)
Tunisia	m	m	375	(2.8)	380	(4.0)	404	(2.9)	404	(4.5)	361	(3.1)
United Arab Emirates	m	m	m	m	m	m	m	m	442	(2.5)	434	(2.9)
Uruguay	m	m	434	(3.4)	413	(3.4)	426	(2.6)	411	(3.2)	437	(2.5)
Viet Nam	m	m	m	m	m	m	m	m	508	(4.4)	487	(3.7)
Argentina**	418	(9.9)	m	m	374	(7.2)	398	(4.6)	396	(3.7)	425	(3.2)
Kazakhstan**	m	m	m	m	m	m	390	(3.1)	393	(2.7)	427	(3.4)
Malaysia**	m	m	m	m	m	m	414	(2.9)	398	(3.3)	431	(3.5)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
The average 3-year trend is the average change between the earliest available measurement in PISA and PISA 2015.
The curvilinear trend is estimated by a regression of performance on time (measured in years since 2015) and time-squared. The linear term is the estimated annual increase (if positive) or decrease (if negative) in performance in 2015. The quadratic term is the rate at which changes in performance are accelerating (if of the same sign as the linear term) or decelerating (if of opposite sign). The curvilinear trend is only reported for countries/economies with at least four comparable performance measures prior to 2015.
Albania, Argentina, Bulgaria, Chile, the FYROM, Indonesia, Peru and Thailand conducted the PISA 2000 assessment in 2001, Hong Kong (China), Israel and Romania in 2002, as part of PISA 2000+. Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+. Estimates of the average three-year trend and the curvilinear trend for these countries consider the exact year in which the assessment was conducted.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433195

[Part 2/3]

Table I.4.4a Mean reading performance, 2000 through 2015

		Change between 2000 and 2015 (PISA 2015 – PISA 2000)		Change between 2003 and 2015 (PISA 2015 – PISA 2003)		Change between 2006 and 2015 (PISA 2015 – PISA 2006)		Change between 2009 and 2015 (PISA 2015 – PISA 2009)		Change between 2012 and 2015 (PISA 2015 – PISA 2012)	
		Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	**-25**	(7.8)	**-23**	(6.0)	-10	(7.1)	**-12**	(4.5)	-9	(5.7)
	Austria	-7	(7.8)	-6	(7.2)	-5	(8.3)	m	m	-5	(6.6)
	Belgium	-9	(8.0)	-8	(6.4)	-2	(7.7)	-7	(4.8)	-10	(6.2)
	Canada	-8	(7.4)	-1	(6.1)	0	(7.4)	2	(4.4)	4	(6.1)
	Chile	**49**	(8.1)	m	m	16	(8.7)	9	(5.3)	**17**	(6.5)
	Czech Republic	-4	(7.7)	-1	(6.9)	5	(8.2)	9	(5.2)	-6	(6.5)
	Denmark	3	(7.6)	7	(6.6)	5	(7.8)	5	(4.7)	4	(6.4)
	Estonia	m	m	m	m	**18**	(7.6)	**18**	(4.9)	3	(6.1)
	Finland	**-20**	(7.7)	**-17**	(6.2)	**-20**	(7.4)	-9	(4.8)	2	(6.3)
	France	-5	(7.7)	3	(6.5)	12	(8.2)	4	(5.5)	-6	(6.5)
	Germany	**25**	(7.8)	**18**	(7.0)	14	(8.5)	**12**	(5.3)	1	(6.7)
	Greece	-7	(9.5)	-5	(8.0)	7	(8.9)	**-16**	(7.0)	-10	(7.6)
	Hungary	-10	(8.3)	-12	(6.5)	-13	(7.8)	**-25**	(5.4)	**-19**	(6.7)
	Iceland	**-25**	(7.2)	-10	(6.0)	-3	(7.2)	**-19**	(4.2)	-1	(5.9)
	Ireland	-6	(7.9)	5	(6.5)	4	(7.9)	**25**	(5.2)	-2	(6.3)
	Israel	**27**	(11.5)	m	m	**40**	(8.9)	5	(6.3)	-7	(8.2)
	Italy	-3	(7.9)	9	(6.7)	**16**	(7.5)	-1	(4.6)	-5	(6.2)
	Japan	-6	(9.1)	**18**	(7.4)	**18**	(8.2)	-4	(5.8)	**-22**	(7.2)
	Korea	-7	(8.0)	**-17**	(7.1)	**-39**	(8.4)	**-22**	(6.0)	**-18**	(7.4)
	Latvia	**30**	(8.8)	-3	(6.8)	8	(7.8)	4	(4.9)	-1	(6.0)
	Luxembourg	m	m	2	(5.8)	2	(6.9)	**9**	(3.9)	-6	(5.7)
	Mexico	1	(8.0)	**24**	(7.2)	13	(7.7)	-2	(4.7)	0	(6.0)
	Netherlands	m	m	-10	(6.6)	-4	(7.6)	-5	(6.6)	-8	(6.7)
	New Zealand	**-20**	(7.7)	-12	(6.4)	-12	(7.6)	**-12**	(4.8)	-3	(6.3)
	Norway	8	(7.8)	**13**	(6.6)	**29**	(7.8)	**10**	(5.0)	9	(6.7)
	Poland	**27**	(8.5)	9	(6.6)	-2	(7.6)	5	(5.0)	-12	(6.6)
	Portugal	**28**	(8.6)	**21**	(7.1)	**26**	(8.0)	9	(5.3)	10	(7.0)
	Slovak Republic	m	m	**-17**	(6.8)	-14	(7.8)	**-25**	(5.1)	-10	(7.3)
	Slovenia	m	m	m	m	11	(6.8)	**22**	(3.9)	**24**	(5.6)
	Spain	3	(7.7)	**15**	(6.4)	**35**	(7.4)	**15**	(4.6)	8	(6.1)
	Sweden	**-16**	(8.0)	**-14**	(6.9)	-7	(8.2)	3	(5.7)	**17**	(7.0)
	Switzerland	-2	(8.6)	-7	(7.0)	-7	(7.9)	-8	(5.2)	**-17**	(6.6)
	Turkey	m	m	-13	(8.8)	**-19**	(8.8)	**-36**	(6.3)	**-47**	(7.8)
	United Kingdom	m	m	m	m	3	(7.5)	4	(5.0)	-1	(6.9)
	United States	-7	(10.4)	2	(7.1)	m	m	-3	(6.1)	-1	(7.3)
	OECD average-24	-3	(6.9)	1	(5.5)	3	(6.7)	-2	(3.5)	-4	(5.3)
	OECD average-28	-1	(6.9)	m	m	m	m	m	m	-3	(5.3)
	OECD average-30	m	m	-1	(5.4)	m	m	m	m	-6	(5.3)
	OECD average-34-R	m	m	m	m	4	(6.6)	m	m	-4	(5.3)
	OECD average-34	m	m	m	m	m	m	-1	(3.5)	-4	(5.3)
	OECD average-35	m	m	m	m	m	m	m	m	-4	(5.3)
Partners	Albania	**56**	(8.6)	m	m	m	m	**20**	(6.7)	11	(7.4)
	Algeria	m	m	m	m	m	m	m	m	m	m
	Brazil	11	(8.0)	5	(7.6)	14	(8.1)	-4	(5.2)	1	(6.3)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m
	Bulgaria	1	(9.8)	m	m	**30**	(10.8)	3	(9.0)	-4	(9.4)
	CABA (Argentina)	m	m	m	m	m	m	m	m	**46**	(12.7)
	Colombia	m	m	m	m	**40**	(8.8)	**12**	(5.9)	**22**	(6.9)
	Costa Rica	m	m	m	m	m	m	**-15**	(5.4)	-13	(6.8)
	Croatia	m	m	m	m	9	(7.7)	**11**	(5.2)	2	(6.8)
	Cyprus*	m	m	m	m	m	m	m	m	-6	(5.6)
	Dominican Republic	m	m	m	m	m	m	m	m	m	m
	FYROM	**-21**	(7.2)	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	**27**	(5.4)	m	m
	Hong Kong (China)	1	(7.9)	**17**	(7.1)	-9	(7.5)	-6	(4.8)	**-18**	(6.5)
	Indonesia	**27**	(8.4)	**16**	(7.0)	4	(9.3)	-4	(5.8)	1	(7.3)
	Jordan	m	m	m	m	8	(7.9)	3	(5.6)	9	(7.0)
	Kosovo	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m
	Lithuania	m	m	m	m	2	(7.7)	4	(5.0)	-5	(6.4)
	Macao (China)	m	m	11	(5.9)	**16**	(6.8)	**22**	(3.8)	0	(5.5)
	Malta	m	m	m	m	m	m	5	(4.2)	m	m
	Moldova	m	m	m	m	m	m	**28**	(5.1)	m	m
	Montenegro	m	m	m	m	**35**	(6.9)	**19**	(4.1)	5	(5.6)
	Peru	**70**	(8.6)	m	m	m	m	**28**	(6.0)	13	(7.4)
	Qatar	m	m	m	m	**90**	(6.8)	**30**	(3.7)	**14**	(5.4)
	Romania	6	(8.7)	m	m	**38**	(9.1)	9	(6.7)	-4	(7.7)
	Russia	**33**	(8.5)	**52**	(7.4)	**55**	(8.5)	**35**	(5.7)	**19**	(6.8)
	Singapore	m	m	m	m	m	m	**9**	(3.9)	-7	(5.7)
	Chinese Taipei	m	m	m	m	1	(7.8)	2	(5.0)	**-26**	(6.6)
	Thailand	**-22**	(8.2)	-11	(6.9)	-8	(7.8)	**-12**	(5.5)	**-32**	(7.0)
	Trinidad and Tobago	m	m	m	m	m	m	**11**	(3.9)	m	m
	Tunisia	m	m	**-14**	(6.8)	**-19**	(8.3)	**-43**	(5.4)	**-43**	(7.6)
	United Arab Emirates	m	m	m	m	m	m	m	m	-8	(6.5)
	Uruguay	m	m	2	(6.9)	**24**	(7.9)	**11**	(5.0)	**25**	(6.6)
	Viet Nam	m	m	m	m	m	m	m	m	**-21**	(7.8)
	Argentina**	7	(12.4)	m	m	**52**	(10.3)	**27**	(6.6)	**29**	(7.2)
	Kazakhstan**	m	m	m	m	m	m	**37**	(5.7)	**34**	(6.8)
	Malaysia**	m	m	m	m	m	m	**17**	(5.7)	**32**	(7.1)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
The average 3-year trend is the average change between the earliest available measurement in PISA and PISA 2015.
The curvilinear trend is estimated by a regression of performance on time (measured in years since 2015) and time-squared. The linear term is the estimated annual increase (if positive) or decrease (if negative) in performance in 2015. The quadratic term is the rate at which changes in performance are accelerating (if of the same sign as the linear term) or decelerating (if of opposite sign). The curvilinear trend is only reported for countries/economies with at least four comparable performance measures prior to 2015.
Albania, Argentina, Bulgaria, Chile, the FYROM, Indonesia, Peru and Thailand conducted the PISA 2000 assessment in 2001, Hong Kong (China), Israel and Romania in 2002, as part of PISA 2000+. Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+. Estimates of the average three-year trend and the curvilinear trend for these countries consider the exact year in which the assessment was conducted.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
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[Part 3/3]

Table I.4.4a Mean reading performance, 2000 through 2015

		Average 3-year trend in reading performance across PISA assessments (since 2000 or earliest assessment available)			Average 3-year trend in reading performance across PISA assessments (since 2009 or earliest assessment available after 2009)			Curvilinear trend in reading performance since 2000, 2001, 2002 or 2003			
								Annual rate of change in 2015 (linear term)		Rate of acceleration or deceleration in performance (quadratic term)	
		Score dif.	S.E.	p-value	Score dif.	S.E.	p-value	Coef.	S.E.	Coef.	S.E.
OECD	Australia	**-4.7**	(1.4)	0.001	**-5.9**	(2.2)	0.008	-1.3	(1.1)	0.0	(0.1)
	Austria	-1.2	(1.4)	0.396	-4.9	(6.5)	0.452	-0.9	(1.6)	0.0	(0.1)
	Belgium	-0.9	(1.4)	0.524	-3.5	(2.4)	0.137	-0.7	(1.2)	0.0	(0.1)
	Canada	-1.6	(1.3)	0.238	1.3	(2.2)	0.556	1.0	(1.1)	0.1	(0.1)
	Chile	**9.0**	(1.7)	0.000	4.6	(2.7)	0.085	-0.3	(1.5)	**-0.2**	(0.1)
	Czech Republic	-0.4	(1.4)	0.792	4.6	(2.6)	0.077	1.9	(1.3)	0.1	(0.1)
	Denmark	0.8	(1.4)	0.569	2.5	(2.4)	0.282	1.4	(1.2)	0.1	(0.1)
	Estonia	**7.1**	(2.3)	0.002	**9.2**	(2.4)	0.000	m	m	m	m
	Finland	**-4.9**	(1.4)	0.000	**-4.8**	(2.4)	0.046	**-2.6**	(1.2)	-0.1	(0.1)
	France	0.2	(1.4)	0.883	1.7	(2.7)	0.536	2.6	(1.3)	**0.2**	(0.1)
	Germany	**5.0**	(1.4)	0.000	**5.8**	(2.7)	0.028	1.6	(1.3)	0.0	(0.1)
	Greece	0.1	(1.6)	0.973	**-8.1**	(3.5)	0.020	-0.5	(1.6)	0.0	(0.1)
	Hungary	-0.6	(1.5)	0.689	**-12.3**	(2.7)	0.000	**-4.0**	(1.3)	**-0.3**	(0.1)
	Iceland	**-4.0**	(1.3)	0.002	**-9.5**	(2.2)	0.000	-0.5	(1.1)	0.1	(0.1)
	Ireland	-0.7	(1.4)	0.602	**12.8**	(2.6)	0.000	**4.2**	(1.3)	**0.3**	(0.1)
	Israel	**9.2**	(2.4)	0.000	2.5	(3.2)	0.428	3.5	(1.9)	0.0	(0.2)
	Italy	1.4	(1.4)	0.319	-0.4	(2.3)	0.867	**2.8**	(1.2)	**0.2**	(0.1)
	Japan	**3.2**	(1.6)	0.045	-1.8	(2.9)	0.531	**3.6**	(1.4)	0.2	(0.1)
	Korea	-1.4	(1.5)	0.323	**-11.1**	(3.0)	0.000	**-7.7**	(1.4)	**-0.5**	(0.1)
	Latvia	**4.2**	(1.5)	0.006	1.9	(2.5)	0.432	-1.7	(1.3)	**-0.2**	(0.1)
	Luxembourg	1.3	(1.4)	0.371	**4.6**	(1.9)	0.014	1.4	(1.4)	0.1	(0.1)
	Mexico	2.7	(1.4)	0.057	-0.8	(2.3)	0.722	**2.7**	(1.2)	0.1	(0.1)
	Netherlands	-1.6	(1.6)	0.323	-2.7	(3.3)	0.414	-0.8	(1.8)	0.0	(0.1)
	New Zealand	**-3.6**	(1.4)	0.009	**-5.9**	(2.4)	0.015	-1.6	(1.2)	0.0	(0.1)
	Norway	2.0	(1.4)	0.148	**5.0**	(2.5)	0.044	**4.8**	(1.2)	**0.3**	(0.1)
	Poland	**5.4**	(1.5)	0.000	2.5	(2.5)	0.313	-1.9	(1.3)	**-0.2**	(0.1)
	Portugal	**5.4**	(1.5)	0.000	4.4	(2.6)	0.094	**2.7**	(1.3)	0.1	(0.1)
	Slovak Republic	**-3.7**	(1.6)	0.026	**-12.4**	(2.5)	0.000	**-5.1**	(1.6)	**-0.3**	(0.1)
	Slovenia	3.0	(2.0)	0.133	**11.0**	(1.9)	0.000	m	m	m	m
	Spain	1.6	(1.4)	0.247	**7.0**	(2.3)	0.002	**6.6**	(1.2)	**0.4**	(0.1)
	Sweden	**-5.2**	(1.4)	0.000	1.3	(2.8)	0.633	0.2	(1.3)	0.1	(0.1)
	Switzerland	0.5	(1.5)	0.721	-4.3	(2.6)	0.100	-2.1	(1.3)	-0.2	(0.1)
	Turkey	0.4	(2.0)	0.858	**-17.8**	(3.2)	0.000	**-10.5**	(2.0)	**-0.9**	(0.2)
	United Kingdom	1.2	(2.3)	0.589	1.6	(2.4)	0.503	m	m	m	m
	United States	-0.8	(1.7)	0.634	-1.4	(3.0)	0.652	0.4	(1.5)	0.0	(0.1)
	OECD average-24	0.0	(1.2)	0.993	-0.8	(1.8)	0.629	0.6	(1.0)	0.0	(0.1)
	OECD average-28	0.6	(1.3)	0.627	-0.7	(1.9)	0.714	0.6	(1.0)	0.0	(0.1)
	OECD average-30	-0.2	(1.3)	0.882	-1.9	(1.9)	0.319	-0.1	(1.0)	0.0	(0.1)
	OECD average-34-R	0.8	(1.3)	0.568	-0.7	(1.8)	0.698	m	m	m	m
	OECD average-34	0.8	(1.3)	0.562	-0.6	(1.7)	0.726	m	m	m	m
	OECD average-35	0.7	(1.3)	0.591	-0.7	(1.8)	0.690	m	m	m	m
Partners	Albania	**12.1**	(1.7)	0.000	**10.3**	(3.3)	0.002	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m
	Brazil	2.5	(1.4)	0.088	-2.3	(2.7)	0.393	0.5	(1.3)	0.0	(0.1)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m
	Bulgaria	2.6	(2.0)	0.202	1.2	(4.5)	0.789	**4.6**	(2.1)	0.3	(0.1)
	CABA (Argentina)	**46.0**	(12.7)	0.000	**46.0**	(12.7)	0.000	m	m	m	m
	Colombia	**10.9**	(2.7)	0.000	5.8	(3.0)	0.053	m	m	m	m
	Costa Rica	**-9.4**	(3.4)	0.006	**-9.4**	(3.4)	0.006	m	m	m	m
	Croatia	3.7	(2.3)	0.113	**5.5**	(2.6)	0.036	m	m	m	m
	Cyprus*	-6.0	(5.6)	0.282	-6.0	(5.6)	0.282	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m
	FYROM	**-4.1**	(1.5)	0.006	m	m	m	m	m	m	m
	Georgia	**16.2**	(3.2)	0.000	**16.2**	(3.2)	0.000	m	m	m	m
	Hong Kong (China)	**3.6**	(1.5)	0.021	-3.2	(2.4)	0.184	**-3.4**	(1.4)	**-0.3**	(0.1)
	Indonesia	**5.4**	(1.6)	0.001	-2.3	(2.9)	0.437	-2.3	(1.6)	**-0.3**	(0.1)
	Jordan	1.7	(2.4)	0.483	1.6	(2.8)	0.573	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m
	Lithuania	1.7	(2.3)	0.474	2.1	(2.5)	0.396	m	m	m	m
	Macao (China)	**3.9**	(1.4)	0.006	**11.1**	(1.9)	0.000	**5.0**	(1.4)	**0.3**	(0.1)
	Malta	2.8	(2.5)	0.269	2.8	(2.5)	0.269	m	m	m	m
	Moldova	**16.9**	(3.1)	0.000	**16.9**	(3.1)	0.000	m	m	m	m
	Montenegro	**11.9**	(2.0)	0.000	**9.6**	(2.1)	0.000	m	m	m	m
	Peru	**15.2**	(1.8)	0.000	**13.9**	(3.0)	0.000	m	m	m	m
	Qatar	**28.4**	(2.0)	0.000	**14.9**	(1.8)	0.000	m	m	m	m
	Romania	**4.5**	(1.9)	0.018	4.4	(3.4)	0.188	**6.1**	(1.8)	**0.4**	(0.1)
	Russia	**8.0**	(1.5)	0.000	**17.5**	(2.8)	0.000	**10.6**	(1.4)	**0.5**	(0.1)
	Singapore	**4.5**	(2.0)	0.021	**4.5**	(2.0)	0.021	m	m	m	m
	Chinese Taipei	3.1	(2.4)	0.190	1.1	(2.5)	0.673	m	m	m	m
	Thailand	-1.1	(1.5)	0.482	**-6.1**	(2.7)	0.026	-1.3	(1.4)	-0.1	(0.1)
	Trinidad and Tobago	**5.4**	(2.0)	0.006	**5.4**	(2.0)	0.006	m	m	m	m
	Tunisia	-0.4	(1.7)	0.812	**-21.5**	(2.9)	0.000	**-11.7**	(1.8)	**-1.0**	(0.1)
	United Arab Emirates	-8.2	(6.5)	0.208	-8.2	(6.5)	0.208	m	m	m	m
	Uruguay	0.4	(1.6)	0.829	**5.3**	(2.5)	0.032	**6.4**	(1.7)	**0.5**	(0.1)
	Viet Nam	**-21.4**	(7.8)	0.006	**-21.4**	(7.8)	0.006	m	m	m	m
	Argentina**	2.0	(2.5)	0.435	**13.5**	(3.3)	0.000	**11.3**	(2.0)	**0.8**	(0.2)
	Kazakhstan**	**18.6**	(2.9)	0.000	**18.6**	(2.9)	0.000	m	m	m	m
	Malaysia**	**11.8**	(3.6)	0.001	**11.8**	(3.6)	0.001	m	m	m	m

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
The average 3-year trend is the average change between the earliest available measurement in PISA and PISA 2015.
The curvilinear trend is estimated by a regression of performance on time (measured in years since 2015) and time-squared. The linear term is the estimated annual increase (if positive) or decrease (if negative) in performance in 2015. The quadratic term is the rate at which changes in performance are accelerating (if of the same sign as the linear term) or decelerating (if of opposite sign). The curvilinear trend is only reported for countries/economies with at least four comparable performance measures prior to 2015.
Albania, Argentina, Bulgaria, Chile, the FYROM, Indonesia, Peru and Thailand conducted the PISA 2000 assessment in 2001, Hong Kong (China), Israel and Romania in 2002, as part of PISA 2000+. Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+. Estimates of the average three-year trend and the curvilinear trend for these countries consider the exact year in which the assessment was conducted.
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** Coverage is too small to ensure comparability (see Annex A4).

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[Part 1/1]

Table I.4.6a Percentage of low achievers and top performers in reading, by gender (PISA 2015)

	Boys				Girls				Gender differences (boys – girls)			
	Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)	
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	% dif.	S.E.	% dif.	S.E.
OECD												
Australia	22.8	(0.7)	9.0	(0.6)	13.3	(0.7)	13.1	(0.7)	**9.5**	(1.0)	**-4.1**	(0.8)
Austria	25.8	(1.6)	6.2	(0.8)	19.3	(1.4)	8.4	(0.8)	**6.5**	(2.1)	-2.2	(1.1)
Belgium	22.0	(1.2)	8.3	(0.7)	17.0	(1.1)	10.4	(0.7)	**5.0**	(1.5)	**-2.1**	(0.8)
Canada	13.9	(0.9)	11.3	(0.7)	7.5	(0.6)	16.8	(1.0)	**6.3**	(0.7)	**-5.5**	(0.9)
Chile	31.0	(1.5)	2.0	(0.4)	25.7	(1.3)	2.5	(0.4)	**5.3**	(1.5)	-0.5	(0.5)
Czech Republic	26.8	(1.5)	6.9	(0.6)	17.0	(1.2)	8.9	(0.7)	**9.9**	(1.7)	**-2.1**	(0.7)
Denmark	17.9	(0.9)	5.2	(0.8)	12.0	(1.1)	7.8	(0.9)	**5.9**	(1.2)	**-2.6**	(1.1)
Estonia	14.2	(1.2)	8.7	(0.7)	6.9	(0.7)	13.5	(0.9)	**7.3**	(1.3)	**-4.8**	(1.1)
Finland	16.1	(1.1)	9.2	(0.8)	5.7	(0.7)	18.5	(1.0)	**10.4**	(1.1)	**-9.3**	(1.2)
France	26.1	(1.4)	10.4	(0.7)	16.9	(1.0)	14.5	(1.1)	**9.2**	(1.7)	**-4.1**	(1.2)
Germany	18.8	(1.2)	9.8	(0.8)	13.6	(0.9)	13.6	(1.0)	**5.2**	(1.2)	**-3.8**	(1.1)
Greece	34.5	(2.3)	2.7	(0.5)	19.6	(1.6)	5.5	(0.7)	**14.9**	(1.9)	**-2.8**	(0.8)
Hungary	31.9	(1.5)	3.4	(0.5)	23.1	(1.3)	5.1	(0.6)	**8.8**	(1.9)	**-1.7**	(0.8)
Iceland	28.9	(1.4)	4.3	(0.6)	15.7	(1.2)	8.8	(1.0)	**13.2**	(1.8)	**-4.4**	(1.2)
Ireland	12.3	(1.1)	10.7	(0.9)	8.0	(0.8)	10.7	(1.0)	**4.2**	(1.1)	0.0	(1.3)
Israel	31.6	(1.8)	9.0	(1.0)	21.8	(1.5)	9.3	(0.9)	**9.8**	(2.1)	-0.3	(1.3)
Italy	24.1	(1.4)	4.9	(0.6)	17.9	(1.4)	6.4	(0.6)	**6.1**	(1.8)	-1.5	(0.8)
Japan	14.9	(1.3)	10.1	(1.2)	10.8	(1.0)	11.5	(1.1)	**4.1**	(1.3)	-1.4	(1.3)
Korea	19.2	(1.5)	9.6	(1.1)	7.6	(1.0)	16.0	(1.4)	**11.5**	(1.6)	**-6.3**	(1.6)
Latvia	24.4	(1.3)	2.5	(0.5)	11.0	(0.9)	6.2	(0.8)	**13.4**	(1.3)	**-3.7**	(0.9)
Luxembourg	29.3	(0.9)	7.2	(0.5)	22.0	(0.8)	9.1	(0.7)	**7.3**	(1.2)	**-1.9**	(0.9)
Mexico	46.4	(1.5)	0.3	(0.2)	37.0	(1.4)	0.3	(0.2)	**9.4**	(1.5)	0.0	(0.2)
Netherlands	21.7	(1.4)	9.3	(0.7)	14.5	(1.1)	12.4	(1.0)	**7.2**	(1.4)	**-3.2**	(1.2)
New Zealand	22.2	(1.2)	11.1	(1.0)	12.4	(1.0)	16.3	(1.1)	**9.8**	(1.4)	**-5.2**	(1.2)
Norway	20.5	(1.1)	9.0	(0.9)	9.2	(0.9)	15.5	(0.9)	**11.3**	(1.2)	**-6.5**	(1.2)
Poland	19.2	(1.2)	6.6	(0.7)	9.5	(0.9)	9.9	(1.0)	**9.7**	(1.5)	**-3.2**	(1.0)
Portugal	20.3	(1.1)	7.1	(0.7)	14.1	(1.1)	8.0	(0.8)	**6.3**	(1.4)	-0.9	(0.9)
Slovak Republic	38.5	(1.5)	2.5	(0.4)	25.3	(1.4)	4.5	(0.6)	**13.3**	(1.8)	**-2.0**	(0.7)
Slovenia	21.0	(1.1)	5.8	(0.8)	8.9	(0.7)	12.3	(1.0)	**12.0**	(1.4)	**-6.5**	(1.2)
Spain	19.6	(1.2)	4.7	(0.5)	12.8	(1.0)	6.3	(0.8)	**6.8**	(1.4)	-1.6	(0.9)
Sweden	24.5	(1.5)	7.4	(0.8)	12.3	(1.0)	12.5	(1.1)	**12.2**	(1.4)	**-5.1**	(1.1)
Switzerland	24.4	(1.4)	6.4	(0.8)	15.1	(1.2)	9.3	(0.9)	**9.3**	(1.4)	**-3.0**	(1.1)
Turkey	46.1	(2.4)	0.3	(0.2)	33.9	(2.3)	0.9	(0.3)	**12.2**	(2.7)	-0.6	(0.3)
United Kingdom	20.9	(1.1)	7.4	(0.7)	14.8	(1.0)	11.0	(1.0)	**6.0**	(1.3)	**-3.6**	(1.1)
United States	22.6	(1.4)	8.4	(0.8)	15.3	(1.3)	10.8	(1.1)	**7.3**	(1.5)	**-2.4**	(1.2)
OECD average-34	24.4	(0.2)	6.8	(0.1)	15.5	(0.2)	9.9	(0.2)	**8.8**	(0.3)	**-3.1**	(0.2)
OECD average-35	24.4	(0.2)	6.8	(0.1)	15.6	(0.2)	9.9	(0.2)	**8.8**	(0.3)	**-3.1**	(0.2)
Partners												
Albania	62.9	(2.2)	0.4	(0.2)	37.7	(1.9)	1.5	(0.4)	**25.2**	(2.0)	**-1.1**	(0.5)
Algeria	84.9	(1.4)	0.0	(0.0)	72.3	(2.0)	0.0	(0.0)	**12.6**	(1.7)	0.0	(0.0)
Brazil	55.7	(1.2)	1.2	(0.3)	46.5	(1.3)	1.7	(0.3)	**9.2**	(1.1)	-0.4	(0.3)
B-S-J-G (China)	24.1	(1.6)	9.1	(1.1)	19.4	(1.6)	12.9	(1.7)	**4.7**	(1.2)	**-3.8**	(1.2)
Bulgaria	49.6	(2.3)	2.4	(0.4)	32.3	(2.0)	4.9	(0.7)	**17.3**	(2.0)	**-2.5**	(0.6)
CABA (Argentina)	25.4	(2.7)	3.3	(1.3)	18.4	(2.5)	4.2	(1.2)	**7.0**	(2.4)	-0.9	(1.3)
Colombia	46.3	(1.7)	0.8	(0.2)	39.7	(1.7)	1.1	(0.2)	**6.6**	(1.6)	-0.3	(0.3)
Costa Rica	44.0	(1.7)	0.5	(0.2)	36.7	(1.7)	0.8	(0.2)	**7.4**	(1.8)	-0.3	(0.2)
Croatia	25.0	(1.6)	4.7	(0.6)	15.1	(1.1)	7.0	(0.7)	**9.8**	(1.6)	**-2.3**	(0.7)
Cyprus*	46.7	(1.0)	2.2	(0.3)	24.6	(1.0)	3.9	(0.6)	**22.1**	(1.1)	**-1.7**	(0.7)
Dominican Republic	77.3	(1.6)	0.1	(0.1)	67.1	(1.7)	0.1	(0.1)	**10.2**	(1.7)	0.0	(0.1)
FYROM	78.1	(1.0)	0.2	(0.1)	62.4	(1.2)	0.2	(0.2)	**15.7**	(1.6)	0.0	(0.2)
Georgia	62.9	(1.8)	0.7	(0.3)	39.1	(1.5)	1.7	(0.3)	**23.8**	(2.1)	**-1.0**	(0.4)
Hong Kong (China)	12.6	(1.2)	9.2	(0.9)	5.9	(0.7)	14.0	(1.4)	**6.6**	(1.2)	**-4.8**	(1.6)
Indonesia	62.0	(1.7)	0.1	(0.1)	48.8	(1.8)	0.2	(0.1)	**13.2**	(1.8)	-0.2	(0.1)
Jordan	62.8	(1.9)	0.1	(0.1)	30.1	(2.0)	0.5	(0.2)	**32.7**	(2.8)	-0.4	(0.2)
Kosovo	83.2	(1.2)	0.0	c	70.3	(1.4)	0.0	c	**12.9**	(1.9)	0.0	c
Lebanon	72.1	(2.0)	0.8	(0.3)	68.8	(1.9)	0.9	(0.3)	3.3	(2.2)	-0.1	(0.3)
Lithuania	32.2	(1.2)	2.9	(0.5)	17.8	(1.1)	6.0	(0.7)	**14.4**	(1.4)	**-3.1**	(0.7)
Macao (China)	16.5	(0.9)	5.1	(0.7)	6.8	(0.5)	8.2	(0.9)	**9.6**	(1.1)	**-3.0**	(1.1)
Malta	43.0	(1.2)	4.0	(0.5)	27.9	(1.0)	7.3	(0.6)	**15.2**	(1.4)	**-3.3**	(0.7)
Moldova	56.6	(1.3)	0.5	(0.2)	34.9	(1.4)	2.0	(0.4)	**21.6**	(1.6)	**-1.5**	(0.4)
Montenegro	49.0	(1.3)	1.1	(0.3)	34.4	(1.0)	1.7	(0.3)	**14.6**	(1.8)	-0.6	(0.4)
Peru	55.8	(1.8)	0.3	(0.1)	52.0	(1.8)	0.3	(0.1)	3.8	(2.1)	-0.1	(0.2)
Qatar	60.8	(0.6)	1.2	(0.2)	41.9	(0.7)	2.0	(0.3)	**18.9**	(0.9)	**-0.8**	(0.3)
Romania	41.8	(2.0)	1.5	(0.4)	35.7	(2.1)	2.5	(0.6)	**6.1**	(1.8)	-0.9	(0.6)
Russia	20.6	(1.5)	5.1	(0.7)	12.0	(1.3)	8.1	(0.8)	**8.7**	(1.5)	**-3.0**	(0.9)
Singapore	13.7	(0.7)	16.2	(0.9)	8.5	(0.6)	20.7	(1.0)	**5.2**	(0.8)	**-4.6**	(1.3)
Chinese Taipei	20.9	(1.2)	5.4	(0.9)	13.5	(0.9)	8.6	(1.2)	**7.4**	(1.4)	**-3.2**	(1.5)
Thailand	59.1	(2.3)	0.2	(0.1)	43.0	(1.7)	0.4	(0.2)	**16.1**	(1.9)	-0.1	(0.2)
Trinidad and Tobago	52.0	(1.4)	1.2	(0.3)	33.2	(1.2)	3.6	(0.5)	**18.8**	(1.9)	**-2.4**	(0.6)
Tunisia	76.5	(1.4)	0.0	(0.0)	67.3	(1.5)	0.1	(0.1)	**9.2**	(1.3)	0.0	(0.1)
United Arab Emirates	51.6	(1.6)	2.6	(0.4)	29.5	(1.4)	3.4	(0.5)	**22.1**	(2.1)	-0.8	(0.5)
Uruguay	44.7	(1.5)	2.1	(0.5)	33.9	(1.2)	2.9	(0.5)	**10.8**	(1.6)	-0.7	(0.6)
Viet Nam	19.1	(1.9)	1.8	(0.5)	8.8	(1.2)	3.5	(1.0)	**10.2**	(1.5)	**-1.6**	(0.7)
Argentina**	46.2	(1.9)	0.8	(0.2)	37.7	(1.7)	1.1	(0.2)	**8.5**	(1.7)	-0.2	(0.3)
Kazakhstan**	45.3	(2.3)	0.7	(0.3)	37.0	(2.0)	0.9	(0.3)	**8.3**	(2.0)	-0.2	(0.3)
Malaysia**	45.5	(2.0)	0.3	(0.2)	29.8	(1.8)	0.5	(0.2)	**15.7**	(1.8)	-0.3	(0.2)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433195

[Part 1/1]

Table I.4.6b Percentage of low achievers and top performers in reading, by gender (PISA 2009)

		Boys				Girls				Gender differences (boys – girls)			
		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	19.7	(0.8)	9.8	(0.8)	9.1	(0.6)	15.6	(0.9)	**10.6**	(0.9)	**-5.8**	(0.9)
	Austria	m	m	m	m	m	m	m	m	m	m	m	m
	Belgium	21.5	(1.3)	9.4	(0.8)	13.8	(1.0)	13.0	(0.8)	**7.7**	(1.5)	**-3.6**	(1.1)
	Canada	14.5	(0.7)	9.4	(0.5)	6.0	(0.4)	16.2	(0.7)	**8.4**	(0.7)	**-6.8**	(0.8)
	Chile	36.1	(2.0)	1.0	(0.4)	24.8	(1.5)	1.6	(0.4)	**11.3**	(1.9)	-0.5	(0.5)
	Czech Republic	30.8	(1.9)	2.8	(0.4)	14.3	(1.2)	7.8	(0.8)	**16.5**	(2.1)	**-5.0**	(0.8)
	Denmark	19.0	(1.3)	3.2	(0.5)	11.5	(0.9)	6.2	(0.6)	**7.6**	(1.4)	**-3.0**	(0.7)
	Estonia	18.9	(1.5)	3.4	(0.6)	7.3	(0.9)	8.9	(1.0)	**11.6**	(1.5)	**-5.5**	(1.0)
	Finland	13.0	(0.9)	8.1	(0.8)	3.2	(0.5)	20.9	(1.1)	**9.8**	(0.9)	**-12.8**	(1.1)
	France	25.7	(1.7)	6.9	(0.8)	14.1	(1.0)	12.1	(1.3)	**11.5**	(1.5)	**-5.1**	(1.1)
	Germany	24.0	(1.5)	4.4	(0.5)	12.7	(1.1)	11.0	(1.0)	**11.3**	(1.6)	**-6.6**	(0.9)
	Greece	29.7	(2.4)	3.4	(0.6)	13.2	(1.4)	7.7	(0.9)	**16.5**	(1.9)	**-4.3**	(1.1)
	Hungary	23.6	(1.8)	3.9	(0.7)	11.4	(1.5)	8.3	(1.0)	**12.3**	(1.9)	**-4.4**	(0.9)
	Iceland	23.8	(1.0)	5.6	(0.6)	9.9	(0.8)	11.4	(0.9)	**13.9**	(1.3)	**-5.7**	(1.0)
	Ireland	23.1	(1.7)	4.5	(0.6)	11.2	(1.0)	9.5	(0.9)	**11.9**	(1.9)	**-5.0**	(1.1)
	Israel	34.1	(1.6)	6.3	(0.9)	19.3	(1.3)	8.5	(0.8)	**14.8**	(1.7)	**-2.2**	(1.1)
	Italy	28.9	(0.9)	3.9	(0.3)	12.7	(0.7)	7.9	(0.5)	**16.2**	(1.2)	**-4.0**	(0.5)
	Japan	18.9	(1.8)	10.1	(1.1)	8.0	(1.0)	16.9	(1.4)	**10.9**	(1.9)	**-6.8**	(1.8)
	Korea	8.8	(1.4)	9.3	(1.2)	2.4	(0.5)	16.9	(1.6)	**6.4**	(1.4)	**-7.6**	(1.8)
	Latvia	26.6	(1.8)	1.6	(0.4)	8.8	(1.2)	4.3	(0.6)	**17.8**	(1.9)	**-2.7**	(0.6)
	Luxembourg	32.8	(1.1)	3.7	(0.5)	19.1	(0.9)	7.7	(0.7)	**13.8**	(1.5)	**-4.0**	(0.7)
	Mexico	46.2	(1.1)	0.3	(0.1)	34.1	(1.1)	0.5	(0.1)	**12.1**	(1.0)	-0.2	(0.1)
	Netherlands	17.9	(1.9)	7.8	(1.0)	10.8	(1.4)	11.8	(1.3)	**7.2**	(1.3)	**-4.0**	(0.9)
	New Zealand	20.6	(1.2)	11.9	(1.1)	7.8	(0.7)	19.7	(1.1)	**12.8**	(1.2)	**-7.9**	(1.5)
	Norway	21.4	(1.2)	5.0	(0.8)	8.3	(0.8)	12.0	(1.3)	**13.0**	(1.1)	**-7.0**	(1.1)
	Poland	22.6	(1.2)	4.3	(0.6)	7.4	(0.8)	10.1	(0.9)	**15.2**	(1.2)	**-5.8**	(1.1)
	Portugal	24.7	(1.6)	3.3	(0.5)	10.8	(1.1)	6.2	(0.8)	**13.9**	(1.3)	**-2.9**	(0.9)
	Slovak Republic	32.0	(1.8)	2.5	(0.4)	12.5	(1.1)	6.4	(0.8)	**19.5**	(1.8)	**-3.9**	(0.8)
	Slovenia	31.3	(0.9)	2.0	(0.5)	10.7	(0.7)	7.3	(0.8)	**20.5**	(1.1)	**-5.2**	(0.9)
	Spain	24.4	(1.0)	2.4	(0.3)	14.6	(0.9)	4.3	(0.3)	**9.8**	(1.0)	**-1.9**	(0.4)
	Sweden	24.2	(1.3)	6.0	(0.6)	10.5	(1.0)	12.2	(1.0)	**13.7**	(1.4)	**-6.2**	(1.0)
	Switzerland	22.0	(1.2)	5.1	(0.6)	11.4	(0.8)	11.2	(1.1)	**10.6**	(1.1)	**-6.1**	(1.1)
	Turkey	33.4	(1.9)	0.8	(0.3)	15.0	(1.4)	3.0	(0.6)	**18.5**	(1.9)	**-2.2**	(0.5)
	United Kingdom	23.1	(1.2)	6.9	(0.7)	14.0	(0.9)	9.1	(0.8)	**9.1**	(1.4)	-2.1	(1.1)
	United States	21.4	(1.4)	8.2	(1.0)	13.6	(1.1)	11.6	(1.2)	**7.8**	(1.5)	**-3.5**	(1.2)
	OECD average-34	24.7	(0.3)	5.2	(0.1)	12.2	(0.2)	9.9	(0.2)	**12.5**	(0.3)	**-4.7**	(0.2)
	OECD average-35	m	m	m	m	m	m	m	m	**m**	m	**m**	m
Partners	Albania	69.0	(2.4)	0.0	(0.0)	43.6	(2.2)	0.3	(0.2)	**25.4**	(2.5)	-0.3	(0.2)
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	56.5	(1.4)	1.0	(0.2)	43.4	(1.3)	1.6	(0.3)	**13.1**	(1.0)	**-0.6**	(0.2)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	52.0	(3.0)	1.5	(0.5)	29.2	(2.2)	4.2	(0.7)	**22.8**	(2.2)	**-2.7**	(0.6)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	49.5	(2.2)	0.5	(0.2)	44.9	(2.1)	0.6	(0.2)	**4.6**	(1.8)	-0.1	(0.2)
	Costa Rica	37.3	(1.9)	0.9	(0.4)	28.5	(1.5)	0.6	(0.3)	**8.9**	(1.6)	0.3	(0.4)
	Croatia	31.2	(1.8)	1.5	(0.3)	12.5	(1.3)	5.1	(0.8)	**18.7**	(2.1)	**-3.7**	(0.8)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	73.7	(1.4)	0.2	(0.1)	50.0	(1.6)	0.5	(0.2)	**23.7**	(1.6)	-0.2	(0.2)
	Hong Kong (China)	11.3	(1.2)	8.9	(1.0)	4.9	(0.7)	16.4	(1.0)	**6.4**	(1.3)	**-7.5**	(1.4)
	Indonesia	65.5	(2.3)	0.0	c	41.6	(2.6)	0.0	(0.1)	**23.9**	(2.5)	0.0	(0.1)
	Jordan	61.6	(2.3)	0.1	(0.1)	34.3	(2.0)	0.4	(0.1)	**27.3**	(3.0)	-0.3	(0.2)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	35.5	(1.6)	0.9	(0.3)	13.0	(1.0)	5.0	(0.7)	**22.5**	(1.5)	**-4.1**	(0.8)
	Macao (China)	20.6	(0.9)	1.7	(0.3)	9.0	(0.5)	4.1	(0.4)	**11.5**	(1.0)	**-2.4**	(0.4)
	Malta	48.4	(1.1)	2.0	(0.5)	24.4	(1.0)	6.9	(0.7)	**24.1**	(1.6)	**-4.9**	(1.0)
	Moldova	66.6	(1.5)	0.0	(0.0)	47.3	(1.7)	0.2	(0.2)	**19.3**	(1.4)	-0.2	(0.2)
	Montenegro	61.4	(1.2)	0.3	(0.3)	37.1	(1.1)	1.0	(0.3)	**24.3**	(1.4)	-0.7	(0.4)
	Peru	69.7	(1.8)	0.6	(0.3)	59.8	(2.2)	0.4	(0.2)	**9.9**	(2.2)	0.1	(0.2)
	Qatar	72.2	(0.6)	1.4	(0.2)	54.4	(0.7)	2.1	(0.2)	**17.7**	(0.9)	**-0.7**	(0.3)
	Romania	50.7	(2.5)	0.3	(0.2)	30.4	(2.2)	1.1	(0.3)	**20.3**	(2.6)	**-0.9**	(0.4)
	Russia	36.3	(1.8)	1.7	(0.4)	18.6	(1.3)	4.6	(0.8)	**17.7**	(1.7)	**-2.8**	(0.7)
	Singapore	16.2	(0.7)	12.2	(0.7)	8.7	(0.6)	19.3	(0.9)	**7.5**	(0.9)	**-7.1**	(1.2)
	Chinese Taipei	21.6	(1.3)	3.2	(0.8)	9.5	(0.9)	7.2	(1.4)	**12.1**	(1.5)	**-3.9**	(1.6)
	Thailand	55.5	(1.9)	0.1	(0.1)	33.3	(1.9)	0.4	(0.2)	**22.2**	(2.4)	-0.3	(0.2)
	Trinidad and Tobago	55.4	(1.0)	0.8	(0.3)	34.4	(0.9)	3.7	(0.4)	**20.9**	(1.4)	**-2.9**	(0.5)
	Tunisia	57.6	(1.6)	0.1	(0.1)	43.4	(1.9)	0.3	(0.2)	**14.1**	(1.5)	-0.1	(0.2)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	51.3	(1.4)	1.2	(0.3)	33.6	(1.3)	2.3	(0.4)	**17.8**	(1.4)	**-1.1**	(0.5)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	58.8	(2.1)	0.7	(0.2)	45.3	(2.1)	1.2	(0.4)	**13.5**	(1.7)	-0.5	(0.4)
	Kazakhstan**	67.5	(1.6)	0.2	(0.1)	49.7	(1.7)	0.5	(0.2)	**17.8**	(1.5)	-0.3	(0.2)
	Malaysia**	53.2	(1.9)	0.1	(0.1)	35.0	(1.6)	0.1	(0.1)	**18.2**	(1.8)	0.0	(0.2)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Costa Rica, Georgia, Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433195

[Part 1/1]

Table I.4.6d Change between 2009 and 2015 in the percentage of low achievers and top performers in reading, by gender (PISA 2015 - PISA 2009)

		Boys				Girls				Gender differences (boys – girls)			
		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)		Below Level 2 (less than 407.47 score points)		Level 5 or above (above 625.61 score points)	
		% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	**3.1**	(1.4)	-0.8	(1.1)	**4.2**	(1.2)	-2.5	(1.4)	-1.1	(1.3)	1.6	(1.2)
	Austria	m	m	m	m	m	m	m	m	m	m	m	m
	Belgium	0.5	(1.9)	-1.1	(1.2)	3.1	(1.6)	**-2.6**	(1.2)	-2.6	(2.1)	1.5	(1.3)
	Canada	-0.6	(1.2)	1.9	(1.2)	1.5	(0.8)	0.6	(1.7)	**-2.1**	(1.0)	1.3	(1.2)
	Chile	-5.1	(2.9)	1.0	(0.5)	0.9	(2.7)	1.0	(0.5)	**-6.0**	(2.4)	0.0	(0.7)
	Czech Republic	-3.9	(2.8)	**4.1**	(0.8)	2.7	(1.9)	1.2	(1.3)	**-6.6**	(2.6)	**3.0**	(1.1)
	Denmark	-1.1	(1.8)	**2.0**	(1.0)	0.6	(1.6)	1.6	(1.2)	-1.7	(1.9)	0.4	(1.3)
	Estonia	**-4.7**	(2.0)	**5.3**	(1.0)	-0.4	(1.2)	**4.5**	(1.6)	**-4.2**	(2.0)	0.7	(1.5)
	Finland	**3.1**	(1.5)	1.1	(1.2)	**2.5**	(0.9)	-2.4	(2.4)	0.6	(1.4)	**3.5**	(1.6)
	France	0.5	(2.3)	**3.5**	(1.2)	2.8	(1.5)	2.5	(1.9)	-2.3	(2.2)	1.0	(1.6)
	Germany	**-5.2**	(2.1)	**5.4**	(1.0)	0.9	(1.5)	2.6	(1.6)	**-6.1**	(2.0)	**2.8**	(1.4)
	Greece	4.8	(3.6)	-0.8	(0.8)	**6.3**	(2.6)	-2.2	(1.2)	-1.6	(2.7)	1.5	(1.3)
	Hungary	**8.2**	(3.0)	-0.5	(0.9)	**11.7**	(2.2)	**-3.2**	(1.2)	-3.4	(2.6)	**2.7**	(1.2)
	Iceland	**5.1**	(2.1)	-1.3	(0.9)	**5.8**	(1.9)	-2.6	(1.4)	-0.7	(2.2)	1.3	(1.5)
	Ireland	**-10.9**	(2.2)	**6.2**	(1.3)	**-3.2**	(1.3)	1.2	(1.7)	**-7.7**	(2.2)	**5.0**	(1.8)
	Israel	-2.5	(2.6)	2.7	(1.4)	2.5	(2.1)	0.8	(1.3)	-4.9	(2.7)	1.9	(1.7)
	Italy	**-4.8**	(1.9)	1.1	(0.7)	**5.2**	(1.7)	-1.5	(1.0)	**-10.1**	(2.1)	**2.6**	(1.0)
	Japan	-4.0	(2.3)	0.0	(1.8)	**2.8**	(1.4)	**-5.5**	(2.0)	**-6.8**	(2.3)	**5.5**	(2.3)
	Korea	**10.4**	(2.2)	0.3	(1.7)	**5.2**	(1.2)	-0.9	(2.3)	**5.1**	(2.1)	1.2	(2.4)
	Latvia	-2.2	(2.6)	0.9	(0.6)	2.2	(1.6)	1.9	(1.1)	-4.4	(2.3)	-1.0	(1.1)
	Luxembourg	**-3.5**	(1.8)	**3.5**	(0.8)	3.0	(1.6)	1.4	(1.1)	**-6.5**	(2.0)	2.1	(1.2)
	Mexico	0.2	(3.0)	0.0	(0.2)	2.9	(3.2)	-0.2	(0.2)	-2.7	(1.8)	0.2	(0.2)
	Netherlands	3.7	(2.5)	1.5	(1.3)	3.7	(1.9)	0.7	(1.7)	0.0	(2.0)	0.8	(1.5)
	New Zealand	1.6	(1.9)	-0.8	(1.5)	**4.5**	(1.3)	-3.5	(2.0)	-3.0	(1.9)	2.7	(1.9)
	Norway	-0.9	(1.7)	**4.0**	(1.3)	0.8	(1.2)	3.6	(1.9)	-1.7	(1.6)	0.5	(1.6)
	Poland	-3.5	(1.9)	**2.3**	(1.0)	2.0	(1.3)	-0.3	(1.6)	**-5.5**	(1.9)	2.6	(1.5)
	Portugal	**-4.4**	(2.1)	**3.8**	(0.9)	**3.2**	(1.6)	1.7	(1.3)	**-7.6**	(1.9)	2.1	(1.2)
	Slovak Republic	**6.5**	(2.7)	0.0	(0.6)	**12.7**	(2.0)	-1.9	(1.0)	**-6.2**	(2.6)	1.9	(1.0)
	Slovenia	**-10.3**	(1.7)	**3.7**	(1.0)	-1.8	(1.0)	**5.0**	(1.4)	**-8.5**	(1.8)	-1.3	(1.5)
	Spain	**-4.8**	(2.0)	**2.3**	(0.7)	-1.7	(1.4)	**2.0**	(1.0)	-3.1	(1.7)	0.2	(1.0)
	Sweden	0.3	(2.3)	1.5	(1.2)	1.8	(1.5)	0.3	(1.8)	-1.5	(2.0)	1.1	(1.5)
	Switzerland	2.4	(2.1)	1.2	(1.0)	**3.7**	(1.7)	-1.9	(1.5)	-1.3	(1.8)	**3.1**	(1.6)
	Turkey	**12.6**	(4.1)	-0.5	(0.3)	**18.9**	(3.6)	**-2.1**	(0.7)	-6.3	(3.3)	**1.6**	(0.6)
	United Kingdom	-2.2	(1.9)	0.5	(1.0)	0.8	(1.5)	1.9	(1.3)	-3.1	(1.9)	-1.4	(1.6)
	United States	1.2	(2.1)	0.2	(1.3)	1.7	(1.9)	-0.8	(1.7)	-0.5	(2.1)	1.1	(1.7)
	OECD average-34	-0.3	(1.0)	**1.6**	(0.3)	**3.3**	(0.7)	0.0	(0.6)	**-3.6**	(0.4)	**1.6**	(0.2)
	OECD average-35	m	m	m	m	m	m	m	m	m	m	m	m
Partners	Albania	-6.1	(3.5)	**0.4**	(0.2)	-5.9	(3.4)	**1.2**	(0.5)	-0.2	(3.2)	-0.8	(0.5)
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	-0.8	(2.5)	0.2	(0.4)	3.1	(3.1)	0.1	(0.4)	**-3.9**	(1.5)	0.2	(0.4)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	-2.3	(3.9)	0.9	(0.6)	3.2	(3.1)	0.7	(1.0)	-5.5	(3.0)	0.3	(0.9)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	-3.2	(3.6)	0.3	(0.3)	-5.2	(3.4)	0.6	(0.3)	2.0	(2.4)	-0.2	(0.4)
	Costa Rica	6.7	(3.8)	-0.4	(0.4)	8.2	(4.6)	0.2	(0.4)	-1.5	(2.5)	-0.6	(0.5)
	Croatia	**-6.3**	(2.6)	**3.2**	(0.8)	2.6	(2.0)	1.8	(1.0)	**-8.9**	(2.6)	1.4	(1.0)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	**-10.8**	(2.7)	0.4	(0.3)	**-10.8**	(2.9)	**1.2**	(0.4)	0.0	(2.7)	-0.8	(0.4)
	Hong Kong (China)	1.3	(1.7)	0.3	(1.5)	1.0	(1.0)	-2.4	(2.1)	0.3	(1.8)	2.6	(2.1)
	Indonesia	-3.5	(4.6)	0.1	(0.1)	7.2	(4.9)	0.2	(0.2)	**-10.7**	(3.1)	-0.1	(0.1)
	Jordan	1.2	(3.5)	0.0	(0.1)	-4.2	(3.6)	0.1	(0.2)	5.4	(4.1)	-0.1	(0.3)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	-3.3	(2.5)	**2.0**	(0.6)	**4.9**	(1.7)	1.0	(1.1)	**-8.1**	(2.0)	1.0	(1.1)
	Macao (China)	**-4.1**	(1.6)	**3.4**	(0.8)	**-2.2**	(0.8)	**4.1**	(1.2)	-1.9	(1.5)	-0.7	(1.2)
	Malta	**-5.4**	(1.8)	**2.0**	(0.7)	**3.5**	(1.6)	0.5	(1.0)	**-8.9**	(2.1)	1.6	(1.2)
	Moldova	**-10.1**	(3.2)	**0.5**	(0.2)	**-12.4**	(3.1)	**1.7**	(0.4)	2.3	(2.2)	**-1.3**	(0.5)
	Montenegro	**-12.4**	(2.9)	0.8	(0.4)	-2.7	(2.8)	0.7	(0.4)	**-9.7**	(2.3)	0.2	(0.6)
	Peru	**-13.9**	(2.9)	-0.3	(0.3)	**-7.8**	(3.8)	-0.1	(0.2)	**-6.1**	(3.1)	-0.2	(0.3)
	Qatar	**-11.3**	(1.2)	-0.2	(0.3)	**-12.5**	(2.0)	-0.1	(0.3)	1.2	(1.2)	-0.1	(0.4)
	Romania	**-8.9**	(3.9)	**1.3**	(0.4)	5.2	(3.5)	1.3	(0.7)	**-14.2**	(3.2)	-0.1	(0.7)
	Russia	**-15.6**	(2.7)	**3.4**	(0.8)	**-6.6**	(2.0)	**3.6**	(1.2)	**-9.0**	(2.3)	-0.2	(1.2)
	Singapore	**-2.5**	(1.1)	**3.9**	(1.4)	-0.2	(0.9)	1.4	(1.8)	-2.3	(1.2)	2.5	(1.7)
	Chinese Taipei	-0.8	(2.1)	2.1	(1.2)	**3.9**	(1.4)	1.4	(2.0)	**-4.7**	(2.1)	0.7	(2.1)
	Thailand	3.6	(4.2)	0.1	(0.2)	**9.7**	(4.0)	0.0	(0.3)	**-6.1**	(3.0)	0.2	(0.3)
	Trinidad and Tobago	-3.4	(2.3)	0.4	(0.4)	-1.2	(2.1)	-0.1	(0.7)	-2.2	(2.3)	0.5	(0.8)
	Tunisia	**18.9**	(2.8)	-0.1	(0.1)	**23.9**	(3.6)	-0.2	(0.2)	**-4.9**	(2.0)	0.1	(0.2)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	**-6.6**	(2.6)	1.0	(0.5)	0.3	(2.4)	0.6	(0.7)	**-6.9**	(2.2)	0.4	(0.8)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	**-12.7**	(3.4)	0.1	(0.3)	**-7.6**	(3.2)	-0.1	(0.4)	**-5.1**	(2.4)	0.3	(0.5)
	Kazakhstan**	**-22.1**	(4.2)	0.5	(0.3)	**-12.7**	(3.9)	0.4	(0.4)	**-9.4**	(2.5)	0.1	(0.3)
	Malaysia**	**-7.7**	(3.5)	0.1	(0.2)	-5.2	(3.2)	0.4	(0.2)	-2.5	(2.5)	-0.2	(0.2)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Costa Rica, Georgia, Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433195

[Part 1/1]

Table I.4.8a Reading performance, by gender (PISA 2015)

		Boys								Girls								Gender differences (boys – girls)							
		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		50th percentile		90th percentile	
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	487	(2.3)	344	(3.3)	493	(2.9)	620	(3.9)	519	(2.3)	389	(3.6)	524	(2.6)	639	(3.0)	**-32**	(3.0)	**-45**	(4.7)	**-31**	(3.8)	**-20**	(4.7)
	Austria	475	(4.3)	332	(6.8)	480	(5.1)	604	(4.4)	495	(3.7)	363	(6.7)	501	(4.5)	618	(4.1)	**-20**	(5.6)	**-30**	(8.4)	**-21**	(6.5)	**-13**	(6.0)
	Belgium	491	(3.1)	351	(4.9)	498	(4.3)	618	(3.4)	507	(2.9)	370	(5.4)	516	(3.6)	627	(2.6)	**-16**	(3.7)	**-19**	(6.7)	**-17**	(5.0)	**-9**	(3.8)
	Canada	514	(2.6)	387	(4.5)	518	(3.0)	632	(3.2)	540	(2.5)	423	(3.6)	544	(2.9)	651	(3.3)	**-26**	(2.1)	**-36**	(4.5)	**-26**	(3.0)	**-19**	(3.7)
	Chile	453	(3.4)	335	(5.0)	454	(4.0)	567	(4.6)	465	(2.9)	350	(4.5)	467	(3.6)	577	(4.3)	**-12**	(3.6)	**-15**	(6.1)	**-12**	(4.5)	-10	(5.5)
	Czech Republic	475	(3.6)	335	(6.4)	478	(4.6)	607	(4.2)	501	(2.9)	374	(5.5)	505	(3.7)	621	(3.8)	**-26**	(4.2)	**-39**	(7.3)	**-27**	(5.7)	**-14**	(4.7)
	Denmark	489	(2.8)	372	(4.6)	493	(3.0)	599	(4.5)	511	(3.4)	396	(5.8)	518	(3.7)	616	(4.2)	**-22**	(3.7)	**-24**	(6.8)	**-25**	(4.2)	**-17**	(5.3)
	Estonia	505	(2.9)	387	(5.7)	508	(3.8)	619	(4.1)	533	(2.3)	424	(4.3)	536	(3.1)	640	(3.7)	**-28**	(2.9)	**-37**	(6.9)	**-27**	(3.7)	**-21**	(4.8)
	Finland	504	(3.0)	375	(5.5)	511	(3.6)	622	(3.7)	551	(2.8)	440	(4.9)	556	(3.2)	653	(4.3)	**-47**	(2.9)	**-65**	(6.4)	**-45**	(3.9)	**-31**	(5.0)
	France	485	(3.3)	324	(7.8)	494	(4.0)	628	(3.6)	514	(3.3)	367	(6.3)	523	(3.8)	644	(4.1)	**-29**	(4.4)	**-43**	(8.8)	**-30**	(5.6)	**-16**	(4.8)
	Germany	499	(3.7)	364	(6.8)	504	(4.6)	625	(4.0)	520	(3.1)	388	(5.1)	526	(4.1)	641	(3.8)	**-21**	(3.3)	**-24**	(6.8)	**-22**	(4.7)	**-17**	(4.7)
	Greece	449	(5.1)	316	(9.3)	453	(6.3)	576	(4.7)	486	(4.2)	363	(8.4)	492	(4.6)	602	(4.5)	**-37**	(4.5)	**-47**	(8.5)	**-39**	(5.8)	**-26**	(5.8)
	Hungary	457	(3.7)	328	(5.1)	459	(5.8)	582	(4.3)	482	(3.1)	350	(6.2)	490	(4.0)	600	(3.8)	**-25**	(4.4)	**-22**	(7.1)	**-31**	(6.6)	**-18**	(4.8)
	Iceland	460	(2.8)	326	(5.4)	463	(3.4)	587	(4.8)	502	(2.6)	380	(5.6)	505	(3.9)	621	(4.8)	**-42**	(3.7)	**-54**	(7.7)	**-41**	(5.1)	**-34**	(6.2)
	Ireland	515	(3.2)	397	(5.2)	519	(3.9)	629	(3.9)	527	(2.7)	419	(4.8)	530	(3.0)	629	(4.0)	**-12**	(3.4)	**-23**	(6.2)	**-12**	(4.4)	0	(5.5)
	Israel	467	(5.4)	307	(7.4)	473	(7.0)	619	(6.5)	490	(4.6)	349	(7.1)	495	(5.5)	622	(5.1)	**-23**	(6.5)	**-42**	(9.3)	**-22**	(8.1)	-2	(8.0)
	Italy	477	(3.5)	348	(5.5)	480	(4.5)	597	(3.8)	493	(3.6)	370	(5.5)	497	(4.1)	608	(4.1)	**-16**	(4.7)	**-22**	(7.4)	**-16**	(5.8)	**-11**	(5.2)
	Japan	509	(4.2)	381	(6.7)	517	(4.9)	626	(5.2)	523	(3.3)	403	(5.5)	530	(3.7)	631	(4.2)	**-13**	(4.3)	**-21**	(7.0)	**-13**	(5.1)	-6	(5.8)
	Korea	498	(4.8)	362	(7.2)	504	(5.4)	624	(5.1)	539	(4.0)	423	(6.5)	544	(4.6)	648	(5.3)	**-41**	(5.4)	**-61**	(8.6)	**-40**	(6.3)	**-24**	(6.7)
	Latvia	467	(2.3)	356	(4.9)	469	(2.9)	573	(3.8)	509	(2.4)	403	(4.7)	513	(2.9)	609	(4.4)	**-42**	(3.1)	**-47**	(6.1)	**-44**	(3.6)	**-35**	(5.8)
	Luxembourg	471	(1.9)	323	(4.1)	475	(3.4)	609	(3.6)	492	(2.2)	351	(3.7)	497	(3.2)	621	(3.8)	**-21**	(2.8)	**-28**	(5.5)	**-22**	(4.5)	**-12**	(4.8)
	Mexico	416	(2.9)	313	(4.2)	415	(3.7)	519	(4.4)	431	(2.9)	332	(4.3)	434	(3.1)	526	(4.7)	**-16**	(2.5)	**-20**	(4.7)	**-18**	(3.7)	-7	(4.5)
	Netherlands	491	(3.0)	355	(6.4)	495	(4.0)	622	(3.4)	515	(2.9)	383	(5.5)	521	(3.9)	636	(4.6)	**-24**	(3.4)	**-29**	(6.3)	**-26**	(5.4)	**-15**	(5.6)
	New Zealand	493	(3.3)	347	(6.1)	499	(4.2)	631	(5.3)	526	(3.0)	394	(5.3)	529	(3.9)	652	(5.0)	**-32**	(4.1)	**-47**	(7.9)	**-31**	(5.4)	**-20**	(5.8)
	Norway	494	(3.1)	358	(5.2)	499	(3.6)	620	(5.3)	533	(2.9)	412	(5.2)	537	(3.5)	648	(3.7)	**-40**	(3.2)	**-54**	(5.8)	**-38**	(3.9)	**-27**	(6.2)
	Poland	491	(2.9)	367	(5.3)	495	(3.9)	608	(4.5)	521	(2.8)	410	(4.8)	525	(3.4)	625	(4.0)	**-29**	(2.9)	**-43**	(6.8)	**-30**	(4.1)	**-17**	(4.8)
	Portugal	490	(3.1)	364	(4.8)	494	(4.6)	611	(4.0)	507	(2.8)	387	(5.3)	513	(3.5)	617	(3.6)	**-17**	(2.5)	**-24**	(6.4)	**-19**	(4.3)	-6	(4.5)
	Slovak Republic	435	(3.3)	297	(5.3)	439	(4.1)	569	(4.2)	471	(3.5)	333	(7.2)	481	(4.0)	594	(4.2)	**-36**	(4.0)	**-36**	(7.8)	**-42**	(5.4)	**-26**	(4.9)
	Slovenia	484	(2.3)	361	(4.0)	488	(3.1)	601	(4.9)	528	(2.1)	414	(4.7)	532	(2.8)	635	(4.2)	**-43**	(3.3)	**-53**	(6.1)	**-44**	(4.1)	**-33**	(6.7)
	Spain	485	(3.0)	365	(5.7)	491	(3.4)	597	(3.7)	506	(2.8)	394	(4.9)	511	(3.3)	608	(3.7)	**-20**	(3.5)	**-29**	(7.8)	**-20**	(3.7)	**-11**	(4.8)
	Sweden	481	(4.1)	342	(5.8)	486	(5.1)	612	(4.6)	520	(3.5)	394	(5.8)	526	(4.0)	637	(4.7)	**-39**	(3.2)	**-52**	(7.0)	**-40**	(4.6)	**-24**	(5.2)
	Switzerland	480	(3.4)	342	(5.9)	488	(4.2)	606	(4.7)	505	(3.4)	382	(5.5)	509	(4.4)	622	(4.6)	**-25**	(3.3)	**-40**	(6.8)	**-22**	(4.6)	**-17**	(6.2)
	Turkey	414	(4.5)	308	(6.0)	416	(5.5)	519	(6.5)	442	(4.8)	339	(6.6)	442	(5.7)	547	(6.3)	**-28**	(4.9)	**-31**	(8.2)	**-26**	(6.3)	**-28**	(5.8)
	United Kingdom	487	(2.9)	361	(4.7)	489	(3.7)	611	(4.3)	509	(3.5)	385	(4.5)	512	(3.8)	631	(4.8)	**-22**	(3.3)	**-24**	(5.4)	**-23**	(4.3)	**-20**	(5.8)
	United States	487	(3.7)	350	(6.7)	492	(4.6)	617	(5.0)	507	(3.9)	380	(6.0)	510	(4.4)	629	(5.0)	**-20**	(3.6)	**-30**	(6.9)	**-18**	(4.7)	**-13**	(6.2)
	OECD average-34	479	(0.6)	348	(1.0)	484	(0.7)	603	(0.8)	506	(0.5)	384	(0.9)	511	(0.7)	621	(0.7)	**-27**	(0.6)	**-36**	(1.2)	**-28**	(0.8)	**-18**	(0.9)
	OECD average-35	479	(0.6)	348	(1.0)	484	(0.7)	603	(0.8)	506	(0.5)	384	(0.9)	511	(0.6)	621	(0.7)	**-27**	(0.6)	**-36**	(1.2)	**-27**	(0.8)	**-18**	(0.9)
Partners	Albania	376	(4.8)	252	(5.9)	375	(5.3)	501	(7.5)	435	(3.8)	321	(5.2)	435	(4.7)	547	(5.6)	**-59**	(3.9)	**-69**	(6.8)	**-60**	(5.2)	**-46**	(7.2)
	Algeria	335	(2.9)	246	(4.2)	335	(3.3)	426	(4.2)	366	(3.5)	276	(4.6)	365	(3.5)	459	(6.5)	**-31**	(2.9)	**-30**	(5.0)	**-30**	(3.4)	**-33**	(6.6)
	Brazil	395	(3.1)	265	(3.9)	392	(3.3)	532	(4.2)	419	(3.0)	296	(3.8)	416	(3.2)	545	(4.5)	**-23**	(2.5)	**-30**	(4.2)	**-24**	(2.9)	**-13**	(4.2)
	B-S-J-G (China)	486	(5.0)	338	(7.6)	495	(6.1)	621	(6.3)	503	(5.8)	357	(8.3)	509	(6.6)	639	(7.6)	**-16**	(3.4)	**-19**	(6.3)	**-14**	(4.7)	**-18**	(5.8)
	Bulgaria	409	(5.8)	261	(6.5)	409	(7.9)	559	(7.1)	457	(5.0)	305	(8.2)	466	(6.3)	592	(5.4)	**-47**	(4.9)	**-45**	(7.3)	**-57**	(7.3)	**-33**	(7.0)
	CABA (Argentina)	468	(8.1)	343	(11.5)	471	(8.3)	583	(11.3)	483	(7.8)	366	(11.3)	488	(8.3)	590	(10.3)	**-15**	(7.2)	-23	(14.1)	**-17**	(7.9)	-7	(11.3)
	Colombia	417	(3.6)	299	(5.6)	417	(4.3)	535	(3.8)	432	(3.2)	317	(5.1)	432	(4.0)	549	(4.0)	**-16**	(3.4)	**-18**	(6.0)	**-16**	(4.2)	**-14**	(5.3)
	Costa Rica	420	(3.1)	315	(4.2)	420	(3.7)	525	(4.3)	435	(2.9)	338	(3.8)	433	(3.1)	535	(4.8)	**-15**	(2.8)	**-23**	(4.6)	**-13**	(3.5)	**-10**	(4.7)
	Croatia	473	(3.3)	352	(5.0)	473	(4.4)	594	(4.6)	500	(3.0)	385	(5.0)	502	(3.7)	610	(4.1)	**-26**	(3.5)	**-33**	(6.5)	**-28**	(4.9)	**-16**	(5.5)
	Cyprus*	417	(2.0)	279	(3.7)	417	(2.9)	556	(4.0)	469	(2.1)	349	(4.4)	471	(2.7)	586	(4.7)	**-52**	(2.4)	**-70**	(6.0)	**-54**	(3.6)	**-30**	(5.6)
	Dominican Republic	342	(3.5)	237	(5.5)	336	(4.6)	458	(6.0)	373	(3.1)	270	(5.2)	369	(3.4)	481	(5.7)	**-31**	(2.9)	**-33**	(6.1)	**-33**	(4.4)	**-23**	(6.6)
	FYROM	330	(2.3)	202	(4.5)	329	(3.3)	461	(4.4)	376	(1.8)	254	(3.9)	378	(2.7)	496	(4.1)	**-46**	(3.1)	**-52**	(6.5)	**-49**	(4.3)	**-35**	(5.6)
	Georgia	374	(4.1)	240	(5.9)	373	(5.4)	508	(6.2)	432	(2.8)	310	(5.3)	435	(3.3)	551	(4.7)	**-58**	(4.2)	**-70**	(7.3)	**-62**	(6.1)	**-43**	(6.9)
	Hong Kong (China)	513	(3.4)	393	(6.3)	518	(4.0)	622	(4.2)	541	(3.6)	434	(5.8)	547	(4.0)	639	(4.2)	**-28**	(4.6)	**-42**	(7.6)	**-28**	(5.6)	**-17**	(5.6)
	Indonesia	386	(3.4)	290	(5.5)	385	(4.0)	482	(4.7)	409	(3.3)	313	(5.7)	410	(3.4)	505	(4.3)	**-23**	(3.4)	**-22**	(5.3)	**-25**	(4.3)	**-22**	(5.8)
	Jordan	372	(4.3)	247	(6.4)	376	(4.7)	492	(5.2)	444	(3.4)	342	(5.6)	448	(3.6)	539	(3.3)	**-72**	(5.4)	**-96**	(8.4)	**-72**	(5.9)	**-47**	(5.9)
	Kosovo	329	(2.2)	227	(3.7)	330	(2.9)	433	(4.1)	365	(2.0)	268	(4.0)	369	(2.7)	458	(3.7)	**-36**	(2.7)	**-41**	(5.5)	**-38**	(3.9)	**-25**	(5.9)
	Lebanon	339	(5.4)	190	(6.9)	331	(6.1)	502	(9.4)	353	(4.7)	214	(6.2)	345	(6.7)	504	(7.5)	**-14**	(4.8)	**-25**	(7.3)	-14	(7.4)	-3	(9.6)
	Lithuania	453	(3.1)	328	(4.7)	453	(3.3)	579	(5.2)	492	(3.0)	375	(4.4)	495	(3.9)	605	(4.4)	**-39**	(3.1)	**-47**	(5.2)	**-42**	(4.3)	**-26**	(4.8)
	Macao (China)	493	(1.9)	379	(4.3)	496	(2.7)	600	(4.4)	525	(1.6)	425	(3.3)	529	(2.0)	618	(3.7)	**-32**	(2.4)	**-46**	(6.0)	**-32**	(3.6)	**-18**	(5.1)
	Malta	426	(2.7)	265	(7.1)	430	(3.8)	579	(4.2)	468	(2.2)	310	(6.2)	477	(3.5)	609	(4.3)	**-42**	(3.4)	**-45**	(9.6)	**-47**	(5.3)	**-31**	(6.2)
	Moldova	390	(2.7)	266	(4.6)	392	(3.4)	515	(4.0)	442	(3.0)	321	(4.6)	445	(3.8)	560	(5.5)	**-52**	(3.1)	**-54**	(5.7)	**-53**	(4.3)	**-45**	(5.8)
	Montenegro	410	(2.0)	285	(3.3)	410	(3.1)	535	(3.6)	444	(2.3)	330	(3.4)	444	(3.1)	560	(3.8)	**-34**	(3.0)	**-45**	(4.3)	**-35**	(4.6)	**-24**	(5.4)
	Peru	394	(3.4)	278	(3.8)	393	(4.4)	510	(5.1)	401	(3.6)	284	(4.1)	402	(4.3)	518	(5.3)	**-8**	(3.9)	-5	(5.1)	-9	(5.0)	-8	(5.7)
	Qatar	376	(1.3)	230	(2.4)	371	(2.1)	533	(3.8)	429	(1.4)	300	(3.0)	429	(2.3)	558	(2.5)	**-53**	(1.9)	**-70**	(4.1)	**-58**	(3.1)	**-25**	(4.1)
	Romania	425	(4.4)	299	(7.0)	427	(5.2)	546	(6.0)	442	(4.4)	321	(5.5)	442	(5.2)	563	(6.4)	**-18**	(3.7)	**-22**	(7.4)	**-15**	(4.7)	**-17**	(6.7)
	Russia	481	(3.4)	367	(4.9)	482	(4.1)	596	(4.6)	507	(3.5)	399	(5.4)	507	(3.9)	616	(4.5)	**-26**	(3.3)	**-32**	(6.0)	**-26**	(3.9)	**-20**	(5.4)
	Singapore	525	(1.9)	386	(4.4)	534	(2.8)	649	(3.6)	546	(2.3)	417	(4.1)	551	(2.8)	666	(4.1)	**-20**	(2.6)	**-31**	(5.5)	**-18**	(4.1)	**-17**	(5.3)
	Chinese Taipei	485	(3.7)	354	(5.6)	493	(4.2)	601	(5.2)	510	(3.4)	389	(4.9)	517	(3.6)	619	(5.5)	**-25**	(5.1)	**-36**	(6.2)	**-24**	(5.7)	**-18**	(7.5)
	Thailand	392	(4.3)	290	(4.0)	388	(4.9)	501	(7.1)	423	(3.2)	327	(4.1)	421	(3.3)	522	(5.6)	**-31**	(3.6)	**-37**	(4.7)	**-33**	(4.3)	**-21**	(7.1)
	Trinidad and Tobago	401	(2.1)	269	(4.5)	402	(3.8)	535	(3.7)	452	(2.2)	320	(4.3)	455	(3.2)	581	(5.0)	**-51**	(3.1)	**-51**	(6.7)	**-53**	(4.9)	**-45**	(6.3)
	Tunisia	348	(3.9)	243	(6.9)	346	(4.7)	455	(4.5)	373	(3.0)	272	(4.6)	372	(3.0)	475	(4.3)	**-25**	(3.3)	**-29**	(6.7)	**-25**	(4.4)	**-21**	(4.6)
	United Arab Emirates	408	(3.9)	267	(4.3)	402	(4.9)	560	(4.9)	458	(3.3)	337	(4.5)	459	(3.7)	579	(4.4)	**-50**	(5.0)	**-70**	(6.3)	**-56**	(5.9)	**-19**	(6.3)
	Uruguay	424	(3.4)	297	(4.3)	422	(4.2)	555	(5.7)	448	(2.7)	327	(4.0)	447	(3.4)	568	(5.1)	**-23**	(3.3)	**-30**	(5.4)	**-25**	(4.3)	**-13**	(5.6)
	Viet Nam	474	(4.0)	379	(5.2)	473	(4.3)	570	(5.1)	499	(3.8)	412	(4.7)	498	(3.6)	588	(6.4)	**-25**	(2.8)	**-33**	(4.8)	**-25**	(3.6)	**-18**	(5.0)
	Argentina**	417	(3.7)	300	(4.2)	418	(4.8)	534	(5.0)	433	(3.5)	319	(5.6)	436	(3.8)	542	(5.0)	**-16**	(3.2)	**-20**	(5.4)	**-18**	(4.4)	-9	(5.4)
	Kazakhstan**	419	(3.9)	317	(4.6)	417	(4.5)	526	(6.3)	435	(3.7)	335	(5.0)	434	(4.3)	538	(5.8)	**-16**	(3.2)	**-18**	(5.3)	**-17**	(4.3)	**-13**	(5.6)
	Malaysia**	414	(3.8)	304	(5.4)	418	(4.5)	519	(4.9)	445	(3.6)	345	(5.8)	449	(4.1)	539	(4.1)	**-31**	(2.8)	**-41**	(5.2)	**-32**	(3.9)	**-19**	(4.0)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433195

[Part 1/1]

Table I.4.8b Reading performance, by gender (PISA 2009)

		Boys								Girls								Gender differences (boys – girls)							
		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		50th percentile		90th percentile	
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	496	(2.9)	361	(4.1)	502	(3.4)	625	(4.1)	533	(2.6)	413	(3.9)	537	(2.7)	647	(3.6)	**-37**	(3.1)	**-52**	(4.9)	**-36**	(4.0)	**-23**	(3.8)
	Austria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Belgium	493	(3.4)	351	(6.7)	499	(4.3)	623	(3.1)	520	(2.9)	386	(5.9)	530	(3.4)	637	(3.2)	**-27**	(4.4)	**-34**	(8.6)	**-31**	(5.6)	**-13**	(4.2)
	Canada	507	(1.8)	386	(3.3)	511	(2.4)	623	(2.6)	542	(1.7)	431	(2.8)	544	(2.1)	648	(2.6)	**-34**	(1.9)	**-45**	(3.7)	**-34**	(2.9)	**-25**	(3.1)
	Chile	439	(3.9)	329	(6.4)	439	(4.2)	548	(5.1)	461	(3.6)	357	(5.3)	461	(4.2)	562	(5.8)	**-22**	(4.1)	**-28**	(6.2)	**-22**	(5.0)	-13	(8.0)
	Czech Republic	456	(3.7)	339	(5.0)	454	(4.4)	573	(4.6)	504	(3.0)	387	(5.9)	508	(4.1)	616	(3.8)	**-48**	(4.1)	**-48**	(6.2)	**-54**	(5.7)	**-43**	(5.3)
	Denmark	480	(2.5)	368	(4.5)	484	(2.9)	586	(3.6)	509	(2.5)	401	(4.7)	514	(3.0)	609	(3.4)	**-29**	(2.9)	**-32**	(5.6)	**-31**	(3.6)	**-23**	(5.0)
	Estonia	480	(2.9)	372	(5.4)	482	(3.8)	583	(3.3)	524	(2.8)	423	(4.9)	526	(3.0)	621	(4.1)	**-44**	(2.5)	**-51**	(5.5)	**-44**	(3.6)	**-38**	(4.6)
	Finland	508	(2.6)	393	(4.5)	513	(3.1)	617	(4.0)	563	(2.4)	463	(3.8)	570	(2.7)	657	(2.8)	**-55**	(2.3)	**-70**	(5.1)	**-56**	(3.0)	**-40**	(4.6)
	France	475	(4.3)	324	(9.3)	483	(5.5)	610	(5.2)	515	(3.4)	385	(5.6)	524	(5.0)	633	(5.7)	**-40**	(3.7)	**-61**	(8.8)	**-41**	(5.7)	**-24**	(6.0)
	Germany	478	(3.6)	348	(5.3)	485	(4.7)	596	(3.6)	518	(2.9)	394	(6.2)	526	(4.1)	629	(3.5)	**-40**	(3.9)	**-46**	(6.9)	**-41**	(5.6)	**-33**	(4.0)
	Greece	459	(5.5)	330	(8.8)	462	(7.0)	583	(4.7)	506	(3.5)	391	(7.1)	509	(3.7)	615	(4.6)	**-47**	(4.3)	**-61**	(7.4)	**-48**	(6.3)	**-32**	(6.3)
	Hungary	475	(3.9)	349	(8.5)	482	(5.0)	589	(5.1)	513	(3.6)	400	(7.7)	518	(4.3)	619	(4.4)	**-38**	(4.0)	**-51**	(8.8)	**-36**	(5.7)	**-30**	(4.9)
	Iceland	478	(2.1)	345	(5.3)	485	(3.5)	601	(3.3)	522	(1.9)	409	(5.4)	527	(2.3)	632	(4.6)	**-44**	(2.8)	**-64**	(8.2)	**-42**	(4.2)	**-31**	(4.9)
	Ireland	476	(4.2)	349	(8.8)	485	(4.4)	595	(4.9)	515	(3.1)	401	(5.0)	521	(3.6)	623	(4.2)	**-39**	(4.7)	**-52**	(9.5)	**-36**	(5.4)	**-28**	(6.1)
	Israel	452	(5.2)	293	(10.4)	460	(5.4)	601	(6.5)	495	(3.4)	360	(7.4)	502	(4.6)	618	(4.0)	**-42**	(5.2)	**-67**	(10.3)	**-43**	(6.3)	**-17**	(7.1)
	Italy	464	(2.3)	335	(3.9)	468	(2.8)	589	(2.1)	510	(1.9)	393	(3.5)	516	(2.2)	616	(2.2)	**-46**	(2.8)	**-58**	(4.9)	**-49**	(3.3)	**-27**	(2.7)
	Japan	501	(5.6)	359	(11.4)	512	(5.8)	626	(4.7)	540	(3.7)	422	(6.8)	547	(3.8)	651	(5.3)	**-39**	(6.8)	**-63**	(12.3)	**-35**	(7.1)	**-25**	(6.9)
	Korea	523	(4.9)	414	(7.8)	528	(5.6)	623	(4.2)	558	(3.8)	465	(6.3)	562	(4.5)	644	(4.1)	**-35**	(5.9)	**-51**	(9.9)	**-35**	(6.8)	**-21**	(5.5)
	Latvia	460	(3.4)	355	(5.8)	462	(4.8)	563	(4.7)	507	(3.1)	413	(5.2)	511	(4.4)	598	(3.6)	**-47**	(3.2)	**-57**	(7.3)	**-49**	(5.6)	**-35**	(4.6)
	Luxembourg	453	(1.9)	308	(4.3)	461	(2.5)	586	(3.2)	492	(1.5)	363	(4.8)	498	(2.5)	614	(3.8)	**-39**	(2.3)	**-55**	(6.5)	**-36**	(3.7)	**-28**	(4.8)
	Mexico	413	(2.1)	300	(3.4)	416	(2.5)	521	(2.9)	438	(2.1)	331	(3.5)	442	(2.1)	539	(2.5)	**-25**	(1.6)	**-31**	(3.5)	**-26**	(2.1)	**-18**	(2.7)
	Netherlands	496	(5.1)	379	(5.1)	496	(7.5)	615	(5.1)	521	(5.3)	404	(6.2)	522	(7.6)	632	(5.4)	**-24**	(2.4)	**-25**	(5.7)	**-27**	(4.7)	**-18**	(4.6)
	New Zealand	499	(3.6)	357	(5.8)	504	(4.1)	634	(5.1)	544	(2.6)	420	(4.2)	551	(3.1)	661	(4.3)	**-46**	(4.3)	**-63**	(6.5)	**-46**	(5.3)	**-27**	(6.8)
	Norway	480	(3.0)	359	(4.8)	483	(3.7)	599	(3.7)	527	(2.9)	417	(4.3)	530	(3.2)	634	(5.3)	**-47**	(2.9)	**-58**	(5.8)	**-47**	(3.7)	**-35**	(5.0)
	Poland	476	(2.8)	355	(5.1)	478	(3.5)	593	(3.9)	525	(2.9)	421	(4.7)	527	(3.6)	626	(4.0)	**-50**	(2.5)	**-66**	(6.0)	**-49**	(3.6)	**-33**	(5.5)
	Portugal	470	(3.5)	350	(4.6)	473	(4.6)	585	(3.7)	508	(2.9)	404	(4.8)	510	(3.8)	609	(3.5)	**-38**	(2.4)	**-53**	(4.7)	**-37**	(4.0)	**-25**	(3.6)
	Slovak Republic	452	(3.5)	335	(5.3)	450	(4.3)	571	(5.0)	503	(2.8)	394	(6.0)	505	(3.7)	608	(4.7)	**-51**	(3.5)	**-60**	(6.4)	**-56**	(4.9)	**-36**	(5.5)
	Slovenia	456	(1.6)	335	(3.7)	458	(2.8)	576	(3.5)	511	(1.4)	404	(3.2)	515	(2.0)	613	(3.4)	**-55**	(2.3)	**-69**	(4.6)	**-57**	(3.3)	**-38**	(4.4)
	Spain	467	(2.2)	349	(3.9)	473	(2.8)	577	(2.7)	496	(2.2)	385	(3.9)	502	(2.3)	597	(2.5)	**-29**	(2.0)	**-36**	(4.3)	**-29**	(2.4)	**-20**	(3.4)
	Sweden	475	(3.2)	343	(5.1)	480	(3.7)	601	(4.7)	521	(3.1)	405	(5.3)	522	(3.5)	636	(4.2)	**-46**	(2.7)	**-62**	(6.5)	**-42**	(3.8)	**-35**	(4.5)
	Switzerland	481	(2.9)	357	(4.2)	486	(3.1)	600	(3.9)	520	(2.7)	399	(5.1)	527	(2.9)	631	(4.9)	**-39**	(2.5)	**-42**	(5.1)	**-41**	(3.1)	**-31**	(4.3)
	Turkey	443	(3.7)	336	(4.6)	444	(4.4)	550	(5.7)	486	(4.1)	388	(4.7)	487	(4.8)	585	(5.6)	**-43**	(3.7)	**-52**	(4.3)	**-43**	(5.3)	**-35**	(4.6)
	United Kingdom	481	(3.5)	353	(3.9)	483	(4.0)	609	(5.1)	507	(2.9)	389	(4.2)	509	(3.7)	621	(3.9)	**-25**	(4.5)	**-35**	(5.5)	**-26**	(5.3)	-12	(6.8)
	United States	488	(4.2)	357	(5.3)	488	(5.5)	615	(5.4)	513	(3.8)	392	(5.4)	513	(4.0)	635	(5.9)	**-25**	(3.4)	**-34**	(6.2)	**-25**	(4.7)	**-19**	(5.2)
	OECD average-34	474	(0.6)	349	(1.0)	478	(0.7)	594	(0.7)	514	(0.5)	400	(0.9)	518	(0.6)	621	(0.7)	**-39**	(0.6)	**-51**	(1.2)	**-40**	(0.8)	**-27**	(0.9)
	OECD average-35	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	**m**	m	**m**	m	**m**	m	**m**	m
Partners	Albania	355	(5.1)	225	(7.1)	355	(6.0)	486	(6.6)	417	(3.9)	300	(6.4)	422	(5.3)	527	(5.8)	**-62**	(4.4)	**-75**	(8.2)	**-67**	(6.0)	**-41**	(6.3)
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	397	(2.9)	277	(2.9)	392	(3.2)	524	(4.7)	425	(2.8)	309	(3.6)	423	(3.5)	544	(4.7)	**-29**	(1.7)	**-33**	(3.6)	**-31**	(2.6)	**-20**	(4.1)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	400	(7.3)	249	(8.8)	402	(9.1)	548	(6.8)	461	(5.8)	322	(8.9)	468	(7.4)	590	(6.6)	**-61**	(4.7)	**-74**	(9.0)	**-66**	(7.0)	**-42**	(6.1)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	408	(4.5)	297	(7.0)	408	(4.4)	519	(5.7)	418	(4.0)	307	(5.1)	419	(5.3)	529	(5.2)	**-9**	(3.8)	-10	(6.2)	**-11**	(4.1)	-10	(7.8)
	Costa Rica	435	(3.7)	328	(6.2)	436	(4.6)	541	(5.1)	449	(3.0)	351	(4.7)	451	(3.5)	546	(4.5)	**-14**	(2.4)	**-23**	(5.9)	**-15**	(4.1)	-5	(5.3)
	Croatia	452	(3.4)	337	(4.2)	455	(4.3)	564	(4.0)	503	(3.7)	396	(5.5)	507	(4.4)	602	(4.1)	**-51**	(4.6)	**-60**	(6.4)	**-52**	(5.8)	**-37**	(4.4)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	344	(3.4)	216	(4.9)	344	(4.4)	471	(5.2)	405	(3.0)	290	(4.6)	407	(3.2)	516	(5.0)	**-61**	(2.7)	**-74**	(5.3)	**-63**	(4.1)	**-45**	(5.4)
	Hong Kong (China)	518	(3.3)	400	(6.9)	526	(3.8)	621	(4.1)	550	(2.8)	444	(5.7)	558	(3.3)	645	(3.0)	**-33**	(4.4)	**-44**	(8.5)	**-32**	(5.1)	**-24**	(4.8)
	Indonesia	383	(3.8)	301	(4.8)	382	(3.6)	467	(6.3)	420	(3.9)	337	(5.5)	420	(3.9)	500	(5.6)	**-37**	(3.3)	**-37**	(5.1)	**-38**	(3.7)	**-33**	(5.3)
	Jordan	377	(4.7)	257	(7.1)	383	(4.9)	488	(5.9)	434	(4.1)	328	(6.5)	439	(4.0)	532	(4.3)	**-57**	(6.2)	**-71**	(9.7)	**-56**	(6.2)	**-44**	(7.0)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	439	(2.8)	333	(4.7)	440	(2.8)	548	(3.5)	498	(2.6)	394	(4.3)	499	(3.3)	598	(3.7)	**-59**	(2.8)	**-61**	(5.3)	**-59**	(4.0)	**-50**	(4.2)
	Macao (China)	470	(1.3)	370	(3.6)	472	(1.9)	566	(2.7)	504	(1.2)	412	(2.5)	506	(1.8)	595	(2.0)	**-34**	(1.7)	**-41**	(4.7)	**-34**	(2.7)	**-29**	(2.8)
	Malta	406	(2.3)	236	(5.3)	412	(4.2)	561	(4.2)	478	(1.9)	341	(5.8)	483	(3.8)	606	(4.2)	**-72**	(2.8)	**-105**	(7.6)	**-71**	(4.7)	**-45**	(5.9)
	Moldova	366	(3.0)	250	(5.3)	369	(3.7)	479	(4.8)	411	(3.1)	304	(3.8)	413	(3.1)	517	(4.5)	**-45**	(2.5)	**-54**	(5.2)	**-44**	(3.7)	**-37**	(4.7)
	Montenegro	382	(2.1)	265	(3.7)	381	(3.1)	501	(5.3)	434	(2.1)	323	(5.4)	437	(2.6)	544	(3.4)	**-53**	(2.6)	**-57**	(6.5)	**-56**	(3.3)	**-43**	(6.3)
	Peru	359	(4.2)	235	(4.9)	358	(4.8)	483	(7.1)	381	(4.9)	250	(5.4)	382	(5.1)	507	(8.3)	**-22**	(4.7)	**-15**	(5.4)	**-25**	(5.5)	**-24**	(8.4)
	Qatar	347	(1.3)	208	(2.2)	334	(2.1)	514	(4.3)	397	(1.0)	259	(2.8)	395	(2.2)	540	(2.8)	**-50**	(1.8)	**-50**	(3.6)	**-60**	(3.1)	**-26**	(5.1)
	Romania	403	(4.6)	283	(6.2)	406	(5.6)	519	(5.2)	445	(4.3)	334	(6.1)	449	(5.3)	549	(5.9)	**-43**	(4.4)	**-51**	(7.3)	**-43**	(6.2)	**-30**	(5.8)
	Russia	437	(3.6)	323	(6.4)	438	(3.7)	548	(5.4)	482	(3.4)	371	(5.1)	482	(3.5)	590	(5.1)	**-45**	(2.7)	**-48**	(6.4)	**-44**	(3.7)	**-42**	(6.1)
	Singapore	511	(1.7)	373	(4.8)	517	(2.9)	635	(2.5)	542	(1.5)	415	(3.6)	546	(2.3)	659	(3.2)	**-31**	(2.3)	**-42**	(5.9)	**-29**	(3.7)	**-24**	(3.9)
	Chinese Taipei	477	(3.7)	357	(5.4)	484	(4.8)	586	(5.9)	514	(3.6)	409	(4.4)	518	(4.0)	612	(6.9)	**-37**	(5.3)	**-52**	(6.4)	**-34**	(6.6)	**-26**	(9.1)
	Thailand	400	(3.3)	311	(4.6)	398	(3.6)	495	(5.3)	438	(3.1)	355	(3.9)	436	(3.3)	525	(5.7)	**-38**	(3.8)	**-44**	(4.7)	**-38**	(4.4)	**-30**	(7.6)
	Trinidad and Tobago	387	(1.9)	236	(5.6)	390	(3.0)	532	(3.6)	445	(1.6)	305	(5.5)	449	(2.5)	579	(4.1)	**-58**	(2.5)	**-69**	(6.1)	**-59**	(4.2)	**-47**	(5.2)
	Tunisia	387	(3.2)	272	(4.8)	391	(3.5)	498	(6.2)	418	(3.0)	317	(4.6)	421	(4.0)	518	(4.9)	**-31**	(2.2)	**-45**	(4.6)	**-30**	(3.4)	**-21**	(4.9)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	404	(3.2)	270	(6.4)	404	(3.8)	536	(6.0)	445	(2.8)	326	(5.5)	446	(3.2)	563	(3.9)	**-42**	(3.1)	**-56**	(6.6)	**-42**	(4.2)	**-27**	(6.2)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	379	(5.1)	232	(8.8)	384	(6.0)	518	(8.0)	415	(4.9)	283	(8.3)	419	(5.5)	546	(7.0)	**-37**	(3.8)	**-52**	(9.5)	**-36**	(5.1)	**-28**	(6.9)
	Kazakhstan**	369	(3.2)	256	(4.1)	364	(3.8)	492	(6.1)	412	(3.4)	305	(4.0)	408	(3.8)	527	(4.9)	**-43**	(2.7)	**-49**	(4.8)	**-44**	(3.2)	**-35**	(5.2)
	Malaysia**	396	(3.0)	285	(5.4)	400	(4.1)	498	(4.0)	431	(3.0)	333	(5.3)	436	(3.1)	523	(3.7)	**-35**	(2.3)	**-48**	(5.2)	**-36**	(3.8)	**-24**	**(3.9)**

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Costa Rica, Georgia, Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433195

[Part 1/1]

Table I.4.8d Change between 2009 and 2015 in reading performance, by gender (PISA 2015 - PISA 2009)

		Boys								Girls								Gender differences (boys – girls)							
		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		50th percentile		90th percentile	
		Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	-9	(5.0)	**-16**	(6.3)	-9	(5.7)	-5	(6.6)	**-14**	(4.9)	**-24**	(6.3)	**-14**	(5.1)	-8	(5.8)	5	(4.3)	7	(6.8)	5	(5.5)	3	(6.1)
	Austria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Belgium	-2	(5.8)	0	(9.0)	-1	(7.0)	-5	(5.8)	**-13**	(5.4)	-16	(8.7)	**-14**	(6.0)	-10	(5.3)	11	(5.8)	16	(10.9)	13	(7.5)	4	(5.6)
	Canada	6	(4.6)	2	(6.6)	7	(5.1)	9	(5.3)	-2	(4.6)	-8	(5.7)	-1	(5.0)	3	(5.4)	**8**	(2.9)	10	(5.8)	8	(4.1)	6	(4.8)
	Chile	**14**	(6.2)	6	(8.8)	**15**	(6.7)	**18**	(7.7)	4	(5.7)	-8	(7.8)	5	(6.5)	15	(8.0)	10	(5.4)	13	(8.6)	10	(6.7)	3	(9.7)
	Czech Republic	**19**	(6.2)	-4	(8.8)	**25**	(7.2)	**34**	(7.1)	-3	(5.4)	-13	(8.8)	-3	(6.5)	4	(6.3)	**22**	(5.9)	9	(9.6)	**27**	(8.0)	**29**	(7.1)
	Denmark	8	(5.1)	4	(7.3)	9	(5.4)	**14**	(6.7)	2	(5.4)	-4	(8.2)	3	(5.8)	7	(6.4)	7	(4.7)	8	(8.8)	6	(5.5)	6	(7.3)
	Estonia	**26**	(5.4)	14	(8.5)	**26**	(6.4)	**36**	(6.3)	10	(5.0)	1	(7.4)	10	(5.5)	**19**	(6.5)	**16**	(3.9)	14	(8.9)	**16**	(5.2)	**17**	(6.6)
	Finland	-4	(5.2)	**-18**	(7.9)	-2	(5.9)	5	(6.5)	**-13**	(5.0)	**-23**	(7.1)	**-14**	(5.4)	-4	(6.2)	**9**	(3.7)	6	(8.2)	**11**	(4.9)	9	(6.8)
	France	10	(6.4)	0	(12.6)	11	(7.6)	**18**	(7.2)	-1	(5.9)	**-18**	(9.1)	-1	(7.1)	11	(7.8)	11	(5.7)	18	(12.5)	11	(8.0)	7	(7.6)
	Germany	**21**	(6.2)	16	(9.2)	**19**	(7.4)	**29**	(6.4)	2	(5.5)	-6	(8.7)	1	(6.7)	**12**	(6.2)	**19**	(5.1)	**22**	(9.7)	**19**	(7.3)	**16**	(6.2)
	Greece	-10	(8.3)	-14	(13.3)	-9	(10.0)	-7	(7.5)	**-19**	(6.5)	**-28**	(11.5)	**-17**	(6.8)	-13	(7.2)	10	(6.2)	14	(11.2)	9	(8.6)	6	(8.5)
	Hungary	**-18**	(6.4)	**-21**	(10.5)	**-23**	(8.3)	-7	(7.5)	**-31**	(5.9)	**-50**	(10.5)	**-29**	(6.8)	**-19**	(6.8)	**13**	(5.9)	**29**	(11.4)	6	(8.7)	12	(6.9)
	Iceland	**-18**	(4.9)	**-19**	(8.3)	**-21**	(5.9)	**-15**	(6.8)	**-21**	(4.7)	**-29**	(8.5)	**-23**	(5.7)	-11	(7.5)	3	(4.7)	10	(11.3)	1	(6.6)	-3	(7.9)
	Ireland	**39**	(6.3)	**48**	(10.8)	**34**	(6.8)	**34**	(7.1)	**11**	(5.4)	**18**	(7.7)	9	(5.8)	5	(6.7)	**27**	(5.8)	**30**	(11.4)	**25**	(7.0)	**29**	(8.2)
	Israel	15	(8.3)	14	(13.2)	14	(9.5)	18	(9.8)	-5	(6.7)	-11	(10.8)	-7	(7.9)	4	(7.3)	**19**	(8.4)	25	(13.9)	**21**	(10.3)	15	(10.6)
	Italy	**13**	(5.4)	13	(7.6)	**13**	(6.3)	8	(5.6)	**-17**	(5.3)	**-23**	(7.4)	**-19**	(5.8)	-9	(5.8)	**30**	(5.5)	**36**	(8.9)	**32**	(6.7)	**16**	(5.8)
	Japan	8	(7.8)	23	(13.7)	5	(8.3)	0	(7.8)	**-17**	(6.1)	**-19**	(9.4)	**-17**	(6.3)	**-19**	(7.6)	**26**	(8.0)	**42**	(14.1)	**22**	(8.8)	**19**	(9.0)
	Korea	**-24**	(7.6)	**-52**	(11.2)	**-24**	(8.5)	0	(7.5)	**-19**	(6.5)	**-42**	(9.7)	**-19**	(7.3)	4	(7.5)	-5	(8.0)	-10	(13.1)	-5	(9.3)	-4	(8.6)
	Latvia	7	(5.4)	0	(8.3)	7	(6.6)	10	(7.0)	1	(5.2)	-10	(7.8)	2	(6.3)	11	(6.6)	5	(4.5)	10	(9.5)	5	(6.7)	-1	(7.4)
	Luxembourg	**18**	(4.3)	**15**	(6.9)	**14**	(5.5)	**23**	(5.9)	0	(4.3)	-12	(7.0)	0	(5.3)	7	(6.4)	**18**	(3.7)	**27**	(8.5)	**14**	(5.9)	**16**	(6.8)
	Mexico	3	(5.0)	13	(6.4)	-1	(5.6)	-3	(6.3)	-6	(4.9)	2	(6.5)	-8	(5.1)	**-13**	(6.3)	**9**	(2.9)	11	(5.8)	7	(4.3)	10	(5.3)
	Netherlands	-5	(6.9)	**-24**	(8.8)	0	(9.2)	7	(7.0)	-6	(7.0)	**-21**	(8.9)	-2	(9.2)	4	(7.9)	1	(4.1)	-3	(8.4)	1	(7.1)	3	(7.2)
	New Zealand	-5	(6.0)	-10	(9.1)	-6	(6.8)	-3	(8.1)	**-19**	(5.2)	**-26**	(7.6)	**-21**	(6.1)	-9	(7.5)	**13**	(5.9)	16	(10.2)	**16**	(7.6)	6	(8.9)
	Norway	**13**	(5.5)	-1	(7.9)	**16**	(6.2)	**21**	(7.3)	6	(5.3)	-5	(7.6)	7	(5.9)	14	(7.3)	7	(4.3)	3	(8.2)	9	(5.3)	8	(8.0)
	Poland	**16**	(5.3)	12	(8.1)	**17**	(6.3)	**15**	(6.8)	-5	(5.3)	-12	(7.6)	-2	(6.1)	-1	(6.6)	**20**	(3.8)	**23**	(9.1)	**19**	(5.5)	**16**	(7.3)
	Portugal	**20**	(5.8)	13	(7.5)	**20**	(7.3)	**26**	(6.4)	-1	(5.3)	**-16**	(7.9)	3	(6.2)	7	(6.1)	**21**	(3.5)	**30**	(7.9)	**18**	(5.8)	**19**	(5.7)
	Slovak Republic	**-16**	(5.9)	**-37**	(8.3)	-11	(6.8)	-2	(7.4)	**-32**	(5.6)	**-61**	(10.0)	**-25**	(6.4)	-13	(7.2)	**16**	(5.3)	**24**	(10.1)	14	(7.3)	11	(7.4)
	Slovenia	**28**	(4.4)	**26**	(6.4)	**30**	(5.4)	**26**	(7.0)	**17**	(4.3)	10	(6.7)	**17**	(4.8)	**21**	(6.4)	**12**	(4.0)	**15**	(7.6)	**13**	(5.3)	4	(8.1)
	Spain	**19**	(5.1)	**17**	(7.7)	**18**	(5.5)	**21**	(5.7)	**10**	(5.0)	10	(7.1)	9	(5.3)	**11**	(5.6)	**9**	(4.1)	7	(8.9)	**9**	(4.4)	9	(5.9)
	Sweden	6	(6.2)	-1	(8.5)	6	(7.2)	11	(7.4)	-1	(5.8)	-11	(8.6)	4	(6.3)	0	(7.2)	6	(4.2)	10	(9.6)	2	(6.0)	11	(6.9)
	Switzerland	-1	(5.6)	-15	(8.0)	2	(6.3)	6	(7.0)	**-15**	(5.5)	**-17**	(8.3)	**-17**	(6.3)	-8	(7.5)	**14**	(4.2)	2	(8.5)	**19**	(5.5)	14	(7.6)
	Turkey	**-29**	(6.8)	**-28**	(8.3)	**-28**	(7.8)	**-30**	(9.3)	**-44**	(7.2)	**-50**	(8.8)	**-44**	(8.2)	**-38**	(9.1)	**15**	(6.2)	**21**	(9.3)	**16**	(8.2)	8	(7.4)
	United Kingdom	6	(5.7)	8	(7.0)	6	(6.5)	2	(7.5)	3	(5.7)	-4	(7.0)	3	(6.3)	9	(7.0)	3	(5.6)	12	(7.7)	3	(6.9)	-7	(8.9)
	United States	-1	(6.6)	-8	(9.2)	4	(7.9)	1	(8.2)	-6	(6.4)	-12	(8.8)	-3	(6.8)	-5	(8.5)	5	(4.9)	4	(9.3)	6	(6.7)	6	(8.1)
	OECD average-34	5	(3.5)	-1	(3.7)	5	(3.6)	**9**	(3.6)	**-7**	(3.5)	**-16**	(3.7)	-7	(3.5)	0	(3.6)	**12**	(0.9)	**15**	(1.7)	**12**	(1.2)	**10**	(1.3)
	OECD average-35	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Partners	Albania	**21**	(7.8)	**27**	(9.8)	**19**	(8.7)	15	(10.5)	**18**	(6.5)	**21**	(8.9)	13	(7.8)	**20**	(8.8)	3	(5.9)	7	(10.7)	6	(8.0)	-5	(9.6)
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	-1	(5.5)	-11	(6.0)	-1	(5.8)	8	(7.2)	-7	(5.3)	**-13**	(6.2)	-7	(5.9)	1	(7.3)	6	(3.0)	2	(5.5)	6	(3.9)	7	(5.8)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	10	(9.9)	12	(11.5)	7	(12.5)	11	(10.4)	-4	(8.4)	-17	(12.5)	-2	(10.3)	2	(9.2)	**14**	(6.8)	**29**	(11.6)	9	(10.1)	9	(9.3)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	8	(6.7)	2	(9.6)	8	(7.1)	**16**	(7.7)	**15**	(6.1)	11	(8.0)	13	(7.4)	**21**	(7.4)	-6	(5.1)	-8	(8.6)	-5	(5.8)	-5	(9.4)
	Costa Rica	**-15**	(5.9)	-12	(8.2)	**-16**	(6.8)	**-16**	(7.5)	**-14**	(5.4)	-13	(7.0)	**-18**	(5.8)	-11	(7.4)	-1	(3.7)	0	(7.5)	2	(5.4)	-5	(7.1)
	Croatia	**21**	(5.9)	**15**	(7.4)	**19**	(7.1)	**30**	(7.0)	-3	(5.8)	-12	(8.2)	-5	(6.7)	9	(6.7)	**25**	(5.8)	**27**	(9.1)	**23**	(7.6)	**21**	(7.1)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	**29**	(6.3)	**24**	(8.4)	**29**	(7.7)	**37**	(8.7)	**27**	(5.4)	**20**	(7.8)	**27**	(5.8)	**35**	(7.7)	3	(5.0)	4	(9.0)	1	(7.3)	2	(8.8)
	Hong Kong (China)	-5	(5.9)	-8	(9.9)	-7	(6.5)	1	(6.8)	-9	(5.7)	-10	(8.9)	-11	(6.2)	-6	(6.2)	4	(6.4)	2	(11.4)	4	(7.6)	7	(7.4)
	Indonesia	2	(6.1)	-10	(8.1)	3	(6.3)	15	(8.5)	-11	(6.1)	**-25**	(8.7)	-11	(6.2)	4	(7.8)	**13**	(4.7)	14	(7.4)	**13**	(5.7)	11	(7.9)
	Jordan	-5	(7.2)	-10	(10.1)	-7	(7.6)	4	(8.5)	10	(6.4)	14	(9.3)	9	(6.3)	7	(6.4)	-15	(8.2)	-24	(12.9)	-15	(8.5)	-3	(9.2)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	**14**	(5.4)	-5	(7.5)	**13**	(5.5)	**31**	(7.2)	-6	(5.2)	**-19**	(7.0)	-4	(6.1)	7	(6.7)	**20**	(4.2)	14	(7.4)	**17**	(5.8)	**24**	(6.4)
	Macao (China)	**23**	(4.1)	8	(6.6)	**25**	(4.8)	**34**	(6.2)	**21**	(4.0)	**14**	(5.4)	**23**	(4.3)	**23**	(5.4)	3	(2.9)	-5	(7.6)	2	(4.5)	11	(5.8)
	Malta	**20**	(4.9)	**29**	(9.5)	**18**	(6.6)	**17**	(6.8)	**-10**	(4.5)	**-31**	(9.2)	-6	(6.2)	3	(6.9)	**30**	(4.4)	**60**	(12.2)	**24**	(7.1)	14	(8.6)
	Moldova	**24**	(5.3)	**17**	(7.8)	**23**	(6.1)	**35**	(7.1)	**31**	(5.5)	**17**	(6.9)	**32**	(6.0)	**43**	(7.9)	-6	(4.0)	0	(7.7)	-9	(5.7)	-8	(7.5)
	Montenegro	**28**	(4.5)	**20**	(6.0)	**28**	(5.6)	**35**	(7.3)	**10**	(4.6)	8	(7.3)	7	(5.3)	**16**	(6.2)	**19**	(3.9)	12	(7.8)	**21**	(5.7)	**19**	(8.3)
	Peru	**35**	(6.4)	**44**	(7.1)	**36**	(7.4)	**27**	(9.4)	**21**	(7.0)	**34**	(7.6)	**20**	(7.5)	11	(10.4)	**14**	(6.1)	10	(7.4)	**15**	(7.5)	16	(10.2)
	Qatar	**29**	(3.9)	**22**	(4.7)	**36**	(4.5)	**19**	(6.7)	**32**	(3.9)	**41**	(5.4)	**34**	(4.7)	**18**	(5.1)	-3	(2.6)	**-20**	(5.5)	2	(4.4)	2	(6.6)
	Romania	**22**	(7.2)	16	(10.0)	**22**	(8.4)	**27**	(8.7)	-3	(7.0)	-13	(8.9)	-6	(8.2)	15	(9.3)	**25**	(5.7)	**29**	(10.4)	**28**	(7.8)	12	(8.8)
	Russia	**44**	(6.0)	**44**	(8.8)	**43**	(6.5)	**49**	(7.9)	**26**	(6.0)	**28**	(8.2)	**25**	(6.3)	**27**	(7.7)	**19**	(4.3)	16	(8.8)	**18**	(5.4)	**22**	(8.1)
	Singapore	**15**	(4.2)	12	(7.4)	**16**	(5.3)	**14**	(5.6)	4	(4.4)	1	(6.5)	5	(4.9)	7	(6.2)	**11**	(3.5)	11	(8.0)	**12**	(5.6)	7	(6.6)
	Chinese Taipei	8	(6.2)	-4	(8.5)	9	(7.3)	15	(8.6)	-4	(6.1)	**-20**	(7.3)	-1	(6.4)	7	(9.5)	12	(7.4)	16	(8.9)	10	(8.7)	8	(11.7)
	Thailand	-8	(6.4)	**-21**	(7.0)	-9	(7.0)	6	(9.5)	**-15**	(5.6)	**-28**	(6.6)	**-15**	(5.8)	-3	(8.7)	7	(5.2)	7	(6.6)	6	(6.1)	9	(10.4)
	Trinidad and Tobago	**14**	(4.5)	**33**	(7.9)	12	(5.9)	3	(6.2)	7	(4.3)	**16**	(7.8)	6	(5.3)	2	(7.4)	7	(4.0)	18	(9.0)	6	(6.5)	1	(8.1)
	Tunisia	**-40**	(6.1)	**-28**	(9.1)	**-45**	(6.8)	**-43**	(8.4)	**-46**	(5.4)	**-45**	(7.4)	**-49**	(6.1)	**-43**	(7.4)	6	(4.0)	**16**	(8.1)	5	(5.5)	0	(6.7)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	**21**	(5.8)	**27**	(8.4)	**18**	(6.7)	**19**	(9.0)	2	(5.1)	1	(7.6)	1	(5.8)	5	(7.3)	**18**	(4.5)	**26**	(8.5)	**17**	(6.0)	14	(8.3)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	**38**	(7.2)	**68**	(10.4)	**34**	(8.4)	16	(10.0)	**18**	(6.9)	**36**	(10.6)	**17**	(7.5)	-4	(9.2)	**21**	(5.0)	**32**	(10.9)	**17**	(6.8)	**19**	(8.8)
	Kazakhstan**	**50**	(6.1)	**61**	(7.1)	**52**	(6.8)	**33**	(9.4)	**23**	(6.1)	**30**	(7.3)	**26**	(6.7)	11	(8.3)	**27**	(4.1)	**31**	(7.1)	**27**	(5.3)	**22**	(7.6)
	Malaysia**	**18**	(5.9)	**19**	(8.4)	**17**	(7.0)	**21**	(7.2)	**14**	(5.8)	12	(8.6)	**14**	(6.2)	**16**	(6.5)	3	(3.6)	7	(7.4)	4	(5.5)	5	(5.6)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Costa Rica, Georgia, Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433195

[Part 1/1]

Table I.5.1a Percentage of students at each proficiency level in mathematics

		All students													
		Below Level 1 (below 357.77 score points)		Level 1 (from 357.77 to less than 420.07 score points)		Level 2 (from 420.07 to less than 482.38 score points)		Level 3 (from 482.38 to less than 544.68 score points)		Level 4 (from 544.68 to less than 606.99 score points)		Level 5 (from 606.99 to less than 669.30 score points)		Level 6 (above 669.30 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	7.6	(0.4)	14.4	(0.4)	22.6	(0.7)	25.4	(0.6)	18.7	(0.5)	8.6	(0.5)	2.7	(0.3)
	Austria	7.8	(0.7)	13.9	(0.7)	21.3	(0.8)	24.6	(0.9)	19.9	(0.8)	9.7	(0.7)	2.7	(0.4)
	Belgium	7.2	(0.6)	12.9	(0.6)	18.8	(0.8)	23.4	(0.7)	21.8	(0.7)	12.3	(0.5)	3.6	(0.4)
	Canada	3.8	(0.4)	10.5	(0.5)	20.4	(0.6)	27.1	(0.6)	23.0	(0.7)	11.4	(0.6)	3.7	(0.3)
	Chile	23.0	(1.1)	26.3	(1.0)	25.5	(0.8)	17.4	(0.9)	6.4	(0.5)	1.3	(0.2)	0.1	(0.1)
	Czech Republic	7.4	(0.7)	14.3	(0.8)	23.3	(0.9)	26.2	(0.8)	18.4	(0.7)	8.1	(0.6)	2.2	(0.3)
	Denmark	3.1	(0.3)	10.5	(0.7)	21.9	(1.0)	29.5	(0.9)	23.4	(0.9)	9.8	(0.7)	1.9	(0.3)
	Estonia	2.2	(0.3)	9.0	(0.7)	21.5	(0.9)	28.9	(0.8)	24.2	(0.7)	11.3	(0.7)	2.9	(0.4)
	Finland	3.6	(0.5)	10.0	(0.7)	21.8	(0.8)	29.3	(0.8)	23.7	(1.0)	9.5	(0.7)	2.2	(0.3)
	France	8.8	(0.7)	14.7	(0.7)	20.7	(0.9)	23.8	(0.8)	20.6	(0.7)	9.5	(0.6)	1.9	(0.3)
	Germany	5.1	(0.6)	12.1	(0.8)	21.8	(0.9)	26.8	(0.7)	21.2	(0.9)	10.1	(0.6)	2.9	(0.4)
	Greece	15.1	(1.3)	20.7	(1.0)	26.0	(0.9)	22.1	(1.0)	12.3	(0.9)	3.4	(0.4)	0.5	(0.1)
	Hungary	11.3	(0.8)	16.6	(0.8)	23.1	(1.0)	24.5	(1.0)	16.3	(0.8)	6.7	(0.5)	1.5	(0.3)
	Iceland	8.4	(0.6)	15.2	(0.9)	23.7	(1.1)	24.8	(1.1)	17.5	(0.9)	8.1	(0.7)	2.2	(0.3)
	Ireland	3.5	(0.5)	11.5	(0.6)	24.1	(0.9)	30.0	(0.9)	21.2	(0.7)	8.3	(0.5)	1.5	(0.2)
	Israel	15.0	(1.0)	17.1	(0.8)	21.1	(1.0)	21.7	(1.0)	16.1	(0.8)	7.1	(0.6)	1.9	(0.3)
	Italy	8.3	(0.6)	14.9	(0.8)	23.3	(0.8)	24.7	(0.8)	18.3	(0.9)	8.1	(0.6)	2.4	(0.3)
	Japan	2.9	(0.4)	7.8	(0.6)	17.2	(0.9)	25.8	(0.9)	25.9	(0.9)	15.0	(0.9)	5.3	(0.7)
	Korea	5.4	(0.6)	10.0	(0.7)	17.2	(0.8)	23.7	(0.8)	22.7	(0.9)	14.3	(0.9)	6.6	(0.7)
	Latvia	5.7	(0.6)	15.8	(0.8)	28.3	(0.9)	28.8	(1.0)	16.3	(0.7)	4.5	(0.4)	0.6	(0.1)
	Luxembourg	8.8	(0.5)	17.0	(0.7)	22.5	(0.7)	23.6	(1.0)	18.0	(0.7)	7.8	(0.4)	2.2	(0.3)
	Mexico	25.5	(1.1)	31.1	(0.9)	26.9	(0.9)	12.9	(0.8)	3.2	(0.4)	0.3	(0.1)	0.0	(0.0)
	Netherlands	5.2	(0.5)	11.5	(0.7)	19.8	(0.7)	24.9	(0.9)	23.0	(0.8)	12.3	(0.7)	3.2	(0.3)
	New Zealand	7.1	(0.5)	14.6	(0.8)	22.6	(1.0)	25.3	(1.0)	19.0	(0.8)	8.6	(0.7)	2.8	(0.4)
	Norway	4.8	(0.5)	12.3	(0.7)	23.6	(0.9)	27.7	(0.8)	21.0	(1.0)	8.7	(0.6)	1.9	(0.3)
	Poland	4.5	(0.5)	12.7	(0.8)	22.9	(1.0)	27.1	(0.8)	20.6	(0.9)	9.3	(0.6)	2.9	(0.5)
	Portugal	8.7	(0.6)	15.1	(0.7)	21.6	(0.7)	23.9	(0.8)	19.2	(0.8)	8.9	(0.6)	2.5	(0.3)
	Slovak Republic	11.6	(0.8)	16.1	(0.7)	23.5	(1.0)	24.3	(0.9)	16.7	(0.7)	6.6	(0.5)	1.3	(0.3)
	Slovenia	4.4	(0.4)	11.7	(0.6)	21.4	(0.8)	26.8	(0.8)	22.3	(0.8)	10.4	(0.6)	3.0	(0.4)
	Spain	7.2	(0.5)	15.0	(0.8)	24.9	(0.8)	27.5	(1.0)	18.1	(0.7)	6.3	(0.5)	1.0	(0.2)
	Sweden	7.0	(0.7)	13.8	(0.8)	23.3	(1.0)	26.1	(1.1)	19.4	(0.9)	8.4	(0.6)	2.0	(0.4)
	Switzerland	4.9	(0.5)	10.9	(0.8)	18.1	(0.8)	23.6	(0.9)	23.3	(0.8)	14.0	(0.8)	5.3	(0.5)
	Turkey	22.9	(1.5)	28.4	(1.4)	25.3	(1.1)	16.3	(1.2)	5.9	(0.9)	1.0	(0.3)	0.1	(0.1)
	United Kingdom	7.7	(0.6)	14.1	(0.7)	22.7	(0.8)	26.0	(0.8)	18.8	(0.8)	8.3	(0.6)	2.3	(0.3)
	United States	10.6	(0.8)	18.8	(1.0)	26.2	(1.0)	23.8	(0.9)	14.7	(0.8)	5.0	(0.6)	0.9	(0.2)
	EU total	7.7	(0.2)	14.4	(0.2)	22.6	(0.2)	25.4	(0.3)	19.2	(0.3)	8.5	(0.2)	2.2	(0.1)
	OECD total	10.9	(0.3)	17.5	(0.3)	23.4	(0.3)	22.9	(0.3)	16.2	(0.3)	7.1	(0.2)	2.0	(0.1)
	OECD average	8.5	(0.1)	14.9	(0.1)	22.5	(0.1)	24.8	(0.1)	18.6	(0.1)	8.4	(0.1)	2.3	(0.1)
Partners	Albania	26.3	(1.5)	27.0	(1.5)	25.4	(1.2)	14.8	(1.0)	5.4	(0.6)	1.0	(0.3)	0.1	(0.1)
	Algeria	50.6	(1.7)	30.4	(0.9)	14.2	(1.0)	4.0	(0.5)	0.8	(0.2)	0.1	(0.1)	0.0	(0.0)
	Brazil	43.7	(1.3)	26.5	(0.8)	17.2	(0.7)	8.6	(0.5)	3.1	(0.4)	0.8	(0.2)	0.1	(0.1)
	B-S-J-G (China)	5.8	(0.7)	10.0	(0.8)	16.3	(0.9)	20.5	(0.9)	21.8	(0.9)	16.6	(1.1)	9.0	(1.1)
	Bulgaria	20.8	(1.5)	21.2	(1.1)	23.7	(1.0)	19.3	(1.0)	10.6	(0.8)	3.6	(0.5)	0.8	(0.3)
	CABA (Argentina)	13.8	(2.1)	20.2	(2.4)	27.0	(2.0)	22.3	(1.9)	12.5	(1.8)	3.5	(1.0)	0.5	(0.3)
	Colombia	35.4	(1.3)	30.9	(0.8)	21.5	(0.8)	9.5	(0.6)	2.4	(0.2)	0.3	(0.1)	0.0	(0.0)
	Costa Rica	27.4	(1.2)	35.1	(1.0)	25.8	(1.0)	9.4	(0.8)	2.0	(0.4)	0.3	(0.1)	0.0	(0.0)
	Croatia	11.5	(0.9)	20.5	(0.8)	26.3	(0.9)	23.0	(0.8)	13.1	(0.8)	4.6	(0.5)	1.0	(0.2)
	Cyprus*	20.2	(0.7)	22.4	(0.7)	25.8	(0.8)	18.9	(0.8)	9.5	(0.5)	2.8	(0.4)	0.4	(0.1)
	Dominican Republic	68.3	(1.6)	22.2	(1.1)	7.7	(0.8)	1.5	(0.4)	0.2	(0.1)	0.0	(0.0)	0.0	c
	FYROM	45.1	(0.7)	25.1	(0.8)	17.3	(0.9)	8.6	(0.6)	3.1	(0.4)	0.7	(0.2)	0.2	(0.1)
	Georgia	31.2	(1.4)	25.9	(1.0)	22.8	(0.8)	13.4	(0.7)	5.2	(0.5)	1.4	(0.3)	0.2	(0.1)
	Hong Kong (China)	2.5	(0.4)	6.4	(0.6)	13.6	(0.9)	23.4	(0.9)	27.4	(1.1)	18.8	(0.9)	7.7	(0.7)
	Indonesia	37.9	(1.7)	30.7	(1.1)	19.6	(1.0)	8.4	(0.7)	2.7	(0.4)	0.6	(0.2)	0.1	(0.1)
	Jordan	38.9	(1.3)	28.7	(0.9)	20.9	(0.9)	9.2	(0.6)	2.1	(0.3)	0.2	(0.1)	0.0	(0.0)
	Kosovo	48.7	(1.0)	29.0	(1.3)	16.5	(0.9)	5.1	(0.6)	0.7	(0.2)	0.0	(0.0)	0.0	(0.0)
	Lebanon	36.6	(1.7)	23.6	(1.2)	19.5	(0.9)	12.3	(0.9)	5.9	(0.6)	1.7	(0.3)	0.3	(0.1)
	Lithuania	8.5	(0.8)	16.9	(0.8)	26.4	(1.1)	25.4	(1.0)	15.9	(0.9)	5.8	(0.6)	1.1	(0.2)
	Macao (China)	1.3	(0.2)	5.3	(0.5)	15.1	(0.6)	27.3	(0.8)	29.1	(0.7)	16.9	(0.7)	5.0	(0.5)
	Malta	14.7	(0.6)	14.4	(0.8)	20.0	(0.9)	21.6	(0.7)	17.5	(0.8)	8.9	(0.6)	3.0	(0.3)
	Moldova	24.8	(1.0)	25.5	(1.0)	25.0	(1.1)	16.3	(0.8)	6.7	(0.6)	1.5	(0.2)	0.2	(0.1)
	Montenegro	25.0	(0.7)	26.9	(0.8)	24.9	(1.0)	15.7	(0.7)	6.1	(0.4)	1.4	(0.2)	0.2	(0.1)
	Peru	37.7	(1.2)	28.4	(0.9)	21.0	(0.9)	9.8	(0.7)	2.7	(0.4)	0.4	(0.1)	0.0	(0.0)
	Qatar	34.7	(0.5)	24.0	(0.6)	19.9	(0.6)	12.8	(0.4)	6.4	(0.3)	1.9	(0.2)	0.3	(0.1)
	Romania	16.2	(1.3)	23.7	(1.2)	27.4	(1.1)	20.1	(1.1)	9.3	(0.9)	2.8	(0.4)	0.4	(0.2)
	Russia	5.1	(0.7)	13.9	(0.9)	25.5	(0.9)	27.5	(0.9)	19.3	(1.0)	7.3	(0.6)	1.5	(0.2)
	Singapore	2.0	(0.2)	5.5	(0.4)	12.4	(0.6)	20.0	(0.7)	25.1	(0.9)	21.7	(0.8)	13.1	(0.7)
	Chinese Taipei	4.4	(0.4)	8.3	(0.5)	14.6	(0.7)	21.2	(0.9)	23.3	(0.9)	18.0	(0.6)	10.1	(0.9)
	Thailand	24.2	(1.2)	29.6	(1.1)	26.1	(0.9)	13.8	(0.9)	4.8	(0.6)	1.2	(0.3)	0.2	(0.1)
	Trinidad and Tobago	28.3	(0.8)	23.9	(0.9)	22.1	(0.8)	15.6	(0.8)	7.5	(0.5)	2.2	(0.3)	0.4	(0.1)
	Tunisia	47.4	(1.5)	27.4	(1.1)	16.4	(0.9)	6.4	(0.6)	1.8	(0.4)	0.4	(0.2)	0.1	(0.1)
	United Arab Emirates	24.4	(1.0)	24.4	(0.7)	23.2	(0.8)	15.9	(0.7)	8.5	(0.5)	3.1	(0.3)	0.6	(0.1)
	Uruguay	25.4	(1.2)	27.0	(1.0)	24.4	(0.9)	15.3	(0.8)	6.2	(0.5)	1.5	(0.3)	0.2	(0.1)
	Viet Nam	4.5	(0.8)	14.6	(1.2)	26.4	(1.2)	27.0	(1.3)	18.2	(1.1)	7.2	(0.9)	2.1	(0.7)
	Argentina**	26.6	(1.3)	29.4	(1.0)	26.0	(0.9)	13.0	(0.8)	4.2	(0.5)	0.7	(0.2)	0.1	(0.0)
	Kazakhstan**	10.2	(1.1)	21.9	(1.4)	29.8	(1.3)	22.8	(1.3)	11.0	(1.0)	3.5	(0.6)	0.8	(0.3)
	Malaysia**	13.8	(1.0)	23.7	(1.0)	29.5	(0.9)	21.9	(1.0)	9.1	(0.8)	1.8	(0.4)	0.2	(0.1)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433203

[Part 1/2]

Table I.5.2a Percentage of low achievers and top performers in mathematics, 2003 through 2015

		Proficiency levels in PISA 2003				Proficiency levels in PISA 2006				Proficiency levels in PISA 2009				Proficiency levels in PISA 2012				Proficiency levels in PISA 2015			
		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	14.3	(0.7)	19.8	(0.8)	13.0	(0.6)	16.4	(0.8)	15.9	(0.7)	16.4	(0.9)	19.7	(0.6)	14.8	(0.6)	22.0	(0.6)	11.3	(0.6)
	Austria	18.8	(1.2)	14.3	(1.0)	20.0	(1.4)	15.8	(1.0)	m	m	m	m	18.7	(1.0)	14.3	(0.9)	21.8	(1.1)	12.5	(0.9)
	Belgium	16.5	(0.8)	26.4	(0.8)	17.3	(1.0)	22.3	(0.8)	19.1	(0.8)	20.4	(0.7)	19.0	(0.8)	19.5	(0.8)	20.1	(1.0)	15.9	(0.7)
	Canada	10.1	(0.5)	20.3	(0.7)	10.8	(0.6)	17.9	(0.7)	11.5	(0.5)	18.3	(0.6)	13.8	(0.5)	16.4	(0.6)	14.4	(0.7)	15.1	(0.8)
	Chile	m	m	m	m	55.1	(2.2)	1.5	(0.4)	51.0	(1.7)	1.3	(0.3)	51.5	(1.7)	1.6	(0.2)	49.4	(1.3)	1.4	(0.2)
	Czech Republic	16.6	(1.3)	18.3	(1.2)	19.2	(1.2)	18.3	(1.2)	22.3	(1.1)	11.6	(0.9)	21.0	(1.2)	12.9	(0.8)	21.7	(1.1)	10.4	(0.8)
	Denmark	15.4	(0.8)	15.9	(0.9)	13.6	(1.0)	13.7	(0.8)	17.1	(0.9)	11.6	(0.8)	16.8	(1.0)	10.0	(0.7)	13.6	(0.9)	11.7	(0.7)
	Estonia	m	m	m	m	12.1	(1.0)	12.5	(0.8)	12.6	(0.9)	12.1	(0.8)	10.5	(0.6)	14.6	(0.8)	11.2	(0.7)	14.2	(0.8)
	Finland	6.8	(0.5)	23.4	(0.8)	6.0	(0.6)	24.4	(1.0)	7.8	(0.5)	21.7	(0.9)	12.3	(0.7)	15.3	(0.7)	13.6	(0.8)	11.7	(0.7)
	France	16.6	(1.1)	15.1	(0.9)	22.3	(1.3)	12.5	(0.9)	22.5	(1.3)	13.7	(1.0)	22.4	(0.9)	12.9	(0.8)	23.5	(0.9)	11.4	(0.7)
	Germany	21.6	(1.2)	16.2	(0.9)	19.9	(1.4)	15.4	(1.0)	18.6	(1.1)	17.8	(0.9)	17.7	(1.0)	17.5	(0.9)	17.2	(1.0)	12.9	(0.8)
	Greece	38.9	(1.9)	4.0	(0.6)	32.3	(1.4)	5.0	(0.5)	30.3	(1.8)	5.7	(0.6)	35.7	(1.3)	3.9	(0.4)	35.8	(1.8)	3.9	(0.5)
	Hungary	23.0	(1.0)	10.7	(0.9)	21.2	(1.1)	10.3	(0.9)	22.3	(1.5)	10.1	(1.1)	28.1	(1.3)	9.3	(1.1)	28.0	(1.2)	8.1	(0.6)
	Iceland	15.0	(0.7)	15.5	(0.7)	16.8	(0.8)	12.7	(0.7)	17.0	(0.6)	13.6	(0.6)	21.5	(0.7)	11.2	(0.7)	23.6	(1.0)	10.3	(0.8)
	Ireland	16.8	(1.0)	11.4	(0.8)	16.4	(1.2)	10.2	(0.8)	20.8	(1.0)	6.7	(0.6)	16.9	(1.0)	10.7	(0.5)	15.0	(0.9)	9.8	(0.6)
	Israel	m	m	m	m	42.0	(1.7)	6.1	(0.6)	39.5	(1.3)	5.9	(0.7)	33.5	(1.7)	9.4	(1.0)	32.1	(1.4)	8.9	(0.9)
	Italy	31.9	(1.5)	7.0	(0.5)	32.8	(0.9)	6.2	(0.5)	24.9	(0.6)	9.0	(0.5)	24.7	(0.8)	9.9	(0.6)	23.3	(1.1)	10.5	(0.8)
	Japan	13.3	(1.2)	24.3	(1.5)	13.0	(1.1)	18.3	(1.0)	12.5	(1.0)	20.9	(1.2)	11.1	(1.0)	23.7	(1.5)	10.7	(0.8)	20.3	(1.3)
	Korea	9.5	(0.8)	24.8	(1.4)	8.9	(1.0)	27.1	(1.5)	8.1	(1.0)	25.6	(1.6)	9.1	(0.9)	30.9	(1.8)	15.5	(1.1)	20.9	(1.3)
	Latvia	23.7	(1.4)	8.0	(0.8)	20.7	(1.2)	6.6	(0.6)	22.6	(1.4)	5.7	(0.6)	19.9	(1.1)	8.0	(0.8)	21.4	(1.0)	5.2	(0.4)
	Luxembourg	21.7	(0.6)	10.8	(0.6)	22.8	(0.6)	10.6	(0.5)	23.9	(0.6)	11.4	(0.6)	24.3	(0.5)	11.2	(0.4)	25.8	(0.7)	10.0	(0.5)
	Mexico	65.9	(1.7)	0.4	(0.1)	56.5	(1.3)	0.8	(0.2)	50.8	(1.0)	0.7	(0.1)	54.7	(0.8)	0.6	(0.1)	56.6	(1.3)	0.3	(0.1)
	Netherlands	10.9	(1.1)	25.5	(1.3)	11.5	(1.0)	21.1	(1.1)	13.4	(1.4)	19.9	(1.5)	14.8	(1.3)	19.3	(1.2)	16.7	(0.9)	15.5	(0.8)
	New Zealand	15.1	(0.8)	20.7	(0.7)	14.0	(0.8)	18.9	(0.9)	15.4	(0.9)	18.9	(0.9)	22.6	(0.8)	15.0	(0.9)	21.6	(1.0)	11.4	(0.7)
	Norway	20.8	(1.0)	11.4	(0.6)	22.2	(1.2)	10.4	(0.7)	18.2	(0.9)	10.2	(0.7)	22.3	(1.1)	9.4	(0.7)	17.1	(0.8)	10.6	(0.7)
	Poland	22.0	(1.1)	10.1	(0.6)	19.8	(0.9)	10.6	(0.8)	20.5	(1.1)	10.4	(0.9)	14.4	(0.9)	16.7	(1.3)	17.2	(1.0)	12.2	(0.9)
	Portugal	30.1	(1.7)	5.4	(0.5)	30.7	(1.5)	5.7	(0.5)	23.7	(1.1)	9.6	(0.8)	24.9	(1.5)	10.6	(0.8)	23.8	(1.0)	11.4	(0.7)
	Slovak Republic	19.9	(1.4)	12.7	(0.9)	20.9	(1.0)	11.0	(0.9)	21.0	(1.2)	12.7	(1.0)	27.5	(1.3)	11.0	(0.9)	27.7	(1.2)	7.8	(0.6)
	Slovenia	m	m	m	m	17.7	(0.7)	13.7	(0.6)	20.3	(0.5)	14.2	(0.6)	20.1	(0.6)	13.7	(0.6)	16.1	(0.6)	13.5	(0.7)
	Spain	23.0	(1.0)	7.9	(0.7)	24.7	(1.1)	7.2	(0.5)	23.7	(0.8)	8.0	(0.5)	23.6	(0.8)	8.0	(0.4)	22.2	(1.0)	7.2	(0.6)
	Sweden	17.3	(0.9)	15.8	(0.8)	18.3	(1.0)	12.6	(0.7)	21.1	(1.0)	11.4	(0.8)	27.1	(1.1)	8.0	(0.5)	20.8	(1.2)	10.4	(0.9)
	Switzerland	14.5	(0.8)	21.2	(1.5)	13.5	(0.9)	22.6	(1.2)	13.5	(0.8)	24.1	(1.4)	12.4	(0.7)	21.4	(1.2)	15.8	(1.0)	19.2	(1.0)
	Turkey	52.2	(2.6)	5.5	(1.6)	52.1	(1.8)	4.2	(1.2)	42.1	(1.8)	5.6	(1.2)	42.0	(1.9)	5.9	(1.1)	51.4	(2.2)	1.1	(0.4)
	United Kingdom	m	m	m	m	19.8	(0.8)	11.1	(0.6)	20.2	(0.9)	9.8	(0.7)	21.8	(1.3)	11.8	(0.8)	21.9	(1.0)	10.6	(0.7)
	United States	25.7	(1.2)	10.1	(0.7)	28.1	(1.7)	7.6	(0.8)	23.4	(1.3)	9.9	(1.0)	25.8	(1.4)	8.8	(0.8)	29.4	(1.4)	5.9	(0.7)
	OECD average-30	21.6	(0.2)	14.4	(0.2)	21.3	(0.2)	13.2	(0.2)	m	m	m	m	22.2	(0.2)	12.9	(0.2)	22.9	(0.2)	10.8	(0.1)
	OECD average-34	m	m	m	m	22.5	(0.2)	12.5	(0.1)	22.0	(0.2)	12.5	(0.2)	23.0	(0.2)	12.5	(0.1)	23.4	(0.2)	10.6	(0.1)
	OECD average-35	m	m	m	m	22.5	(0.2)	12.6	(0.1)	m	m	m	m	22.9	(0.2)	12.5	(0.1)	23.4	(0.2)	10.7	(0.1)
Partners	Albania	m	m	m	m	m	m	m	m	67.7	(1.9)	0.4	(0.2)	60.7	(1.0)	0.8	(0.2)	53.3	(1.9)	1.1	(0.2)
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	81.0	(1.3)	0.1	(0.1)
	Brazil	75.2	(1.7)	1.2	(0.4)	72.5	(1.2)	1.0	(0.3)	69.1	(1.2)	0.8	(0.2)	68.3	(1.0)	0.7	(0.2)	70.3	(1.2)	0.9	(0.2)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	15.8	(1.2)	25.6	(1.9)
	Bulgaria	m	m	m	m	53.3	(2.4)	3.1	(0.8)	47.1	(2.5)	3.8	(1.0)	43.8	(1.8)	4.1	(0.6)	42.1	(1.8)	4.4	(0.6)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	46.8	(3.5)	1.0	(0.3)	34.1	(3.2)	4.0	(1.1)
	Colombia	m	m	m	m	71.9	(1.6)	0.4	(0.2)	70.4	(1.6)	0.1	(0.1)	73.8	(1.4)	0.3	(0.1)	66.3	(1.2)	0.3	(0.1)
	Costa Rica	m	m	m	m	m	m	m	m	56.7	(1.9)	0.3	(0.2)	59.9	(1.9)	0.6	(0.2)	62.5	(1.5)	0.3	(0.1)
	Croatia	m	m	m	m	28.6	(1.2)	4.7	(0.5)	33.2	(1.4)	4.9	(0.7)	29.9	(1.4)	7.0	(1.1)	32.0	(1.4)	5.6	(0.5)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m	42.0	(0.6)	3.7	(0.3)	42.6	(0.8)	3.2	(0.4)
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	90.5	(1.0)	0.0	(0.0)
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	70.2	(0.8)	0.8	(0.2)
	Georgia	m	m	m	m	m	m	m	m	68.7	(1.2)	0.6	(0.2)	m	m	m	m	57.1	(1.2)	1.6	(0.4)
	Hong Kong (China)	10.4	(1.2)	30.7	(1.5)	9.5	(0.9)	27.7	(1.2)	8.8	(0.7)	30.7	(1.2)	8.5	(0.8)	33.7	(1.4)	9.0	(0.8)	26.5	(1.1)
	Indonesia	78.1	(1.7)	0.2	(0.1)	65.8	(3.1)	0.4	(0.2)	76.7	(1.9)	0.1	(0.0)	75.7	(2.1)	0.3	(0.2)	68.6	(1.6)	0.7	(0.2)
	Jordan	m	m	m	m	66.4	(1.6)	0.2	(0.1)	65.3	(1.9)	0.3	(0.2)	68.6	(1.5)	0.6	(0.4)	67.5	(1.3)	0.3	(0.1)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	77.7	(1.0)	0.0	(0.0)
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	60.2	(1.6)	2.0	(0.3)
	Lithuania	m	m	m	m	23.0	(1.1)	9.1	(0.9)	26.3	(1.2)	7.0	(0.7)	26.0	(1.2)	8.1	(0.6)	25.4	(1.1)	6.9	(0.7)
	Macao (China)	11.2	(1.2)	18.7	(1.4)	10.9	(0.7)	17.4	(0.7)	11.0	(0.5)	17.1	(0.5)	10.8	(0.5)	24.3	(0.6)	6.6	(0.5)	21.9	(0.6)
	Malta	m	m	m	m	m	m	m	m	33.7	(0.8)	7.7	(0.4)	m	m	m	m	29.1	(0.8)	11.8	(0.7)
	Moldova	m	m	m	m	m	m	m	m	60.7	(1.6)	0.7	(0.2)	m	m	m	m	50.3	(1.2)	1.7	(0.3)
	Montenegro	m	m	m	m	60.1	(1.0)	0.8	(0.2)	58.4	(1.1)	1.0	(0.2)	56.6	(1.0)	1.0	(0.2)	51.9	(1.0)	1.5	(0.2)
	Peru	m	m	m	m	m	m	m	m	73.5	(1.8)	0.6	(0.2)	74.6	(1.8)	0.6	(0.2)	66.2	(1.4)	0.4	(0.1)
	Qatar	m	m	m	m	87.2	(0.6)	0.6	(0.1)	73.8	(0.4)	1.8	(0.2)	69.6	(0.5)	2.0	(0.2)	58.7	(0.7)	2.2	(0.2)
	Romania	m	m	m	m	52.7	(2.2)	1.3	(0.3)	47.0	(2.0)	1.3	(0.3)	40.8	(1.9)	3.2	(0.6)	39.9	(1.8)	3.3	(0.5)
	Russia	30.2	(1.8)	7.0	(0.8)	26.6	(1.6)	7.4	(0.8)	28.6	(1.5)	5.2	(0.8)	24.0	(1.1)	7.8	(0.8)	18.9	(1.2)	8.8	(0.7)
	Singapore	m	m	m	m	m	m	m	m	9.8	(0.6)	35.6	(0.8)	8.3	(0.5)	40.0	(0.7)	7.6	(0.4)	34.8	(0.8)
	Chinese Taipei	m	m	m	m	12.0	(1.1)	31.9	(1.4)	12.8	(0.8)	28.6	(1.5)	12.8	(0.8)	37.2	(1.2)	12.7	(0.7)	28.1	(1.2)
	Thailand	54.0	(1.7)	1.6	(0.4)	53.0	(1.3)	1.3	(0.3)	52.5	(1.6)	1.3	(0.4)	49.7	(1.7)	2.6	(0.5)	53.8	(1.6)	1.4	(0.3)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	53.2	(0.7)	2.5	(0.3)	m	m	m	m	52.3	(0.8)	2.5	(0.3)
	Tunisia	78.0	(1.2)	0.2	(0.1)	72.5	(1.8)	0.5	(0.2)	73.6	(1.5)	0.3	(0.2)	67.7	(1.8)	0.8	(0.4)	74.8	(1.2)	0.5	(0.2)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m	46.3	(1.2)	3.5	(0.3)	48.7	(1.2)	3.7	(0.3)
	Uruguay	48.1	(1.5)	2.8	(0.4)	46.1	(1.2)	3.2	(0.5)	47.6	(1.3)	2.4	(0.4)	55.8	(1.3)	1.4	(0.3)	52.4	(1.2)	1.7	(0.4)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	14.2	(1.7)	13.3	(1.5)	19.1	(1.7)	9.3	(1.3)
	Argentina**	m	m	m	m	64.1	(2.5)	1.0	(0.4)	63.6	(2.0)	0.9	(0.3)	66.5	(2.0)	0.3	(0.1)	56.1	(1.7)	0.8	(0.2)
	Kazakhstan**	m	m	m	m	m	m	m	m	59.1	(1.5)	1.2	(0.4)	45.2	(1.7)	0.9	(0.3)	32.2	(2.1)	4.2	(0.8)
	Malaysia**	m	m	m	m	m	m	m	m	59.3	(1.6)	0.4	(0.1)	51.8	(1.7)	1.3	(0.3)	37.5	(1.6)	2.0	(0.4)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Costa Rica, Georgia, Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433203

[Part 2/2]

Table I.5.2a Percentage of low achievers and top performers in mathematics, 2003 through 2015

	Change between 2003 and 2015 (PISA 2015 - PISA 2003)				Change between 2006 and 2015 (PISA 2015 - PISA 2006)				Change between 2009 and 2015 (PISA 2015 - PISA 2009)				Change between 2012 and 2015 (PISA 2015 - PISA 2012)			
	Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)	
	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.
OECD																
Australia	**7.6**	(3.2)	**-8.4**	(2.1)	**9.0**	(1.6)	**-5.1**	(1.2)	**6.1**	(1.8)	**-5.1**	(1.4)	2.3	(1.6)	**-3.5**	(1.2)
Austria	3.0	(3.2)	-1.8	(2.3)	1.8	(2.1)	**-3.3**	(1.5)	m	m	m	m	3.1	(1.8)	-1.8	(1.5)
Belgium	3.6	(2.7)	**-10.6**	(2.7)	2.7	(1.7)	**-6.5**	(1.4)	1.0	(1.7)	**-4.5**	(1.5)	1.1	(1.6)	**-3.7**	(1.4)
Canada	4.2	(2.4)	-5.2	(2.7)	**3.6**	(1.3)	**-2.9**	(1.4)	**2.9**	(1.4)	**-3.2**	(1.4)	0.5	(1.3)	-1.3	(1.4)
Chile	m	m	m	m	-5.8	(3.7)	-0.1	(0.4)	-1.7	(3.8)	0.1	(0.4)	-2.2	(3.5)	-0.2	(0.3)
Czech Republic	5.1	(3.6)	**-7.9**	(2.0)	2.5	(2.0)	**-7.9**	(1.6)	-0.6	(2.1)	-1.3	(1.4)	0.7	(2.0)	-2.5	(1.3)
Denmark	-1.8	(2.8)	-4.3	(2.2)	-0.1	(1.7)	-2.1	(1.2)	**-3.5**	(1.7)	0.1	(1.3)	-3.3	(1.7)	1.7	(1.2)
Estonia	m	m	m	m	-0.9	(1.6)	1.7	(1.6)	-1.4	(1.6)	2.1	(1.7)	0.7	(1.3)	-0.4	(1.6)
Finland	**6.8**	(2.3)	**-11.7**	(2.8)	**7.6**	(1.3)	**-12.8**	(1.6)	**5.7**	(1.4)	**-10.0**	(1.6)	1.3	(1.3)	**-3.6**	(1.4)
France	**6.8**	(3.1)	-3.7	(2.8)	1.2	(1.9)	-1.1	(1.5)	1.0	(2.0)	-2.2	(1.7)	1.1	(1.7)	-1.4	(1.5)
Germany	-4.4	(2.9)	-3.3	(2.4)	-2.7	(2.0)	-2.5	(1.5)	-1.4	(1.9)	**-4.9**	(1.5)	-0.5	(1.8)	**-4.5**	(1.5)
Greece	-3.2	(6.0)	-0.1	(0.9)	3.4	(3.2)	-1.1	(0.7)	5.4	(3.6)	**-1.8**	(0.8)	0.1	(3.2)	0.0	(0.7)
Hungary	5.0	(3.6)	-2.5	(1.6)	**6.8**	(2.0)	-2.2	(1.2)	**5.6**	(2.3)	-2.0	(1.3)	-0.1	(2.1)	-1.1	(1.4)
Iceland	**8.6**	(3.8)	**-5.1**	(1.6)	**6.8**	(1.9)	**-2.3**	(1.2)	**6.7**	(2.1)	**-3.3**	(1.1)	2.1	(1.9)	-0.8	(1.2)
Ireland	-1.8	(3.3)	-1.5	(1.9)	-1.4	(1.9)	-0.4	(1.2)	**-5.8**	(1.9)	**3.2**	(1.1)	-1.9	(1.8)	-0.8	(1.0)
Israel	m	m	m	m	**-9.8**	(2.5)	**2.9**	(1.2)	**-7.3**	(2.4)	**3.1**	(1.2)	-1.4	(2.5)	-0.4	(1.4)
Italy	**-8.7**	(4.0)	**3.5**	(1.7)	**-9.6**	(2.0)	**4.3**	(1.1)	-1.7	(2.0)	1.6	(1.1)	-1.4	(1.9)	0.6	(1.1)
Japan	-2.6	(1.9)	-3.9	(4.3)	-2.4	(1.5)	2.0	(2.2)	-1.8	(1.4)	-0.5	(2.4)	-0.4	(1.4)	-3.3	(2.4)
Korea	**5.9**	(2.2)	-3.9	(3.5)	**6.6**	(1.6)	**-6.2**	(2.3)	**7.3**	(1.7)	-4.7	(2.5)	**6.3**	(1.6)	**-10.0**	(2.5)
Latvia	-2.3	(4.9)	**-2.8**	(1.3)	0.7	(2.5)	-1.4	(0.8)	-1.1	(2.8)	-0.5	(0.8)	1.5	(2.5)	**-2.8**	(1.0)
Luxembourg	4.1	(3.6)	-0.8	(1.7)	3.0	(1.7)	-0.6	(0.9)	1.9	(1.8)	-1.4	(1.1)	1.5	(1.7)	-1.2	(0.9)
Mexico	-9.3	(8.0)	0.0	(0.1)	0.1	(3.6)	**-0.5**	(0.2)	5.8	(3.9)	**-0.4**	(0.2)	1.9	(3.5)	**-0.3**	(0.1)
Netherlands	**5.8**	(2.7)	**-10.0**	(3.9)	**5.2**	(1.6)	**-5.6**	(2.0)	3.3	(2.0)	-4.3	(2.4)	1.9	(1.8)	-3.7	(2.1)
New Zealand	**6.6**	(3.3)	**-9.3**	(2.3)	**7.6**	(1.8)	**-7.5**	(1.4)	**6.2**	(1.9)	**-7.5**	(1.5)	-1.0	(1.8)	**-3.6**	(1.4)
Norway	-3.8	(2.8)	-0.7	(2.0)	**-5.2**	(1.7)	0.2	(1.2)	-1.1	(1.6)	0.4	(1.3)	**-5.2**	(1.6)	1.2	(1.2)
Poland	-4.9	(2.8)	2.1	(2.3)	-2.7	(1.6)	1.6	(1.4)	-3.3	(1.8)	1.8	(1.6)	2.8	(1.6)	**-4.5**	(1.8)
Portugal	-6.3	(3.7)	**6.1**	(2.1)	**-7.0**	(2.2)	**5.7**	(1.2)	0.0	(2.1)	1.8	(1.4)	-1.1	(2.2)	0.8	(1.3)
Slovak Republic	7.8	(4.0)	**-4.9**	(1.7)	**6.8**	(2.2)	**-3.1**	(1.3)	**6.7**	(2.4)	**-4.9**	(1.3)	0.2	(2.3)	**-3.1**	(1.3)
Slovenia	m	m	m	m	-1.6	(1.3)	-0.2	(1.3)	**-4.2**	(1.3)	-0.7	(1.3)	**-4.0**	(1.2)	-0.2	(1.2)
Spain	-0.8	(3.6)	-0.7	(1.4)	-2.5	(1.9)	0.0	(0.9)	-1.5	(2.0)	-0.8	(0.9)	-1.4	(1.8)	-0.8	(0.9)
Sweden	3.6	(3.2)	**-5.4**	(2.0)	2.5	(1.9)	-2.2	(1.2)	-0.2	(2.0)	-1.0	(1.4)	**-6.2**	(2.0)	**2.4**	(1.2)
Switzerland	1.2	(2.3)	-2.0	(3.5)	2.3	(1.5)	-3.4	(1.9)	2.3	(1.5)	**-4.9**	(2.2)	**3.3**	(1.4)	-2.1	(2.0)
Turkey	-0.8	(7.3)	**-4.4**	(1.6)	-0.7	(3.7)	**-3.1**	(1.2)	**9.2**	(4.0)	**-4.5**	(1.3)	**9.4**	(3.8)	**-4.7**	(1.2)
United Kingdom	m	m	m	m	2.1	(1.8)	-0.5	(1.2)	1.7	(2.0)	0.8	(1.3)	0.1	(2.1)	-1.2	(1.3)
United States	3.7	(5.3)	**-4.2**	(1.5)	1.2	(2.9)	-1.7	(1.2)	**6.0**	(3.0)	**-4.0**	(1.3)	3.5	(2.8)	**-2.9**	(1.2)
OECD average-30	1.3	(3.1)	**-3.6**	(1.7)	1.6	(1.2)	**-2.4**	(0.7)	m	m	m	m	0.7	(1.2)	**-2.1**	(0.7)
OECD average-34	m	m	m	m	0.9	(1.2)	**-1.9**	(0.7)	1.4	(1.4)	**-1.9**	(0.8)	0.4	(1.3)	**-1.8**	(0.7)
OECD average-35	m	m	m	m	0.9	(1.2)	**-1.9**	(0.7)	m	m	m	m	0.4	(1.3)	**-1.8**	(0.7)
Partners																
Albania	m	m	m	m	m	m	m	m	**-14.5**	(3.9)	**0.7**	(0.3)	**-7.4**	(3.3)	0.3	(0.3)
Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Brazil	-4.9	(4.8)	-0.3	(0.5)	-2.3	(2.5)	-0.1	(0.4)	1.1	(2.7)	0.1	(0.3)	2.0	(2.4)	0.2	(0.3)
B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Bulgaria	m	m	m	m	**-11.2**	(3.6)	1.3	(1.0)	-5.0	(3.8)	0.6	(1.2)	-1.7	(3.2)	0.4	(0.9)
CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	**-12.8**	(5.2)	**3.0**	(1.2)
Colombia	m	m	m	m	-5.6	(3.1)	-0.1	(0.2)	-4.2	(3.4)	0.2	(0.1)	**-7.5**	(3.1)	0.0	(0.2)
Costa Rica	m	m	m	m	m	m	m	m	5.8	(5.1)	-0.1	(0.2)	2.6	(4.7)	-0.3	(0.2)
Croatia	m	m	m	m	3.5	(2.7)	0.9	(0.8)	-1.1	(3.0)	0.6	(0.9)	2.2	(2.8)	-1.4	(1.3)
Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m	0.6	(2.0)	-0.5	(0.5)
Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Georgia	m	m	m	m	m	m	m	m	**-11.6**	(3.0)	**1.0**	(0.5)	m	m	m	m
Hong Kong (China)	-1.4	(1.6)	-4.1	(6.3)	-0.5	(1.3)	-1.2	(3.0)	0.2	(1.1)	-4.1	(3.3)	0.5	(1.1)	**-7.2**	(3.1)
Indonesia	-9.5	(7.5)	**0.4**	(0.2)	2.9	(4.6)	0.3	(0.3)	-8.0	(4.2)	**0.6**	(0.2)	-7.0	(4.0)	0.4	(0.3)
Jordan	m	m	m	m	1.2	(3.1)	0.0	(0.2)	2.3	(3.5)	0.0	(0.2)	-1.0	(3.1)	-0.3	(0.5)
Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Lithuania	m	m	m	m	2.5	(2.4)	-2.2	(1.2)	-0.9	(2.6)	0.0	(1.0)	-0.6	(2.4)	-1.1	(1.0)
Macao (China)	**-4.5**	(1.6)	3.2	(6.0)	**-4.3**	(0.9)	4.4	(2.4)	**-4.3**	(0.8)	4.7	(2.7)	**-4.1**	(0.8)	-2.5	(2.4)
Malta	m	m	m	m	m	m	m	m	**-4.6**	(1.6)	**4.1**	(1.2)	m	m	m	m
Moldova	m	m	m	m	m	m	m	m	**-10.4**	(3.3)	**1.1**	(0.3)	m	m	m	m
Montenegro	m	m	m	m	**-8.2**	(3.0)	**0.7**	(0.3)	-6.5	(3.5)	0.6	(0.3)	-4.8	(3.1)	0.5	(0.3)
Peru	m	m	m	m	m	m	m	m	**-7.4**	(3.4)	-0.2	(0.2)	**-8.4**	(3.1)	-0.2	(0.2)
Qatar	m	m	m	m	**-28.5**	(2.1)	**1.6**	(0.2)	**-15.1**	(2.3)	0.5	(0.3)	**-10.9**	(2.1)	0.2	(0.3)
Romania	m	m	m	m	**-12.8**	(3.6)	**2.0**	(0.6)	-7.1	(3.7)	**2.0**	(0.6)	-0.9	(3.5)	0.1	(0.8)
Russia	**-11.3**	(3.8)	1.8	(2.1)	**-7.7**	(2.3)	1.4	(1.3)	**-9.6**	(2.3)	**3.6**	(1.3)	**-5.0**	(2.0)	1.0	(1.3)
Singapore	m	m	m	m	m	m	m	m	**-2.3**	(0.8)	-0.8	(3.1)	-0.7	(0.7)	-5.2	(2.8)
Chinese Taipei	m	m	m	m	0.7	(1.4)	-3.7	(2.6)	-0.1	(1.2)	-0.4	(2.8)	-0.1	(1.2)	**-9.1**	(2.5)
Thailand	-0.2	(9.1)	-0.2	(0.5)	0.8	(4.1)	0.1	(0.4)	1.3	(4.7)	0.2	(0.6)	4.0	(4.3)	-1.1	(0.6)
Trinidad and Tobago	m	m	m	m	m	m	m	m	-0.9	(2.3)	0.0	(0.4)	m	m	m	m
Tunisia	-3.2	(4.1)	0.3	(0.3)	2.3	(2.5)	0.0	(0.3)	1.2	(2.4)	0.3	(0.3)	**7.1**	(2.6)	-0.3	(0.4)
United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m	2.4	(2.9)	0.2	(0.5)
Uruguay	4.3	(7.0)	**-1.1**	(0.6)	**6.3**	(3.2)	**-1.5**	(0.6)	4.9	(3.6)	-0.7	(0.5)	-3.4	(3.3)	0.3	(0.5)
Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	4.9	(2.9)	-3.9	(2.0)
Argentina**	m	m	m	m	**-8.1**	(4.0)	-0.2	(0.4)	-7.5	(4.0)	0.0	(0.4)	**-10.4**	(3.8)	**0.5**	(0.3)
Kazakhstan**	m	m	m	m	m	m	m	m	**-27.0**	(3.9)	**3.1**	(0.9)	**-13.1**	(3.7)	**3.3**	(0.8)
Malaysia**	m	m	m	m	m	m	m	m	**-21.8**	(3.7)	**1.7**	(0.5)	**-14.2**	(3.4)	0.7	(0.5)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Costa Rica, Georgia, Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433203

[Part 1/1]

Table I.5.3 Mean score and variation in mathematics performance

	Mean score		Standard deviation		Percentiles													
					5th		10th		25th		Median (50th)		75th		90th		95th	
	Mean	S.E.	S.D.	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
OECD																		
Australia	494	(1.6)	93	(1.2)	339	(2.8)	371	(2.5)	430	(2.0)	495	(2.1)	559	(2.1)	613	(2.8)	645	(3.3)
Austria	497	(2.9)	95	(1.8)	337	(5.7)	370	(4.5)	431	(3.9)	501	(3.6)	564	(3.4)	618	(3.7)	648	(4.2)
Belgium	507	(2.4)	97	(1.5)	341	(4.4)	374	(3.9)	438	(3.5)	513	(3.0)	579	(2.5)	630	(2.5)	657	(2.7)
Canada	516	(2.3)	88	(1.1)	368	(3.7)	400	(3.2)	456	(2.9)	518	(2.5)	577	(2.6)	627	(3.2)	657	(3.6)
Chile	423	(2.5)	85	(1.4)	284	(4.0)	313	(3.5)	363	(2.9)	422	(3.0)	483	(3.5)	534	(3.6)	563	(3.7)
Czech Republic	492	(2.4)	91	(1.7)	340	(4.8)	373	(4.2)	431	(3.4)	494	(2.8)	555	(2.9)	608	(3.6)	639	(4.4)
Denmark	511	(2.2)	81	(1.2)	376	(3.3)	405	(3.2)	457	(2.9)	513	(2.7)	567	(2.5)	614	(2.9)	639	(3.5)
Estonia	520	(2.0)	80	(1.1)	386	(3.7)	415	(3.1)	464	(2.6)	521	(2.3)	576	(2.6)	623	(2.7)	650	(3.4)
Finland	511	(2.3)	82	(1.3)	372	(5.1)	404	(3.8)	456	(3.1)	514	(2.7)	568	(2.4)	614	(2.9)	642	(3.5)
France	493	(2.1)	95	(1.5)	331	(4.5)	364	(3.9)	425	(3.3)	499	(2.9)	564	(2.6)	613	(2.7)	639	(3.3)
Germany	506	(2.9)	89	(1.4)	356	(4.9)	389	(4.1)	445	(3.5)	508	(3.2)	568	(3.4)	620	(3.4)	650	(3.9)
Greece	454	(3.8)	89	(1.8)	306	(5.7)	336	(5.3)	391	(5.0)	455	(4.0)	517	(4.0)	570	(3.7)	598	(4.2)
Hungary	477	(2.5)	94	(1.7)	321	(4.0)	351	(4.1)	411	(3.7)	480	(3.3)	543	(3.2)	598	(3.5)	627	(4.0)
Iceland	488	(2.0)	93	(1.3)	333	(3.9)	367	(3.6)	424	(3.0)	489	(2.7)	553	(2.7)	608	(4.0)	640	(4.3)
Ireland	504	(2.1)	80	(1.4)	371	(4.4)	400	(3.8)	450	(2.7)	505	(2.3)	559	(2.2)	606	(2.6)	633	(2.7)
Israel	470	(3.6)	103	(2.2)	296	(5.3)	332	(4.7)	396	(4.3)	473	(4.5)	545	(4.3)	601	(4.9)	634	(6.1)
Italy	490	(2.8)	94	(1.7)	334	(4.7)	368	(3.8)	426	(3.3)	491	(3.2)	555	(3.6)	610	(3.8)	640	(4.4)
Japan	532	(3.0)	88	(1.7)	381	(5.6)	416	(4.4)	474	(3.5)	536	(3.5)	594	(3.5)	643	(4.2)	672	(5.4)
Korea	524	(3.7)	100	(1.8)	353	(5.9)	391	(5.5)	458	(4.5)	529	(4.3)	594	(4.2)	649	(4.3)	681	(4.8)
Latvia	482	(1.9)	78	(1.2)	353	(4.4)	382	(3.0)	430	(2.7)	483	(2.3)	536	(2.1)	582	(2.9)	608	(3.1)
Luxembourg	486	(1.3)	94	(1.2)	334	(2.8)	363	(2.2)	417	(2.1)	487	(1.9)	553	(2.0)	607	(2.5)	638	(3.7)
Mexico	408	(2.2)	75	(1.3)	284	(4.1)	312	(2.6)	357	(2.5)	407	(2.6)	459	(2.9)	505	(3.5)	533	(3.6)
Netherlands	512	(2.2)	92	(1.5)	356	(3.9)	390	(3.9)	449	(3.3)	516	(2.8)	579	(2.4)	627	(3.1)	655	(3.6)
New Zealand	495	(2.3)	92	(1.3)	342	(3.8)	375	(3.8)	431	(3.2)	497	(2.9)	560	(2.8)	613	(3.1)	646	(4.4)
Norway	502	(2.2)	85	(1.1)	359	(4.0)	391	(3.4)	444	(2.5)	504	(2.7)	561	(2.7)	610	(3.0)	638	(3.0)
Poland	504	(2.4)	88	(1.7)	363	(4.5)	391	(4.1)	443	(3.0)	505	(2.5)	565	(3.0)	617	(3.6)	649	(4.8)
Portugal	492	(2.5)	96	(1.3)	332	(4.4)	365	(3.8)	424	(3.1)	495	(3.1)	561	(2.8)	614	(3.6)	644	(4.1)
Slovak Republic	475	(2.7)	95	(1.6)	312	(5.4)	349	(4.2)	412	(3.9)	479	(3.2)	543	(2.8)	596	(3.3)	625	(3.9)
Slovenia	510	(1.3)	88	(1.3)	363	(3.5)	394	(2.5)	449	(2.1)	512	(2.0)	572	(1.9)	622	(3.0)	651	(4.1)
Spain	486	(2.2)	85	(1.3)	342	(3.8)	374	(3.4)	428	(2.8)	489	(2.6)	546	(2.5)	593	(3.3)	621	(3.7)
Sweden	494	(3.2)	90	(1.7)	342	(5.0)	376	(4.4)	433	(3.8)	496	(3.5)	557	(4.0)	609	(3.9)	638	(4.7)
Switzerland	521	(2.9)	96	(1.6)	358	(5.1)	394	(4.4)	455	(3.9)	526	(3.3)	590	(3.4)	641	(3.4)	671	(3.9)
Turkey	420	(4.1)	82	(2.3)	291	(4.8)	317	(3.9)	363	(3.8)	417	(4.7)	477	(6.0)	529	(6.3)	559	(7.5)
United Kingdom	492	(2.5)	93	(1.4)	337	(4.3)	371	(3.7)	430	(3.2)	496	(2.9)	556	(3.1)	610	(3.1)	641	(4.0)
United States	470	(3.2)	88	(1.5)	323	(4.7)	355	(3.9)	408	(3.9)	470	(3.5)	532	(3.5)	585	(4.2)	613	(5.0)
EU total	493	(0.8)	92	(0.5)	338	(1.4)	371	(1.2)	429	(1.1)	495	(0.9)	558	(0.9)	610	(1.0)	640	(1.2)
OECD total	478	(1.1)	96	(0.5)	321	(1.5)	353	(1.3)	410	(1.4)	478	(1.4)	546	(1.3)	602	(1.4)	634	(1.3)
OECD average	490	(0.4)	89	(0.3)	340	(0.8)	373	(0.7)	428	(0.6)	492	(0.5)	553	(0.5)	605	(0.6)	634	(0.7)
Partners																		
Albania	413	(3.4)	86	(1.6)	272	(5.7)	303	(4.3)	354	(4.0)	413	(4.2)	472	(4.2)	525	(4.4)	556	(5.0)
Algeria	360	(3.0)	71	(1.5)	247	(4.2)	271	(3.8)	312	(3.0)	357	(2.8)	405	(3.6)	452	(4.4)	481	(5.2)
Brazil	377	(2.9)	89	(1.7)	240	(3.0)	267	(3.3)	315	(3.1)	371	(3.1)	434	(3.7)	496	(4.7)	533	(5.5)
B-S-J-G (China)	531	(4.9)	106	(2.5)	351	(6.7)	388	(5.9)	458	(5.9)	538	(5.4)	609	(5.8)	664	(5.6)	695	(6.2)
Bulgaria	441	(4.0)	97	(2.4)	284	(5.6)	315	(5.2)	371	(4.7)	441	(4.8)	509	(4.9)	568	(5.6)	601	(5.8)
CABA (Argentina)	456	(6.9)	89	(3.4)	307	(9.9)	340	(8.9)	397	(7.3)	457	(8.0)	518	(8.1)	571	(8.7)	599	(9.2)
Colombia	390	(2.3)	77	(1.3)	269	(3.7)	293	(3.1)	335	(2.9)	386	(2.6)	441	(2.7)	492	(3.3)	522	(3.8)
Costa Rica	400	(2.5)	68	(1.4)	292	(2.7)	315	(2.9)	353	(2.5)	398	(2.6)	445	(3.0)	489	(4.2)	517	(5.0)
Croatia	464	(2.8)	88	(1.6)	322	(4.6)	351	(4.2)	402	(3.7)	462	(3.4)	525	(3.3)	580	(3.6)	612	(4.5)
Cyprus*	437	(1.7)	92	(1.1)	286	(3.4)	317	(3.4)	373	(2.2)	438	(1.7)	500	(2.3)	558	(3.0)	590	(3.9)
Dominican Republic	328	(2.7)	69	(2.0)	220	(4.3)	243	(3.9)	281	(3.2)	324	(3.1)	373	(3.6)	418	(4.7)	446	(7.0)
FYROM	371	(1.3)	96	(1.6)	217	(4.5)	251	(3.0)	306	(2.0)	369	(1.6)	434	(2.4)	496	(3.4)	533	(4.4)
Georgia	404	(2.8)	94	(2.2)	250	(4.9)	285	(4.3)	341	(3.6)	403	(3.1)	467	(3.4)	525	(4.7)	559	(6.3)
Hong Kong (China)	548	(3.0)	90	(1.5)	389	(5.8)	426	(5.0)	490	(4.3)	554	(3.3)	611	(2.8)	659	(3.5)	687	(4.6)
Indonesia	386	(3.1)	80	(2.0)	264	(4.1)	289	(4.1)	331	(3.5)	381	(3.3)	436	(3.9)	492	(5.4)	528	(6.2)
Jordan	380	(2.7)	86	(2.1)	238	(6.1)	271	(4.0)	324	(3.2)	382	(2.9)	439	(3.2)	489	(3.2)	519	(3.9)
Kosovo	362	(1.6)	75	(1.4)	238	(3.5)	265	(2.9)	310	(2.3)	360	(2.0)	413	(2.6)	460	(4.2)	487	(4.3)
Lebanon	396	(3.7)	101	(2.0)	236	(5.5)	268	(5.2)	324	(4.7)	392	(4.5)	464	(4.6)	531	(5.5)	568	(6.2)
Lithuania	478	(2.3)	86	(1.4)	337	(3.8)	365	(3.8)	419	(3.0)	479	(2.7)	539	(2.9)	590	(3.5)	620	(4.0)
Macao (China)	544	(1.1)	80	(1.1)	408	(4.4)	439	(2.4)	491	(1.7)	547	(1.5)	599	(1.9)	643	(2.5)	669	(4.0)
Malta	479	(1.7)	110	(1.4)	289	(5.9)	331	(3.5)	405	(2.5)	485	(2.7)	558	(2.5)	616	(3.0)	648	(4.3)
Moldova	420	(2.5)	90	(1.5)	271	(4.8)	303	(3.7)	358	(3.4)	419	(3.1)	482	(3.3)	536	(4.1)	568	(4.2)
Montenegro	418	(1.5)	87	(1.4)	279	(3.5)	308	(2.8)	358	(2.2)	416	(2.1)	477	(2.4)	531	(2.3)	563	(3.3)
Peru	387	(2.7)	83	(1.4)	254	(3.5)	283	(2.6)	329	(2.7)	384	(2.8)	442	(4.0)	495	(4.3)	526	(4.5)
Qatar	402	(1.3)	99	(1.0)	248	(2.6)	278	(2.0)	331	(1.8)	397	(1.8)	470	(1.6)	536	(2.0)	573	(2.8)
Romania	444	(3.8)	86	(2.1)	305	(5.1)	334	(4.6)	384	(4.3)	442	(4.3)	502	(4.6)	557	(5.4)	590	(5.9)
Russia	494	(3.1)	83	(1.3)	357	(5.5)	387	(4.6)	437	(3.4)	494	(3.5)	552	(3.4)	601	(3.8)	629	(4.2)
Singapore	564	(1.5)	95	(0.8)	399	(2.8)	436	(2.6)	500	(2.4)	571	(2.0)	632	(1.6)	682	(2.4)	711	(3.4)
Chinese Taipei	542	(3.0)	103	(1.9)	364	(4.4)	404	(4.2)	474	(3.6)	548	(3.2)	616	(3.6)	670	(4.6)	701	(6.2)
Thailand	415	(3.0)	82	(1.9)	286	(4.1)	313	(3.7)	360	(3.1)	412	(3.2)	468	(4.0)	521	(5.2)	555	(6.3)
Trinidad and Tobago	417	(1.4)	96	(1.2)	265	(3.6)	294	(3.0)	348	(2.4)	415	(2.3)	484	(2.1)	545	(3.3)	578	(3.5)
Tunisia	367	(3.0)	84	(2.3)	235	(4.7)	263	(4.6)	310	(3.3)	363	(3.1)	421	(3.6)	476	(5.0)	510	(7.2)
United Arab Emirates	427	(2.4)	97	(1.3)	275	(3.8)	306	(3.3)	360	(2.9)	423	(3.0)	493	(3.2)	557	(3.5)	593	(3.6)
Uruguay	418	(2.5)	87	(1.7)	281	(3.5)	309	(2.7)	357	(3.3)	415	(2.9)	477	(3.4)	532	(3.6)	565	(5.2)
Viet Nam	495	(4.5)	84	(2.7)	361	(5.9)	388	(5.4)	436	(4.7)	492	(4.7)	551	(4.9)	604	(6.9)	636	(8.3)
Argentina**	409	(3.1)	81	(1.5)	280	(4.3)	306	(3.4)	354	(3.5)	407	(3.4)	463	(3.7)	514	(4.1)	545	(4.7)
Kazakhstan**	460	(4.3)	82	(2.4)	329	(5.8)	357	(4.9)	403	(4.7)	457	(4.5)	513	(5.1)	567	(6.3)	600	(7.4)
Malaysia**	446	(3.3)	80	(1.7)	315	(4.4)	343	(3.9)	391	(3.4)	447	(3.6)	501	(3.9)	549	(4.5)	577	(5.3)

* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433203

[Part 1/2]

Table I.5.4a Mean mathematics performance, 2003 through 2015

		PISA 2003		PISA 2006		PISA 2009		PISA 2012		PISA 2015	
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.
OECD	Australia	524	(2.1)	520	(2.2)	514	(2.5)	504	(1.6)	494	(1.6)
	Austria	506	(3.3)	505	(3.7)	m	m	506	(2.7)	497	(2.9)
	Belgium	529	(2.3)	520	(3.0)	515	(2.3)	515	(2.1)	507	(2.4)
	Canada	532	(1.8)	527	(2.0)	527	(1.6)	518	(1.8)	516	(2.3)
	Chile	m	m	411	(4.6)	421	(3.1)	423	(3.1)	423	(2.5)
	Czech Republic	516	(3.5)	510	(3.6)	493	(2.8)	499	(2.9)	492	(2.4)
	Denmark	514	(2.7)	513	(2.6)	503	(2.6)	500	(2.3)	511	(2.2)
	Estonia	m	m	515	(2.7)	512	(2.6)	521	(2.0)	520	(2.0)
	Finland	544	(1.9)	548	(2.3)	541	(2.2)	519	(1.9)	511	(2.3)
	France	511	(2.5)	496	(3.2)	497	(3.1)	495	(2.5)	493	(2.1)
	Germany	503	(3.3)	504	(3.9)	513	(2.9)	514	(2.9)	506	(2.9)
	Greece	445	(3.9)	459	(3.0)	466	(3.9)	453	(2.5)	454	(3.8)
	Hungary	490	(2.8)	491	(2.9)	490	(3.5)	477	(3.2)	477	(2.5)
	Iceland	515	(1.4)	506	(1.8)	507	(1.4)	493	(1.7)	488	(2.0)
	Ireland	503	(2.4)	501	(2.8)	487	(2.5)	501	(2.2)	504	(2.1)
	Israel	m	m	442	(4.3)	447	(3.3)	466	(4.7)	470	(3.6)
	Italy	466	(3.1)	462	(2.3)	483	(1.9)	485	(2.0)	490	(2.8)
	Japan	534	(4.0)	523	(3.3)	529	(3.3)	536	(3.6)	532	(3.0)
	Korea	542	(3.2)	547	(3.8)	546	(4.0)	554	(4.6)	524	(3.7)
	Latvia	483	(3.7)	486	(3.0)	482	(3.1)	491	(2.8)	482	(1.9)
	Luxembourg	493	(1.0)	490	(1.1)	489	(1.2)	490	(1.1)	486	(1.3)
	Mexico	385	(3.6)	406	(2.9)	419	(1.8)	413	(1.4)	408	(2.2)
	Netherlands	538	(3.1)	531	(2.6)	526	(4.7)	523	(3.5)	512	(2.2)
	New Zealand	523	(2.3)	522	(2.4)	519	(2.3)	500	(2.2)	495	(2.3)
	Norway	495	(2.4)	490	(2.6)	498	(2.4)	489	(2.7)	502	(2.2)
	Poland	490	(2.5)	495	(2.4)	495	(2.8)	518	(3.6)	504	(2.4)
	Portugal	466	(3.4)	466	(3.1)	487	(2.9)	487	(3.8)	492	(2.5)
	Slovak Republic	498	(3.3)	492	(2.8)	497	(3.1)	482	(3.4)	475	(2.7)
	Slovenia	m	m	504	(1.0)	501	(1.2)	501	(1.2)	510	(1.3)
	Spain	485	(2.4)	480	(2.3)	483	(2.1)	484	(1.9)	486	(2.2)
	Sweden	509	(2.6)	502	(2.4)	494	(2.9)	478	(2.3)	494	(3.2)
	Switzerland	527	(3.4)	530	(3.2)	534	(3.3)	531	(3.0)	521	(2.9)
	Turkey	423	(6.7)	424	(4.9)	445	(4.4)	448	(4.8)	420	(4.1)
	United Kingdom	m	m	495	(2.1)	492	(2.4)	494	(3.3)	492	(2.5)
	United States	483	(2.9)	474	(4.0)	487	(3.6)	481	(3.6)	470	(3.2)
	OECD average-30	499	(0.6)	497	(0.5)	m	m	496	(0.5)	491	(0.5)
	OECD average-34	m	m	494	(0.5)	495	(0.5)	494	(0.5)	490	(0.4)
	OECD average-35	m	m	494	(0.5)	m	m	494	(0.5)	490	(0.4)
Partners	Albania	m	m	m	m	377	(4.0)	394	(2.0)	413	(3.4)
	Algeria	m	m	m	m	m	m	m	m	360	(3.0)
	Brazil	356	(4.8)	370	(2.9)	386	(2.4)	389	(1.9)	377	(2.9)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	531	(4.9)
	Bulgaria	m	m	413	(6.1)	428	(5.9)	439	(4.0)	441	(4.0)
	CABA (Argentina)	m	m	m	m	m	m	418	(7.3)	456	(6.9)
	Colombia	m	m	370	(3.8)	381	(3.2)	376	(2.9)	390	(2.3)
	Costa Rica	m	m	m	m	409	(3.0)	407	(3.0)	400	(2.5)
	Croatia	m	m	467	(2.4)	460	(3.1)	471	(3.5)	464	(2.8)
	Cyprus*	m	m	m	m	m	m	440	(1.1)	437	(1.7)
	Dominican Republic	m	m	m	m	m	m	m	m	328	(2.7)
	FYROM	m	m	m	m	m	m	m	m	371	(1.3)
	Georgia	m	m	m	m	379	(2.8)	m	m	404	(2.8)
	Hong Kong (China)	550	(4.5)	547	(2.7)	555	(2.7)	561	(3.2)	548	(3.0)
	Indonesia	360	(3.9)	391	(5.6)	371	(3.7)	375	(4.0)	386	(3.1)
	Jordan	m	m	384	(3.3)	387	(3.7)	386	(3.1)	380	(2.7)
	Kosovo	m	m	m	m	m	m	m	m	362	(1.6)
	Lebanon	m	m	m	m	m	m	m	m	396	(3.7)
	Lithuania	m	m	486	(2.9)	477	(2.6)	479	(2.6)	478	(2.3)
	Macao (China)	527	(2.9)	525	(1.3)	525	(0.9)	538	(1.0)	544	(1.1)
	Malta	m	m	m	m	463	(1.4)	m	m	479	(1.7)
	Moldova	m	m	m	m	397	(3.1)	m	m	420	(2.5)
	Montenegro	m	m	399	(1.4)	403	(2.0)	410	(1.1)	418	(1.5)
	Peru	m	m	m	m	365	(4.0)	368	(3.7)	387	(2.7)
	Qatar	m	m	318	(1.0)	368	(0.7)	376	(0.8)	402	(1.3)
	Romania	m	m	415	(4.2)	427	(3.4)	445	(3.8)	444	(3.8)
	Russia	468	(4.2)	476	(3.9)	468	(3.3)	482	(3.0)	494	(3.1)
	Singapore	m	m	m	m	562	(1.4)	573	(1.3)	564	(1.5)
	Chinese Taipei	m	m	549	(4.1)	543	(3.4)	560	(3.3)	542	(3.0)
	Thailand	417	(3.0)	417	(2.3)	419	(3.2)	427	(3.4)	415	(3.0)
	Trinidad and Tobago	m	m	m	m	414	(1.3)	m	m	417	(1.4)
	Tunisia	359	(2.5)	365	(4.0)	371	(3.0)	388	(3.9)	367	(3.0)
	United Arab Emirates	m	m	m	m	m	m	434	(2.4)	427	(2.4)
	Uruguay	422	(3.3)	427	(2.6)	427	(2.6)	409	(2.8)	418	(2.5)
	Viet Nam	m	m	m	m	m	m	511	(4.8)	495	(4.5)
	Argentina**	m	m	381	(6.2)	388	(4.1)	388	(3.5)	409	(3.1)
	Kazakhstan**	m	m	m	m	405	(3.0)	432	(3.0)	460	(4.3)
	Malaysia**	m	m	m	m	404	(2.7)	421	(3.2)	446	(3.3)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Average 3-year trend is the average change between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average 3-year trend is calculated with a linear regression model. This model considers that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
For Costa Rica, Georgia, Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433203

[Part 2/2]

Table I.5.4a Mean mathematics performance, 2003 through 2015

		Change between 2003 and 2015 (PISA 2015 - PISA 2003)		Change between 2006 and 2015 (PISA 2015 - PISA 2006)		Change between 2009 and 2015 (PISA 2015 - PISA 2009)		Change between 2012 and 2015 (PISA 2015 - PISA 2012)		Average 3-year trend in mathematics performance across PISA assessments		
		Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	p-value
OECD	Australia	**-30**	(6.2)	**-26**	(4.5)	**-20**	(4.8)	**-10**	(4.2)	**-7.7**	(1.3)	0.000
	Austria	-9	(7.1)	-9	(5.9)	m	m	-9	(5.3)	-1.8	(1.5)	0.226
	Belgium	**-22**	(6.5)	**-13**	(5.2)	-8	(5.0)	-8	(4.8)	**-5.0**	(1.4)	0.000
	Canada	**-17**	(6.3)	**-11**	(4.6)	**-11**	(4.7)	-2	(4.6)	**-4.3**	(1.3)	0.001
	Chile	m	m	11	(6.3)	2	(5.5)	0	(5.3)	3.5	(1.9)	0.069
	Czech Republic	**-24**	(7.1)	**-18**	(5.5)	0	(5.3)	-7	(5.1)	**-5.8**	(1.5)	0.000
	Denmark	-3	(6.6)	-2	(4.9)	8	(5.1)	**11**	(4.8)	-1.9	(1.4)	0.162
	Estonia	m	m	5	(4.9)	7	(5.0)	-1	(4.6)	2.3	(1.6)	0.151
	Finland	**-33**	(6.3)	**-37**	(4.8)	**-29**	(4.9)	-8	(4.7)	**-9.7**	(1.3)	0.000
	France	**-18**	(6.5)	-3	(5.2)	-4	(5.3)	-2	(4.8)	**-3.6**	(1.4)	0.009
	Germany	3	(7.1)	2	(6.0)	-7	(5.6)	-8	(5.4)	1.7	(1.5)	0.262
	Greece	9	(7.8)	-6	(5.9)	-12	(6.6)	1	(5.7)	1.1	(1.6)	0.483
	Hungary	-13	(6.8)	**-14**	(5.2)	**-13**	(5.7)	0	(5.4)	**-4.0**	(1.4)	0.004
	Iceland	**-27**	(6.1)	**-18**	(4.4)	**-19**	(4.5)	-5	(4.4)	**-6.7**	(1.3)	0.000
	Ireland	1	(6.5)	2	(4.9)	**17**	(5.0)	2	(4.7)	0.1	(1.4)	0.918
	Israel	m	m	**28**	(6.7)	**23**	(6.2)	3	(6.9)	**10.1**	(2.1)	0.000
	Italy	**24**	(7.0)	**28**	(5.1)	7	(5.1)	4	(5.0)	**7.1**	(1.4)	0.000
	Japan	-2	(7.5)	9	(5.7)	3	(5.9)	-4	(5.9)	1.0	(1.6)	0.534
	Korea	**-18**	(7.5)	**-23**	(6.3)	**-22**	(6.7)	**-30**	(6.9)	-2.9	(1.6)	0.069
	Latvia	-1	(7.0)	-4	(5.0)	0	(5.2)	-8	(4.9)	0.1	(1.5)	0.928
	Luxembourg	-7	(5.8)	-4	(3.9)	-3	(4.2)	-4	(3.9)	-1.6	(1.2)	0.191
	Mexico	**23**	(7.1)	2	(5.1)	**-10**	(4.8)	-5	(4.4)	**5.3**	(1.5)	0.000
	Netherlands	**-26**	(6.8)	**-18**	(4.9)	**-14**	(6.5)	**-11**	(5.4)	**-5.8**	(1.4)	0.000
	New Zealand	**-28**	(6.5)	**-27**	(4.8)	**-24**	(5.0)	-5	(4.8)	**-7.9**	(1.3)	0.000
	Norway	7	(6.5)	**12**	(4.9)	4	(5.0)	**12**	(5.0)	1.2	(1.4)	0.387
	Poland	**14**	(6.6)	9	(4.9)	10	(5.3)	**-13**	(5.6)	**5.0**	(1.4)	0.000
	Portugal	**26**	(7.0)	**25**	(5.3)	5	(5.4)	5	(5.8)	**7.2**	(1.5)	0.000
	Slovak Republic	**-23**	(7.1)	**-17**	(5.2)	**-21**	(5.6)	-6	(5.6)	**-5.6**	(1.5)	0.000
	Slovenia	m	m	5	(3.9)	**8**	(4.2)	**9**	(4.0)	1.7	(1.2)	0.163
	Spain	1	(6.5)	6	(4.7)	2	(4.8)	2	(4.6)	0.5	(1.3)	0.683
	Sweden	**-15**	(6.9)	-8	(5.3)	0	(5.7)	**16**	(5.3)	**-5.4**	(1.4)	0.000
	Switzerland	-5	(7.2)	-8	(5.5)	**-13**	(5.8)	-10	(5.5)	-1.0	(1.5)	0.523
	Turkey	-3	(9.7)	-3	(7.3)	**-25**	(7.1)	**-28**	(7.3)	1.9	(2.1)	0.368
	United Kingdom	m	m	-3	(4.8)	0	(5.1)	-1	(5.4)	-0.7	(1.6)	0.637
	United States	-13	(7.1)	-5	(6.2)	**-18**	(6.1)	**-12**	(6.0)	-2.0	(1.5)	0.197
	OECD average-30	-8	(5.7)	-6	(3.6)	m	m	-5	(3.6)	-1.7	(1.1)	0.144
	OECD average-34	m	m	-4	(3.6)	-5	(3.8)	-4	(3.6)	-0.9	(1.1)	0.415
	OECD average-35	m	m	-4	(3.6)	m	m	-4	(3.6)	-1.0	(1.1)	0.403
Partners	Albania	m	m	m	m	**36**	(6.5)	**19**	(5.3)	**17.8**	(3.2)	0.000
	Algeria	m	m	m	m	m	m	m	m	m	m	m
	Brazil	**21**	(7.9)	8	(5.4)	-9	(5.3)	**-11**	(5.0)	**6.2**	(1.6)	0.000
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	m	m	**28**	(8.1)	13	(8.0)	2	(6.6)	**9.3**	(2.6)	0.000
	CABA (Argentina)	m	m	m	m	m	m	**38**	(10.7)	**38.3**	(10.7)	0.000
	Colombia	m	m	**20**	(5.6)	9	(5.5)	**13**	(5.1)	**5.4**	(1.8)	0.002
	Costa Rica	m	m	m	m	-9	(5.4)	-7	(5.3)	-5.8	(3.2)	0.067
	Croatia	m	m	-3	(5.1)	4	(5.6)	-7	(5.7)	0.1	(1.6)	0.956
	Cyprus*	m	m	m	m	m	m	-3	(4.1)	-2.6	(4.1)	0.532
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	**24**	(5.5)	m	m	**14.6**	(3.3)	0.000
	Hong Kong (China)	-2	(7.8)	0	(5.3)	-7	(5.5)	**-13**	(5.6)	0.9	(1.6)	0.569
	Indonesia	**26**	(7.5)	-5	(7.3)	**15**	(6.1)	11	(6.2)	**3.6**	(1.7)	0.032
	Jordan	m	m	-4	(5.5)	-6	(5.9)	-5	(5.4)	-1.2	(1.8)	0.485
	Kosovo	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	m	m	-8	(5.1)	2	(5.2)	0	(5.0)	-2.2	(1.6)	0.178
	Macao (China)	**17**	(6.4)	**19**	(3.9)	**19**	(4.0)	6	(3.8)	**4.6**	(1.3)	0.000
	Malta	m	m	m	m	**16**	(4.4)	m	m	**9.5**	(2.6)	0.000
	Moldova	m	m	m	m	**22**	(5.5)	m	m	**13.3**	(3.3)	0.000
	Montenegro	m	m	**19**	(4.0)	**15**	(4.5)	**8**	(4.0)	**6.2**	(1.3)	0.000
	Peru	m	m	m	m	**21**	(6.1)	**18**	(5.8)	**10.4**	(3.0)	0.001
	Qatar	m	m	**84**	(3.9)	**34**	(4.1)	**26**	(3.8)	**26.3**	(1.2)	0.000
	Romania	m	m	**29**	(6.7)	**17**	(6.3)	-1	(6.4)	**10.5**	(2.1)	0.000
	Russia	**26**	(7.7)	**18**	(6.1)	**26**	(5.9)	**12**	(5.6)	**5.9**	(1.6)	0.000
	Singapore	m	m	m	m	2	(4.3)	**-9**	(4.1)	1.2	(2.3)	0.585
	Chinese Taipei	m	m	-7	(6.2)	-1	(5.9)	**-18**	(5.7)	-0.5	(1.9)	0.801
	Thailand	-2	(7.0)	-2	(5.2)	-3	(5.8)	-11	(5.8)	0.6	(1.5)	0.678
	Trinidad and Tobago	m	m	m	m	3	(4.2)	m	m	1.6	(2.1)	0.450
	Tunisia	8	(6.8)	1	(6.1)	-5	(5.7)	**-21**	(6.1)	**3.8**	(1.5)	0.010
	United Arab Emirates	m	m	m	m	m	m	-7	(4.9)	-6.5	(4.9)	0.185
	Uruguay	-4	(7.0)	-9	(5.0)	-9	(5.2)	9	(5.1)	-2.6	(1.5)	0.080
	Viet Nam	m	m	m	m	m	m	**-17**	(7.5)	**-16.8**	(7.5)	0.024
	Argentina**	m	m	**28**	(7.8)	**21**	(6.4)	**21**	(5.9)	**8.4**	(2.4)	0.001
	Kazakhstan**	m	m	m	m	**55**	(6.5)	**28**	(6.3)	**27.0**	(3.2)	0.000
	Malaysia**	m	m	m	m	**42**	(5.7)	**26**	(5.8)	**25.2**	**(3.4)**	0.000

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Average 3-year trend is the average change between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average 3-year trend is calculated with a linear regression model. This model considers that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
For Costa Rica, Georgia, Malta and Moldova, the change between the PISA 2009 and PISA 2015 represents change between 2010 and 2015 because these countries implemented the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

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[Part 1/1]

Table I.5.6a Percentage of low achievers and top performers in mathematics, by gender (PISA 2015)

		Boys				Girls				Gender differences (boys - girls)			
		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	22.1	(0.9)	13.0	(0.7)	21.9	(1.0)	9.6	(0.8)	0.2	(1.5)	**3.4**	(0.9)
	Austria	18.8	(1.3)	16.7	(1.3)	24.8	(1.6)	8.1	(0.8)	**-6.0**	(2.0)	**8.6**	(1.4)
	Belgium	18.9	(1.2)	18.7	(1.0)	21.2	(1.2)	12.9	(0.7)	-2.3	(1.4)	**5.7**	(1.0)
	Canada	14.0	(0.9)	17.2	(1.1)	14.7	(0.8)	13.0	(0.8)	-0.7	(0.9)	**4.2**	(1.2)
	Chile	45.2	(1.6)	1.9	(0.3)	53.5	(1.5)	0.9	(0.2)	**-8.3**	(1.8)	**1.0**	(0.3)
	Czech Republic	22.1	(1.4)	12.2	(1.0)	21.3	(1.3)	8.4	(0.9)	0.8	(1.6)	**3.8**	(1.1)
	Denmark	12.9	(0.9)	13.7	(1.0)	14.2	(1.2)	9.6	(0.8)	-1.3	(1.2)	**4.1**	(1.2)
	Estonia	12.1	(1.0)	15.8	(1.0)	10.4	(0.7)	12.5	(1.1)	1.7	(1.1)	**3.3**	(1.3)
	Finland	15.7	(1.0)	12.2	(0.8)	11.2	(0.9)	11.2	(0.9)	**4.5**	(1.0)	1.0	(0.9)
	France	23.8	(1.4)	13.3	(0.9)	23.1	(1.1)	9.6	(0.9)	0.7	(1.7)	**3.6**	(1.1)
	Germany	15.1	(1.3)	15.5	(1.1)	19.3	(1.1)	10.3	(0.8)	**-4.2**	(1.2)	**5.2**	(1.1)
	Greece	36.9	(2.3)	4.6	(0.6)	34.6	(1.7)	3.2	(0.5)	2.3	(2.1)	**1.5**	(0.7)
	Hungary	27.2	(1.5)	9.6	(0.9)	28.7	(1.5)	6.7	(0.7)	-1.4	(1.9)	**2.9**	(1.0)
	Iceland	24.4	(1.3)	10.4	(1.2)	22.8	(1.3)	10.3	(0.9)	1.6	(1.7)	0.1	(1.4)
	Ireland	14.1	(1.2)	12.9	(1.0)	15.8	(1.0)	6.5	(0.8)	-1.7	(1.3)	**6.4**	(1.3)
	Israel	32.2	(2.0)	11.4	(1.4)	32.0	(1.7)	6.6	(0.8)	0.2	(2.5)	**4.8**	(1.5)
	Italy	20.7	(1.2)	13.2	(1.0)	25.8	(1.6)	7.8	(0.9)	**-5.0**	(1.9)	**5.4**	(1.1)
	Japan	9.8	(1.0)	23.5	(1.7)	11.6	(1.0)	17.1	(1.2)	-1.7	(1.1)	**6.4**	(1.6)
	Korea	17.8	(1.5)	21.7	(1.9)	13.0	(1.3)	20.0	(1.4)	**4.8**	(1.8)	1.7	(2.1)
	Latvia	23.0	(1.3)	6.1	(0.6)	19.9	(1.3)	4.2	(0.6)	3.1	(1.6)	**1.9**	(0.8)
	Luxembourg	24.9	(1.0)	12.1	(0.9)	26.7	(1.0)	7.9	(0.6)	-1.8	(1.4)	**4.3**	(1.0)
	Mexico	54.4	(1.6)	0.4	(0.2)	59.0	(1.5)	0.2	(0.1)	**-4.6**	(1.6)	0.2	(0.2)
	Netherlands	17.2	(1.1)	17.0	(0.9)	16.2	(1.0)	14.1	(1.0)	1.0	(1.1)	**3.0**	(1.1)
	New Zealand	21.7	(1.4)	13.6	(1.1)	21.6	(1.4)	9.2	(0.8)	0.1	(1.9)	**4.4**	(1.2)
	Norway	18.8	(1.0)	11.5	(0.9)	15.3	(1.0)	9.8	(0.7)	**3.5**	(1.3)	1.8	(1.0)
	Poland	16.0	(1.1)	14.2	(1.1)	18.5	(1.4)	10.1	(0.9)	-2.5	(1.4)	**4.1**	(1.1)
	Portugal	23.4	(1.1)	14.1	(0.9)	24.2	(1.3)	8.7	(0.8)	-0.8	(1.4)	**5.3**	(0.9)
	Slovak Republic	27.6	(1.3)	9.0	(0.8)	27.9	(1.7)	6.6	(0.9)	-0.3	(1.7)	**2.5**	(1.0)
	Slovenia	16.1	(0.9)	14.9	(0.9)	16.1	(0.8)	12.0	(0.9)	0.1	(1.3)	**2.9**	(1.2)
	Spain	20.4	(1.1)	9.5	(0.9)	24.0	(1.3)	5.0	(0.6)	**-3.6**	(1.3)	**4.4**	(0.9)
	Sweden	22.0	(1.5)	11.4	(1.1)	19.6	(1.2)	9.4	(1.0)	2.4	(1.4)	2.0	(1.3)
	Switzerland	15.5	(1.3)	22.3	(1.3)	16.1	(1.2)	16.0	(1.3)	-0.5	(1.4)	**6.3**	(1.5)
	Turkey	50.2	(2.4)	1.4	(0.5)	52.6	(2.6)	0.8	(0.3)	-2.4	(2.5)	0.6	(0.4)
	United Kingdom	20.6	(1.1)	12.5	(1.0)	23.2	(1.3)	8.8	(0.8)	-2.6	(1.4)	**3.7**	(1.3)
	United States	28.6	(1.6)	6.8	(0.9)	30.1	(1.8)	5.0	(0.7)	-1.5	(1.8)	**1.7**	(0.9)
	OECD average-30	22.6	(0.2)	12.6	(0.2)	23.2	(0.2)	9.0	(0.2)	**-0.6**	(0.3)	**3.5**	(0.2)
	OECD average-35	23.0	(0.2)	12.4	(0.2)	23.7	(0.2)	8.9	(0.1)	**-0.8**	(0.3)	**3.5**	(0.2)
Partners	Albania	55.4	(2.2)	1.2	(0.4)	51.2	(2.1)	1.0	(0.3)	**4.2**	(2.0)	0.3	(0.5)
	Algeria	82.5	(1.5)	0.0	(0.1)	79.3	(1.7)	0.1	(0.1)	3.2	(1.8)	-0.1	(0.1)
	Brazil	66.6	(1.4)	1.2	(0.3)	73.7	(1.3)	0.6	(0.2)	**-7.0**	(1.0)	**0.5**	(0.2)
	B-S-J-G (China)	15.7	(1.3)	27.1	(1.8)	16.0	(1.4)	23.9	(2.3)	-0.2	(1.2)	**3.3**	(1.3)
	Bulgaria	43.4	(2.2)	4.9	(0.8)	40.6	(2.0)	3.8	(0.7)	2.8	(2.3)	1.1	(0.8)
	CABA (Argentina)	30.7	(3.6)	6.1	(1.6)	37.2	(4.1)	2.1	(0.9)	-6.6	(4.3)	**3.9**	(1.4)
	Colombia	63.0	(1.7)	0.4	(0.2)	69.2	(1.2)	0.2	(0.1)	**-6.3**	(1.7)	0.3	(0.2)
	Costa Rica	57.3	(1.7)	0.4	(0.2)	67.5	(1.9)	0.2	(0.1)	**-10.2**	(1.9)	0.2	(0.2)
	Croatia	30.0	(1.7)	7.1	(0.8)	33.9	(1.9)	4.1	(0.6)	-3.9	(2.3)	**3.0**	(0.8)
	Cyprus*	44.3	(1.0)	3.9	(0.5)	40.9	(1.2)	2.6	(0.5)	**3.5**	(1.5)	**1.3**	(0.6)
	Dominican Republic	90.3	(1.2)	0.0	(0.0)	90.8	(1.2)	0.0	c	-0.5	(1.1)	0.0	(0.0)
	FYROM	71.1	(1.1)	1.0	(0.3)	69.3	(1.1)	0.7	(0.3)	1.8	(1.6)	0.2	(0.4)
	Georgia	59.9	(1.7)	1.8	(0.5)	54.0	(1.3)	1.3	(0.4)	**5.9**	(1.9)	0.6	(0.4)
	Hong Kong (China)	9.8	(1.0)	28.3	(1.4)	8.2	(1.0)	24.7	(1.8)	1.6	(1.3)	3.6	(2.3)
	Indonesia	69.6	(1.8)	0.7	(0.2)	67.7	(1.9)	0.7	(0.2)	1.9	(2.1)	0.0	(0.2)
	Jordan	69.1	(1.8)	0.4	(0.2)	65.9	(1.9)	0.1	(0.1)	3.2	(2.7)	0.2	(0.2)
	Kosovo	74.9	(1.3)	0.1	(0.1)	80.5	(1.5)	0.0	(0.0)	**-5.6**	(1.8)	0.1	(0.1)
	Lebanon	55.5	(1.9)	2.9	(0.5)	64.4	(1.8)	1.2	(0.3)	**-8.9**	(2.0)	**1.7**	(0.5)
	Lithuania	26.7	(1.2)	7.6	(0.9)	24.1	(1.3)	6.3	(0.7)	2.5	(1.4)	1.3	(0.8)
	Macao (China)	8.0	(0.8)	21.2	(0.9)	5.3	(0.6)	22.5	(1.1)	**2.8**	(1.0)	-1.3	(1.5)
	Malta	30.7	(1.1)	12.7	(1.0)	27.5	(1.0)	11.0	(1.0)	**3.2**	(1.4)	1.7	(1.4)
	Moldova	50.9	(1.6)	1.8	(0.3)	49.7	(1.8)	1.6	(0.4)	1.2	(2.2)	0.2	(0.4)
	Montenegro	51.7	(1.3)	1.9	(0.3)	52.1	(1.2)	1.2	(0.3)	-0.4	(1.7)	0.7	(0.4)
	Peru	63.9	(1.6)	0.5	(0.2)	68.4	(1.7)	0.3	(0.1)	**-4.5**	(1.7)	0.2	(0.2)
	Qatar	60.6	(0.8)	2.7	(0.3)	56.6	(1.0)	1.7	(0.2)	**4.0**	(1.2)	**1.0**	(0.3)
	Romania	39.9	(2.0)	3.6	(0.6)	40.0	(2.1)	2.9	(0.6)	-0.2	(1.9)	0.7	(0.6)
	Russia	18.4	(1.5)	9.7	(1.0)	19.4	(1.4)	7.9	(0.8)	-1.0	(1.6)	1.7	(1.0)
	Singapore	8.6	(0.6)	35.6	(1.1)	6.4	(0.6)	34.0	(1.0)	**2.2**	(0.8)	1.7	(1.5)
	Chinese Taipei	13.0	(1.0)	30.1	(1.9)	12.4	(0.9)	26.1	(1.7)	0.6	(1.1)	4.0	(2.6)
	Thailand	54.7	(1.9)	1.5	(0.5)	53.1	(1.9)	1.4	(0.4)	1.6	(2.0)	0.2	(0.6)
	Trinidad and Tobago	56.5	(1.3)	2.1	(0.4)	48.1	(1.0)	2.8	(0.4)	**8.5**	(1.6)	-0.7	(0.6)
	Tunisia	73.0	(1.4)	0.7	(0.3)	76.4	(1.5)	0.3	(0.2)	**-3.4**	(1.4)	0.4	(0.2)
	United Arab Emirates	50.9	(1.8)	4.9	(0.6)	46.6	(1.5)	2.6	(0.4)	**4.4**	(2.2)	**2.3**	(0.7)
	Uruguay	49.6	(1.9)	2.5	(0.5)	55.0	(1.2)	1.0	(0.3)	**-5.3**	(2.0)	**1.5**	(0.5)
	Viet Nam	20.8	(1.9)	9.8	(1.3)	17.5	(1.8)	8.9	(1.6)	**3.3**	(1.6)	0.8	(1.0)
	Argentina**	51.9	(1.9)	1.3	(0.4)	59.9	(2.0)	0.4	(0.2)	**-8.0**	(2.0)	**0.9**	(0.3)
	Kazakhstan**	32.8	(2.4)	4.3	(0.8)	31.5	(2.4)	4.1	(0.9)	1.3	(2.2)	0.2	(0.7)
	Malaysia**	40.4	(1.9)	2.6	(0.6)	34.9	(1.6)	1.5	(0.4)	**5.5**	(1.6)	**1.1**	(0.5)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
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[Part 1/1]

Table I.5.6b Percentage of low achievers and top performers in mathematics, by gender (PISA 2003)

		Boys				Girls				Gender differences (boys - girls)			
		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	14.9	(0.8)	21.6	(1.2)	13.8	(0.9)	17.9	(1.0)	1.1	(1.1)	**3.8**	(1.6)
	Austria	19.2	(1.4)	16.7	(1.3)	18.4	(1.5)	11.8	(1.2)	0.8	(1.8)	**4.9**	(1.5)
	Belgium	17.2	(1.2)	29.1	(1.2)	15.7	(1.1)	23.6	(1.0)	1.5	(1.8)	**5.5**	(1.4)
	Canada	10.3	(0.6)	25.2	(1.0)	9.4	(0.6)	17.8	(0.9)	0.8	(0.8)	**7.3**	(1.2)
	Chile	m	m	m	m	m	m	m	m	m	m	m	m
	Czech Republic	15.1	(1.4)	21.6	(1.5)	18.1	(1.7)	14.8	(1.3)	-2.9	(1.8)	**6.8**	(1.7)
	Denmark	13.4	(1.0)	18.0	(1.2)	17.4	(1.2)	13.9	(1.0)	**-4.0**	(1.4)	**4.1**	(1.2)
	Estonia	m	m	m	m	m	m	m	m	m	m	m	m
	Finland	7.3	(0.7)	26.0	(1.2)	6.2	(0.6)	20.8	(1.0)	1.1	(0.9)	**5.2**	(1.5)
	France	16.8	(1.5)	17.9	(1.5)	16.5	(1.3)	12.6	(1.0)	0.3	(1.7)	**5.3**	(1.7)
	Germany	21.4	(1.5)	18.3	(1.3)	21.4	(1.4)	14.1	(1.1)	0.0	(1.7)	**4.2**	(1.5)
	Greece	35.8	(2.1)	5.8	(0.8)	41.9	(2.1)	2.3	(0.5)	**-6.2**	(1.8)	**3.4**	(0.7)
	Hungary	22.2	(1.3)	11.9	(1.0)	23.9	(1.4)	9.3	(1.0)	-1.7	(1.7)	**2.7**	(1.0)
	Iceland	18.3	(1.0)	15.0	(1.0)	11.5	(0.9)	15.9	(1.0)	**6.7**	(1.4)	-0.9	(1.5)
	Ireland	15.0	(1.3)	13.7	(1.1)	18.7	(1.4)	9.0	(1.0)	**-3.7**	(1.9)	**4.7**	(1.4)
	Israel	m	m	m	m	m	m	m	m	m	m	m	m
	Italy	29.7	(2.1)	9.6	(0.7)	34.0	(2.1)	4.6	(0.4)	-4.2	(2.9)	**5.0**	(0.7)
	Japan	14.2	(1.5)	27.5	(2.3)	12.4	(1.4)	21.3	(1.5)	1.8	(1.7)	**6.2**	(2.5)
	Korea	8.5	(1.1)	28.6	(1.8)	11.0	(1.3)	19.1	(2.0)	-2.5	(1.6)	**9.5**	(2.5)
	Latvia	24.4	(1.9)	9.4	(1.1)	23.1	(1.6)	6.7	(0.9)	1.2	(2.0)	**2.7**	(1.1)
	Luxembourg	20.0	(0.8)	13.8	(0.8)	23.4	(0.9)	7.9	(0.7)	**-3.4**	(1.2)	**5.9**	(1.0)
	Mexico	63.1	(2.1)	0.5	(0.2)	68.5	(2.0)	0.2	(0.1)	**-5.4**	(2.1)	**0.3**	(0.1)
	Netherlands	10.2	(1.5)	26.1	(1.7)	11.7	(1.4)	24.9	(1.5)	-1.5	(1.8)	1.3	(1.7)
	New Zealand	14.5	(0.9)	23.9	(1.1)	15.6	(1.3)	17.4	(0.9)	-1.1	(1.5)	**6.5**	(1.4)
	Norway	20.6	(1.1)	13.2	(0.8)	21.1	(1.5)	9.6	(0.8)	-0.5	(1.6)	**3.6**	(1.0)
	Poland	22.7	(1.2)	12.1	(1.0)	21.4	(1.3)	8.1	(0.8)	1.3	(1.4)	**4.0**	(1.5)
	Portugal	28.7	(2.0)	7.2	(0.8)	31.3	(1.8)	3.7	(0.6)	-2.6	(1.6)	**3.6**	(1.0)
	Slovak Republic	18.0	(1.6)	15.4	(1.1)	22.0	(1.7)	9.8	(0.9)	**-3.9**	(1.6)	**5.6**	(1.1)
	Slovenia	m	m	m	m	m	m	m	m	m	m	m	m
	Spain	22.5	(1.3)	9.9	(1.1)	23.4	(1.0)	6.1	(0.6)	-0.9	(1.3)	**3.8**	(1.0)
	Sweden	16.7	(1.1)	17.3	(1.1)	17.9	(1.0)	14.2	(1.2)	-1.2	(1.2)	3.1	(1.7)
	Switzerland	13.4	(1.0)	24.2	(2.4)	15.7	(1.1)	18.0	(1.4)	-2.3	(1.3)	**6.3**	(2.4)
	Turkey	49.3	(2.9)	6.5	(1.9)	55.8	(3.0)	4.2	(1.4)	**-6.4**	(3.1)	**2.4**	(1.1)
	United Kingdom	m	m	m	m	m	m	m	m	m	m	m	m
	United States	25.2	(1.3)	11.7	(1.0)	26.3	(1.4)	8.4	(0.9)	-1.1	(1.5)	**3.3**	(1.2)
	OECD average-30	20.9	(0.3)	16.6	(0.2)	22.2	(0.3)	12.3	(0.2)	**-1.3**	(0.3)	**4.3**	(0.3)
	OECD average-35	m	m	m	m	m	m	m	m	m	m	m	m
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	72.5	(2.3)	1.9	(0.7)	77.5	(1.5)	0.5	(0.3)	**-4.9**	(1.7)	**1.4**	(0.6)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	m	m	m	m	m	m	m	m	m	m	m	m
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	m	m	m	m	m	m	m	m	m	m	m	m
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	m	m	m	m	m	m	m	m	m	m	m	m
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	11.8	(1.7)	33.1	(2.3)	9.0	(1.1)	28.3	(2.0)	2.8	(1.6)	4.8	(3.1)
	Indonesia	78.0	(1.7)	0.2	(0.1)	78.3	(2.0)	0.2	(0.1)	-0.3	(1.5)	0.0	(0.1)
	Jordan	m	m	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	m	m	m	m	m	m	m	m	m	m	m	m
	Macao (China)	10.8	(1.7)	24.0	(2.7)	11.5	(1.7)	13.6	(1.6)	-0.6	(2.4)	**10.3**	(3.4)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	m	m	m	m	m	m	m	m	m	m	m	m
	Peru	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	m	m	m	m	m	m	m	m	m	m	m	m
	Romania	m	m	m	m	m	m	m	m	m	m	m	m
	Russia	29.9	(2.3)	8.9	(1.1)	30.6	(2.0)	5.1	(0.8)	-0.7	(2.3)	**3.8**	(1.0)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	m	m	m	m	m	m	m	m	m	m	m	m
	Thailand	55.0	(2.1)	1.7	(0.5)	53.1	(1.9)	1.6	(0.5)	1.9	(2.2)	0.0	(0.6)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	76.3	(1.2)	0.3	(0.2)	79.6	(1.5)	0.2	(0.1)	**-3.3**	(1.4)	0.1	(0.2)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	45.6	(1.8)	3.8	(0.6)	50.5	(1.9)	1.9	(0.4)	**-4.9**	(2.0)	**1.9**	(0.5)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433203

[Part 1/1]

Table I.5.6d Change between 2003 and 2015 in the percentage of low achievers and top performers in mathematics, by gender (PISA 2015 - PISA 2003)

		Boys				Girls				Gender differences (boys - girls)			
		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)		Below Level 2 (less than 420.07 score points)		Level 5 or above (above 606.99 score points)	
		% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	**7.2**	(2.8)	**-8.6**	(2.5)	**8.1**	(4.0)	**-8.2**	(2.1)	-1.0	(1.9)	-0.3	(1.8)
	Austria	-0.4	(3.0)	0.0	(3.9)	6.4	(4.0)	**-3.7**	(1.6)	**-6.8**	(2.7)	3.7	(2.0)
	Belgium	1.7	(3.0)	**-10.4**	(3.2)	**5.5**	(2.8)	**-10.6**	(2.5)	-3.7	(2.2)	0.2	(1.7)
	Canada	3.8	(2.1)	**-8.0**	(3.1)	5.3	(2.9)	-4.9	(2.6)	-1.5	(1.2)	-3.1	(1.7)
	Chile	m	m	m	m	m	m	m	m	m	m	m	m
	Czech Republic	**7.0**	(3.5)	**-9.4**	(2.4)	3.2	(4.1)	**-6.4**	(2.1)	3.7	(2.4)	-3.0	(2.0)
	Denmark	-0.5	(2.8)	-4.3	(2.5)	-3.1	(3.1)	-4.3	(2.2)	2.7	(1.9)	0.0	(1.7)
	Estonia	m	m	m	m	m	m	m	m	m	m	m	m
	Finland	**8.4**	(2.6)	**-13.8**	(2.5)	**5.0**	(2.1)	**-9.7**	(3.4)	**3.4**	(1.4)	**-4.2**	(1.7)
	France	**7.1**	(3.3)	-4.6	(3.4)	**6.6**	(3.4)	-3.0	(2.6)	0.4	(2.4)	-1.6	(2.0)
	Germany	**-6.3**	(2.9)	-2.8	(3.0)	-2.1	(3.3)	-3.8	(2.2)	**-4.2**	(2.0)	1.0	(1.8)
	Greece	1.1	(5.2)	-1.2	(1.2)	-7.3	(7.6)	0.8	(0.9)	**8.4**	(2.8)	**-2.0**	(1.0)
	Hungary	5.0	(4.1)	-2.4	(1.8)	4.8	(3.6)	-2.6	(1.6)	0.2	(2.6)	0.2	(1.4)
	Iceland	6.2	(5.2)	**-4.6**	(1.9)	**11.3**	(3.1)	**-5.7**	(1.9)	**-5.1**	(2.2)	1.0	(2.1)
	Ireland	-0.8	(3.1)	-0.8	(2.6)	-2.8	(3.9)	-2.5	(1.8)	2.0	(2.3)	1.7	(1.9)
	Israel	m	m	m	m	m	m	m	m	m	m	m	m
	Italy	**-9.0**	(3.5)	3.6	(2.6)	-8.2	(5.4)	**3.2**	(1.3)	-0.8	(3.5)	0.3	(1.3)
	Japan	**-4.4**	(2.2)	-4.0	(5.3)	-0.9	(2.1)	-4.2	(3.7)	-3.5	(2.0)	0.2	(2.9)
	Korea	**9.2**	(2.8)	-6.9	(3.9)	2.0	(2.3)	0.9	(3.9)	**7.3**	(2.4)	**-7.8**	(3.2)
	Latvia	-1.4	(4.5)	**-3.3**	(1.7)	-3.3	(5.8)	-2.5	(1.3)	1.9	(2.6)	-0.8	(1.4)
	Luxembourg	4.9	(3.9)	-1.7	(2.1)	3.4	(3.7)	-0.1	(1.6)	1.5	(1.9)	-1.6	(1.5)
	Mexico	-8.7	(8.0)	-0.1	(0.2)	-9.6	(8.2)	0.0	(0.1)	0.8	(2.6)	-0.1	(0.2)
	Netherlands	**7.1**	(3.0)	**-9.1**	(3.8)	4.6	(2.8)	**-10.8**	(4.2)	2.5	(2.1)	1.7	(2.0)
	New Zealand	**7.2**	(3.3)	**-10.3**	(2.9)	6.0	(3.8)	**-8.3**	(2.1)	1.2	(2.4)	-2.1	(1.9)
	Norway	-1.8	(2.8)	-1.7	(2.5)	-5.8	(3.3)	0.2	(1.7)	4.0	(2.0)	-1.9	(1.4)
	Poland	**-6.7**	(2.6)	2.1	(2.9)	-3.0	(3.5)	2.0	(2.3)	-3.7	(2.0)	0.1	(1.9)
	Portugal	-5.3	(3.6)	**6.8**	(2.5)	-7.1	(4.2)	**5.1**	(1.9)	1.8	(2.1)	1.8	(1.4)
	Slovak Republic	**9.5**	(4.2)	**-6.4**	(1.9)	5.9	(4.2)	-3.2	(1.9)	3.6	(2.4)	**-3.2**	(1.5)
	Slovenia	m	m	m	m	m	m	m	m	m	m	m	m
	Spain	-2.1	(3.7)	-0.4	(2.0)	0.6	(3.7)	-1.1	(1.1)	-2.6	(1.9)	0.7	(1.4)
	Sweden	5.4	(3.3)	**-5.9**	(2.4)	1.7	(3.4)	**-4.9**	(2.1)	3.6	(1.8)	-1.1	(2.1)
	Switzerland	2.1	(2.5)	-2.0	(4.4)	0.3	(2.5)	-2.0	(3.0)	1.7	(1.9)	0.0	(2.8)
	Turkey	0.8	(7.1)	**-5.1**	(1.9)	-3.2	(8.0)	**-3.3**	(1.4)	4.0	(4.0)	-1.8	(1.1)
	United Kingdom	m	m	m	m	m	m	m	m	m	m	m	m
	United States	3.5	(4.4)	**-4.9**	(2.0)	3.9	(6.6)	**-3.4**	(1.4)	-0.4	(2.3)	-1.5	(1.5)
	OECD average-30	1.7	(2.9)	**-4.0**	(1.9)	0.9	(3.3)	**-3.2**	(1.4)	0.7	(0.4)	**-0.8**	(0.3)
	OECD average-35	m	m	m	m	m	m	m	m	m	m	m	m
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	-5.9	(5.0)	-0.8	(0.7)	-3.8	(4.8)	0.1	(0.3)	-2.1	(2.0)	-0.9	(0.6)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	m	m	m	m	m	m	m	m	m	m	m	m
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	m	m	m	m	m	m	m	m	m	m	m	m
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	m	m	m	m	m	m	m	m	m	m	m	m
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	-2.1	(2.2)	-4.8	(6.4)	-0.8	(1.6)	-3.5	(6.9)	-1.3	(2.0)	-1.2	(3.8)
	Indonesia	-8.4	(7.5)	0.4	(0.3)	-10.6	(7.8)	0.4	(0.3)	2.2	(2.6)	0.0	(0.3)
	Jordan	m	m	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	m	m	m	m	m	m	m	m	m	m	m	m
	Macao (China)	-2.8	(2.2)	-2.8	(5.8)	**-6.2**	(1.9)	8.9	(7.0)	3.4	(2.6)	**-11.7**	(3.8)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	m	m	m	m	m	m	m	m	m	m	m	m
	Peru	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	m	m	m	m	m	m	m	m	m	m	m	m
	Romania	m	m	m	m	m	m	m	m	m	m	m	m
	Russia	**-11.4**	(4.4)	0.7	(2.7)	**-11.2**	(3.8)	2.8	(1.7)	-0.3	(2.8)	-2.1	(1.4)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	m	m	m	m	m	m	m	m	m	m	m	m
	Thailand	-0.3	(8.1)	-0.1	(0.7)	0.0	(10.3)	-0.3	(0.6)	-0.3	(3.0)	0.1	(0.9)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	-3.4	(4.2)	0.4	(0.4)	-3.2	(4.2)	0.2	(0.2)	-0.1	(2.0)	0.3	(0.3)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	4.1	(6.8)	-1.3	(0.8)	4.5	(7.5)	-0.9	(0.5)	-0.4	(2.8)	-0.4	(0.7)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433203

[Part 1/1]

Table I.5.8a Mathematics performance, by gender (PISA 2015)

		Boys								Girls								Gender differences (boys - girls)							
		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		50th percentile		90th percentile	
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	497	(2.1)	369	(2.9)	499	(2.9)	621	(3.4)	491	(2.5)	374	(3.7)	493	(2.8)	605	(3.9)	6	(3.4)	-5	(4.2)	6	(3.9)	**16**	(4.0)
	Austria	510	(3.8)	380	(5.2)	515	(4.9)	633	(5.0)	483	(3.6)	363	(5.9)	487	(4.2)	598	(4.1)	**27**	(5.0)	**17**	(7.8)	**28**	(6.1)	**35**	(5.5)
	Belgium	514	(3.1)	378	(5.0)	520	(4.1)	639	(3.1)	500	(2.8)	370	(4.6)	506	(3.6)	619	(2.9)	**14**	(3.4)	8	(5.4)	**14**	(4.8)	**20**	(3.8)
	Canada	520	(2.9)	401	(4.0)	522	(3.4)	635	(4.3)	511	(2.6)	400	(3.4)	513	(3.2)	619	(3.5)	**9**	(2.8)	1	(3.7)	**9**	(4.0)	**16**	(4.8)
	Chile	432	(3.1)	320	(4.4)	431	(3.8)	544	(4.3)	413	(3.0)	307	(4.3)	413	(3.5)	522	(4.0)	**18**	(3.6)	**13**	(5.6)	**19**	(4.4)	**22**	(5.1)
	Czech Republic	496	(3.3)	370	(5.4)	499	(4.3)	617	(4.7)	489	(2.8)	377	(4.8)	490	(3.2)	599	(5.1)	7	(3.7)	-6	(6.3)	9	(4.9)	**18**	(5.5)
	Denmark	516	(2.5)	407	(3.9)	517	(3.6)	621	(3.7)	506	(2.8)	403	(4.1)	509	(3.6)	606	(3.6)	**9**	(3.1)	4	(4.8)	8	(4.5)	**16**	(4.3)
	Estonia	522	(2.7)	412	(4.4)	525	(2.9)	630	(4.1)	517	(2.3)	419	(3.5)	517	(2.7)	617	(4.0)	5	(2.9)	-7	(4.5)	**8**	(3.4)	**12**	(5.1)
	Finland	507	(2.6)	396	(4.6)	510	(2.9)	617	(3.5)	515	(2.6)	414	(4.5)	518	(3.1)	611	(3.5)	**-8**	(2.4)	**-18**	(4.8)	**-9**	(3.1)	6	(4.2)
	France	496	(2.9)	362	(4.9)	503	(4.0)	620	(3.4)	490	(2.6)	367	(4.9)	495	(3.7)	605	(3.6)	6	(3.6)	-5	(5.9)	8	(5.2)	**15**	(4.2)
	Germany	514	(3.5)	398	(5.6)	515	(3.8)	629	(4.3)	498	(3.0)	381	(4.6)	500	(3.6)	608	(3.8)	**17**	(2.9)	**16**	(5.2)	**15**	(3.4)	**21**	(4.9)
	Greece	454	(4.7)	330	(6.3)	454	(5.3)	574	(4.6)	454	(3.6)	343	(6.2)	455	(4.1)	564	(4.7)	0	(3.8)	-13	(7.3)	-1	(5.1)	10	(5.4)
	Hungary	481	(3.6)	355	(5.1)	482	(4.8)	605	(4.2)	473	(3.0)	347	(5.6)	478	(3.8)	589	(4.4)	8	(4.3)	8	(7.1)	4	(5.7)	**16**	(5.1)
	Iceland	487	(2.9)	365	(5.5)	489	(3.8)	608	(5.4)	489	(2.4)	368	(4.2)	489	(3.5)	608	(4.7)	-1	(3.5)	-4	(6.9)	0	(4.9)	0	(6.5)
	Ireland	512	(3.0)	402	(6.0)	514	(3.3)	618	(3.3)	495	(2.4)	398	(3.7)	497	(3.1)	590	(3.8)	**16**	(3.4)	4	(6.4)	**16**	(4.1)	**28**	(4.9)
	Israel	474	(5.4)	328	(7.0)	478	(7.0)	614	(7.5)	466	(4.0)	336	(6.0)	470	(5.0)	589	(4.8)	8	(6.1)	-8	(9.2)	8	(7.9)	**25**	(7.7)
	Italy	500	(3.5)	375	(5.2)	502	(4.5)	621	(4.4)	480	(3.4)	361	(4.9)	481	(4.1)	596	(5.3)	**20**	(4.3)	**14**	(6.5)	**21**	(5.8)	**25**	(5.4)
	Japan	539	(3.8)	421	(5.6)	544	(4.5)	652	(5.6)	525	(3.1)	412	(5.3)	529	(3.7)	632	(4.9)	**14**	(3.6)	9	(6.5)	**14**	(4.6)	**20**	(5.4)
	Korea	521	(5.2)	381	(7.4)	526	(6.0)	655	(6.4)	528	(3.9)	405	(6.7)	532	(4.9)	644	(4.2)	-7	(5.6)	**-25**	(9.1)	-6	(6.6)	11	(6.5)
	Latvia	481	(2.6)	377	(4.6)	481	(3.2)	587	(3.7)	483	(2.5)	387	(4.0)	485	(3.1)	576	(3.8)	-2	(3.4)	-10	(5.5)	-3	(4.3)	**11**	(5.0)
	Luxembourg	491	(2.0)	365	(3.0)	492	(2.9)	618	(4.1)	480	(2.0)	361	(3.9)	481	(2.6)	596	(3.2)	**11**	(3.1)	3	(5.0)	**11**	(4.1)	**21**	(5.5)
	Mexico	412	(2.7)	311	(3.5)	411	(3.3)	513	(4.0)	404	(2.4)	313	(3.1)	404	(2.7)	496	(3.7)	**7**	(2.3)	-2	(4.1)	**7**	(3.1)	**16**	(3.9)
	Netherlands	513	(2.6)	389	(5.3)	517	(3.3)	632	(3.5)	511	(2.5)	391	(4.5)	516	(3.3)	622	(3.7)	2	(2.4)	-2	(5.8)	1	(3.8)	**10**	(4.1)
	New Zealand	499	(3.4)	372	(5.2)	501	(4.6)	623	(4.1)	491	(2.7)	377	(4.3)	492	(3.4)	603	(4.2)	**9**	(4.2)	-6	(6.2)	9	(5.3)	**20**	(5.5)
	Norway	501	(2.9)	383	(5.4)	503	(3.6)	614	(4.1)	503	(2.3)	398	(3.7)	504	(3.1)	606	(3.2)	-2	(2.8)	**-14**	(6.3)	-2	(4.1)	8	(4.5)
	Poland	510	(2.8)	396	(4.3)	509	(3.3)	627	(4.6)	499	(2.8)	387	(5.3)	501	(3.4)	608	(4.4)	**11**	(2.9)	9	(5.8)	**8**	(4.0)	**19**	(5.3)
	Portugal	497	(3.0)	364	(5.1)	499	(3.9)	625	(3.7)	487	(2.7)	366	(4.2)	490	(3.6)	602	(3.6)	**10**	(2.9)	-2	(5.4)	**9**	(4.1)	**24**	(4.1)
	Slovak Republic	478	(3.0)	351	(5.0)	480	(3.9)	602	(4.2)	472	(3.6)	346	(6.1)	478	(4.4)	590	(4.6)	6	(3.9)	5	(6.8)	2	(5.4)	**12**	(5.4)
	Slovenia	512	(1.9)	395	(4.2)	513	(2.9)	628	(4.6)	508	(2.2)	393	(3.9)	512	(2.9)	616	(4.3)	4	(3.3)	1	(6.4)	1	(4.2)	11	(6.3)
	Spain	494	(2.4)	378	(4.0)	497	(2.9)	605	(4.2)	478	(2.8)	369	(4.4)	481	(3.7)	581	(3.4)	**16**	(2.8)	9	(5.1)	**16**	(4.0)	**24**	(4.4)
	Sweden	493	(3.8)	371	(5.7)	494	(4.3)	613	(5.0)	495	(3.3)	381	(5.4)	498	(3.9)	604	(4.8)	-2	(3.3)	-10	(6.5)	-4	(4.0)	8	(5.3)
	Switzerland	527	(3.2)	394	(6.0)	534	(3.8)	650	(5.1)	515	(3.5)	395	(5.3)	519	(4.4)	631	(5.2)	**12**	(3.3)	0	(6.9)	**15**	(4.6)	**19**	(6.7)
	Turkey	423	(4.6)	320	(5.1)	420	(5.4)	533	(7.2)	418	(4.9)	314	(5.6)	414	(5.6)	526	(6.8)	6	(4.6)	6	(7.0)	6	(5.7)	7	(6.0)
	United Kingdom	498	(2.9)	375	(4.7)	500	(3.5)	618	(4.4)	487	(3.1)	367	(4.7)	491	(3.5)	601	(4.3)	**12**	(3.4)	8	(5.1)	**9**	(4.1)	**17**	(5.9)
	United States	474	(3.6)	355	(4.3)	475	(4.6)	591	(5.4)	465	(3.4)	355	(5.5)	465	(3.7)	577	(5.5)	**9**	(3.1)	0	(5.9)	**10**	(4.3)	**14**	(6.0)
	OECD average-30	495	(0.6)	374	(0.9)	497	(0.7)	613	(0.8)	488	(0.5)	374	(0.9)	490	(0.7)	597	(0.8)	**8**	(0.6)	0	(1.1)	**7**	(0.9)	**16**	(0.9)
	OECD average-35	494	(0.6)	373	(0.9)	496	(0.7)	612	(0.8)	486	(0.5)	373	(0.8)	489	(0.6)	596	(0.7)	**8**	(0.6)	0	(1.0)	**8**	(0.8)	**16**	(0.9)
Partners	Albania	409	(4.2)	295	(5.7)	408	(5.0)	523	(5.8)	418	(3.5)	311	(5.2)	418	(4.6)	526	(4.7)	**-9**	(3.7)	**-16**	(6.9)	**-10**	(4.7)	-2	(5.7)
	Algeria	356	(3.1)	269	(4.3)	354	(3.2)	447	(5.3)	363	(3.6)	273	(4.6)	360	(3.7)	457	(6.0)	-7	(3.4)	-5	(5.1)	-5	(4.0)	-10	(6.5)
	Brazil	385	(3.2)	272	(3.7)	379	(3.8)	508	(5.0)	370	(3.0)	263	(3.6)	365	(3.0)	484	(4.9)	**15**	(2.4)	**9**	(2.9)	**14**	(3.1)	**24**	(3.9)
	B-S-J-G (China)	534	(4.8)	388	(6.8)	540	(5.8)	670	(5.4)	528	(5.7)	388	(6.7)	534	(6.2)	658	(7.2)	6	(3.6)	0	(6.4)	6	(4.8)	11	(6.0)
	Bulgaria	440	(4.8)	313	(5.5)	438	(6.0)	572	(6.8)	442	(4.3)	318	(6.4)	444	(5.5)	563	(6.4)	-2	(4.7)	-5	(6.1)	-6	(6.2)	9	(7.3)
	CABA (Argentina)	467	(8.0)	347	(11.6)	468	(10.5)	586	(10.3)	446	(7.8)	336	(9.9)	448	(9.3)	554	(9.5)	**21**	(7.5)	11	(12.7)	20	(10.6)	**32**	(10.1)
	Colombia	395	(3.3)	296	(4.4)	392	(3.5)	500	(4.0)	384	(2.4)	290	(3.4)	382	(2.8)	484	(4.1)	**11**	(3.4)	6	(4.6)	**11**	(3.9)	**16**	(5.3)
	Costa Rica	408	(2.8)	319	(4.0)	407	(3.1)	501	(5.3)	392	(3.0)	311	(3.6)	390	(3.4)	476	(4.5)	**16**	(3.0)	9	(5.0)	**16**	(3.6)	**25**	(5.1)
	Croatia	471	(3.7)	355	(4.9)	469	(4.7)	591	(4.8)	458	(3.4)	348	(5.1)	457	(4.2)	570	(4.4)	**13**	(4.2)	7	(6.3)	**13**	(5.7)	**21**	(5.4)
	Cyprus*	435	(2.1)	307	(4.2)	435	(2.8)	564	(4.0)	440	(2.2)	329	(4.3)	440	(2.4)	551	(4.0)	-5	(2.5)	**-22**	(4.9)	-6	(3.8)	**13**	(5.3)
	Dominican Republic	326	(3.2)	239	(4.7)	321	(3.7)	419	(5.9)	330	(2.8)	247	(4.3)	327	(2.9)	417	(5.0)	-4	(2.8)	-8	(5.1)	-6	(3.2)	2	(5.5)
	FYROM	368	(2.2)	245	(3.9)	366	(2.8)	497	(5.1)	375	(1.8)	258	(4.0)	373	(2.4)	495	(4.3)	**-7**	(3.1)	**-12**	(5.3)	**-8**	(3.5)	2	(6.5)
	Georgia	398	(3.9)	275	(5.6)	396	(4.4)	526	(6.6)	411	(2.5)	298	(4.8)	411	(3.2)	524	(4.6)	**-13**	(3.7)	**-23**	(6.1)	**-15**	(4.5)	2	(6.4)
	Hong Kong (China)	549	(3.6)	421	(6.2)	555	(4.0)	665	(4.2)	547	(4.3)	432	(6.9)	552	(4.5)	651	(4.7)	2	(5.1)	-11	(8.6)	3	(5.5)	**14**	(6.0)
	Indonesia	385	(3.5)	289	(4.5)	379	(3.8)	489	(6.6)	387	(3.7)	289	(5.2)	383	(4.2)	494	(6.5)	-3	(3.6)	1	(5.6)	-4	(4.3)	-5	(7.0)
	Jordan	373	(4.0)	255	(6.3)	374	(4.2)	491	(4.9)	387	(3.6)	287	(5.4)	387	(4.0)	488	(4.4)	**-14**	(5.5)	**-32**	(6.9)	**-13**	(5.9)	3	(6.6)
	Kosovo	366	(2.2)	268	(4.0)	364	(2.9)	468	(4.4)	357	(2.1)	263	(3.9)	356	(2.6)	452	(5.1)	**9**	(2.9)	5	(5.3)	**8**	(3.9)	**16**	(6.6)
	Lebanon	408	(4.4)	274	(7.1)	404	(5.5)	546	(6.0)	386	(3.9)	264	(6.0)	383	(5.0)	516	(6.2)	**22**	(3.9)	11	(7.5)	**22**	(5.7)	**30**	(6.1)
	Lithuania	478	(2.8)	362	(4.5)	478	(3.9)	594	(4.7)	479	(2.5)	369	(5.3)	479	(2.8)	586	(4.2)	-1	(2.7)	-7	(5.6)	-2	(3.8)	8	(4.9)
	Macao (China)	540	(1.7)	432	(4.2)	543	(2.1)	644	(3.8)	548	(1.5)	447	(3.2)	551	(2.4)	643	(2.9)	**-8**	(2.3)	**-15**	(5.6)	**-8**	(3.3)	1	(4.4)
	Malta	477	(2.4)	325	(4.5)	482	(4.2)	619	(4.6)	481	(2.4)	338	(5.7)	488	(3.4)	612	(4.6)	-4	(3.3)	-13	(6.9)	-6	(5.6)	8	(6.6)
	Moldova	419	(2.9)	300	(4.7)	418	(3.9)	539	(4.5)	421	(3.1)	307	(5.7)	421	(4.2)	534	(5.0)	-2	(3.4)	-7	(6.8)	-3	(5.4)	5	(5.8)
	Montenegro	418	(2.1)	303	(4.2)	416	(3.2)	535	(3.4)	418	(2.0)	313	(3.6)	416	(2.6)	528	(3.6)	0	(2.9)	-10	(5.4)	1	(4.0)	8	(4.9)
	Peru	391	(3.0)	286	(3.3)	388	(3.9)	501	(4.7)	382	(3.2)	280	(3.4)	380	(3.6)	488	(5.3)	**9**	(3.0)	6	(4.2)	**9**	(4.2)	**13**	(5.4)
	Qatar	397	(1.8)	266	(2.7)	389	(2.9)	541	(2.8)	408	(1.8)	293	(3.2)	405	(2.7)	531	(3.0)	**-12**	(2.5)	**-27**	(4.3)	**-16**	(4.0)	**10**	(3.9)
	Romania	444	(4.2)	332	(6.1)	443	(4.7)	558	(6.3)	444	(4.1)	335	(5.1)	442	(4.9)	556	(6.1)	1	(3.2)	-3	(5.9)	1	(4.4)	2	(6.0)
	Russia	497	(4.0)	387	(6.0)	499	(4.7)	606	(4.4)	491	(3.2)	387	(5.0)	490	(4.0)	597	(4.2)	6	(3.5)	0	(6.3)	8	(5.1)	9	(4.9)
	Singapore	564	(2.1)	429	(3.7)	570	(3.0)	689	(3.4)	564	(1.7)	443	(4.5)	571	(2.3)	675	(3.5)	0	(2.5)	**-14**	(5.9)	-1	(3.7)	**14**	(4.4)
	Chinese Taipei	545	(4.7)	401	(5.7)	552	(5.4)	675	(6.6)	539	(4.1)	407	(5.2)	545	(4.4)	664	(6.0)	6	(6.4)	-6	(7.2)	8	(6.9)	11	(9.1)
	Thailand	414	(3.7)	309	(5.1)	410	(4.0)	523	(6.7)	417	(3.4)	317	(4.1)	414	(3.7)	520	(5.9)	-3	(3.7)	-8	(5.0)	-4	(4.2)	4	(7.1)
	Trinidad and Tobago	408	(2.1)	286	(4.4)	404	(3.4)	538	(4.5)	426	(2.0)	305	(4.2)	425	(2.8)	550	(4.1)	**-18**	(2.9)	**-19**	(6.2)	**-21**	(4.2)	**-12**	(5.9)
	Tunisia	370	(3.4)	262	(6.1)	367	(3.7)	481	(5.6)	364	(3.2)	263	(4.3)	360	(3.4)	470	(6.0)	**6**	(3.0)	0	(5.6)	**8**	(3.5)	10	(6.1)
	United Arab Emirates	424	(3.9)	294	(4.6)	417	(4.9)	567	(5.5)	431	(2.9)	320	(4.3)	428	(3.5)	548	(4.5)	-7	(4.9)	**-26**	(6.5)	-11	(5.8)	**20**	(7.0)
	Uruguay	425	(3.6)	313	(3.7)	421	(4.1)	545	(6.2)	412	(2.5)	306	(3.6)	409	(3.0)	521	(4.5)	**14**	(3.5)	7	(4.7)	**11**	(4.5)	**23**	(7.4)
	Viet Nam	493	(4.7)	384	(5.6)	490	(5.5)	606	(6.4)	496	(4.8)	394	(6.6)	493	(4.9)	601	(8.3)	-3	(3.4)	-10	(5.5)	-3	(4.5)	4	(5.8)
	Argentina**	418	(3.5)	313	(4.3)	416	(4.0)	526	(5.3)	400	(3.3)	301	(4.3)	400	(4.1)	500	(4.4)	**18**	(3.0)	**12**	(4.7)	**16**	(4.5)	**25**	(5.4)
	Kazakhstan**	459	(4.7)	355	(5.2)	456	(5.2)	568	(6.6)	461	(4.6)	359	(6.1)	458	(4.9)	567	(7.5)	-1	(3.7)	-4	(6.2)	-1	(4.4)	0	(5.9)
	Malaysia**	443	(3.9)	335	(4.7)	441	(4.3)	553	(6.0)	449	(3.2)	351	(4.3)	451	(3.8)	547	(4.2)	-7	(2.7)	**-16**	(4.8)	**-10**	(3.8)	6	(4.5)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433203

[Part 1/1]

Table I.5.8b Mathematics performance, by gender (PISA 2003)

		Boys								Girls								Gender differences (boys - girls)							
		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		50th percentile		90th percentile	
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	527	(3.0)	396	(3.8)	531	(3.7)	653	(4.2)	522	(2.7)	402	(5.1)	524	(3.5)	637	(3.6)	5	(3.8)	-6	(5.5)	6	(5.1)	**16**	(5.6)
	Austria	509	(4.0)	379	(4.9)	510	(4.7)	637	(5.1)	502	(4.0)	387	(3.9)	503	(5.3)	615	(4.7)	8	(4.4)	-8	(5.7)	7	(6.2)	**22**	(6.1)
	Belgium	533	(3.4)	378	(6.4)	542	(4.9)	673	(3.6)	525	(3.2)	384	(8.4)	533	(3.5)	654	(3.3)	8	(4.8)	-6	(11.0)	9	(6.0)	**19**	(5.1)
	Canada	541	(2.1)	419	(3.4)	545	(2.4)	657	(3.4)	530	(1.9)	422	(3.1)	530	(2.3)	635	(3.4)	**11**	(2.1)	-4	(4.5)	**15**	(3.1)	**22**	(4.2)
	Chile	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Czech Republic	524	(4.3)	399	(5.7)	523	(5.1)	652	(4.6)	509	(4.4)	385	(7.7)	511	(5.5)	626	(4.6)	**15**	(5.1)	13	(7.5)	13	(6.7)	**25**	(5.0)
	Denmark	523	(3.4)	404	(4.8)	525	(4.4)	638	(3.9)	506	(3.0)	388	(5.1)	507	(3.4)	623	(4.2)	**17**	(3.2)	**16**	(6.2)	**18**	(4.6)	**15**	(4.6)
	Estonia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Finland	548	(2.5)	435	(4.9)	548	(2.3)	660	(4.3)	541	(2.1)	441	(3.2)	540	(2.9)	643	(3.3)	**7**	(2.7)	-6	(5.5)	**8**	(3.1)	**17**	(4.7)
	France	515	(3.6)	385	(8.3)	519	(3.7)	636	(4.7)	507	(2.9)	392	(5.5)	511	(3.4)	619	(4.6)	**9**	(4.2)	-8	(8.8)	8	(4.8)	**18**	(6.1)
	Germany	508	(4.0)	364	(6.9)	513	(6.1)	641	(5.1)	499	(3.9)	363	(7.5)	506	(5.6)	624	(4.4)	**9**	(4.4)	1	(9.2)	7	(6.7)	**17**	(6.5)
	Greece	455	(4.8)	329	(6.4)	456	(5.3)	582	(6.6)	436	(3.8)	320	(6.2)	438	(4.3)	550	(5.3)	**19**	(3.6)	10	(6.6)	**18**	(4.5)	**33**	(6.0)
	Hungary	494	(3.3)	371	(5.1)	492	(4.3)	618	(5.8)	486	(3.3)	369	(5.3)	487	(4.4)	603	(6.5)	**8**	(3.5)	2	(5.5)	5	(5.7)	**16**	(6.6)
	Iceland	508	(2.3)	383	(4.7)	511	(3.1)	627	(4.9)	523	(2.2)	412	(4.6)	525	(4.0)	631	(4.1)	**-15**	(3.5)	**-29**	(6.6)	**-14**	(5.3)	-4	(6.6)
	Ireland	510	(3.0)	398	(5.7)	510	(3.3)	622	(4.9)	495	(3.4)	388	(4.8)	496	(3.7)	603	(4.5)	**15**	(4.2)	9	(7.4)	**15**	(5.0)	**20**	(6.8)
	Israel	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Italy	475	(4.6)	346	(8.2)	476	(5.0)	605	(4.6)	457	(3.8)	340	(6.5)	458	(4.4)	573	(3.2)	**18**	(5.9)	5	(9.5)	**18**	(6.6)	**32**	(4.8)
	Japan	539	(5.8)	397	(6.9)	544	(6.1)	674	(9.0)	530	(4.0)	406	(8.1)	536	(4.4)	646	(4.1)	8	(5.9)	-9	(8.8)	8	(6.5)	**27**	(8.9)
	Korea	552	(4.4)	430	(7.5)	556	(5.3)	668	(5.0)	528	(5.3)	415	(6.1)	528	(6.3)	643	(7.9)	**23**	(6.8)	15	(9.6)	**28**	(8.5)	**25**	(6.6)
	Latvia	485	(4.8)	368	(8.8)	485	(5.3)	604	(6.4)	482	(3.6)	373	(5.5)	484	(4.1)	590	(5.0)	3	(4.0)	-6	(10.5)	2	(4.8)	**14**	(6.4)
	Luxembourg	502	(1.9)	377	(4.4)	504	(3.1)	624	(3.7)	485	(1.5)	368	(3.2)	487	(2.2)	595	(4.2)	**17**	(2.8)	9	(5.9)	**17**	(3.9)	**29**	(5.8)
	Mexico	391	(4.3)	280	(5.5)	390	(4.7)	505	(5.8)	380	(4.1)	272	(6.2)	380	(4.2)	488	(6.9)	**11**	(3.9)	8	(7.5)	**10**	(4.3)	**17**	(7.6)
	Netherlands	540	(4.1)	420	(7.2)	541	(5.6)	659	(4.3)	535	(3.5)	410	(7.2)	537	(5.8)	654	(3.9)	5	(4.3)	9	(9.2)	4	(6.5)	6	(5.3)
	New Zealand	531	(2.8)	396	(5.7)	534	(3.5)	661	(3.6)	516	(3.2)	393	(5.5)	518	(4.0)	637	(3.8)	**14**	(3.9)	3	(7.8)	**16**	(5.3)	**24**	(5.1)
	Norway	498	(2.8)	373	(4.6)	498	(4.1)	622	(5.2)	492	(2.9)	379	(5.1)	493	(3.7)	605	(3.9)	6	(3.2)	-5	(7.1)	5	(4.5)	**17**	(5.9)
	Poland	493	(3.0)	370	(5.6)	494	(3.5)	618	(4.9)	487	(2.9)	381	(4.4)	486	(3.5)	597	(4.4)	6	(3.1)	-10	(6.7)	**8**	(3.7)	**21**	(6.3)
	Portugal	472	(4.2)	349	(6.6)	475	(4.8)	593	(4.2)	460	(3.4)	355	(5.4)	461	(4.3)	566	(5.1)	**12**	(3.3)	-6	(7.2)	**14**	(4.6)	**27**	(6.0)
	Slovak Republic	507	(3.9)	384	(6.9)	508	(4.7)	630	(4.7)	489	(3.6)	374	(5.4)	489	(4.3)	606	(4.3)	**19**	(3.7)	10	(5.2)	**18**	(5.6)	**24**	(4.7)
	Slovenia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Spain	490	(3.4)	367	(6.0)	492	(4.6)	606	(4.6)	481	(2.2)	369	(3.7)	483	(2.8)	587	(2.8)	**9**	(3.0)	-2	(6.6)	8	(4.3)	**19**	(4.6)
	Sweden	512	(3.0)	388	(5.9)	512	(3.7)	638	(5.4)	506	(3.1)	387	(4.4)	507	(4.0)	623	(4.4)	**7**	(3.3)	1	(5.7)	4	(4.7)	**15**	(5.7)
	Switzerland	535	(4.7)	402	(5.8)	537	(5.6)	664	(6.9)	518	(3.6)	390	(5.4)	522	(4.8)	638	(6.0)	**17**	(4.9)	12	(6.9)	**15**	(6.9)	**26**	(7.5)
	Turkey	430	(7.9)	301	(6.7)	422	(8.1)	571	(16.9)	415	(6.7)	300	(5.7)	406	(7.2)	545	(14.9)	**15**	(6.2)	1	(7.1)	15	(8.1)	**26**	(11.6)
	United Kingdom	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	United States	486	(3.3)	355	(5.5)	486	(3.7)	616	(4.7)	480	(3.2)	358	(5.7)	481	(3.3)	599	(5.0)	**6**	(2.9)	-4	(6.8)	5	(3.5)	**16**	(6.3)
	OECD average-30	504	(0.7)	378	(1.1)	506	(0.8)	628	(1.1)	494	(0.6)	377	(1.0)	496	(0.8)	608	(1.0)	**10**	(0.8)	1	(1.4)	**10**	(1.0)	**20**	(1.1)
	OECD average-35	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	365	(6.1)	240	(7.0)	355	(5.3)	506	(11.2)	348	(4.4)	228	(5.6)	345	(4.9)	471	(6.9)	**16**	(4.1)	11	(7.1)	**10**	(4.7)	**35**	(8.2)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	552	(6.5)	407	(13.2)	565	(7.0)	681	(6.5)	548	(4.6)	426	(6.7)	555	(5.9)	661	(5.1)	4	(6.6)	-20	(12.5)	10	(8.5)	**20**	(7.9)
	Indonesia	362	(3.9)	263	(5.9)	359	(4.2)	464	(5.6)	358	(4.6)	257	(5.4)	354	(4.7)	468	(8.7)	3	(3.4)	5	(6.7)	5	(3.5)	-4	(6.7)
	Jordan	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Macao (China)	538	(4.8)	416	(10.4)	542	(5.8)	652	(9.8)	517	(3.3)	414	(8.7)	518	(6.3)	624	(7.4)	**21**	(5.8)	2	(14.1)	**24**	(8.0)	**28**	(12.4)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Peru	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Romania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Russia	473	(5.3)	351	(6.9)	472	(6.4)	600	(7.1)	463	(4.2)	350	(5.4)	463	(4.8)	576	(5.3)	**10**	(4.4)	1	(7.2)	9	(5.6)	**25**	(6.4)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Thailand	415	(4.0)	312	(4.2)	409	(4.5)	527	(6.9)	419	(3.4)	321	(3.9)	414	(3.9)	525	(5.9)	-4	(4.2)	-9	(4.9)	-5	(5.3)	3	(8.6)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	365	(2.7)	263	(4.6)	361	(3.4)	472	(6.0)	353	(2.9)	250	(4.0)	349	(3.3)	461	(6.1)	**12**	(2.5)	**14**	(5.0)	**12**	(4.1)	11	(6.9)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	428	(4.0)	295	(4.4)	432	(5.7)	559	(5.7)	416	(3.8)	287	(5.9)	419	(5.3)	541	(5.8)	**12**	(4.2)	8	(7.2)	**13**	(5.8)	**18**	(6.6)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433203

[Part 1/1]

Table I.5.8d Change between 2003 and 2015 in mathematics performance, by gender (PISA 2015 - PISA 2003)

		Boys								Girls								Gender differences (boys - girls)							
		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		Median (50th percentile)		90th percentile		Mean		10th percentile		50th percentile		90th percentile	
		Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	**-30**	(6.7)	**-27**	(7.4)	**-32**	(7.3)	**-32**	(7.8)	**-31**	(6.7)	**-28**	(8.4)	**-32**	(7.2)	**-32**	(7.7)	0	(5.0)	1	(6.9)	0	(6.4)	0	(6.9)
	Austria	1	(7.8)	1	(9.1)	5	(8.8)	-4	(9.1)	**-19**	(7.7)	**-25**	(9.0)	-16	(8.8)	**-17**	(8.4)	**19**	(6.6)	**25**	(9.6)	**21**	(8.7)	13	(8.2)
	Belgium	**-19**	(7.2)	0	(9.9)	**-22**	(8.5)	**-34**	(7.4)	**-26**	(7.0)	-14	(11.1)	**-27**	(7.5)	**-36**	(7.1)	7	(5.9)	14	(12.2)	5	(7.7)	1	(6.4)
	Canada	**-21**	(6.6)	**-18**	(7.7)	**-23**	(7.0)	**-22**	(7.8)	**-18**	(6.4)	**-23**	(7.3)	**-17**	(6.8)	**-16**	(7.4)	-2	(3.5)	5	(5.8)	-6	(5.1)	-6	(6.3)
	Chile	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Czech Republic	**-28**	(7.8)	**-28**	(9.6)	**-24**	(8.7)	**-35**	(8.6)	**-20**	(7.6)	-9	(10.7)	**-20**	(8.5)	**-27**	(8.8)	-8	(6.3)	**-19**	(9.8)	-4	(8.3)	-8	(7.4)
	Denmark	-7	(7.0)	3	(8.3)	-7	(8.0)	**-16**	(7.8)	0	(6.9)	16	(8.6)	3	(7.5)	**-17**	(7.9)	-7	(4.4)	-12	(7.8)	-10	(6.5)	1	(6.3)
	Estonia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Finland	**-41**	(6.7)	**-39**	(8.8)	**-38**	(6.7)	**-43**	(7.9)	**-26**	(6.5)	**-26**	(7.9)	**-22**	(7.0)	**-32**	(7.4)	**-15**	(3.6)	-12	(7.3)	**-16**	(4.4)	-11	(6.3)
	France	**-19**	(7.3)	**-23**	(11.2)	**-16**	(7.8)	**-16**	(8.1)	**-17**	(6.8)	**-26**	(9.2)	**-16**	(7.5)	-13	(8.1)	-3	(5.5)	3	(10.6)	0	(7.1)	-3	(7.5)
	Germany	6	(7.7)	**33**	(10.5)	2	(9.1)	-12	(8.7)	-1	(7.5)	18	(10.4)	-6	(8.7)	**-16**	(8.1)	8	(5.3)	15	(10.6)	7	(7.5)	4	(8.1)
	Greece	-1	(8.7)	1	(10.6)	-2	(9.4)	-8	(9.8)	**18**	(7.7)	**24**	(10.4)	**17**	(8.2)	15	(9.0)	**-19**	(5.2)	**-23**	(9.8)	**-19**	(6.8)	**-23**	(8.0)
	Hungary	-13	(7.4)	-15	(9.2)	-10	(8.6)	-13	(9.1)	-13	(7.2)	**-21**	(9.5)	-9	(8.1)	-13	(9.6)	0	(5.5)	6	(9.0)	-1	(8.1)	0	(8.3)
	Iceland	**-20**	(6.7)	**-18**	(9.1)	**-22**	(7.5)	**-19**	(9.3)	**-34**	(6.5)	**-43**	(8.4)	**-37**	(7.7)	**-23**	(8.4)	**14**	(4.9)	**25**	(9.6)	**14**	(7.2)	4	(9.2)
	Ireland	1	(7.0)	5	(10.0)	3	(7.3)	-4	(8.2)	0	(7.0)	9	(8.3)	2	(7.4)	-12	(8.1)	1	(5.4)	-5	(9.8)	2	(6.5)	8	(8.4)
	Israel	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Italy	**25**	(8.0)	**30**	(11.2)	**26**	(8.7)	16	(8.5)	**23**	(7.6)	**21**	(9.9)	**23**	(8.2)	**23**	(8.4)	2	(7.3)	9	(11.5)	3	(8.8)	-7	(7.2)
	Japan	1	(8.9)	**24**	(10.5)	0	(9.4)	-21	(12.0)	-5	(7.6)	6	(11.2)	-7	(8.0)	-14	(8.5)	5	(6.9)	18	(10.9)	6	(7.9)	-8	(10.4)
	Korea	**-31**	(8.8)	**-49**	(12.0)	**-30**	(9.8)	-13	(9.9)	-1	(8.7)	-9	(10.7)	4	(9.7)	1	(10.6)	**-30**	(8.8)	**-40**	(13.2)	**-34**	(10.8)	-14	(9.3)
	Latvia	-3	(7.8)	9	(11.4)	-4	(8.4)	-17	(9.3)	1	(7.1)	13	(8.9)	1	(7.6)	-14	(8.4)	-5	(5.2)	-4	(11.9)	-5	(6.4)	-3	(8.1)
	Luxembourg	-10	(6.2)	-12	(7.8)	-12	(7.0)	-6	(7.9)	-5	(6.1)	-7	(7.5)	-6	(6.6)	1	(7.7)	-6	(4.2)	-5	(7.7)	-6	(5.7)	-7	(8.0)
	Mexico	**21**	(7.5)	**31**	(8.6)	**21**	(8.0)	8	(9.0)	**24**	(7.3)	**41**	(9.0)	**24**	(7.5)	8	(9.6)	-4	(4.6)	-10	(8.5)	-3	(5.3)	0	(8.6)
	Netherlands	**-27**	(7.4)	**-31**	(10.6)	**-24**	(8.6)	**-27**	(7.9)	**-24**	(7.0)	**-20**	(10.1)	**-21**	(8.7)	**-31**	(7.8)	-3	(4.9)	-11	(10.9)	-4	(7.5)	4	(6.6)
	New Zealand	**-31**	(7.1)	**-24**	(9.6)	**-32**	(8.1)	**-39**	(7.8)	**-25**	(7.0)	-16	(8.9)	**-25**	(7.7)	**-34**	(8.0)	-6	(5.8)	-8	(9.9)	-7	(7.5)	-5	(7.5)
	Norway	2	(6.9)	10	(9.1)	5	(7.8)	-8	(8.6)	11	(6.7)	**19**	(8.5)	11	(7.4)	1	(7.5)	**-8**	(4.2)	-9	(9.5)	-6	(6.1)	-9	(7.4)
	Poland	**17**	(6.9)	**26**	(9.1)	**15**	(7.4)	9	(8.7)	11	(6.9)	7	(8.9)	**15**	(7.4)	11	(8.4)	6	(4.3)	**20**	(8.8)	0	(5.5)	-2	(8.3)
	Portugal	**24**	(7.6)	15	(10.0)	**24**	(8.4)	**32**	(7.9)	**26**	(7.1)	11	(8.8)	**29**	(7.9)	**36**	(8.4)	-2	(4.4)	4	(9.0)	-5	(6.1)	-3	(7.3)
	Slovak Republic	**-29**	(7.5)	**-33**	(10.2)	**-27**	(8.3)	**-28**	(8.4)	**-16**	(7.6)	**-28**	(9.9)	-11	(8.3)	-16	(8.4)	**-13**	(5.3)	-5	(8.5)	**-16**	(7.7)	-11	(7.2)
	Slovenia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Spain	4	(7.0)	11	(9.1)	5	(7.8)	-2	(8.4)	-3	(6.6)	0	(8.0)	-2	(7.3)	-6	(7.1)	7	(4.1)	11	(8.3)	8	(5.9)	4	(6.4)
	Sweden	**-20**	(7.4)	-17	(9.9)	**-18**	(7.9)	**-25**	(9.3)	-11	(7.2)	-5	(9.0)	-9	(7.9)	**-19**	(8.6)	-9	(4.6)	-12	(8.7)	-8	(6.2)	-7	(7.8)
	Switzerland	-8	(8.0)	-8	(10.0)	-3	(8.8)	-14	(10.2)	-3	(7.6)	5	(9.4)	-3	(8.6)	-7	(9.7)	-5	(5.9)	-13	(9.7)	0	(8.3)	-7	(10.1)
	Turkey	-7	(10.7)	19	(10.1)	-2	(11.3)	**-38**	(19.2)	2	(10.0)	14	(9.7)	8	(10.7)	-19	(17.3)	-9	(7.7)	5	(10.0)	-10	(9.9)	-19	(13.1)
	United Kingdom	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	United States	-12	(7.5)	0	(9.0)	-11	(8.2)	**-25**	(9.1)	-14	(7.3)	-3	(9.7)	**-16**	(7.5)	**-22**	(9.3)	2	(4.3)	3	(9.0)	5	(5.5)	-3	(8.7)
	OECD average-30	-9	(5.7)	-4	(5.8)	-8	(5.7)	**-15**	(5.8)	-6	(5.7)	-3	(5.8)	-6	(5.7)	**-11**	(5.7)	**-3**	(1.0)	-1	(1.8)	**-3**	(1.3)	**-4**	(1.5)
	OECD average-35	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	**20**	(8.9)	**33**	(9.7)	**23**	(8.6)	2	(13.5)	**21**	(7.7)	**35**	(8.7)	**19**	(8.0)	13	(10.1)	-1	(4.7)	-2	(7.7)	4	(5.6)	-11	(9.1)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	-3	(9.3)	14	(15.6)	-9	(9.8)	-16	(9.6)	-2	(8.4)	6	(11.1)	-3	(9.3)	-10	(8.9)	-2	(8.4)	9	(15.2)	-7	(10.1)	-6	(9.9)
	Indonesia	**23**	(7.7)	**26**	(9.3)	**20**	(8.0)	**25**	(10.3)	**29**	(8.1)	**31**	(9.4)	**29**	(8.4)	**27**	(12.2)	-6	(5.0)	-5	(8.7)	-9	(5.5)	-2	(9.7)
	Jordan	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Macao (China)	2	(7.6)	16	(12.6)	1	(8.3)	-8	(11.9)	**31**	(6.7)	**33**	(10.8)	**33**	(8.8)	19	(9.7)	**-29**	(6.3)	-17	(15.2)	**-32**	(8.6)	**-27**	(13.1)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Peru	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Romania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Russia	**24**	(8.7)	**36**	(10.7)	**27**	(9.7)	5	(10.1)	**28**	(7.7)	**37**	(9.2)	**27**	(8.4)	**21**	(8.8)	-4	(5.6)	-1	(9.6)	0	(7.6)	-16	(8.1)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Thailand	-1	(7.8)	-3	(8.7)	1	(8.2)	-4	(11.1)	-2	(7.4)	-4	(8.0)	0	(7.8)	-5	(10.0)	1	(5.6)	1	(7.0)	1	(6.7)	1	(11.1)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	5	(7.1)	-1	(9.5)	6	(7.6)	9	(10.0)	11	(7.1)	13	(8.2)	10	(7.3)	10	(10.3)	-6	(3.9)	-14	(7.6)	-4	(5.4)	-1	(9.2)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	-3	(7.7)	**18**	(8.0)	-11	(9.0)	-14	(10.2)	-5	(7.2)	**18**	(8.9)	-9	(8.3)	**-19**	(9.2)	2	(5.4)	-1	(8.6)	-1	(7.3)	6	(9.9)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433203

[Part 1/3]

Table I.6.1 Change between 2003 and 2015 in the enrolment of 15-year-olds in grade 7 and above

		PISA 2015				PISA 2012			
		Total population of 15-year-olds	Total population of 15-year-olds enrolled in grade 7 or above	Weighted number of participating students	Coverage index 3: Coverage of the national 15-year-old population	Total population of 15-year-olds	Total population of 15-year-olds enrolled in grade 7 or above	Weighted number of participating students	Coverage index 3: Coverage of the national 15-year-old population
OECD	Australia	282 888	282 547	256 329	0.91	291 967	288 159	250 779	0.86
	Austria	88 013	82 683	73 379	0.83	93 537	89 073	82 242	0.88
	Belgium	123 630	121 954	114 902	0.93	123 469	121 493	117 912	0.95
	Canada	396 966	381 660	331 546	0.84	417 873	409 453	348 070	0.83
	Chile	255 440	245 947	203 782	0.80	274 803	252 733	229 199	0.83
	Czech Republic	90 391	90 076	84 519	0.94	96 946	93 214	82 101	0.85
	Denmark	68 174	67 466	60 655	0.89	72 310	70 854	65 642	0.91
	Estonia	11 676	11 491	10 834	0.93	12 649	12 438	11 634	0.92
	Finland	58 526	58 955	56 934	0.97	62 523	62 195	60 047	0.96
	France	807 867	778 679	734 944	0.91	792 983	755 447	701 399	0.88
	Germany	774 149	774 149	743 969	0.96	798 136	798 136	756 907	0.95
	Greece	105 530	105 253	96 157	0.91	110 521	105 096	96 640	0.87
	Hungary	94 515	90 065	84 644	0.90	111 761	108 816	91 179	0.82
	Iceland	4 250	4 195	3 966	0.93	4 505	4 491	4 169	0.93
	Ireland	61 234	59 811	59 082	0.96	59 296	57 979	54 010	0.91
	Israel	124 852	118 997	117 031	0.94	118 953	113 278	107 745	0.91
	Italy	616 761	567 268	495 093	0.80	605 490	566 973	521 288	0.86
	Japan	1 201 615	1 175 907	1 138 349	0.95	1 241 786	1 214 756	1 128 179	0.91
	Korea	620 687	619 950	569 106	0.92	687 104	672 101	603 632	0.88
	Latvia	17 255	16 955	15 320	0.89	18 789	18 389	16 054	0.85
	Luxembourg	6 327	6 053	5 540	0.88	6 187	6 082	5 523	0.85
	Mexico	2 257 399	1 401 247	1 392 995	0.62	2 114 745	1 472 875	1 326 025	0.63
	Netherlands	201 670	200 976	191 817	0.95	194 000	193 190	196 262	1.01
	New Zealand	60 162	57 448	54 274	0.90	60 940	59 118	53 414	0.88
	Norway	63 642	63 491	58 083	0.91	64 917	64 777	59 432	0.92
	Poland	380 366	361 600	345 709	0.91	425 597	410 700	379 275	0.89
	Portugal	110 939	101 107	97 214	0.88	108 728	127 537	96 034	0.88
	Slovak Republic	55 674	55 203	49 654	0.89	59 723	59 367	54 486	0.91
	Slovenia	18 078	17 689	16 773	0.93	19 471	18 935	18 303	0.94
	Spain	440 084	414 276	399 935	0.91	423 444	404 374	374 266	0.88
	Sweden	97 749	97 210	91 491	0.94	102 087	102 027	94 988	0.93
	Switzerland	85 495	83 655	82 223	0.96	87 200	85 239	79 679	0.91
	Turkey	1 324 089	1 100 074	925 366	0.70	1 266 638	965 736	866 681	0.68
	United Kingdom	747 593	746 328	627 703	0.84	738 066	745 581	688 236	0.93
	United States	4 220 325	3 992 053	3 524 497	0.84	3 985 714	4 074 457	3 536 153	0.89
Partners	Albania	48 610	45 163	40 896	0.84	76 910	50 157	42 466	0.55
	Algeria	389 315	354 936	306 647	0.79	m	m	m	m
	Brazil	3 430 255	2 853 388	2 425 961	0.71	3 435 778	2 786 064	2 470 804	0.72
	B-S-J-G (China)	2 084 958	1 507 518	1 331 794	0.64	m	m	m	m
	Bulgaria	66 601	59 397	53 685	0.81	70 188	59 684	54 255	0.77
	CABA (Argentina)	30 974	35 767	32 180	1.04	36 183	36 694	33 009	0.91
	Colombia	760 919	674 079	567 848	0.75	889 729	620 422	560 805	0.63
	Costa Rica	81 773	66 524	51 897	0.63	81 489	64 326	40 384	0.50
	Croatia	45 031	35 920	40 899	0.91	48 155	46 550	45 502	0.94
	Cyprus*	9 255	9 255	8 785	0.95	9 956	9 956	9 650	0.97
	Dominican Republic	193 153	139 555	132 300	0.68	m	m	m	m
	FYROM	16 719	16 717	15 847	0.95	m	m	m	m
	Georgia	48 695	43 197	38 334	0.79	m	m	m	m
	Hong Kong (China)	65 100	61 630	57 662	0.89	84 200	77 864	70 636	0.84
	Indonesia	4 534 216	3 182 816	3 092 773	0.68	4 174 217	3 599 844	2 645 155	0.63
	Jordan	126 399	121 729	108 669	0.86	129 492	125 333	111 098	0.86
	Kosovo	31 546	28 229	22 333	0.71	m	m	m	m
	Lebanon	64 044	62 281	42 331	0.66	m	m	m	m
	Lithuania	33 163	32 097	29 915	0.90	38 524	35 567	33 042	0.86
	Macao (China)	5 100	4 417	4 507	0.88	6 600	5 416	5 366	0.81
	Malta	4 397	4 406	4 296	0.98	m	m	m	m
	Moldova	31 576	30 601	29 341	0.93	m	m	m	m
	Montenegro	7 524	7 506	6 777	0.90	8 600	8 600	7 714	0.90
	Peru	580 371	478 229	431 738	0.74	584 294	508 969	419 945	0.72
	Qatar	13 871	13 850	12 951	0.93	11 667	11 532	11 003	0.94
	Romania	176 334	176 334	164 216	0.93	146 243	146 243	140 915	0.96
	Russia	1 176 473	1 172 943	1 120 932	0.95	1 272 632	1 268 814	1 172 539	0.92
	Singapore	48 218	47 050	46 224	0.96	53 637	52 163	51 088	0.95
	Chinese Taipei	295 056	287 783	251 424	0.85	328 356	328 336	292 542	0.89
	Thailand	895 513	756 917	634 795	0.71	982 080	784 897	703 012	0.72
	Trinidad and Tobago	17 371	17 371	13 197	0.76	m	m	m	m
	Tunisia	122 186	122 186	113 599	0.93	132 313	132 313	120 784	0.91
	United Arab Emirates	51 687	51 518	46 950	0.91	48 824	48 446	40 612	0.83
	Uruguay	53 533	43 865	38 287	0.72	54 638	46 442	39 771	0.73
	Viet Nam	1 803 552	1 032 599	874 859	0.49	1 717 996	1 091 462	956 517	0.56
	Argentina**	718 635	578 308	394 917	0.55	684 879	637 603	545 942	0.80
	Kazakhstan**	211 407	209 555	192 909	0.91	258 716	247 048	208 411	0.81
	Malaysia**	540 000	448 838	412 524	0.76	544 302	457 999	432 080	0.79

Notes: Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
For Brazil, estimates of the Total population of 15-year-olds across years have been updated at the request of the National Institute for Educational Studies and Research (INEP). Therefore, the estimates reported in this table do not match those that appear in previous PISA reports.
For Mexico, in 2015, the Total population of 15-year-olds enrolled in grade 7 or above is an estimate of the target population size of the sample frame from which the 15-year-olds students were selected for the PISA test. At the time Mexico provided the information to PISA, the official figure for this population was 1 573 952.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 2/3]

Table I.6.1 Change between 2003 and 2015 in the enrolment of 15-year-olds in grade 7 and above

		PISA 2009				PISA 2006			
		Total population of 15-year-olds	Total population of 15-year-olds enrolled in grade 7 or above	Weighted number of participating students	Coverage index 3: Coverage of the national 15-year-old population	Total population of 15-year-olds	Total population of 15-year-olds enrolled in grade 7 or above	Weighted number of participating students	Coverage index 3: Coverage of the national 15-year-old population
OECD	Australia	286 334	269 669	240 851	0.84	270 115	256 754	234 940	0.87
	Austria	99 818	94 192	87 326	0.87	97 337	92 149	89 925	0.92
	Belgium	126 377	126 335	119 140	0.94	124 943	124 557	123 161	0.99
	Canada	430 791	426 590	360 286	0.84	426 967	428 876	370 879	0.87
	Chile	290 056	265 542	247 270	0.85	299 426	255 459	233 526	0.78
	Czech Republic	122 027	116 153	113 951	0.93	127 748	124 764	128 827	1.01
	Denmark	70 522	68 897	60 855	0.86	66 989	65 984	57 013	0.85
	Estonia	14 248	14 106	12 978	0.91	19 871	19 623	18 662	0.94
	Finland	66 198	66 198	61 463	0.93	66 232	66 232	61 387	0.93
	France	749 808	732 825	677 620	0.90	809 375	809 375	739 428	0.91
	Germany	852 044	852 044	766 993	0.90	951 535	1 062 920	903 512	0.95
	Greece	102 229	105 664	93 088	0.91	107 505	110 663	96 412	0.90
	Hungary	121 155	118 387	105 611	0.87	124 444	120 061	106 010	0.85
	Iceland	4 738	4 738	4 410	0.93	4 820	4 777	4 624	0.96
	Ireland	56 635	55 464	52 794	0.93	58 667	57 648	55 114	0.94
	Israel	122 701	112 254	103 184	0.84	122 626	109 370	93 347	0.76
	Italy	586 904	573 542	506 733	0.86	578 131	639 971	520 055	0.90
	Japan	1 211 642	1 189 263	1 113 403	0.92	1 246 207	1 222 171	1 113 701	0.89
	Korea	717 164	700 226	630 030	0.88	660 812	627 868	576 669	0.87
	Latvia	28 749	28 149	23 362	0.81	34 277	33 659	29 232	0.85
	Luxembourg	5 864	5 623	5 124	0.87	4 595	4 595	4 733	1.03
	Mexico	2 151 771	1 425 397	1 305 461	0.61	2 200 916	1 383 364	1 190 420	0.54
	Netherlands	199 000	198 334	183 546	0.92	197 046	193 769	189 576	0.96
	New Zealand	63 460	60 083	55 129	0.87	63 800	59 341	53 398	0.84
	Norway	63 352	62 948	57 367	0.91	61 708	61 449	59 884	0.97
	Poland	482 500	473 700	448 866	0.93	549 000	546 000	515 993	0.94
	Portugal	115 669	107 583	96 820	0.84	115 426	100 816	90 079	0.78
	Slovak Republic	72 826	72 454	69 274	0.95	79 989	78 427	76 201	0.95
	Slovenia	20 314	19 571	18 773	0.92	23 431	23 018	20 595	0.88
	Spain	433 224	425 336	387 054	0.89	439 415	436 885	381 686	0.87
	Sweden	121 486	121 216	113 054	0.93	129 734	127 036	126 393	0.97
	Switzerland	90 623	89 423	80 839	0.89	87 766	86 108	89 651	1.02
	Turkey	1 336 842	859 172	757 298	0.57	1 423 514	800 968	665 477	0.47
	United Kingdom	786 626	786 825	683 380	0.87	779 076	767 248	732 004	0.94
	United States	4 103 738	4 210 475	3 373 264	0.82	4 192 939	4 192 939	3 578 040	0.85
Partners	Albania	55 587	42 767	34 134	0.61	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m
	Brazil	3 436 726	2 654 489	2 080 159	0.61	3 454 698	2 374 044	1 875 461	0.54
	B-S-J-G (China)	m	m	m	m	m	m	m	m
	Bulgaria	80 226	70 688	57 833	0.72	89 751	88 071	74 326	0.83
	CABA (Argentina)	m	m	m	m	m	m	m	m
	Colombia	893 057	582 640	522 388	0.58	897 477	543 630	537 262	0.60
	Costa Rica	80 523	63 603	42 954	0.53	m	m	m	m
	Croatia	48 491	46 256	43 065	0.89	54 500	51 318	46 523	0.85
	Cyprus*	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m
	Georgia	56 070	51 351	42 641	0.76	m	m	m	m
	Hong Kong (China)	85 000	78 224	75 548	0.89	77 398	75 542	75 145	0.97
	Indonesia	4 267 801	3 158 173	2 259 118	0.53	4 238 600	3 119 393	2 248 313	0.53
	Jordan	117 732	107 254	104 056	0.88	138 026	126 708	90 267	0.65
	Kosovo	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m
	Lithuania	51 822	43 967	40 530	0.78	53 931	51 808	50 329	0.93
	Macao (China)	7 500	5 969	5 978	0.80	m	m	m	m
	Malta	5 152	4 930	4 807	0.93	m	m	m	m
	Moldova	47 873	44 069	43 195	0.90	m	m	m	m
	Montenegro	8 500	8 493	7 728	0.91	9 190	8 973	7 734	0.84
	Peru	585 567	491 514	427 607	0.73	m	m	m	m
	Qatar	10 974	10 665	9 806	0.89	8 053	7 865	7 271	0.90
	Romania	152 084	152 084	151 130	0.99	341 181	241 890	223 887	0.66
	Russia	1 673 085	1 667 460	1 290 047	0.77	2 243 924	2 077 231	1 810 856	0.81
	Singapore	54 982	54 212	51 874	0.94	m	m	m	m
	Chinese Taipei	329 249	329 189	297 203	0.90	m	m	m	m
	Thailand	949 891	763 679	691 916	0.73	895 924	727 860	644 125	0.72
	Trinidad and Tobago	19 260	17 768	14 938	0.78	m	m	m	m
	Tunisia	153 914	153 914	136 545	0.89	153 331	153 331	138 491	0.90
	United Arab Emirates	41 564	40 447	38 707	0.94	m	m	m	m
	Uruguay	53 801	43 281	33 971	0.63	52 119	40 815	36 011	0.69
	Viet Nam	m	m	m	m	m	m	m	m
	Argentina**	688 434	636 713	472 106	0.69	662 686	579 222	523 048	0.79
	Kazakhstan**	281 659	263 206	250 657	0.89	m	m	m	m
	Malaysia**	539 295	492 758	421 448	0.78	m	m	m	m

Notes: Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
For Brazil, estimates of the Total population of 15-year-olds across years have been updated at the request of the National Institute for Educational Studies and Research (INEP). Therefore, the estimates reported in this table do not match those that appear in previous PISA reports.
For Mexico, in 2015, the Total population of 15-year-olds enrolled in grade 7 or above is an estimate of the target population size of the sample frame from which the 15-year-olds students were selected for the PISA test. At the time Mexico provided the information to PISA, the official figure for this population was 1 573 952.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 3/3]

Table I.6.1 Change between 2003 and 2015 in the enrolment of 15-year-olds in grade 7 and above

		PISA 2003				Change between 2015 and 2003 (or earliest available year)			
		Total population of 15-year-olds	Total population of 15-year-olds enrolled in grade 7 or above	Weighted number of participating students	Coverage index 3: Coverage of the national 15-year-old population	Total population of 15-year-olds	Total population of 15-year-olds enrolled in grade 7 or above	Weighted number of participating students	Coverage index 3: Coverage of the national 15-year-old population
OECD	Australia	268 164	250 635	235 591	0.88	14 724	31 912	20 738	0.03
	Austria	94 515	89 049	85 931	0.91	-6 502	-6 366	-12 552	-0.08
	Belgium	120 802	118 185	111 831	0.93	2 828	3 769	3 071	0.00
	Canada	398 865	399 265	330 436	0.83	-1 899	-17 605	1 109	0.01
	Chile	m	m	m	m	-43 986	-9 512	-29 744	0.02
	Czech Republic	130 679	126 348	121 183	0.93	-40 288	-36 272	-36 665	0.01
	Denmark	59 156	58 188	51 741	0.87	9 018	9 278	8 914	0.02
	Estonia	m	m	m	m	-8 195	-8 132	-7 828	-0.01
	Finland	61 107	61 107	57 883	0.95	-2 581	-2 152	-949	0.03
	France	809 053	808 276	734 579	0.91	-1 186	-29 597	365	0.00
	Germany	951 800	916 869	884 358	0.93	-177 651	-142 720	-140 388	0.03
	Greece	111 286	108 314	105 131	0.94	-5 756	-3 061	-8 974	-0.03
	Hungary	129 138	123 762	107 044	0.83	-34 623	-33 697	-22 400	0.07
	Iceland	4 168	4 112	3 928	0.94	82	83	38	-0.01
	Ireland	61 535	58 997	54 850	0.89	-301	814	4 233	0.07
	Israel	m	m	m	m	2 226	9 627	23 684	0.18
	Italy	561 304	574 611	481 521	0.86	55 457	-7 343	13 573	-0.06
	Japan	1 365 471	1 328 498	1 240 054	0.91	-163 856	-152 591	-101 705	0.04
	Korea	606 722	606 370	533 504	0.88	13 965	13 580	35 602	0.04
	Latvia	37 544	37 138	33 643	0.90	-20 289	-20 183	-18 324	-0.01
	Luxembourg	4 204	4 204	4 080	0.97	2 123	1 849	1 460	-0.09
	Mexico	2 192 452	1 273 163	1 071 650	0.49	64 947	128 084	321 345	0.13
	Netherlands	194 216	194 216	184 943	0.95	7 454	6 760	6 874	0.00
	New Zealand	55 440	53 293	48 638	0.88	4 722	4 155	5 637	0.02
	Norway	56 060	55 648	52 816	0.94	7 582	7 843	5 266	-0.03
	Poland	589 506	569 294	534 900	0.91	-209 140	-207 694	-189 191	0.00
	Portugal	109 149	99 216	96 857	0.89	1 790	1 891	357	-0.01
	Slovak Republic	84 242	81 945	77 067	0.91	-28 568	-26 742	-27 413	-0.02
	Slovenia	m	m	m	m	-5 353	-5 329	-3 822	0.05
	Spain	454 064	418 005	344 372	0.76	-13 980	-3 729	55 563	0.15
	Sweden	109 482	112 258	107 104	0.98	-11 733	-15 048	-15 614	-0.04
	Switzerland	83 247	81 020	86 491	1.04	2 248	2 635	-4 267	-0.08
	Turkey	1 351 492	725 030	481 279	0.36	-27 403	375 044	444 086	0.34
	United Kingdom	768 180	736 785	698 579	0.91	-20 587	9 543	-70 876	-0.07
	United States	3 979 116	3 979 116	3 147 089	0.79	241 209	12 937	377 408	0.04
Partners	Albania	m	m	m	m	-6 977	2 396	6 762	0.23
	Algeria	m	m	m	m	m	m	m	m
	Brazil	3 477 928	2 359 854	1 952 253	0.56	-47 673	493 534	473 708	0.15
	B-S-J-G (China)	m	m	m	m	m	m	m	m
	Bulgaria	m	m	m	m	-23 150	-28 674	-20 641	-0.02
	CABA (Argentina)	m	m	m	m	-5 209	-927	-829	0.13
	Colombia	m	m	m	m	-136 558	130 449	30 586	0.15
	Costa Rica	m	m	m	m	1 250	2 921	8 943	0.10
	Croatia	m	m	m	m	-9 469	-15 398	-5 623	0.06
	Cyprus*	m	m	m	m	-701	-701	-865	-0.02
	Dominican Republic	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	-7 375	-8 154	-4 307	0.03
	Hong Kong (China)	75 000	72 631	72 484	0.97	-9 900	-11 001	-14 822	-0.08
	Indonesia	4 281 895	3 113 548	1 971 476	0.46	252 321	69 268	1 121 296	0.22
	Jordan	m	m	m	m	-11 627	-4 979	18 403	0.21
	Kosovo	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m
	Lithuania	m	m	m	m	-20 768	-19 711	-20 414	-0.03
	Macao (China)	8 318	6 939	6 546	0.79	-3 218	-2 522	-2 040	0.10
	Malta	m	m	m	m	-755	-524	-511	0.05
	Moldova	m	m	m	m	-16 297	-13 468	-13 854	0.03
	Montenegro	m	m	m	m	-1 666	-1 467	-957	0.06
	Peru	m	m	m	m	-5 196	-13 285	4 131	0.01
	Qatar	m	m	m	m	5 818	5 985	5 680	0.03
	Romania	m	m	m	m	-164 847	-65 556	-59 671	0.27
	Russia	2 496 216	2 366 285	2 153 373	0.86	-1 319 743	-1 193 342	-1 032 441	0.09
	Singapore	m	m	m	m	-6 764	-7 162	-5 650	0.02
	Chinese Taipei	m	m	m	m	-34 193	-41 406	-45 779	-0.05
	Thailand	927 070	778 267	637 076	0.69	-31 557	-21 350	-2 281	0.02
	Trinidad and Tobago	m	m	m	m	-1 889	-397	-1 741	-0.02
	Tunisia	164 758	164 758	150 875	0.92	-42 572	-42 572	-37 276	0.01
	United Arab Emirates	m	m	m	m	10 123	11 071	8 243	-0.03
	Uruguay	53 948	40 023	33 775	0.63	-415	3 842	4 511	0.09
	Viet Nam	m	m	m	m	85 556	-58 863	-81 658	-0.07
	Argentina**	m	m	m	m	55 949	-914	-128 131	-0.24
	Kazakhstan**	m	m	m	m	-70 252	-53 651	-57 748	0.02
	Malaysia**	m	m	m	m	705	-43 920	-8 924	-0.02

Notes: Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
For Brazil, estimates of the Total population of 15-year-olds across years have been updated at the request of the National Institute for Educational Studies and Research (INEP). Therefore, the estimates reported in this table do not match those that appear in previous PISA reports.
For Mexico, in 2015, the Total population of 15-year-olds enrolled in grade 7 or above is an estimate of the target population size of the sample frame from which the 15-year-olds students were selected for the PISA test. At the time Mexico provided the information to PISA, the official figure for this population was 1 573 952.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.2a Socio-economic status of students

Results based on students' self-reports

		PISA index of economic, social and cultural status (ESCS)																	
		All students		Variability in index		Bottom quarter		Second quarter		Third quarter		Top quarter		5th percentile		95th percentile		Difference between 5th and 95th percentiles	
		Mean index	S.E.	S.D.	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Dif.	S.E.
OECD	Australia	0.27	(0.01)	0.79	(0.01)	-0.81	(0.02)	0.06	(0.01)	0.65	(0.01)	1.18	(0.01)	-1.10	(0.02)	1.35	(0.02)	**2.45**	(0.02)
	Austria	0.09	(0.02)	0.85	(0.01)	-0.97	(0.03)	-0.24	(0.02)	0.37	(0.03)	1.21	(0.02)	-1.19	(0.04)	1.46	(0.02)	**2.64**	(0.04)
	Belgium	0.16	(0.02)	0.91	(0.01)	-1.05	(0.03)	-0.13	(0.03)	0.59	(0.03)	1.25	(0.02)	-1.31	(0.03)	1.44	(0.02)	**2.75**	(0.03)
	Canada	0.53	(0.02)	0.81	(0.01)	-0.58	(0.02)	0.34	(0.02)	0.91	(0.02)	1.46	(0.01)	-0.90	(0.03)	1.66	(0.01)	**2.56**	(0.02)
	Chile	-0.49	(0.03)	1.09	(0.01)	-1.86	(0.04)	-0.92	(0.03)	-0.12	(0.04)	0.96	(0.03)	-2.25	(0.05)	1.27	(0.02)	**3.52**	(0.05)
	Czech Republic	-0.21	(0.01)	0.80	(0.01)	-1.19	(0.02)	-0.53	(0.02)	0.04	(0.02)	0.85	(0.02)	-1.39	(0.03)	1.11	(0.01)	**2.50**	(0.03)
	Denmark	0.59	(0.02)	0.87	(0.01)	-0.64	(0.03)	0.41	(0.03)	1.07	(0.02)	1.53	(0.01)	-1.02	(0.03)	1.66	(0.01)	**2.68**	(0.03)
	Estonia	0.05	(0.01)	0.77	(0.01)	-0.96	(0.02)	-0.25	(0.02)	0.39	(0.02)	1.01	(0.01)	-1.18	(0.03)	1.19	(0.02)	**2.38**	(0.04)
	Finland	0.25	(0.02)	0.75	(0.01)	-0.73	(0.02)	-0.02	(0.03)	0.60	(0.03)	1.17	(0.02)	-0.95	(0.01)	1.32	(0.02)	**2.27**	(0.02)
	France	-0.14	(0.02)	0.80	(0.01)	-1.17	(0.02)	-0.42	(0.02)	0.19	(0.02)	0.85	(0.02)	-1.44	(0.03)	1.05	(0.01)	**2.49**	(0.03)
	Germany	0.12	(0.02)	0.95	(0.01)	-1.07	(0.02)	-0.24	(0.02)	0.43	(0.03)	1.36	(0.02)	-1.33	(0.02)	1.59	(0.01)	**2.92**	(0.02)
	Greece	-0.08	(0.03)	0.96	(0.01)	-1.31	(0.03)	-0.47	(0.04)	0.32	(0.04)	1.14	(0.02)	-1.58	(0.03)	1.33	(0.02)	**2.91**	(0.03)
	Hungary	-0.23	(0.02)	0.96	(0.01)	-1.44	(0.02)	-0.62	(0.03)	0.13	(0.03)	1.02	(0.02)	-1.75	(0.04)	1.25	(0.02)	**3.00**	(0.04)
	Iceland	0.73	(0.01)	0.73	(0.01)	-0.28	(0.02)	0.57	(0.02)	1.10	(0.01)	1.55	(0.01)	-0.59	(0.03)	1.71	(0.02)	**2.30**	(0.04)
	Ireland	0.16	(0.02)	0.84	(0.01)	-0.94	(0.02)	-0.15	(0.03)	0.52	(0.03)	1.21	(0.02)	-1.19	(0.04)	1.42	(0.02)	**2.62**	(0.04)
	Israel	0.16	(0.03)	0.85	(0.02)	-0.99	(0.05)	-0.01	(0.04)	0.55	(0.02)	1.10	(0.02)	-1.28	(0.06)	1.28	(0.02)	**2.56**	(0.05)
	Italy	-0.07	(0.02)	0.95	(0.01)	-1.31	(0.02)	-0.38	(0.02)	0.27	(0.02)	1.16	(0.02)	-1.64	(0.02)	1.43	(0.03)	**3.06**	(0.03)
	Japan	-0.18	(0.01)	0.70	(0.01)	-1.10	(0.02)	-0.44	(0.02)	0.08	(0.02)	0.72	(0.01)	-1.32	(0.01)	0.94	(0.01)	**2.26**	(0.02)
	Korea	-0.20	(0.02)	0.68	(0.01)	-1.06	(0.02)	-0.45	(0.03)	0.04	(0.03)	0.68	(0.03)	-1.27	(0.03)	0.91	(0.02)	**2.18**	(0.03)
	Latvia	-0.44	(0.02)	0.92	(0.01)	-1.62	(0.02)	-0.82	(0.02)	-0.02	(0.03)	0.72	(0.02)	-1.84	(0.02)	0.94	(0.03)	**2.78**	(0.03)
	Luxembourg	0.07	(0.01)	1.11	(0.01)	-1.42	(0.02)	-0.26	(0.02)	0.56	(0.02)	1.41	(0.01)	-1.89	(0.04)	1.62	(0.01)	**3.52**	(0.04)
	Mexico	-1.22	(0.04)	1.22	(0.02)	-2.72	(0.04)	-1.73	(0.04)	-0.86	(0.05)	0.42	(0.05)	-3.09	(0.05)	0.88	(0.05)	**3.96**	(0.06)
	Netherlands	0.16	(0.02)	0.76	(0.01)	-0.85	(0.03)	-0.07	(0.02)	0.50	(0.02)	1.07	(0.02)	-1.08	(0.03)	1.25	(0.02)	**2.34**	(0.03)
	New Zealand	0.17	(0.02)	0.78	(0.01)	-0.89	(0.02)	-0.06	(0.02)	0.52	(0.02)	1.09	(0.02)	-1.18	(0.04)	1.28	(0.02)	**2.46**	(0.04)
	Norway	0.48	(0.02)	0.73	(0.01)	-0.53	(0.03)	0.33	(0.02)	0.82	(0.02)	1.31	(0.01)	-0.82	(0.03)	1.47	(0.01)	**2.28**	(0.03)
	Poland	-0.39	(0.02)	0.82	(0.01)	-1.34	(0.02)	-0.81	(0.02)	-0.18	(0.03)	0.75	(0.02)	-1.53	(0.02)	1.05	(0.02)	**2.58**	(0.03)
	Portugal	-0.39	(0.03)	1.15	(0.01)	-1.83	(0.02)	-0.88	(0.03)	0.00	(0.05)	1.16	(0.03)	-2.15	(0.02)	1.45	(0.03)	**3.60**	(0.04)
	Slovak Republic	-0.11	(0.02)	0.95	(0.03)	-1.24	(0.04)	-0.47	(0.02)	0.18	(0.03)	1.10	(0.02)	-1.38	(0.05)	1.37	(0.02)	**2.74**	(0.06)
	Slovenia	0.03	(0.01)	0.82	(0.01)	-1.04	(0.01)	-0.30	(0.02)	0.40	(0.02)	1.07	(0.01)	-1.22	(0.02)	1.26	(0.02)	**2.48**	(0.03)
	Spain	-0.51	(0.04)	1.19	(0.01)	-2.06	(0.03)	-0.98	(0.04)	-0.04	(0.05)	1.03	(0.03)	-2.40	(0.04)	1.31	(0.03)	**3.70**	(0.04)
	Sweden	0.33	(0.02)	0.82	(0.01)	-0.78	(0.03)	0.12	(0.03)	0.72	(0.02)	1.27	(0.01)	-1.07	(0.03)	1.44	(0.01)	**2.50**	(0.03)
	Switzerland	0.14	(0.02)	0.92	(0.01)	-1.05	(0.03)	-0.18	(0.03)	0.50	(0.03)	1.30	(0.02)	-1.43	(0.03)	1.50	(0.01)	**2.92**	(0.03)
	Turkey	-1.43	(0.05)	1.17	(0.02)	-2.87	(0.04)	-1.91	(0.05)	-1.06	(0.06)	0.14	(0.07)	-3.22	(0.03)	0.62	(0.07)	**3.84**	(0.07)
	United Kingdom	0.21	(0.02)	0.86	(0.01)	-0.92	(0.02)	-0.09	(0.03)	0.58	(0.03)	1.27	(0.02)	-1.18	(0.02)	1.48	(0.03)	**2.67**	(0.03)
	United States	0.10	(0.04)	1.00	(0.02)	-1.25	(0.06)	-0.18	(0.04)	0.55	(0.04)	1.29	(0.02)	-1.67	(0.07)	1.51	(0.02)	**3.18**	(0.07)
	OECD average	-0.04	(0.00)	0.89	(0.00)	-1.20	(0.00)	-0.35	(0.00)	0.32	(0.01)	1.08	(0.00)	-1.48	(0.01)	1.31	(0.00)	**2.79**	(0.01)
Partners	Albania	-0.77	(0.03)	0.95	(0.01)	-1.90	(0.02)	-1.21	(0.02)	-0.52	(0.04)	0.54	(0.03)	-2.17	(0.03)	0.85	(0.03)	**3.02**	(0.04)
	Algeria	-1.28	(0.04)	1.03	(0.02)	-2.63	(0.04)	-1.57	(0.04)	-0.94	(0.04)	0.01	(0.05)	-3.03	(0.04)	0.37	(0.04)	**3.40**	(0.05)
	Brazil	-0.96	(0.03)	1.16	(0.01)	-2.43	(0.03)	-1.36	(0.03)	-0.61	(0.03)	0.57	(0.04)	-2.85	(0.03)	1.00	(0.03)	**3.84**	(0.04)
	B-S-J-G (China)	-1.07	(0.04)	1.10	(0.02)	-2.36	(0.03)	-1.57	(0.03)	-0.83	(0.06)	0.47	(0.07)	-2.67	(0.04)	0.91	(0.06)	**3.58**	(0.07)
	Bulgaria	-0.08	(0.03)	1.00	(0.02)	-1.37	(0.04)	-0.46	(0.04)	0.37	(0.04)	1.14	(0.02)	-1.63	(0.05)	1.31	(0.02)	**2.94**	(0.05)
	CABA (Argentina)	0.01	(0.09)	1.17	(0.04)	-1.63	(0.10)	-0.29	(0.13)	0.67	(0.11)	1.29	(0.05)	-2.16	(0.07)	1.48	(0.04)	**3.63**	(0.08)
	Colombia	-0.99	(0.04)	1.12	(0.02)	-2.41	(0.04)	-1.36	(0.03)	-0.62	(0.04)	0.44	(0.05)	-2.86	(0.07)	0.82	(0.05)	**3.69**	(0.08)
	Costa Rica	-0.80	(0.04)	1.16	(0.01)	-2.29	(0.03)	-1.23	(0.04)	-0.41	(0.05)	0.73	(0.03)	-2.69	(0.03)	1.02	(0.03)	**3.71**	(0.04)
	Croatia	-0.24	(0.02)	0.82	(0.01)	-1.22	(0.02)	-0.59	(0.01)	-0.03	(0.03)	0.89	(0.02)	-1.44	(0.03)	1.16	(0.02)	**2.60**	(0.04)
	Cyprus*	0.20	(0.01)	0.93	(0.01)	-1.02	(0.01)	-0.15	(0.02)	0.62	(0.02)	1.33	(0.01)	-1.33	(0.03)	1.54	(0.02)	**2.87**	(0.03)
	Dominican Republic	-0.90	(0.03)	1.04	(0.01)	-2.23	(0.04)	-1.27	(0.03)	-0.57	(0.03)	0.46	(0.03)	-2.61	(0.04)	0.78	(0.03)	**3.40**	(0.05)
	FYROM	-0.23	(0.01)	0.90	(0.01)	-1.38	(0.02)	-0.55	(0.01)	0.11	(0.02)	0.90	(0.01)	-1.74	(0.02)	1.12	(0.02)	**2.85**	(0.03)
	Georgia	-0.33	(0.02)	0.88	(0.01)	-1.47	(0.02)	-0.67	(0.03)	0.05	(0.03)	0.76	(0.02)	-1.72	(0.03)	0.96	(0.02)	**2.68**	(0.03)
	Hong Kong (China)	-0.53	(0.03)	0.95	(0.01)	-1.73	(0.02)	-0.91	(0.03)	-0.18	(0.04)	0.69	(0.03)	-2.00	(0.03)	0.96	(0.03)	**2.97**	(0.03)
	Indonesia	-1.87	(0.04)	1.11	(0.02)	-3.20	(0.04)	-2.34	(0.05)	-1.59	(0.05)	-0.36	(0.05)	-3.47	(0.06)	0.21	(0.04)	**3.68**	(0.07)
	Jordan	-0.42	(0.03)	1.01	(0.02)	-1.75	(0.05)	-0.72	(0.03)	0.00	(0.03)	0.77	(0.02)	-2.11	(0.08)	1.01	(0.02)	**3.12**	(0.08)
	Kosovo	-0.14	(0.02)	0.87	(0.01)	-1.25	(0.02)	-0.44	(0.02)	0.16	(0.02)	0.97	(0.02)	-1.61	(0.04)	1.23	(0.02)	**2.83**	(0.04)
	Lebanon	-0.60	(0.04)	1.07	(0.02)	-2.05	(0.05)	-0.87	(0.04)	-0.18	(0.04)	0.68	(0.05)	-2.48	(0.05)	1.02	(0.04)	**3.51**	(0.05)
	Lithuania	-0.06	(0.02)	0.87	(0.01)	-1.24	(0.02)	-0.37	(0.03)	0.38	(0.03)	0.97	(0.02)	-1.44	(0.02)	1.14	(0.02)	**2.58**	(0.03)
	Macao (China)	-0.54	(0.01)	0.86	(0.01)	-1.59	(0.02)	-0.87	(0.01)	-0.30	(0.01)	0.60	(0.01)	-1.90	(0.02)	0.95	(0.02)	**2.84**	(0.03)
	Malta	-0.05	(0.01)	0.95	(0.01)	-1.27	(0.02)	-0.44	(0.02)	0.31	(0.02)	1.19	(0.02)	-1.51	(0.02)	1.46	(0.03)	**2.97**	(0.03)
	Moldova	-0.69	(0.02)	0.90	(0.01)	-1.79	(0.03)	-1.02	(0.02)	-0.42	(0.03)	0.49	(0.03)	-2.09	(0.02)	0.81	(0.04)	**2.90**	(0.04)
	Montenegro	-0.18	(0.01)	0.83	(0.01)	-1.23	(0.01)	-0.48	(0.01)	0.13	(0.01)	0.88	(0.01)	-1.49	(0.01)	1.08	(0.02)	**2.58**	(0.02)
	Peru	-1.08	(0.04)	1.20	(0.02)	-2.56	(0.03)	-1.58	(0.04)	-0.74	(0.05)	0.55	(0.05)	-2.91	(0.03)	0.98	(0.05)	**3.89**	(0.05)
	Qatar	0.58	(0.01)	0.78	(0.01)	-0.47	(0.01)	0.47	(0.01)	0.89	(0.01)	1.42	(0.01)	-0.89	(0.03)	1.61	(0.01)	**2.50**	(0.03)
	Romania	-0.58	(0.04)	0.87	(0.02)	-1.59	(0.03)	-0.91	(0.02)	-0.43	(0.05)	0.60	(0.06)	-1.88	(0.05)	0.97	(0.04)	**2.85**	(0.06)
	Russia	0.05	(0.02)	0.75	(0.01)	-0.95	(0.03)	-0.20	(0.03)	0.40	(0.03)	0.95	(0.02)	-1.19	(0.04)	1.09	(0.02)	**2.28**	(0.04)
	Singapore	0.03	(0.01)	0.91	(0.01)	-1.22	(0.02)	-0.20	(0.02)	0.45	(0.02)	1.09	(0.01)	-1.61	(0.03)	1.27	(0.02)	**2.88**	(0.04)
	Chinese Taipei	-0.21	(0.02)	0.83	(0.01)	-1.28	(0.02)	-0.51	(0.02)	0.11	(0.03)	0.84	(0.02)	-1.56	(0.03)	1.07	(0.02)	**2.63**	(0.03)
	Thailand	-1.23	(0.04)	1.10	(0.02)	-2.53	(0.02)	-1.70	(0.03)	-0.98	(0.04)	0.29	(0.07)	-2.80	(0.02)	0.81	(0.05)	**3.61**	(0.05)
	Trinidad and Tobago	-0.23	(0.01)	0.93	(0.01)	-1.44	(0.02)	-0.51	(0.02)	0.11	(0.02)	0.93	(0.02)	-1.83	(0.05)	1.23	(0.04)	**3.07**	(0.07)
	Tunisia	-0.83	(0.03)	1.16	(0.02)	-2.31	(0.04)	-1.24	(0.03)	-0.48	(0.04)	0.69	(0.04)	-2.76	(0.05)	1.06	(0.04)	**3.82**	(0.06)
	United Arab Emirates	0.50	(0.01)	0.74	(0.01)	-0.49	(0.03)	0.37	(0.02)	0.79	(0.01)	1.32	(0.01)	-0.84	(0.04)	1.51	(0.01)	**2.35**	(0.04)
	Uruguay	-0.78	(0.02)	1.10	(0.01)	-2.12	(0.02)	-1.25	(0.02)	-0.46	(0.03)	0.71	(0.04)	-2.43	(0.02)	1.15	(0.04)	**3.58**	(0.04)
	Viet Nam	-1.87	(0.05)	1.11	(0.03)	-3.15	(0.06)	-2.29	(0.04)	-1.67	(0.05)	-0.36	(0.07)	-3.47	(0.07)	0.29	(0.13)	**3.76**	(0.14)
	Argentina**	-0.79	(0.04)	1.16	(0.01)	-2.28	(0.04)	-1.23	(0.05)	-0.39	(0.06)	0.73	(0.04)	-2.64	(0.03)	1.07	(0.03)	**3.71**	(0.04)
	Kazakhstan**	-0.19	(0.02)	0.70	(0.01)	-1.11	(0.02)	-0.44	(0.02)	0.13	(0.02)	0.66	(0.02)	-1.34	(0.04)	0.81	(0.02)	**2.15**	(0.04)
	Malaysia**	-0.47	(0.04)	1.09	(0.02)	-1.82	(0.04)	-0.91	(0.04)	-0.12	(0.05)	0.96	(0.04)	-2.21	(0.06)	1.34	(0.03)	**3.54**	(0.06)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.3a Socio-economic status and science performance

Results based on students' self-reports

		Unadjusted science score		Science score adjusted by ESCS[1]		Percentage of variance in student performance in science explained by ESCS (strength of the socio-economic gradient)		Score-point difference in science associated with one-unit increase in ESCS (slope of the socio-economic gradient)		Performance in science, by socio-economic status: Bottom quarter of ESCS		Second quarter of ESCS		Third quarter of ESCS		Top quarter of ESCS		Difference in science performance between students in the top quarter and students in the bottom quarter of ESCS	
		Mean score	S.E.	Mean score	S.E.	%	S.E.	Score dif.	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.
OECD	Australia	510	(1.5)	500	(1.5)	11.7	(0.8)	**44**	(1.5)	468	(2.4)	497	(2.1)	525	(2.6)	559	(2.6)	**92**	(3.4)
	Austria	495	(2.4)	492	(2.0)	15.9	(1.3)	**45**	(2.0)	448	(3.3)	478	(4.2)	512	(3.5)	545	(4.1)	**97**	(5.4)
	Belgium	502	(2.3)	496	(1.7)	19.3	(1.3)	**48**	(1.8)	450	(3.7)	482	(3.1)	522	(3.3)	560	(3.0)	**111**	(4.9)
	Canada	528	(2.1)	511	(1.8)	8.8	(0.7)	**34**	(1.5)	492	(2.7)	518	(2.5)	542	(3.1)	563	(3.0)	**71**	(3.4)
	Chile	447	(2.4)	463	(2.2)	16.9	(1.3)	**32**	(1.4)	402	(3.5)	441	(4.3)	452	(3.5)	497	(3.4)	**95**	(4.7)
	Czech Republic	493	(2.3)	505	(2.0)	18.8	(1.2)	**52**	(2.1)	444	(4.0)	476	(3.1)	505	(3.2)	551	(3.2)	**107**	(4.9)
	Denmark	502	(2.4)	483	(2.0)	10.4	(1.0)	**34**	(1.7)	467	(2.8)	489	(3.4)	512	(3.8)	543	(3.8)	**76**	(4.4)
	Estonia	534	(2.1)	533	(2.0)	7.8	(0.9)	**32**	(1.8)	504	(3.5)	524	(3.3)	539	(3.3)	573	(2.8)	**69**	(4.2)
	Finland	531	(2.4)	521	(2.1)	10.0	(1.0)	**40**	(2.3)	494	(3.6)	517	(3.3)	542	(3.7)	572	(3.8)	**78**	(4.9)
	France	495	(2.1)	505	(1.7)	20.3	(1.3)	**57**	(2.0)	441	(3.3)	477	(3.1)	515	(3.4)	558	(3.3)	**118**	(5.0)
	Germany	509	(2.7)	511	(2.3)	15.8	(1.2)	**42**	(1.9)	466	(4.5)	503	(3.6)	527	(3.7)	569	(3.9)	**103**	(5.1)
	Greece	455	(3.9)	458	(3.3)	12.5	(1.3)	**34**	(2.1)	415	(5.1)	441	(4.8)	461	(5.0)	503	(4.5)	**88**	(5.6)
	Hungary	477	(2.4)	487	(2.1)	21.4	(1.4)	**47**	(1.9)	420	(4.1)	466	(3.8)	486	(4.4)	537	(3.7)	**117**	(5.3)
	Iceland	473	(1.7)	454	(2.3)	4.9	(0.8)	**28**	(2.1)	448	(3.1)	466	(3.9)	482	(3.7)	500	(3.4)	**52**	(4.5)
	Ireland	503	(2.4)	497	(2.2)	12.7	(1.0)	**38**	(1.6)	465	(3.3)	489	(3.6)	513	(3.5)	545	(3.3)	**80**	(3.8)
	Israel	467	(3.4)	461	(2.8)	11.2	(1.3)	**42**	(2.3)	417	(4.9)	454	(4.6)	491	(5.2)	511	(3.9)	**94**	(6.1)
	Italy	481	(2.5)	484	(2.4)	9.6	(1.0)	**30**	(1.7)	442	(3.6)	476	(3.3)	490	(3.9)	518	(3.7)	**76**	(5.0)
	Japan	538	(3.0)	547	(2.7)	10.1	(1.0)	**42**	(2.2)	498	(3.9)	533	(3.7)	549	(3.9)	578	(3.7)	**80**	(4.6)
	Korea	516	(3.1)	525	(2.6)	10.1	(1.3)	**44**	(2.7)	480	(4.1)	502	(3.7)	527	(4.2)	556	(4.9)	**76**	(5.5)
	Latvia	490	(1.6)	502	(1.5)	8.7	(1.0)	**26**	(1.6)	461	(3.0)	478	(2.7)	500	(3.6)	524	(2.7)	**63**	(4.0)
	Luxembourg	483	(1.1)	481	(1.2)	20.8	(1.0)	**41**	(1.1)	425	(2.7)	463	(2.8)	496	(2.9)	551	(2.6)	**125**	(3.7)
	Mexico	416	(2.1)	440	(2.4)	10.9	(1.3)	**19**	(1.1)	386	(3.2)	408	(2.8)	423	(3.1)	446	(3.3)	**60**	(4.2)
	Netherlands	509	(2.3)	502	(2.2)	12.5	(1.3)	**47**	(2.6)	465	(3.9)	494	(4.0)	519	(3.2)	559	(3.8)	**95**	(5.7)
	New Zealand	513	(2.4)	508	(2.1)	13.6	(1.2)	**49**	(2.6)	463	(3.8)	504	(4.5)	533	(3.6)	565	(3.7)	**101**	(5.6)
	Norway	498	(2.3)	482	(1.8)	8.2	(0.9)	**37**	(2.2)	463	(3.1)	489	(3.3)	512	(3.8)	535	(3.4)	**72**	(4.1)
	Poland	501	(2.5)	518	(2.3)	13.4	(1.3)	**40**	(2.0)	463	(3.6)	488	(3.6)	508	(4.5)	549	(3.8)	**86**	(4.8)
	Portugal	501	(2.4)	514	(2.1)	14.9	(1.4)	**31**	(1.5)	459	(3.6)	487	(3.4)	504	(4.1)	556	(3.7)	**96**	(5.0)
	Slovak Republic	461	(2.6)	467	(2.3)	16.0	(1.4)	**41**	(2.3)	413	(5.0)	452	(3.1)	470	(3.4)	513	(4.3)	**101**	(6.3)
	Slovenia	513	(1.3)	512	(1.3)	13.5	(0.9)	**43**	(1.5)	471	(2.9)	496	(3.2)	527	(2.8)	560	(2.5)	**88**	(3.8)
	Spain	493	(2.1)	507	(1.8)	13.4	(1.1)	**27**	(1.1)	454	(3.1)	480	(2.7)	503	(3.4)	536	(3.1)	**82**	(4.0)
	Sweden	493	(3.6)	481	(2.6)	12.2	(1.1)	**44**	(2.2)	450	(3.1)	478	(4.3)	513	(4.6)	543	(5.4)	**94**	(5.0)
	Switzerland	506	(2.9)	500	(2.5)	15.6	(1.2)	**43**	(1.9)	455	(3.9)	496	(3.9)	513	(4.4)	561	(3.9)	**106**	(5.0)
	Turkey	425	(3.9)	455	(4.8)	9.0	(1.9)	**20**	(2.1)	400	(5.0)	416	(4.3)	428	(4.5)	459	(7.1)	**59**	(7.9)
	United Kingdom	509	(2.6)	504	(2.0)	10.5	(1.0)	**37**	(1.9)	473	(3.1)	490	(3.8)	525	(4.1)	557	(3.8)	**84**	(4.4)
	United States	496	(3.2)	494	(2.5)	11.4	(1.1)	**33**	(1.8)	457	(4.1)	478	(3.9)	508	(5.6)	546	(4.0)	**90**	(5.6)
	OECD average	493	(0.4)	494	(0.4)	12.9	(0.2)	**38**	(0.3)	452	(0.6)	481	(0.6)	505	(0.6)	540	(0.6)	**88**	(0.8)
Partners	Albania	427	(3.3)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	376	(2.6)	387	(4.8)	1.4	(0.8)	**8**	(2.3)	369	(2.9)	370	(3.1)	374	(3.2)	391	(6.2)	**22**	(6.9)
	Brazil	401	(2.3)	428	(3.0)	12.5	(1.3)	**27**	(1.6)	368	(2.5)	390	(2.2)	401	(3.0)	450	(5.1)	**82**	(5.4)
	B-S-J-G (China)	518	(4.6)	561	(4.6)	18.5	(2.4)	**40**	(2.5)	460	(5.9)	506	(5.3)	528	(5.2)	578	(8.5)	**118**	(9.7)
	Bulgaria	446	(4.4)	450	(3.5)	16.4	(1.5)	**41**	(2.3)	395	(6.0)	428	(5.1)	464	(5.6)	502	(4.9)	**107**	(6.6)
	CABA (Argentina)	475	(6.3)	475	(4.2)	25.6	(2.9)	**37**	(2.6)	412	(6.7)	465	(7.4)	500	(11.6)	524	(8.0)	**112**	(9.6)
	Colombia	416	(2.4)	442	(2.6)	13.7	(1.7)	**27**	(1.8)	385	(3.1)	399	(3.0)	419	(3.5)	461	(4.8)	**76**	(5.9)
	Costa Rica	420	(2.1)	439	(2.2)	15.6	(1.4)	**24**	(1.3)	390	(2.7)	405	(2.5)	424	(3.4)	460	(3.6)	**71**	(4.3)
	Croatia	475	(2.5)	485	(2.3)	12.1	(1.1)	**38**	(1.9)	444	(3.3)	460	(3.4)	477	(3.0)	522	(4.1)	**78**	(4.8)
	Cyprus*	433	(1.4)	427	(1.3)	9.5	(0.9)	**31**	(1.5)	399	(2.4)	420	(2.8)	440	(3.0)	474	(2.8)	**76**	(3.6)
	Dominican Republic	332	(2.6)	354	(3.6)	12.9	(1.7)	**25**	(2.1)	305	(3.0)	318	(2.7)	332	(4.3)	372	(5.5)	**66**	(6.2)
	FYROM	384	(1.2)	390	(1.4)	6.9	(0.8)	**25**	(1.6)	358	(2.7)	378	(2.8)	389	(2.4)	413	(3.0)	**55**	(4.3)
	Georgia	411	(2.4)	423	(2.5)	11.1	(1.1)	**34**	(2.0)	375	(3.1)	394	(3.4)	424	(4.2)	453	(4.2)	**78**	(4.9)
	Hong Kong (China)	523	(2.5)	534	(2.5)	4.9	(0.9)	**19**	(1.9)	504	(3.3)	516	(3.2)	526	(3.5)	550	(4.2)	**45**	(5.2)
	Indonesia	403	(2.6)	445	(4.3)	13.2	(2.0)	**22**	(1.8)	378	(3.6)	393	(3.0)	403	(3.4)	438	(5.0)	**60**	(6.1)
	Jordan	409	(2.7)	421	(2.5)	9.4	(1.3)	**25**	(1.8)	375	(4.0)	404	(3.4)	419	(3.6)	442	(3.6)	**67**	(5.3)
	Kosovo	378	(1.7)	382	(1.7)	5.1	(0.8)	**18**	(1.6)	363	(2.8)	372	(2.6)	377	(2.9)	405	(3.2)	**42**	(3.9)
	Lebanon	386	(3.4)	403	(3.9)	9.7	(1.8)	**26**	(2.5)	356	(4.0)	376	(3.7)	387	(4.5)	428	(7.4)	**73**	(8.2)
	Lithuania	475	(2.7)	478	(2.3)	11.6	(1.3)	**36**	(2.1)	438	(3.1)	458	(3.0)	488	(4.5)	520	(4.3)	**82**	(5.1)
	Macao (China)	529	(1.1)	535	(1.4)	1.7	(0.4)	**12**	(1.7)	516	(2.5)	526	(2.0)	529	(2.4)	543	(2.5)	**27**	(3.9)
	Malta	465	(1.6)	468	(1.7)	14.5	(1.0)	**47**	(1.8)	412	(3.4)	448	(4.0)	477	(3.9)	525	(3.7)	**113**	(5.1)
	Moldova	428	(2.0)	451	(2.3)	11.6	(1.3)	**33**	(1.9)	392	(3.2)	422	(3.1)	431	(3.3)	468	(3.8)	**76**	(5.1)
	Montenegro	411	(1.0)	416	(1.1)	5.0	(0.6)	**23**	(1.5)	389	(2.2)	403	(2.4)	414	(2.5)	441	(2.6)	**52**	(3.7)
	Peru	397	(2.4)	429	(2.6)	21.6	(1.8)	**30**	(1.4)	350	(2.4)	387	(3.3)	406	(3.3)	444	(4.4)	**94**	(4.8)
	Qatar	418	(1.0)	403	(1.2)	4.4	(0.4)	**27**	(1.4)	381	(1.8)	419	(2.2)	439	(2.1)	436	(2.0)	**55**	(2.8)
	Romania	435	(3.2)	455	(3.0)	13.8	(1.8)	**34**	(2.4)	401	(4.1)	423	(3.5)	439	(4.2)	477	(6.0)	**76**	(6.9)
	Russia	487	(2.9)	487	(2.6)	6.7	(1.0)	**29**	(2.4)	458	(4.2)	480	(4.3)	499	(3.8)	516	(3.4)	**58**	(4.6)
	Singapore	556	(1.2)	554	(1.3)	16.8	(1.0)	**47**	(1.5)	497	(2.8)	543	(2.8)	574	(2.7)	609	(3.3)	**113**	(4.5)
	Chinese Taipei	532	(2.7)	542	(2.2)	14.1	(1.4)	**45**	(2.7)	485	(4.2)	518	(3.0)	544	(3.9)	583	(5.0)	**98**	(6.6)
	Thailand	421	(2.8)	448	(4.4)	9.0	(1.9)	**22**	(2.3)	403	(2.8)	407	(2.9)	418	(4.0)	460	(7.3)	**57**	(8.0)
	Trinidad and Tobago	425	(1.4)	435	(1.5)	10.0	(0.9)	**31**	(1.4)	394	(2.7)	413	(2.7)	432	(3.4)	471	(2.9)	**77**	(3.8)
	Tunisia	386	(2.1)	401	(2.7)	9.0	(1.5)	**17**	(1.7)	366	(2.6)	377	(2.9)	387	(3.2)	418	(4.7)	**53**	(5.3)
	United Arab Emirates	437	(2.4)	423	(2.2)	4.9	(0.6)	**30**	(1.8)	401	(2.8)	432	(3.7)	458	(3.0)	460	(3.6)	**59**	(4.0)
	Uruguay	435	(2.2)	460	(2.3)	16.1	(1.3)	**32**	(1.4)	397	(2.5)	419	(3.1)	440	(3.5)	487	(4.2)	**89**	(4.7)
	Viet Nam	525	(3.9)	567	(6.8)	10.8	(2.2)	**23**	(2.7)	503	(5.0)	512	(3.4)	524	(4.6)	560	(7.5)	**57**	(7.6)
	Argentina**	432	(2.9)	452	(2.8)	12.8	(1.4)	**25**	(1.5)	399	(3.4)	419	(4.8)	437	(3.3)	474	(4.7)	**75**	(5.5)
	Kazakhstan**	456	(3.7)	461	(3.8)	4.5	(1.1)	**23**	(2.9)	436	(3.7)	453	(4.8)	460	(4.4)	477	(5.4)	**41**	(5.7)
	Malaysia**	443	(3.0)	455	(2.8)	12.6	(1.5)	**25**	(1.6)	412	(3.6)	429	(3.4)	449	(4.3)	482	(5.1)	**69**	(5.6)

1. ESCS refers to the PISA index of economic, social and cultural status.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.4a Science performance, by international deciles of socio-economic status

Results based on students' self-reports

		Science performance, by international deciles of ESCS[1]												Percentage of students in bottom two international deciles of ESCS		Percentage of students in top two international deciles of ESCS	
		All students		Bottom decile		Second decile		Middle decile		Ninth decile		Top decile					
		Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	%	S.E.	%	S.E.
OECD	Australia	510	(1.5)	400	(14.5)	423	(12.8)	479	(2.7)	530	(2.5)	561	(2.6)	3.8	(0.2)	35.5	(0.6)
	Austria	495	(2.4)	c	c	390	(13.7)	465	(4.1)	521	(4.3)	552	(3.8)	4.9	(0.5)	26.1	(0.8)
	Belgium	502	(2.3)	368	(13.1)	397	(9.0)	467	(3.9)	533	(2.7)	561	(2.7)	6.5	(0.4)	33.7	(0.9)
	Canada	528	(2.1)	c	c	442	(14.3)	493	(3.9)	531	(2.3)	560	(2.5)	2.3	(0.2)	47.9	(1.0)
	Chile	447	(2.4)	371	(8.2)	399	(4.4)	449	(5.1)	477	(5.2)	516	(3.4)	27.0	(1.1)	18.4	(0.7)
	Czech Republic	493	(2.3)	c	c	399	(10.2)	473	(3.0)	547	(3.9)	565	(4.6)	9.2	(0.5)	16.2	(0.5)
	Denmark	502	(2.4)	377	(17.7)	393	(18.6)	472	(5.3)	498	(4.3)	531	(2.8)	2.7	(0.2)	52.8	(1.1)
	Estonia	534	(2.1)	c	c	c	c	509	(4.1)	561	(3.1)	578	(3.6)	4.8	(0.4)	23.3	(0.7)
	Finland	531	(2.4)	c	c	c	c	507	(4.0)	548	(2.9)	575	(3.5)	2.1	(0.2)	32.7	(1.2)
	France	495	(2.1)	c	c	402	(11.4)	471	(3.9)	555	(3.3)	567	(4.2)	8.6	(0.5)	18.2	(0.7)
	Germany	509	(2.7)	c	c	412	(14.4)	495	(4.0)	536	(3.8)	571	(3.2)	7.2	(0.4)	38.9	(1.0)
	Greece	455	(3.9)	c	c	383	(10.0)	434	(6.1)	481	(4.6)	507	(4.5)	12.9	(0.9)	25.9	(1.1)
	Hungary	477	(2.4)	345	(17.3)	360	(6.8)	472	(4.7)	523	(4.3)	547	(4.1)	16.1	(0.7)	21.9	(0.7)
	Iceland	473	(1.7)	c	c	c	c	441	(8.3)	474	(4.6)	491	(2.6)	1.0	(0.2)	57.0	(0.9)
	Ireland	503	(2.4)	c	c	430	(13.7)	475	(4.2)	523	(3.7)	548	(3.2)	4.9	(0.4)	30.6	(1.2)
	Israel	467	(3.4)	379	(19.9)	381	(10.7)	431	(4.4)	505	(4.5)	507	(4.3)	6.2	(0.6)	28.6	(1.1)
	Italy	481	(2.5)	c	c	414	(8.1)	470	(4.1)	501	(4.8)	524	(3.9)	14.6	(0.5)	24.4	(0.7)
	Japan	538	(3.0)	c	c	469	(11.9)	525	(3.7)	576	(3.9)	590	(6.2)	7.9	(0.5)	11.4	(0.5)
	Korea	516	(3.1)	c	c	425	(17.4)	498	(3.4)	560	(5.1)	574	(7.9)	6.5	(0.5)	9.5	(0.7)
	Latvia	490	(1.6)	c	c	443	(6.3)	484	(3.8)	531	(3.4)	517	(6.8)	25.5	(0.8)	11.0	(0.7)
	Luxembourg	483	(1.1)	413	(9.8)	413	(6.1)	443	(4.5)	504	(4.3)	550	(2.4)	14.3	(0.4)	34.1	(0.5)
	Mexico	416	(2.1)	382	(3.2)	399	(2.6)	425	(3.9)	458	(4.2)	474	(6.4)	53.4	(1.3)	7.8	(0.7)
	Netherlands	509	(2.3)	c	c	430	(18.1)	471	(4.6)	535	(3.6)	567	(4.2)	3.6	(0.4)	27.5	(1.0)
	New Zealand	513	(2.4)	c	c	c	c	476	(5.6)	548	(4.0)	569	(4.1)	4.8	(0.4)	29.4	(1.0)
	Norway	498	(2.3)	c	c	c	c	465	(5.2)	509	(3.5)	533	(3.2)	1.3	(0.2)	44.7	(1.1)
	Poland	501	(2.5)	c	c	422	(11.6)	490	(4.1)	549	(4.6)	565	(5.9)	15.5	(0.8)	13.0	(0.6)
	Portugal	501	(2.4)	435	(6.9)	454	(4.7)	497	(4.4)	541	(4.4)	561	(4.1)	28.0	(1.0)	23.5	(1.1)
	Slovak Republic	461	(2.6)	330	(14.5)	343	(12.0)	449	(3.4)	493	(4.1)	523	(4.3)	7.6	(0.6)	22.5	(0.9)
	Slovenia	513	(1.3)	c	c	402	(14.7)	482	(3.7)	542	(3.8)	568	(3.4)	5.4	(0.3)	24.6	(0.7)
	Spain	493	(2.1)	416	(5.4)	457	(3.9)	487	(4.1)	530	(3.3)	541	(3.5)	30.9	(1.1)	19.9	(1.0)
	Sweden	493	(3.6)	c	c	393	(15.1)	465	(4.7)	512	(4.1)	542	(4.8)	3.4	(0.3)	38.7	(1.1)
	Switzerland	506	(2.9)	c	c	427	(11.6)	479	(4.9)	521	(4.9)	563	(3.8)	8.1	(0.6)	30.9	(1.1)
	Turkey	425	(3.9)	398	(4.5)	416	(4.3)	429	(5.1)	487	(8.4)	502	(12.5)	58.6	(1.7)	4.4	(0.7)
	United Kingdom	509	(2.6)	c	c	410	(14.3)	484	(4.1)	527	(4.1)	560	(3.4)	4.6	(0.3)	34.6	(1.1)
	United States	496	(3.2)	430	(12.3)	437	(10.7)	463	(5.0)	518	(4.1)	546	(3.8)	10.8	(0.9)	32.4	(1.3)
	OECD average	493	(0.4)	388	(3.5)	412	(2.1)	472	(0.8)	522	(0.7)	546	(0.8)	12.1	(0.1)	27.2	(0.2)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m	38.1	(1.2)	9.0	(1.3)
	Algeria	376	(2.6)	371	(3.1)	367	(4.3)	375	(5.2)	413	(11.5)	423	(21.3)	51.7	(1.7)	3.9	(0.4)
	Brazil	401	(2.3)	360	(3.1)	374	(2.8)	402	(3.4)	458	(5.0)	491	(6.4)	43.1	(0.9)	14.4	(0.9)
	B-S-J-G (China)	518	(4.6)	445	(6.1)	472	(5.4)	528	(5.3)	595	(8.3)	615	(8.0)	51.9	(1.4)	8.4	(1.1)
	Bulgaria	446	(4.4)	342	(13.9)	344	(9.1)	421	(5.3)	483	(5.0)	506	(5.1)	13.2	(0.9)	28.1	(1.0)
	CABA (Argentina)	475	(6.3)	379	(11.6)	401	(9.7)	454	(6.6)	505	(7.9)	523	(7.0)	17.7	(1.9)	38.8	(3.7)
	Colombia	416	(2.4)	382	(4.4)	385	(3.4)	419	(4.2)	478	(5.2)	506	(8.6)	43.3	(1.3)	7.9	(0.8)
	Costa Rica	420	(2.1)	376	(4.0)	396	(2.8)	417	(4.2)	462	(3.3)	482	(6.1)	38.3	(1.2)	13.7	(0.9)
	Croatia	475	(2.5)	c	c	414	(9.8)	460	(3.8)	507	(4.9)	546	(4.7)	9.5	(0.5)	17.1	(0.7)
	Cyprus*	433	(1.4)	c	c	382	(7.6)	411	(3.7)	445	(3.8)	474	(2.7)	6.4	(0.3)	35.4	(0.6)
	Dominican Republic	332	(2.6)	296	(5.0)	310	(3.4)	332	(4.3)	390	(6.2)	416	(8.7)	40.3	(1.2)	6.9	(0.6)
	FYROM	384	(1.2)	295	(10.6)	342	(7.0)	378	(3.8)	406	(3.7)	424	(4.7)	13.0	(0.5)	17.9	(0.5)
	Georgia	411	(2.4)	348	(15.4)	349	(7.1)	395	(3.9)	455	(4.8)	456	(5.8)	18.5	(0.7)	12.4	(0.7)
	Hong Kong (China)	523	(2.5)	470	(9.3)	499	(5.3)	518	(4.1)	550	(5.1)	566	(5.9)	26.3	(1.0)	12.5	(1.1)
	Indonesia	403	(2.6)	382	(3.1)	396	(3.0)	427	(5.8)	508	(8.3)	505	(11.4)	73.7	(1.3)	0.9	(0.2)
	Jordan	409	(2.7)	348	(6.9)	366	(5.8)	405	(4.1)	444	(4.4)	448	(6.1)	21.1	(1.0)	13.2	(0.7)
	Kosovo	378	(1.7)	342	(10.4)	352	(6.8)	371	(3.2)	394	(4.1)	416	(4.2)	10.2	(0.6)	19.4	(0.8)
	Lebanon	386	(3.4)	346	(7.7)	353	(5.3)	383	(4.6)	440	(7.7)	465	(8.9)	27.1	(1.3)	10.2	(0.9)
	Lithuania	475	(2.7)	c	c	391	(10.1)	454	(3.9)	511	(4.2)	523	(5.2)	11.7	(0.5)	24.0	(1.1)
	Macao (China)	529	(1.1)	516	(11.7)	507	(6.2)	529	(2.7)	546	(4.6)	566	(5.6)	22.3	(0.5)	9.0	(0.4)
	Malta	465	(1.6)	c	c	354	(17.0)	438	(5.5)	491	(4.8)	535	(4.1)	13.3	(0.5)	25.9	(0.7)
	Moldova	428	(2.0)	359	(8.9)	379	(5.4)	426	(3.8)	475	(5.5)	492	(8.4)	28.4	(0.9)	6.9	(0.6)
	Montenegro	411	(1.0)	c	c	363	(8.7)	404	(3.3)	443	(3.5)	442	(4.4)	11.0	(0.4)	17.0	(0.6)
	Peru	397	(2.4)	343	(3.1)	363	(2.5)	405	(3.9)	452	(4.6)	473	(7.0)	49.8	(1.3)	9.1	(0.9)
	Qatar	418	(1.0)	c	c	358	(8.1)	372	(3.5)	432	(2.0)	438	(1.8)	3.1	(0.2)	48.3	(0.5)
	Romania	435	(3.2)	388	(9.0)	384	(5.9)	432	(3.9)	480	(4.8)	506	(7.6)	20.4	(1.2)	9.5	(1.0)
	Russia	487	(2.9)	c	c	c	c	464	(4.9)	514	(3.2)	512	(5.7)	4.7	(0.5)	23.8	(1.1)
	Singapore	556	(1.2)	456	(11.5)	474	(6.5)	520	(4.0)	592	(3.9)	613	(3.0)	10.8	(0.4)	27.2	(0.6)
	Chinese Taipei	532	(2.7)	434	(17.3)	459	(7.9)	516	(3.5)	575	(4.4)	604	(6.4)	12.3	(0.6)	13.5	(0.8)
	Thailand	421	(2.8)	400	(3.3)	407	(2.6)	424	(5.6)	478	(7.1)	502	(9.4)	55.1	(1.3)	7.9	(0.7)
	Trinidad and Tobago	425	(1.4)	365	(10.2)	378	(8.0)	413	(3.4)	460	(4.8)	489	(4.6)	14.2	(0.5)	18.3	(0.6)
	Tunisia	386	(2.1)	367	(4.0)	362	(3.1)	385	(4.3)	417	(4.5)	445	(9.9)	38.6	(1.1)	14.8	(0.9)
	United Arab Emirates	437	(2.4)	c	c	370	(17.7)	402	(4.4)	455	(2.9)	460	(3.5)	2.8	(0.3)	42.2	(0.8)
	Uruguay	435	(2.2)	389	(4.6)	396	(3.2)	435	(4.4)	480	(5.2)	515	(4.8)	39.2	(0.9)	12.8	(0.8)
	Viet Nam	525	(3.9)	504	(4.4)	515	(3.5)	548	(7.1)	601	(11.1)	610	(17.4)	76.3	(1.5)	2.5	(0.4)
	Argentina**	432	(2.9)	386	(5.0)	407	(4.1)	434	(4.3)	474	(4.8)	496	(5.5)	38.1	(1.6)	12.4	(0.8)
	Kazakhstan**	456	(3.7)	c	c	401	(14.1)	451	(5.3)	480	(6.0)	492	(11.7)	7.3	(0.6)	7.0	(0.6)
	Malaysia**	443	(3.0)	395	(6.4)	406	(4.6)	435	(3.9)	477	(5.3)	490	(4.6)	27.4	(1.4)	16.8	(1.0)

1. ESCS refers to the PISA index of economic, social and cultural status. International deciles refer to the distribution of students on the ESCS index across all countries and economies.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.5 Association of socio-economic status with low, average and high student performance in science

Results based on students' self-reports

		Mean performance in science		Quantile regression estimates of science performance on ESCS[1]										Score-point difference in science associated with one-unit increase in ESCS (slope of the socio-economic gradient)		Difference between coefficients for 90th and 10th percentiles of the performance distribution		Difference between coefficients for 50th and 10th percentiles of the performance distribution		Difference between coefficients for 90th and 50th percentiles of the performance distribution	
				10th percentile of performance distribution		25th percentile of performance distribution		50th percentile of performance distribution		75th percentile of performance distribution		90th percentile of performance distribution									
		Mean score	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Score dif.	S.E.	Dif.	S.E.	Dif.	S.E.	Dif.	S.E.
OECD	Australia	510	(1.5)	42	(3.0)	49	(2.2)	48	(2.4)	42	(1.8)	40	(2.2)	**44**	(1.5)	-2	(3.7)	6	(3.2)	**-8**	(3.3)
	Austria	495	(2.4)	36	(4.2)	47	(2.6)	51	(2.7)	47	(3.3)	45	(3.5)	**45**	(2.0)	9	(5.2)	**14**	(4.6)	-5	(3.0)
	Belgium	502	(2.3)	43	(3.4)	53	(1.9)	54	(2.0)	48	(2.6)	42	(2.7)	**48**	(1.8)	-2	(4.6)	**11**	(3.5)	**-13**	(2.8)
	Canada	528	(2.1)	30	(2.1)	36	(2.2)	36	(1.7)	34	(1.5)	33	(2.8)	**34**	(1.5)	3	(3.2)	**6**	(2.1)	-3	(2.6)
	Chile	447	(2.4)	27	(2.5)	32	(2.0)	35	(1.6)	35	(1.8)	32	(2.3)	**32**	(1.4)	6	(3.1)	**9**	(2.4)	-3	(2.2)
	Czech Republic	493	(2.3)	44	(3.2)	52	(2.9)	57	(3.5)	55	(2.8)	54	(2.6)	**52**	(2.1)	**10**	(4.1)	**13**	(3.9)	-4	(3.3)
	Denmark	502	(2.4)	30	(2.4)	34	(2.2)	35	(2.5)	35	(2.3)	35	(3.3)	**34**	(1.7)	5	(4.0)	5	(2.6)	0	(3.7)
	Estonia	534	(2.1)	28	(3.5)	35	(2.8)	36	(2.2)	33	(2.3)	31	(3.7)	**32**	(1.8)	3	(4.3)	**8**	(3.4)	-5	(3.6)
	Finland	531	(2.4)	42	(3.8)	45	(3.2)	44	(2.9)	40	(2.6)	35	(3.7)	**40**	(2.3)	-7	(5.0)	1	(3.5)	**-9**	(4.1)
	France	495	(2.1)	55	(3.6)	63	(2.8)	63	(2.4)	56	(2.9)	47	(2.6)	**57**	(2.0)	**-8**	(4.2)	**8**	(3.3)	**-16**	(2.9)
	Germany	509	(2.7)	41	(3.6)	44	(2.7)	45	(2.1)	43	(2.3)	40	(2.4)	**42**	(1.9)	-1	(4.0)	4	(3.3)	-5	(2.5)
	Greece	455	(3.9)	28	(3.7)	35	(2.8)	39	(3.0)	35	(2.1)	32	(2.9)	**34**	(2.1)	3	(4.4)	**10**	(4.0)	-7	(3.6)
	Hungary	477	(2.4)	41	(2.6)	49	(2.7)	51	(2.7)	48	(2.3)	44	(2.7)	**47**	(1.9)	3	(4.0)	**10**	(3.6)	**-7**	(2.8)
	Iceland	473	(1.7)	17	(4.0)	25	(3.0)	33	(3.0)	34	(4.0)	30	(3.9)	**28**	(2.1)	**14**	(5.4)	**17**	(4.6)	-3	(4.0)
	Ireland	503	(2.4)	35	(3.6)	39	(2.0)	40	(2.2)	39	(3.0)	37	(2.6)	**38**	(1.6)	2	(4.3)	6	(3.6)	-3	(3.2)
	Israel	467	(3.4)	24	(3.4)	35	(3.3)	47	(2.8)	51	(2.6)	50	(3.6)	**42**	(2.3)	**26**	(4.8)	**23**	(3.4)	3	(3.9)
	Italy	481	(2.5)	26	(3.1)	31	(2.7)	34	(2.5)	30	(3.0)	27	(2.7)	**30**	(1.7)	1	(4.0)	**8**	(3.2)	**-7**	(3.2)
	Japan	538	(3.0)	46	(3.1)	46	(3.5)	44	(3.1)	40	(3.6)	37	(3.2)	**42**	(2.2)	**-9**	(4.3)	-2	(3.5)	**-8**	(3.2)
	Korea	516	(3.1)	42	(4.5)	49	(4.6)	49	(3.4)	45	(3.1)	40	(3.6)	**44**	(2.7)	-2	(6.1)	7	(4.6)	**-9**	(4.0)
	Latvia	490	(1.6)	20	(2.7)	26	(2.0)	29	(2.2)	30	(2.6)	29	(2.5)	**26**	(1.6)	**8**	(4.1)	**9**	(3.0)	-1	(3.2)
	Luxembourg	483	(1.1)	32	(2.2)	40	(1.8)	45	(1.8)	44	(1.4)	42	(1.7)	**41**	(1.1)	**10**	(2.6)	**13**	(2.5)	-3	(2.0)
	Mexico	416	(2.1)	16	(2.0)	18	(1.7)	20	(1.4)	21	(1.6)	21	(1.7)	**19**	(1.1)	**5**	(2.0)	**4**	(1.9)	0	(1.9)
	Netherlands	509	(2.3)	40	(5.2)	50	(4.1)	54	(3.4)	48	(2.7)	40	(3.0)	**47**	(2.6)	0	(5.9)	**14**	(4.9)	**-14**	(3.4)
	New Zealand	513	(2.4)	39	(5.7)	50	(3.4)	55	(3.7)	53	(3.2)	50	(4.4)	**49**	(2.6)	11	(6.5)	**16**	(6.5)	-5	(4.7)
	Norway	498	(2.3)	30	(3.7)	37	(2.7)	42	(3.2)	41	(3.1)	41	(3.5)	**37**	(2.2)	**10**	(4.6)	**11**	(3.9)	-1	(4.0)
	Poland	501	(2.5)	36	(4.0)	43	(2.4)	44	(2.5)	41	(3.3)	38	(4.2)	**40**	(2.0)	2	(5.6)	**8**	(3.9)	-6	(4.1)
	Portugal	501	(2.4)	28	(2.5)	34	(1.6)	34	(2.9)	31	(2.4)	27	(2.3)	**31**	(1.5)	-2	(3.1)	**6**	(2.8)	**-8**	(2.7)
	Slovak Republic	461	(2.6)	38	(3.3)	44	(2.6)	45	(3.1)	44	(3.3)	39	(3.3)	**41**	(2.3)	1	(3.8)	**7**	(3.2)	**-6**	(2.7)
	Slovenia	513	(1.3)	38	(4.0)	44	(2.1)	47	(2.0)	45	(2.8)	41	(3.7)	**43**	(1.5)	4	(5.0)	**9**	(4.5)	-5	(4.0)
	Spain	493	(2.1)	28	(2.3)	30	(1.5)	28	(1.4)	26	(1.7)	24	(1.7)	**27**	(1.1)	-5	(2.7)	0	(2.2)	**-5**	(1.8)
	Sweden	493	(3.6)	34	(4.0)	43	(3.0)	47	(2.7)	49	(3.2)	47	(3.8)	**44**	(2.2)	**14**	(5.3)	**14**	(3.8)	0	(3.8)
	Switzerland	506	(2.9)	36	(3.6)	45	(3.3)	48	(2.6)	44	(2.2)	40	(3.7)	**43**	(1.9)	4	(5.0)	**13**	(3.9)	**-9**	(3.9)
	Turkey	425	(3.9)	15	(2.0)	18	(2.3)	23	(3.0)	23	(3.1)	21	(2.8)	**20**	(2.1)	**7**	(3.0)	**8**	(3.0)	-2	(2.9)
	United Kingdom	509	(2.6)	31	(3.3)	39	(2.7)	40	(2.2)	39	(2.6)	37	(2.6)	**37**	(1.9)	5	(3.4)	**9**	(3.3)	-4	(2.6)
	United States	496	(3.2)	27	(2.9)	32	(2.5)	36	(2.6)	36	(2.2)	33	(2.9)	**33**	(1.8)	6	(4.2)	**9**	(3.0)	-3	(3.1)
	OECD average	493	(0.4)	33	(0.6)	40	(0.5)	42	(0.4)	40	(0.5)	37	(0.5)	**38**	(0.3)	**4**	(0.7)	**9**	(0.6)	**-5**	(0.6)
Partners	Albania	427	(3.3)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	376	(2.6)	2	(2.6)	3	(2.5)	6	(2.0)	11	(3.2)	17	(2.7)	**8**	(2.3)	**15**	(3.4)	4	(2.3)	**10**	(2.4)
	Brazil	401	(2.3)	15	(1.8)	20	(1.9)	28	(1.9)	34	(1.8)	35	(2.1)	**27**	(1.6)	**20**	(2.2)	**13**	(1.7)	**7**	(1.5)
	B-S-J-G (China)	518	(4.6)	37	(3.6)	46	(3.0)	45	(3.4)	40	(3.3)	34	(3.1)	**40**	(2.5)	-3	(4.1)	**8**	(3.2)	**-11**	(2.6)
	Bulgaria	446	(4.4)	32	(3.1)	41	(2.8)	46	(3.1)	45	(3.1)	42	(4.6)	**41**	(2.3)	11	(5.7)	**15**	(3.6)	-4	(4.6)
	CABA (Argentina)	475	(6.3)	36	(5.2)	38	(3.7)	39	(3.5)	38	(2.6)	35	(3.1)	**37**	(2.6)	-1	(4.9)	3	(5.2)	-4	(4.1)
	Colombia	416	(2.4)	18	(2.3)	23	(2.3)	28	(2.2)	30	(2.5)	30	(1.6)	**27**	(1.8)	**12**	(2.1)	**10**	(2.0)	2	(1.8)
	Costa Rica	420	(2.1)	20	(1.9)	22	(1.7)	24	(1.5)	26	(2.0)	27	(2.1)	**24**	(1.3)	**7**	(2.7)	**5**	(1.7)	3	(1.9)
	Croatia	475	(2.5)	31	(3.2)	37	(2.7)	41	(2.7)	41	(2.5)	38	(2.9)	**38**	(1.9)	7	(4.1)	**10**	(4.1)	-4	(3.2)
	Cyprus*	433	(1.4)	20	(2.5)	27	(2.6)	34	(1.9)	38	(2.1)	37	(2.6)	**31**	(1.5)	**18**	(3.9)	**14**	(2.6)	4	(2.5)
	Dominican Republic	332	(2.6)	12	(3.3)	17	(2.6)	24	(2.2)	30	(2.4)	35	(3.0)	**25**	(2.1)	**23**	(3.8)	**12**	(3.2)	**11**	(2.6)
	FYROM	384	(1.2)	19	(3.1)	21	(2.1)	26	(2.3)	30	(2.7)	31	(2.7)	**25**	(1.6)	**12**	(3.2)	**7**	(3.2)	**5**	(2.6)
	Georgia	411	(2.4)	26	(2.5)	31	(2.9)	36	(2.0)	38	(3.0)	39	(3.2)	**34**	(2.0)	**13**	(3.3)	**9**	(2.6)	4	(3.0)
	Hong Kong (China)	523	(2.5)	23	(3.6)	22	(2.8)	19	(2.3)	17	(2.2)	15	(2.4)	**19**	(1.9)	**-8**	(3.2)	-4	(2.8)	-4	(2.0)
	Indonesia	403	(2.6)	16	(2.3)	19	(1.8)	22	(2.1)	26	(1.5)	27	(2.2)	**22**	(1.8)	**12**	(2.8)	**7**	(2.0)	**5**	(2.3)
	Jordan	409	(2.7)	21	(3.8)	24	(3.0)	27	(2.0)	27	(2.2)	27	(2.9)	**25**	(1.8)	5	(4.3)	5	(3.3)	0	(2.9)
	Kosovo	378	(1.7)	13	(3.3)	16	(2.6)	19	(2.6)	21	(2.0)	23	(2.6)	**18**	(1.6)	**10**	(3.7)	6	(4.1)	4	(3.3)
	Lebanon	386	(3.4)	11	(3.7)	18	(3.0)	27	(3.6)	33	(2.8)	35	(3.8)	**26**	(2.5)	**24**	(5.3)	**16**	(3.3)	8	(4.4)
	Lithuania	475	(2.7)	26	(3.7)	34	(3.0)	40	(2.9)	41	(2.9)	38	(4.0)	**36**	(2.1)	**12**	(4.6)	**14**	(4.0)	-2	(3.0)
	Macao (China)	529	(1.1)	9	(3.3)	13	(2.4)	14	(2.5)	13	(2.3)	13	(2.6)	**12**	(1.7)	4	(3.9)	5	(3.1)	-1	(3.1)
	Malta	465	(1.6)	42	(3.3)	48	(3.0)	51	(2.4)	49	(3.3)	45	(3.2)	**47**	(1.8)	2	(3.8)	**8**	(3.7)	-6	(3.7)
	Moldova	428	(2.0)	29	(3.0)	32	(2.7)	35	(3.6)	34	(2.1)	33	(2.8)	**33**	(1.9)	4	(3.6)	6	(3.2)	-2	(3.4)
	Montenegro	411	(1.0)	16	(2.5)	20	(1.7)	25	(2.2)	28	(1.9)	26	(3.1)	**23**	(1.5)	**10**	(3.5)	**8**	(2.7)	2	(3.3)
	Peru	397	(2.4)	21	(2.0)	26	(1.7)	31	(1.2)	35	(1.9)	35	(1.7)	**30**	(1.4)	**14**	(2.4)	**9**	(1.6)	**4**	(1.6)
	Qatar	418	(1.0)	12	(2.3)	17	(2.0)	28	(1.7)	40	(1.9)	44	(2.7)	**27**	(1.4)	**32**	(3.6)	**17**	(2.5)	**15**	(3.2)
	Romania	435	(3.2)	31	(2.4)	33	(3.2)	35	(2.4)	36	(2.8)	35	(4.1)	**34**	(2.4)	4	(4.2)	4	(2.4)	0	(3.3)
	Russia	487	(2.9)	22	(3.6)	26	(3.3)	31	(2.8)	33	(2.7)	33	(4.3)	**29**	(2.4)	**11**	(5.2)	**9**	(4.0)	2	(4.3)
	Singapore	556	(1.2)	51	(3.0)	54	(2.3)	51	(2.5)	42	(2.0)	38	(2.2)	**47**	(1.5)	**-13**	(3.5)	0	(3.3)	**-13**	(3.0)
	Chinese Taipei	532	(2.7)	45	(3.1)	51	(3.3)	48	(3.4)	42	(3.5)	39	(3.5)	**45**	(2.7)	-5	(3.6)	4	(3.7)	**-9**	(3.2)
	Thailand	421	(2.8)	12	(2.8)	16	(2.4)	22	(2.7)	27	(3.2)	28	(3.3)	**22**	(2.3)	**16**	(3.2)	**10**	(2.4)	**6**	(2.5)
	Trinidad and Tobago	425	(1.4)	20	(2.9)	27	(3.0)	34	(2.1)	36	(2.6)	36	(3.4)	**31**	(1.4)	**15**	(4.2)	**14**	(3.1)	1	(3.9)
	Tunisia	386	(2.1)	11	(2.4)	14	(1.3)	17	(1.4)	19	(3.0)	21	(2.7)	**17**	(1.7)	**11**	(3.5)	**6**	(2.2)	**5**	(2.3)
	United Arab Emirates	437	(2.4)	13	(2.3)	20	(3.2)	32	(2.3)	42	(2.0)	45	(2.8)	**30**	(1.8)	**32**	(3.0)	**19**	(2.4)	**13**	(3.0)
	Uruguay	435	(2.2)	22	(2.2)	29	(2.1)	34	(1.6)	36	(1.8)	34	(2.5)	**32**	(1.4)	**13**	(2.9)	**12**	(2.3)	0	(2.3)
	Viet Nam	525	(3.9)	18	(3.0)	21	(3.0)	23	(2.3)	24	(4.0)	26	(5.2)	**23**	(2.7)	8	(4.5)	**5**	(2.3)	2	(3.8)
	Argentina**	432	(2.9)	22	(2.4)	24	(2.1)	26	(1.9)	26	(2.0)	26	(2.7)	**25**	(1.5)	4	(3.2)	**4**	(2.1)	0	(2.7)
	Kazakhstan**	456	(3.7)	18	(3.8)	20	(2.1)	23	(3.3)	25	(3.6)	27	(4.3)	**23**	(2.9)	8	(4.8)	4	(3.3)	4	(3.7)
	Malaysia**	443	(3.0)	21	(3.1)	25	(1.9)	26	(1.8)	27	(2.1)	26	(2.4)	**25**	(1.6)	5	(3.1)	5	(2.8)	0	(2.0)

1. ESCS refers to the PISA index of economic, social and cultural status.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/2]

Table I.6.6a Low and top performance in science, by students' socio-economic status

Results based on students' self-reports

	All students				Students in the bottom quarter of ESCS[1]				Students in the second quarter of ESCS			
	Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)		Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)		Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)	
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD												
Australia	17.6	(0.6)	11.2	(0.5)	29.2	(1.3)	4.3	(0.5)	19.2	(0.9)	7.9	(0.8)
Austria	20.8	(1.0)	7.7	(0.5)	35.1	(1.8)	1.6	(0.3)	23.6	(1.8)	4.1	(0.7)
Belgium	19.8	(0.9)	9.0	(0.4)	35.2	(1.9)	2.2	(0.4)	22.9	(1.3)	4.5	(0.6)
Canada	11.1	(0.5)	12.4	(0.6)	18.6	(1.0)	5.2	(0.6)	11.7	(0.9)	9.4	(0.8)
Chile	34.8	(1.2)	1.2	(0.2)	56.2	(2.1)	0.1	(0.1)	35.0	(2.4)	0.6	(0.3)
Czech Republic	20.6	(1.0)	7.3	(0.5)	36.5	(2.4)	1.4	(0.3)	22.6	(1.5)	3.4	(0.7)
Denmark	15.9	(0.8)	7.0	(0.6)	25.3	(1.4)	2.3	(0.5)	18.7	(1.4)	4.6	(0.9)
Estonia	8.8	(0.6)	13.5	(0.7)	13.5	(1.3)	6.6	(1.1)	9.7	(1.2)	10.0	(1.2)
Finland	11.5	(0.7)	14.3	(0.7)	19.7	(1.5)	6.8	(0.9)	13.2	(1.3)	10.5	(1.0)
France	22.0	(0.9)	8.0	(0.5)	39.9	(1.9)	2.0	(0.5)	25.2	(1.4)	4.0	(0.7)
Germany	17.0	(1.0)	10.6	(0.6)	27.9	(2.1)	3.3	(0.6)	15.8	(1.3)	7.6	(1.0)
Greece	32.7	(1.9)	2.1	(0.3)	49.8	(2.9)	0.4	(0.2)	37.7	(2.7)	0.9	(0.4)
Hungary	26.0	(1.0)	4.6	(0.5)	47.0	(2.3)	0.5	(0.3)	27.6	(1.9)	2.3	(0.5)
Iceland	25.3	(0.9)	3.8	(0.4)	33.3	(1.9)	1.6	(0.6)	26.4	(2.1)	2.5	(0.8)
Ireland	15.3	(1.0)	7.1	(0.5)	26.4	(1.7)	2.4	(0.5)	17.3	(1.7)	4.1	(0.7)
Israel	31.4	(1.4)	5.8	(0.5)	48.2	(2.5)	0.9	(0.4)	34.1	(2.1)	3.2	(0.5)
Italy	23.2	(1.0)	4.1	(0.4)	36.9	(1.9)	1.2	(0.4)	23.2	(1.6)	3.4	(0.6)
Japan	9.6	(0.7)	15.3	(1.0)	17.2	(1.4)	5.9	(0.9)	9.6	(1.0)	13.2	(1.4)
Korea	14.4	(0.9)	10.6	(0.8)	23.2	(1.7)	4.6	(0.9)	16.5	(1.5)	6.7	(1.0)
Latvia	17.2	(0.8)	3.8	(0.4)	25.0	(1.9)	1.2	(0.4)	20.8	(1.5)	2.1	(0.6)
Luxembourg	25.8	(0.7)	6.9	(0.4)	45.1	(1.6)	0.6	(0.3)	29.3	(1.6)	2.6	(0.6)
Mexico	47.7	(1.3)	0.1	(0.1)	65.2	(2.1)	0.0	(0.0)	52.3	(1.9)	0.1	(0.1)
Netherlands	18.5	(1.0)	11.1	(0.6)	30.2	(1.9)	4.2	(0.7)	21.1	(1.7)	7.0	(0.9)
New Zealand	17.4	(0.9)	12.8	(0.7)	29.7	(2.2)	4.3	(0.8)	17.7	(1.7)	8.8	(1.2)
Norway	18.7	(0.8)	8.0	(0.5)	28.5	(1.5)	3.2	(0.7)	19.5	(1.4)	5.1	(0.9)
Poland	16.2	(0.8)	7.3	(0.6)	27.8	(1.8)	1.8	(0.6)	18.0	(1.6)	4.9	(0.9)
Portugal	17.4	(0.9)	7.4	(0.5)	29.9	(1.8)	2.7	(0.6)	18.8	(1.5)	4.0	(0.7)
Slovak Republic	30.7	(1.1)	3.6	(0.4)	49.9	(2.3)	0.9	(0.4)	31.8	(1.7)	1.9	(0.5)
Slovenia	15.0	(0.5)	10.6	(0.6)	25.1	(1.4)	3.3	(0.7)	17.5	(1.2)	5.7	(1.0)
Spain	18.3	(0.8)	5.0	(0.4)	31.6	(1.8)	1.6	(0.4)	20.8	(1.4)	3.1	(0.6)
Sweden	21.6	(1.1)	8.5	(0.7)	33.6	(1.6)	2.2	(0.5)	24.1	(2.0)	4.4	(0.8)
Switzerland	18.4	(1.1)	9.8	(0.7)	32.7	(2.1)	2.4	(0.5)	19.2	(1.7)	6.4	(1.0)
Turkey	44.4	(2.1)	0.3	(0.1)	57.8	(3.0)	0.1	(0.1)	48.8	(2.5)	0.1	(0.1)
United Kingdom	17.4	(0.8)	10.9	(0.7)	25.7	(1.3)	4.4	(0.7)	21.6	(1.4)	6.6	(0.9)
United States	20.3	(1.1)	8.5	(0.6)	32.0	(2.1)	2.7	(0.6)	23.8	(1.7)	4.9	(1.0)
OECD average	21.2	(0.2)	7.7	(0.1)	34.0	(0.3)	2.5	(0.1)	23.3	(0.3)	4.9	(0.1)
Partners												
Albania	41.7	(1.7)	0.4	(0.2)	m	m	m	m	m	m	m	m
Algeria	70.7	(1.4)	0.0	(0.0)	74.8	(1.6)	0.0	(0.0)	74.3	(1.9)	0.0	c
Brazil	56.6	(1.1)	0.7	(0.1)	72.3	(1.2)	0.0	(0.1)	61.4	(1.3)	0.1	(0.1)
B-S-J-G (China)	16.2	(1.3)	13.6	(1.4)	31.1	(2.6)	3.7	(0.8)	15.2	(1.5)	7.6	(1.4)
Bulgaria	37.8	(1.9)	2.9	(0.4)	59.1	(3.1)	0.5	(0.3)	43.9	(2.4)	1.6	(0.4)
CABA (Argentina)	22.7	(2.4)	2.7	(0.8)	49.3	(4.1)	0.2	(0.3)	23.1	(4.1)	1.8	(0.9)
Colombia	49.0	(1.3)	0.4	(0.1)	65.1	(1.9)	0.0	(0.0)	57.3	(1.9)	0.0	(0.0)
Costa Rica	46.3	(1.2)	0.1	(0.1)	64.1	(2.0)	0.0	c	53.7	(1.9)	0.0	(0.0)
Croatia	24.6	(1.2)	4.0	(0.4)	36.0	(1.8)	1.3	(0.4)	28.5	(1.9)	1.8	(0.5)
Cyprus*	42.1	(0.8)	1.6	(0.2)	56.9	(1.8)	0.2	(0.2)	46.5	(1.6)	0.7	(0.4)
Dominican Republic	85.7	(1.1)	0.0	(0.0)	96.7	(0.7)	0.0	c	91.8	(1.1)	0.0	c
FYROM	62.9	(0.8)	0.2	(0.1)	74.8	(1.6)	0.1	(0.1)	65.6	(1.7)	0.1	(0.1)
Georgia	50.8	(1.3)	0.9	(0.2)	67.9	(1.8)	0.1	(0.1)	59.0	(2.1)	0.3	(0.2)
Hong Kong (China)	9.4	(0.7)	7.4	(0.6)	14.1	(1.3)	4.8	(0.8)	10.2	(1.3)	5.5	(0.8)
Indonesia	55.9	(1.6)	0.1	(0.1)	71.1	(2.3)	0.0	c	61.9	(2.4)	0.0	(0.0)
Jordan	49.7	(1.4)	0.2	(0.1)	67.2	(2.2)	0.0	(0.0)	52.5	(2.1)	0.1	(0.1)
Kosovo	67.7	(1.1)	0.0	(0.0)	76.6	(1.8)	0.0	c	71.7	(2.0)	0.0	c
Lebanon	62.6	(1.7)	0.4	(0.1)	78.1	(2.1)	0.0	(0.1)	67.7	(2.3)	0.1	(0.1)
Lithuania	24.7	(1.1)	4.2	(0.5)	38.7	(2.0)	1.1	(0.4)	28.8	(1.5)	2.1	(0.5)
Macao (China)	8.1	(0.4)	9.2	(0.5)	10.1	(0.9)	6.7	(1.0)	7.3	(0.9)	8.3	(0.9)
Malta	32.5	(0.8)	7.6	(0.5)	49.6	(1.9)	2.2	(0.6)	36.6	(2.0)	4.1	(0.8)
Moldova	42.2	(1.1)	0.7	(0.2)	59.4	(2.0)	0.1	(0.1)	44.1	(1.9)	0.4	(0.2)
Montenegro	51.0	(0.7)	0.5	(0.1)	61.9	(1.4)	0.1	(0.2)	55.1	(1.4)	0.4	(0.2)
Peru	58.4	(1.4)	0.1	(0.1)	84.9	(1.3)	0.0	c	64.5	(2.4)	0.0	c
Qatar	49.8	(0.5)	1.7	(0.2)	66.3	(1.0)	0.3	(0.2)	47.9	(1.2)	1.1	(0.2)
Romania	38.5	(1.8)	0.7	(0.2)	56.1	(2.7)	0.1	(0.1)	44.4	(2.5)	0.2	(0.2)
Russia	18.1	(1.1)	3.7	(0.4)	27.1	(2.2)	1.3	(0.4)	19.3	(1.7)	2.0	(0.7)
Singapore	9.6	(0.4)	24.2	(0.6)	21.1	(1.2)	9.1	(0.9)	9.2	(0.9)	17.7	(1.3)
Chinese Taipei	12.4	(0.8)	15.4	(1.1)	23.1	(1.7)	5.3	(0.7)	13.4	(1.1)	9.7	(0.9)
Thailand	46.7	(1.5)	0.5	(0.2)	56.2	(1.9)	0.1	(0.1)	53.3	(2.0)	0.1	(0.1)
Trinidad and Tobago	45.8	(0.8)	1.4	(0.2)	58.6	(1.7)	0.3	(0.2)	50.6	(1.8)	0.6	(0.3)
Tunisia	65.9	(1.3)	0.0	(0.0)	78.1	(1.7)	0.0	c	71.5	(2.1)	0.0	c
United Arab Emirates	41.8	(1.1)	2.8	(0.2)	55.9	(1.5)	0.6	(0.2)	43.3	(1.9)	1.9	(0.4)
Uruguay	40.8	(1.1)	1.3	(0.2)	59.3	(1.9)	0.1	(0.1)	47.0	(1.8)	0.4	(0.3)
Viet Nam	5.9	(0.8)	8.3	(1.2)	9.4	(1.7)	3.9	(0.8)	6.3	(1.2)	3.8	(0.7)
Argentina**	39.7	(1.5)	0.7	(0.2)	57.0	(2.1)	0.1	(0.2)	45.7	(2.6)	0.2	(0.2)
Kazakhstan**	28.1	(1.6)	1.8	(0.6)	37.2	(2.3)	0.5	(0.2)	30.1	(2.2)	1.7	(0.8)
Malaysia**	33.7	(1.5)	0.6	(0.2)	49.7	(2.3)	0.1	(0.1)	40.3	(2.3)	0.1	(0.1)

1. ESCS refers to the PISA index of economic, social and cultural status.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 2/2]

Table I.6.6a Low and top performance in science, by students' socio-economic status

Results based on students' self-reports

		Students in the third quarter of ESCS[1]				Students in the top quarter of ESCS				Increased likelihood of students in the bottom quarter of ESCS scoring below Level 2 in science, relative to non-disadvantaged students (3 other quarters of ESCS)		Increased likelihood of students in the bottom quarter of ESCS scoring below Level 2 in science, relative to advantaged students (top quarter of ESCS)	
		Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)		Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)					
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	Odds ratio	S.E.	Odds ratio	S.E.
OECD	Australia	12.4	(1.0)	12.1	(0.9)	6.7	(0.6)	21.7	(1.2)	**2.82**	(0.2)	**3.49**	(0.3)
	Austria	14.8	(1.2)	9.0	(1.0)	8.4	(1.0)	16.5	(1.5)	**2.93**	(0.3)	**4.78**	(0.6)
	Belgium	12.8	(1.1)	10.6	(0.9)	5.9	(0.8)	19.2	(1.2)	**3.37**	(0.3)	**5.38**	(0.7)
	Canada	7.6	(0.8)	14.4	(1.1)	5.4	(0.5)	21.6	(1.3)	**2.55**	(0.2)	**3.07**	(0.4)
	Chile	30.7	(1.8)	0.7	(0.3)	15.7	(1.3)	3.7	(0.6)	**3.45**	(0.3)	**5.69**	(0.6)
	Czech Republic	15.8	(1.5)	7.2	(0.9)	6.0	(0.8)	17.6	(1.6)	**3.32**	(0.4)	**6.10**	(0.9)
	Denmark	11.1	(1.2)	7.1	(1.0)	6.8	(1.0)	14.5	(1.5)	**2.45**	(0.2)	**3.53**	(0.5)
	Estonia	7.6	(1.1)	14.1	(1.3)	3.7	(0.7)	24.1	(1.5)	**2.07**	(0.3)	**3.31**	(0.6)
	Finland	8.0	(1.1)	15.0	(1.4)	4.5	(0.8)	25.4	(1.6)	**2.61**	(0.3)	**4.46**	(0.7)
	France	13.6	(1.3)	8.9	(1.0)	5.2	(0.8)	18.0	(1.3)	**3.85**	(0.3)	**5.46**	(0.8)
	Germany	11.8	(1.0)	12.1	(1.3)	4.8	(0.9)	24.7	(1.5)	**3.19**	(0.3)	**2.34**	(0.3)
	Greece	27.8	(2.3)	2.0	(0.5)	14.7	(1.6)	5.4	(0.9)	**2.72**	(0.2)	**5.21**	(0.6)
	Hungary	21.2	(1.9)	4.2	(0.7)	8.0	(0.9)	11.7	(1.4)	**3.80**	(0.4)	**8.71**	(1.3)
	Iceland	22.5	(2.0)	4.1	(0.9)	17.7	(1.5)	7.4	(1.1)	**1.75**	(0.2)	**2.04**	(0.3)
	Ireland	11.0	(1.2)	6.9	(1.1)	6.3	(0.8)	15.0	(1.2)	**2.76**	(0.2)	**4.71**	(0.6)
	Israel	22.8	(1.9)	7.9	(1.1)	17.8	(1.3)	11.6	(1.1)	**2.80**	(0.3)	**3.46**	(0.4)
	Italy	19.9	(1.7)	4.5	(0.7)	11.5	(1.3)	7.5	(1.0)	**2.63**	(0.2)	**3.71**	(0.5)
	Japan	7.1	(0.9)	17.0	(1.4)	3.4	(0.6)	25.7	(2.0)	**2.89**	(0.3)	**4.09**	(0.7)
	Korea	10.3	(1.2)	11.2	(1.2)	7.0	(1.0)	20.2	(1.8)	**2.38**	(0.2)	**3.72**	(0.6)
	Latvia	14.0	(1.6)	4.3	(0.9)	8.4	(1.1)	7.8	(1.0)	**1.99**	(0.2)	**3.22**	(0.6)
	Luxembourg	19.9	(1.5)	6.8	(0.9)	7.5	(0.8)	18.2	(1.2)	**3.53**	(0.3)	**7.08**	(0.8)
	Mexico	42.6	(2.0)	0.0	(0.1)	30.3	(1.8)	0.4	(0.2)	**2.62**	(0.3)	**4.09**	(0.5)
	Netherlands	14.9	(1.2)	11.9	(1.1)	6.9	(1.0)	21.7	(1.6)	**2.59**	(0.3)	**4.74**	(0.7)
	New Zealand	11.5	(1.2)	15.6	(1.7)	6.8	(1.1)	24.7	(1.7)	**3.10**	(0.4)	**3.14**	(0.4)
	Norway	14.8	(1.4)	9.6	(1.1)	10.3	(1.0)	15.0	(1.3)	**2.30**	(0.2)	**2.73**	(0.3)
	Poland	12.7	(1.6)	7.4	(1.1)	5.2	(0.8)	15.5	(1.7)	**2.83**	(0.3)	**5.38**	(0.9)
	Portugal	15.8	(1.5)	7.3	(0.9)	4.5	(0.7)	16.1	(1.5)	**2.84**	(0.3)	**7.09**	(1.1)
	Slovak Republic	25.3	(1.5)	2.9	(0.5)	13.5	(1.4)	8.9	(1.2)	**3.23**	(0.3)	**5.00**	(0.7)
	Slovenia	10.0	(0.9)	12.3	(1.4)	6.3	(0.8)	21.5	(1.6)	**2.64**	(0.3)	**4.04**	(0.5)
	Spain	14.0	(1.4)	5.3	(0.8)	6.0	(0.9)	10.1	(1.0)	**2.95**	(0.3)	**6.00**	(0.9)
	Sweden	14.4	(1.6)	9.5	(1.3)	10.7	(1.2)	18.7	(1.8)	**2.58**	(0.3)	**2.86**	(0.4)
	Switzerland	14.7	(1.6)	9.4	(1.2)	6.3	(0.9)	21.3	(1.7)	**3.15**	(0.3)	**5.83**	(0.9)
	Turkey	42.4	(2.7)	0.1	(0.1)	27.9	(3.0)	0.9	(0.4)	**2.09**	(0.2)	**3.37**	(0.5)
	United Kingdom	12.4	(1.4)	12.2	(1.3)	7.2	(0.8)	22.1	(1.5)	**2.17**	(0.2)	**2.76**	(0.3)
	United States	15.1	(1.9)	8.6	(1.1)	8.6	(1.0)	18.3	(1.4)	**2.50**	(0.3)	**3.89**	(0.5)
	OECD average	16.7	(0.3)	8.4	(0.2)	9.3	(0.2)	15.8	(0.2)	**2.78**	(0.0)	**4.41**	(0.1)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	71.5	(2.0)	0.0	(0.1)	61.7	(3.2)	0.1	(0.1)	**1.33**	(0.1)	**1.74**	(0.2)
	Brazil	55.1	(1.5)	0.5	(0.2)	34.6	(2.0)	2.2	(0.5)	**2.57**	(0.2)	**3.68**	(0.3)
	B-S-J-G (China)	12.7	(1.3)	13.7	(1.8)	6.0	(1.2)	29.6	(3.7)	**3.55**	(0.4)	**7.09**	(1.3)
	Bulgaria	28.9	(2.4)	2.6	(0.7)	17.0	(1.6)	7.2	(1.2)	**3.38**	(0.3)	**5.37**	(0.7)
	CABA (Argentina)	12.1	(3.6)	3.5	(1.6)	6.3	(2.1)	5.5	(2.2)	**6.07**	(1.2)	**11.55**	(3.6)
	Colombia	46.1	(2.1)	0.2	(0.1)	27.5	(2.1)	1.2	(0.3)	**2.41**	(0.2)	**4.63**	(0.6)
	Costa Rica	43.6	(2.3)	0.1	(0.1)	23.8	(2.0)	0.5	(0.3)	**2.64**	(0.3)	**5.08**	(0.6)
	Croatia	22.5	(1.8)	2.9	(0.6)	11.1	(1.3)	9.9	(1.2)	**2.16**	(0.2)	**4.07**	(0.5)
	Cyprus*	39.1	(1.7)	1.9	(0.6)	24.9	(1.3)	3.6	(0.7)	**2.27**	(0.2)	**3.57**	(0.3)
	Dominican Republic	86.1	(1.9)	0.0	c	68.1	(2.8)	0.0	(0.1)	**6.57**	(1.6)	**13.43**	(3.3)
	FYROM	61.0	(1.5)	0.1	(0.1)	48.8	(1.9)	0.5	(0.3)	**2.12**	(0.2)	**2.87**	(0.3)
	Georgia	44.1	(2.3)	0.7	(0.4)	31.5	(1.9)	2.4	(0.6)	**2.60**	(0.2)	**4.34**	(0.5)
	Hong Kong (China)	7.7	(1.1)	6.8	(1.0)	4.7	(0.8)	13.0	(1.7)	**2.01**	(0.3)	**2.61**	(0.5)
	Indonesia	54.4	(2.6)	0.0	(0.0)	36.2	(2.8)	0.4	(0.3)	**2.39**	(0.3)	**4.31**	(0.6)
	Jordan	44.3	(1.9)	0.1	(0.1)	32.9	(2.1)	0.5	(0.3)	**2.70**	(0.3)	**3.70**	(0.4)
	Kosovo	68.6	(2.1)	0.0	(0.0)	52.7	(2.3)	0.0	(0.0)	**1.82**	(0.2)	**2.73**	(0.3)
	Lebanon	61.6	(2.3)	0.2	(0.2)	42.2	(3.6)	1.4	(0.5)	**2.68**	(0.3)	**4.61**	(0.8)
	Lithuania	19.0	(1.6)	4.8	(1.0)	11.6	(1.3)	9.1	(1.5)	**2.55**	(0.2)	**3.97**	(0.5)
	Macao (China)	8.0	(0.9)	9.2	(1.0)	6.6	(0.8)	12.6	(1.1)	**1.42**	(0.2)	**1.54**	(0.3)
	Malta	27.6	(1.6)	8.0	(1.1)	14.9	(1.4)	16.5	(1.3)	**2.76**	(0.2)	**4.91**	(0.6)
	Moldova	40.6	(2.1)	0.7	(0.3)	24.2	(1.6)	1.9	(0.5)	**2.56**	(0.2)	**4.33**	(0.5)
	Montenegro	49.3	(1.5)	0.5	(0.2)	36.3	(1.4)	0.9	(0.3)	**1.84**	(0.1)	**2.56**	(0.2)
	Peru	51.9	(2.0)	0.1	(0.1)	32.4	(2.3)	0.4	(0.2)	**5.72**	(0.6)	**11.56**	(1.4)
	Qatar	40.1	(1.1)	2.5	(0.4)	43.0	(0.9)	3.0	(0.4)	**2.54**	(0.1)	**2.40**	(0.1)
	Romania	34.2	(2.4)	0.5	(0.3)	19.2	(2.4)	1.9	(0.6)	**2.65**	(0.3)	**5.32**	(0.8)
	Russia	13.1	(1.5)	4.3	(0.8)	11.4	(1.3)	7.9	(1.2)	**2.16**	(0.3)	**2.32**	(0.3)
	Singapore	5.9	(0.6)	28.0	(1.4)	2.1	(0.6)	42.2	(1.7)	**4.37**	(0.4)	**11.94**	(3.3)
	Chinese Taipei	9.1	(1.1)	16.8	(1.7)	4.0	(0.6)	29.8	(2.6)	**3.11**	(0.3)	**6.90**	(1.2)
	Thailand	47.3	(2.5)	0.2	(0.2)	28.4	(2.9)	1.5	(0.6)	**1.70**	(0.2)	**2.80**	(0.4)
	Trinidad and Tobago	42.0	(1.8)	1.3	(0.5)	26.9	(1.5)	3.6	(0.9)	**2.14**	(0.2)	**2.77**	(0.3)
	Tunisia	65.5	(2.2)	0.0	(0.0)	46.1	(2.2)	0.2	(0.2)	**2.28**	(0.2)	**3.43**	(0.4)
	United Arab Emirates	33.4	(1.4)	3.9	(0.5)	33.1	(1.6)	5.0	(0.5)	**2.19**	(0.1)	**2.34**	(0.2)
	Uruguay	37.0	(1.8)	1.0	(0.4)	19.0	(1.5)	3.7	(0.7)	**2.79**	(0.2)	**5.48**	(0.6)
	Viet Nam	5.3	(1.1)	7.3	(1.3)	2.6	(0.7)	18.0	(3.4)	**2.10**	(0.4)	**3.88**	(1.3)
	Argentina**	35.5	(2.1)	0.4	(0.2)	20.7	(2.0)	2.2	(0.7)	**2.58**	(0.2)	**4.91**	(0.6)
	Kazakhstan**	25.7	(2.2)	2.0	(0.8)	19.4	(2.0)	3.0	(1.0)	**1.77**	(0.2)	**2.46**	(0.3)
	Malaysia**	28.5	(2.4)	0.3	(0.2)	16.1	(1.8)	1.8	(0.7)	**2.51**	(0.2)	**4.83**	(0.7)

1. ESCS refers to the PISA index of economic, social and cultural status.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.7 Change between 2006 and 2015 in the percentage of resilient students

Results based on students' self-reports

		PISA 2015		PISA 2006		Change between 2006 and 2015 (PISA 2015 – PISA 2006)	
		Percentage of resilient students[1] among disadvantaged students		Percentage of resilient students among disadvantaged students		Change in the percentage of resilient students among disadvantaged students	
		%	S.E.	%	S.E.	% dif.	S.E.
OECD	Australia	32.9	(1.2)	33.1	(1.1)	-0.2	(1.6)
	Austria	25.9	(1.6)	28.1	(2.4)	-2.2	(2.8)
	Belgium	27.2	(1.4)	25.8	(1.3)	1.4	(2.0)
	Canada	38.7	(1.4)	38.0	(1.3)	0.7	(1.9)
	Chile	14.6	(1.2)	15.0	(1.5)	-0.4	(1.9)
	Czech Republic	24.9	(1.7)	28.8	(2.0)	-3.9	(2.6)
	Denmark	27.5	(1.6)	19.6	(1.3)	**7.9**	(2.0)
	Estonia	48.3	(1.8)	46.2	(2.3)	2.0	(2.9)
	Finland	42.8	(1.9)	53.1	(1.6)	**-10.4**	(2.5)
	France	26.6	(1.3)	23.6	(1.6)	3.0	(2.1)
	Germany	33.5	(1.8)	24.8	(1.8)	**8.7**	(2.5)
	Greece	18.1	(1.6)	20.4	(1.8)	-2.3	(2.4)
	Hungary	19.3	(1.5)	26.0	(2.1)	**-6.7**	(2.6)
	Iceland	17.0	(1.5)	18.8	(1.4)	-1.8	(2.0)
	Ireland	29.6	(1.8)	29.2	(2.0)	0.4	(2.7)
	Israel	15.7	(1.3)	13.4	(1.6)	2.3	(2.1)
	Italy	26.6	(1.7)	23.7	(1.1)	2.8	(2.0)
	Japan	48.8	(1.9)	40.5	(2.4)	**8.2**	(3.1)
	Korea	40.4	(1.9)	43.6	(2.2)	-3.2	(2.9)
	Latvia	35.2	(1.7)	29.3	(1.9)	**6.0**	(2.6)
	Luxembourg	20.7	(1.4)	19.2	(1.4)	1.5	(2.0)
	Mexico	12.8	(1.2)	14.7	(1.4)	-1.9	(1.8)
	Netherlands	30.7	(1.7)	32.0	(2.0)	-1.3	(2.7)
	New Zealand	30.4	(1.9)	35.1	(1.8)	-4.7	(2.6)
	Norway	26.5	(1.4)	17.2	(1.2)	**9.3**	(1.9)
	Poland	34.6	(1.9)	31.4	(2.0)	3.2	(2.7)
	Portugal	38.1	(1.9)	33.7	(2.0)	4.4	(2.7)
	Slovak Republic	17.5	(1.4)	20.3	(1.7)	-2.8	(2.2)
	Slovenia	34.6	(1.5)	30.3	(1.3)	**4.3**	(2.0)
	Spain	39.2	(1.4)	28.5	(1.3)	**10.7**	(1.9)
	Sweden	24.7	(1.5)	24.0	(1.5)	0.6	(2.1)
	Switzerland	29.1	(1.8)	27.9	(1.5)	1.2	(2.3)
	Turkey	21.8	(2.5)	23.2	(2.0)	-1.4	(3.2)
	United Kingdom	35.4	(1.5)	30.5	(1.7)	**5.0**	(2.3)
	United States	31.6	(1.9)	19.3	(1.6)	**12.3**	(2.5
	OECD average	29.2	(0.3)	27.7	(0.3)	**1.5**	(0.4)
Partners	Albania	m	m	m	m	m	m
	Algeria	7.4	(1.1)	m	m	m	m
	Brazil	9.4	(0.7)	10.3	(1.3)	-0.9	(1.5)
	B-S-J-G (China)	45.3	(2.5)	m	m	m	m
	Bulgaria	13.6	(1.5)	9.4	(1.3)	**4.1**	(2.0)
	CABA (Argentina)	14.9	(1.9)	m	m	m	m
	Colombia	11.4	(1.0)	11.1	(1.5)	0.3	(1.8)
	Costa Rica	9.4	(1.0)	m	m	m	m
	Croatia	24.4	(1.7)	24.9	(2.0)	-0.5	(2.6)
	Cyprus*	10.1	(1.1)	m	m	m	m
	Dominican Republic	0.4	(0.2)	m	m	m	m
	FYROM	4.1	(0.7)	m	m	m	m
	Georgia	7.5	(1.2)	m	m	m	m
	Hong Kong (China)	61.8	(1.8)	62.5	(1.9)	-0.7	(2.6)
	Indonesia	10.9	(1.3)	15.1	(2.5)	-4.1	(2.9)
	Jordan	7.7	(0.9)	14.3	(1.3)	**-6.6**	(1.6)
	Kosovo	2.5	(0.8)	m	m	m	m
	Lebanon	6.1	(1.2)	m	m	m	m
	Lithuania	23.1	(1.5)	25.2	(1.9)	-2.1	(2.4)
	Macao (China)	64.6	(1.4)	58.7	(1.9)	**5.8**	(2.3)
	Malta	21.8	(1.6)	m	m	m	m
	Moldova	13.4	(1.3)	m	m	m	m
	Montenegro	9.4	(0.9)	7.6	(0.9)	1.8	(1.3)
	Peru	3.2	(0.5)	m	m	m	m
	Qatar	5.7	(0.5)	0.8	(0.3)	**4.9**	(0.5)
	Romania	11.3	(1.4)	6.5	(1.2)	**4.8**	(1.9)
	Russia	25.5	(2.0)	26.5	(2.3)	-1.0	(3.0)
	Singapore	48.8	(1.5)	m	m	m	m
	Chinese Taipei	46.3	(1.8)	44.3	(2.4)	2.0	(3.0)
	Thailand	18.4	(1.6)	23.6	(1.8)	**-5.2**	(2.4)
	Trinidad and Tobago	12.9	(1.2)	m	m	m	m
	Tunisia	4.7	(0.8)	16.4	(1.4)	**-11.7**	(1.6)
	United Arab Emirates	7.7	(0.7)	m	m	m	m
	Uruguay	14.0	(1.1)	15.8	(1.6)	-1.8	(2.0)
	Viet Nam	75.5	(2.7)	m	m	m	m
	Argentina**	16.4	(1.5)	7.4	(1.1)	**8.9**	(1.9)
	Kazakhstan**	16.6	(1.8)	m	m	m	m
	Malaysia**	15.5	(1.5)	m	m	m	m

1. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and performs in the top quarter of students among all countries/economies, after accounting for socio-economic status.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.8 Disparities in science-related attitudes, by socio-economic status

Results based on students' self-reports

		Percentage of students expecting to pursue a career in science						Epistemic beliefs[2]					
		Disadvantaged students (bottom quarter of ESCS[1])		Advantaged students (top quarter of ESCS)		Disadvantaged students' likelihood of expecting a career in science (relative to advantaged students), after accounting for performance		Disadvantaged students (bottom quarter of ESCS)		Advantaged students (top quarter of ESCS)		Difference between advantaged and disadvantaged students (top quarter – bottom quarter)	
		%	S.E.	%	S.E.	Odds ratio	S.E.	Mean index	S.E.	Mean index	S.E.	Dif.	S.E.
OECD	Australia	21.4	(0.9)	36.6	(1.2)	**0.68**	(0.05)	0.05	(0.02)	0.54	(0.03)	**0.49**	(0.03)
	Austria	18.8	(1.2)	27.7	(1.5)	0.87	(0.08)	-0.47	(0.03)	0.24	(0.04)	**0.72**	(0.05)
	Belgium	19.2	(1.5)	33.6	(1.8)	0.89	(0.13)	-0.20	(0.03)	0.23	(0.02)	**0.42**	(0.03)
	Canada	26.2	(1.0)	42.6	(1.1)	**0.62**	(0.05)	0.09	(0.02)	0.53	(0.03)	**0.43**	(0.03)
	Chile	32.2	(1.5)	45.4	(1.3)	**0.78**	(0.07)	-0.30	(0.04)	0.06	(0.03)	**0.36**	(0.05)
	Czech Republic	9.8	(1.1)	25.3	(1.4)	**0.63**	(0.09)	-0.44	(0.03)	0.00	(0.03)	**0.44**	(0.05)
	Denmark	13.2	(1.0)	15.4	(1.1)	1.10	(0.15)	-0.01	(0.03)	0.45	(0.03)	**0.47**	(0.05)
	Estonia	19.2	(1.3)	30.4	(1.3)	**0.71**	(0.08)	-0.10	(0.03)	0.21	(0.03)	**0.31**	(0.04)
	Finland	9.0	(0.9)	24.3	(1.3)	**0.46**	(0.05)	-0.29	(0.03)	0.20	(0.03)	**0.49**	(0.04)
	France	14.2	(1.1)	30.6	(1.2)	0.84	(0.10)	-0.17	(0.03)	0.27	(0.03)	**0.44**	(0.04)
	Germany	10.0	(0.8)	26.1	(1.2)	**0.52**	(0.06)	-0.39	(0.04)	0.15	(0.03)	**0.53**	(0.05)
	Greece	19.4	(1.4)	35.7	(1.5)	**0.66**	(0.08)	-0.34	(0.04)	0.05	(0.03)	**0.39**	(0.05)
	Hungary	10.0	(1.1)	27.6	(1.5)	**0.59**	(0.09)	-0.57	(0.03)	-0.14	(0.03)	**0.43**	(0.04)
	Iceland	20.3	(1.7)	28.1	(1.5)	0.80	(0.10)	0.08	(0.04)	0.51	(0.04)	**0.43**	(0.06)
	Ireland	20.6	(1.3)	33.8	(1.5)	**0.76**	(0.08)	0.05	(0.03)	0.38	(0.03)	**0.34**	(0.04)
	Israel	26.4	(1.2)	34.4	(1.3)	**0.81**	(0.06)	-0.06	(0.03)	0.41	(0.03)	**0.47**	(0.05)
	Italy	16.1	(1.2)	30.2	(1.6)	**0.60**	(0.07)	-0.26	(0.03)	0.06	(0.03)	**0.33**	(0.04)
	Japan	13.0	(1.0)	23.8	(1.4)	**0.63**	(0.07)	-0.34	(0.03)	0.21	(0.03)	**0.55**	(0.04)
	Korea	15.4	(1.0)	25.0	(1.7)	0.81	(0.09)	-0.21	(0.03)	0.29	(0.04)	**0.50**	(0.04)
	Latvia	14.6	(1.2)	27.9	(1.3)	**0.60**	(0.07)	-0.37	(0.03)	-0.13	(0.03)	**0.24**	(0.04)
	Luxembourg	14.7	(1.1)	30.9	(1.3)	0.85	(0.11)	-0.42	(0.03)	0.17	(0.03)	**0.59**	(0.05)
	Mexico	35.6	(1.4)	45.6	(1.4)	**0.76**	(0.07)	-0.29	(0.03)	-0.05	(0.03)	**0.24**	(0.04)
	Netherlands	12.6	(1.0)	21.2	(1.1)	0.91	(0.11)	-0.33	(0.03)	0.04	(0.02)	**0.37**	(0.04)
	New Zealand	17.5	(1.2)	32.5	(1.4)	**0.66**	(0.08)	-0.05	(0.03)	0.49	(0.04)	**0.54**	(0.05)
	Norway	25.2	(1.5)	33.9	(1.4)	**0.81**	(0.07)	-0.19	(0.03)	0.20	(0.03)	**0.39**	(0.04)
	Poland	12.2	(1.0)	30.9	(1.5)	**0.46**	(0.06)	-0.25	(0.03)	0.13	(0.03)	**0.38**	(0.05)
	Portugal	19.0	(1.3)	38.8	(1.8)	**0.71**	(0.07)	0.05	(0.03)	0.57	(0.04)	**0.52**	(0.05)
	Slovak Republic	11.6	(1.1)	26.2	(1.3)	**0.65**	(0.08)	-0.59	(0.03)	-0.12	(0.03)	**0.47**	(0.04)
	Slovenia	26.7	(1.5)	32.4	(1.7)	1.03	(0.12)	-0.08	(0.03)	0.28	(0.04)	**0.36**	(0.04)
	Spain	21.0	(1.2)	36.8	(1.4)	**0.76**	(0.07)	-0.10	(0.03)	0.34	(0.03)	**0.44**	(0.04)
	Sweden	16.2	(1.1)	26.0	(1.3)	0.86	(0.11)	-0.11	(0.04)	0.46	(0.04)	**0.58**	(0.05)
	Switzerland	14.9	(1.3)	26.1	(1.4)	**0.78**	(0.10)	-0.33	(0.03)	0.26	(0.04)	**0.59**	(0.05)
	Turkey	27.2	(1.8)	35.0	(2.2)	0.93	(0.09)	-0.34	(0.05)	-0.04	(0.04)	**0.30**	(0.06)
	United Kingdom	25.4	(1.1)	36.1	(1.4)	**0.83**	(0.07)	0.06	(0.02)	0.47	(0.03)	**0.41**	(0.03)
	United States	34.5	(1.2)	45.5	(1.7)	**0.80**	(0.06)	0.02	(0.03)	0.55	(0.04)	**0.53**	(0.05)
	OECD average	18.9	(0.2)	31.5	(0.2)	**0.75**	(0.01)	-0.21	(0.01)	0.24	(0.01)	**0.44**	(0.01
Partners	Albania	17.3	(1.2)	36.2	(1.7)	m	m	-0.12	(0.03)	0.08	(0.03)	**0.21**	(0.04)
	Algeria	23.6	(1.3)	31.7	(2.1)	**0.74**	(0.08)	-0.37	(0.03)	-0.28	(0.04)	0.09	(0.05)
	Brazil	35.7	(1.1)	47.0	(1.1)	**0.79**	(0.05)	-0.17	(0.02)	0.10	(0.03)	**0.27**	(0.04)
	B-S-J-G (China)	13.2	(0.9)	22.2	(1.3)	0.90	(0.12)	-0.30	(0.03)	0.18	(0.04)	**0.48**	(0.05)
	Bulgaria	19.0	(1.6)	38.3	(2.2)	**0.64**	(0.07)	-0.42	(0.04)	0.05	(0.03)	**0.47**	(0.05)
	CABA (Argentina)	28.0	(2.3)	33.7	(2.2)	1.05	(0.17)	-0.14	(0.04)	0.31	(0.08)	**0.45**	(0.09)
	Colombia	38.2	(1.7)	42.1	(1.3)	0.89	(0.08)	-0.28	(0.03)	0.00	(0.03)	**0.29**	(0.04)
	Costa Rica	40.0	(1.5)	51.0	(1.7)	**0.71**	(0.07)	-0.26	(0.03)	0.02	(0.03)	**0.27**	(0.04)
	Croatia	15.7	(1.3)	34.4	(1.6)	**0.64**	(0.06)	-0.09	(0.03)	0.27	(0.02)	**0.36**	(0.04)
	Cyprus*	23.3	(1.2)	34.4	(1.4)	0.90	(0.10)	-0.36	(0.03)	0.09	(0.03)	**0.44**	(0.05)
	Dominican Republic	44.9	(1.6)	46.8	(1.9)	1.04	(0.10)	-0.13	(0.06)	0.04	(0.04)	**0.17**	(0.07)
	FYROM	20.5	(1.1)	32.1	(1.6)	**0.69**	(0.07)	-0.30	(0.03)	-0.05	(0.03)	**0.25**	(0.04)
	Georgia	14.6	(1.1)	21.7	(1.3)	**0.73**	(0.09)	-0.12	(0.03)	0.30	(0.03)	**0.42**	(0.04)
	Hong Kong (China)	19.8	(1.5)	31.3	(1.6)	**0.68**	(0.08)	-0.06	(0.03)	0.20	(0.03)	**0.26**	(0.04)
	Indonesia	10.9	(1.2)	22.0	(1.2)	**0.51**	(0.08)	-0.36	(0.02)	-0.20	(0.03)	**0.16**	(0.04)
	Jordan	28.1	(2.0)	60.5	(1.5)	**0.38**	(0.03)	-0.28	(0.04)	0.05	(0.04)	**0.33**	(0.06)
	Kosovo	19.2	(1.1)	36.0	(1.8)	**0.54**	(0.06)	-0.05	(0.03)	0.13	(0.04)	**0.18**	(0.05)
	Lebanon	33.0	(1.8)	49.6	(2.1)	**0.73**	(0.10)	-0.29	(0.06)	-0.02	(0.06)	**0.27**	(0.09)
	Lithuania	13.9	(0.9)	34.3	(1.3)	**0.46**	(0.04)	-0.07	(0.03)	0.29	(0.04)	**0.36**	(0.05)
	Macao (China)	17.6	(1.1)	24.9	(1.4)	**0.75**	(0.07)	-0.13	(0.02)	0.02	(0.02)	**0.15**	(0.03)
	Malta	17.0	(1.1)	35.9	(1.6)	0.77	(0.11)	-0.12	(0.03)	0.31	(0.03)	**0.43**	(0.04)
	Moldova	11.8	(1.0)	33.0	(1.6)	**0.38**	(0.04)	-0.28	(0.03)	0.05	(0.03)	**0.33**	(0.04)
	Montenegro	17.3	(1.0)	28.0	(1.4)	**0.67**	(0.07)	-0.38	(0.03)	-0.20	(0.03)	**0.18**	(0.04)
	Peru	31.0	(1.2)	46.4	(1.6)	**0.65**	(0.06)	-0.38	(0.03)	0.00	(0.02)	**0.38**	(0.04)
	Qatar	32.1	(0.8)	38.1	(0.9)	1.04	(0.06)	-0.31	(0.02)	0.03	(0.02)	**0.34**	(0.03)
	Romania	11.5	(1.1)	39.3	(2.1)	**0.32**	(0.04)	-0.49	(0.03)	-0.23	(0.04)	**0.26**	(0.04)
	Russia	21.0	(1.7)	27.3	(1.4)	0.85	(0.11)	-0.42	(0.03)	-0.10	(0.03)	**0.32**	(0.04)
	Singapore	24.6	(1.0)	32.4	(1.4)	0.99	(0.10)	0.06	(0.02)	0.42	(0.03)	**0.37**	(0.04)
	Chinese Taipei	15.9	(1.0)	28.7	(1.3)	0.83	(0.09)	0.06	(0.03)	0.58	(0.04)	**0.53**	(0.05)
	Thailand	15.8	(1.1)	28.0	(1.7)	**0.75**	(0.09)	-0.16	(0.03)	0.11	(0.04)	**0.27**	(0.04)
	Trinidad and Tobago	24.4	(1.3)	35.8	(1.4)	0.87	(0.10)	-0.13	(0.03)	0.14	(0.03)	**0.26**	(0.05)
	Tunisia	29.5	(1.7)	47.6	(1.6)	**0.64**	(0.06)	-0.40	(0.03)	-0.19	(0.04)	**0.20**	(0.05)
	United Arab Emirates	37.9	(1.1)	43.9	(1.2)	1.01	(0.08)	-0.10	(0.02)	0.17	(0.03)	**0.28**	(0.03)
	Uruguay	21.5	(1.2)	39.7	(1.4)	**0.54**	(0.06)	-0.33	(0.04)	0.11	(0.04)	**0.44**	(0.06)
	Viet Nam	18.3	(1.5)	22.7	(1.5)	1.01	(0.12)	-0.24	(0.03)	0.04	(0.03)	**0.28**	(0.05)
	Argentina**	17.0	(1.1)	33.4	(1.5)	**0.51**	(0.06)	-0.43	(0.03)	0.00	(0.04)	**0.44**	(0.05)
	Kazakhstan**	26.8	(1.7)	31.7	(1.6)	0.83	(0.08)	-0.12	(0.03)	0.13	(0.03)	**0.25**	(0.04)
	Malaysia**	22.2	(1.5)	37.2	(1.7)	**0.81**	(0.08)	-0.07	(0.03)	0.22	(0.03)	**0.29**	(0.04)

1. ESCS refers to the PISA index of economic, social and cultural status.
2. Epistemic beliefs are measured by an index summarising students' agreement with six statements about the nature of science and the validity of scientific methods of enquiry as a source of knowledge.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.9 Total variation in science performance, and variation between and within schools

		Mean science performance		Total variation in science performance[1]		Variation in science performance between schools[2]		Variation in science performance within schools		As a percentage of the average total variation in science performance across OECD countries			Index of academic inclusion[3]	
										Total variation	Between-school variation	Within-school variation		
		Mean score	S.E.	Variance	S.E.	Variance	S.E.	Variance	S.E.	%	%	%	%	S.E.
OECD	Australia	510	(1.5)	10 465	(189)	2 212	(170)	8 256	(158)	116.7	24.7	92.1	78.9	(1.3)
	Austria	495	(2.4)	9 476	(254)	4 113	(317)	5 271	(139)	105.7	45.9	58.8	56.2	(2.1)
	Belgium	502	(2.3)	10 037	(249)	4 396	(324)	5 506	(132)	111.9	49.0	61.4	55.6	(2.1)
	Canada	528	(2.1)	8 532	(162)	1 294	(123)	7 161	(154)	95.2	14.4	79.9	84.7	(1.3)
	Chile	447	(2.4)	7 399	(230)	2 810	(264)	4 483	(111)	82.5	31.3	50.0	61.5	(2.4)
	Czech Republic	493	(2.3)	9 075	(275)	3 930	(361)	4 929	(148)	101.2	43.8	55.0	55.6	(2.6)
	Denmark	502	(2.4)	8 153	(206)	1 116	(151)	6 932	(178)	90.9	12.4	77.3	86.1	(1.7)
	Estonia	534	(2.1)	7 904	(195)	1 484	(211)	6 357	(153)	88.1	16.6	70.9	81.1	(2.3)
	Finland	531	(2.4)	9 250	(253)	717	(139)	8 376	(207)	103.2	8.0	93.4	92.1	(1.4)
	France	w	w	w	w	w	w	w	w	w	w	w	w	w
	Germany	509	(2.7)	9 866	(294)	4 261	(313)	5 490	(142)	110.0	47.5	61.2	56.3	(1.9)
	Greece	455	(3.9)	8 450	(337)	2 945	(364)	5 354	(163)	94.2	32.9	59.7	64.5	(3.1)
	Hungary	477	(2.4)	9 281	(305)	5 075	(411)	4 082	(103)	103.5	56.6	45.5	44.6	(2.2)
	Iceland	473	(1.7)	8 319	(211)	328	(149)	8 222	(285)	92.8	3.7	91.7	96.2	(1.7)
	Ireland	503	(2.4)	7 903	(236)	1 035	(145)	6 833	(167)	88.1	11.5	76.2	86.8	(1.6)
	Israel	467	(3.4)	11 313	(347)	4 113	(410)	7 026	(253)	126.2	45.9	78.4	63.1	(2.7)
	Italy	481	(2.5)	8 361	(248)	3 607	(288)	4 719	(119)	93.3	40.2	52.6	56.7	(2.2)
	Japan	538	(3.0)	8 737	(308)	3 779	(335)	4 826	(136)	97.4	42.1	53.8	56.1	(2.3)
	Korea	516	(3.1)	9 059	(280)	2 232	(269)	6 762	(202)	101.0	24.9	75.4	75.2	(2.4)
	Latvia	490	(1.6)	6 758	(175)	1 094	(150)	5 494	(160)	75.4	12.2	61.3	83.4	(2.0)
	Luxembourg	483	(1.1)	10 081	(217)	3 460	(528)	6 743	(351)	112.4	38.6	75.2	66.1	(4.0)
	Mexico	416	(2.1)	5 099	(155)	1 531	(168)	3 566	(93)	56.9	17.1	39.8	70.0	(2.5)
	Netherlands	509	(2.3)	10 189	(300)	5 844	(420)	4 291	(121)	113.6	65.2	47.9	42.3	(2.0)
	New Zealand	513	(2.4)	10 836	(298)	1 867	(250)	8 858	(270)	120.9	20.8	98.8	82.6	(2.1)
	Norway	498	(2.3)	9 263	(250)	730	(104)	8 500	(219)	103.3	8.1	94.8	92.1	(1.1)
	Poland	501	(2.5)	8 244	(243)	1 155	(202)	6 949	(197)	91.9	12.9	77.5	85.7	(2.2)
	Portugal	501	(2.4)	8 431	(198)	1 976	(209)	6 531	(181)	94.0	22.0	72.8	76.8	(2.1)
	Slovak Republic	461	(2.6)	9 788	(302)	4 216	(390)	5 278	(171)	109.2	47.0	58.9	55.6	(2.5)
	Slovenia	513	(1.3)	9 061	(206)	4 303	(405)	4 587	(121)	101.1	48.0	51.2	51.6	(2.5)
	Spain	493	(2.1)	7 746	(190)	1 034	(123)	6 668	(169)	86.4	11.5	74.4	86.6	(1.4)
	Sweden	493	(3.6)	10 502	(282)	1 589	(214)	8 638	(212)	117.1	17.7	96.3	84.5	(1.8)
	Switzerland	506	(2.9)	9 905	(308)	3 744	(372)	6 181	(208)	110.5	41.8	68.9	62.3	(2.7)
	Turkey	425	(3.9)	6 283	(300)	3 331	(329)	2 918	(85)	70.1	37.1	32.5	46.7	(2.7)
	United Kingdom	509	(2.6)	9 931	(203)	2 181	(208)	7 702	(164)	110.8	24.3	85.9	77.9	(1.8)
	United States	496	(3.2)	9 727	(277)	1 857	(222)	7 829	(192)	108.5	20.7	87.3	80.8	(2.0)
	OECD average	493	(0.4)	8 966	(43)	2 695	(49)	6 186	(30)	100.0	30.1	69.0	69.9	(0.4)
Partners	Albania	427	(3.3)	6 159	(228)	1 521	(190)	4 807	(134)	68.7	17.0	53.6	76.0	(2.4)
	Algeria	376	(2.6)	4 800	(210)	1 490	(204)	3 282	(103)	53.5	16.6	36.6	68.8	(2.9)
	Brazil	401	(2.3)	7 948	(227)	3 183	(285)	4 909	(88)	88.6	35.5	54.8	60.7	(2.3)
	B-S-J-G (China)	518	(4.6)	10 689	(510)	5 655	(528)	5 023	(154)	119.2	63.1	56.0	47.0	(2.6)
	Bulgaria	446	(4.4)	10 307	(427)	5 271	(490)	5 009	(155)	115.0	58.8	55.9	48.7	(2.6)
	CABA (Argentina)	475	(6.3)	7 356	(465)	2 580	(408)	4 735	(229)	82.0	28.8	52.8	64.7	(3.9)
	Colombia	416	(2.4)	6 460	(208)	2 123	(248)	4 390	(105)	72.0	23.7	49.0	67.4	(2.7)
	Costa Rica	420	(2.1)	4 903	(170)	1 421	(192)	3 524	(85)	54.7	15.8	39.3	71.3	(2.9)
	Croatia	475	(2.5)	7 978	(223)	2 973	(303)	4 982	(139)	89.0	33.2	55.6	62.6	(2.6)
	Cyprus*	433	(1.4)	8 618	(216)	2 078	(445)	6 554	(188)	96.1	23.2	73.1	75.9	(4.1)
	Dominican Republic	332	(2.6)	5 252	(261)	1 968	(309)	3 378	(105)	58.6	22.0	37.7	63.2	(3.8)
	FYROM	384	(1.2)	7 188	(219)	1 982	(374)	5 041	(219)	80.2	22.1	56.2	71.8	(3.9)
	Georgia	411	(2.4)	8 208	(238)	1 899	(275)	6 407	(164)	91.5	21.2	71.5	77.1	(2.7)
	Hong Kong (China)	523	(2.5)	6 492	(226)	1 987	(228)	4 459	(127)	72.4	22.2	49.7	69.2	(2.4)
	Indonesia	403	(2.6)	4 675	(224)	1 960	(254)	2 739	(91)	52.1	21.9	30.6	58.3	(3.2)
	Jordan	409	(2.7)	7 121	(268)	1 888	(220)	5 111	(152)	79.4	21.1	57.0	73.0	(2.4)
	Kosovo	378	(1.7)	5 082	(158)	1 507	(205)	3 580	(127)	56.7	16.8	39.9	70.4	(3.0)
	Lebanon	386	(3.4)	8 174	(318)	3 968	(419)	4 352	(164)	91.2	44.3	48.5	52.3	(2.8)
	Lithuania	475	(2.7)	8 267	(257)	2 782	(340)	5 504	(150)	92.2	31.0	61.4	66.4	(3.0)
	Macao (China)	529	(1.1)	6 622	(156)	1 503	(356)	4 959	(199)	73.9	16.8	55.3	76.7	(4.5)
	Malta	465	(1.6)	13 839	(355)	4 190	(806)	9 784	(371)	154.3	46.7	109.1	70.0	(4.3)
	Moldova	428	(2.0)	7 403	(233)	1 444	(190)	6 027	(174)	82.6	16.1	67.2	80.7	(2.1)
	Montenegro	411	(1.0)	7 268	(150)	1 848	(379)	5 394	(211)	81.1	20.6	60.2	74.5	(3.8)
	Peru	397	(2.4)	5 883	(217)	2 154	(206)	3 750	(99)	65.6	24.0	41.8	63.5	(2.3)
	Qatar	418	(1.0)	9 749	(145)	3 864	(510)	5 941	(191)	108.7	43.1	66.3	60.6	(3.4)
	Romania	435	(3.2)	6 259	(272)	2 397	(250)	3 795	(96)	69.8	26.7	42.3	61.3	(2.6)
	Russia	487	(2.9)	6 792	(174)	1 311	(163)	5 643	(159)	75.8	14.6	62.9	81.2	(2.0)
	Singapore	556	(1.2)	10 734	(187)	3 730	(427)	6 999	(207)	119.7	41.6	78.1	65.2	(3.0)
	Chinese Taipei	532	(2.7)	9 911	(382)	3 591	(398)	6 288	(182)	110.5	40.0	70.1	63.7	(2.8)
	Thailand	421	(2.8)	6 160	(248)	2 115	(250)	4 154	(113)	68.7	23.6	46.3	66.3	(2.8)
	Trinidad and Tobago	425	(1.4)	8 798	(207)	4 646	(458)	4 044	(125)	98.1	51.8	45.1	46.5	(2.6)
	Tunisia	386	(2.1)	4 206	(204)	1 615	(264)	2 685	(87)	46.9	18.0	29.9	62.4	(4.0)
	United Arab Emirates	437	(2.4)	9 828	(211)	4 123	(321)	5 752	(115)	109.6	46.0	64.2	58.3	(2.0)
	Uruguay	435	(2.2)	7 490	(217)	2 683	(258)	4 866	(127)	83.5	29.9	54.3	64.5	(2.4)
	Viet Nam	525	(3.9)	5 868	(358)	2 350	(363)	3 499	(95)	65.4	26.2	39.0	59.8	(3.9)
	Argentina**	432	(2.9)	6 496	(199)	1 935	(183)	4 559	(111)	72.5	21.6	50.8	70.2	(2.1)
	Kazakhstan**	456	(3.7)	5 841	(389)	2 699	(381)	3 220	(110)	65.1	30.1	35.9	54.4	(3.6)
	Malaysia**	443	(3.0)	5 735	(214)	1 569	(196)	4 166	(131)	64.0	17.5	46.5	72.6	(2.6)

1. The total variation in student performance is calculated from the square of the standard deviation for all students. Due to the unbalanced, clustered nature of the data, the sum of the between- and within-school variation components, as an estimate from a sample, does not necessarily add up to the total.
2. In some countries/economies, subunits within schools were sampled instead of schools; this may affect the estimation of between-school variation components (see Annex A3).
3. The index of academic inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of performance. The intra-class correlation, in turn, is the variation in student performance between schools, divided by the sum of the variation in student performance between schools and the variation in student performance within schools, and multiplied by 100.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.10 Between- and within-school variation in students' socio-economic status

Results based on students' self-reports

		Mean ESCS[1]		Total variation in students' ESCS[2]		Variation in students' ESCS between schools[3]		Variation in students' ESCS within schools		Index of social inclusion[4]	
		Mean index	S.E.	Variance	S.E.	Variance	S.E.	Variance	S.E.	Index	S.E.
OECD	Australia	0.27	(0.01)	0.63	(0.0)	0.16	(0.01)	0.47	(0.01)	74.7	(1.24)
	Austria	0.09	(0.02)	0.73	(0.0)	0.19	(0.02)	0.53	(0.01)	73.0	(2.22)
	Belgium	0.16	(0.02)	0.82	(0.0)	0.22	(0.02)	0.59	(0.01)	72.9	(1.75)
	Canada	0.53	(0.02)	0.66	(0.0)	0.11	(0.01)	0.54	(0.01)	83.0	(1.14)
	Chile	-0.49	(0.03)	1.20	(0.0)	0.53	(0.05)	0.65	(0.02)	54.9	(2.38)
	Czech Republic	-0.21	(0.01)	0.64	(0.0)	0.17	(0.02)	0.45	(0.01)	72.1	(2.14)
	Denmark	0.59	(0.02)	0.75	(0.0)	0.12	(0.01)	0.63	(0.02)	84.0	(1.45)
	Estonia	0.05	(0.01)	0.59	(0.0)	0.12	(0.01)	0.46	(0.01)	79.1	(2.25)
	Finland	0.25	(0.02)	0.57	(0.0)	0.07	(0.01)	0.49	(0.01)	87.2	(1.63)
	France	w	w	w	w	w	w	w	w	w	w
	Germany	0.12	(0.02)	0.89	(0.0)	0.20	(0.02)	0.68	(0.02)	77.2	(1.63)
	Greece	-0.08	(0.03)	0.92	(0.0)	0.21	(0.03)	0.70	(0.02)	76.7	(2.43)
	Hungary	-0.23	(0.02)	0.92	(0.0)	0.34	(0.03)	0.56	(0.02)	62.6	(2.40)
	Iceland	0.73	(0.01)	0.54	(0.0)	0.06	(0.01)	0.47	(0.02)	89.2	(2.16)
	Ireland	0.16	(0.02)	0.71	(0.0)	0.12	(0.02)	0.58	(0.02)	82.3	(2.11)
	Israel	0.16	(0.03)	0.72	(0.0)	0.16	(0.02)	0.56	(0.03)	78.2	(2.33)
	Italy	-0.07	(0.02)	0.90	(0.0)	0.21	(0.02)	0.68	(0.01)	76.3	(1.96)
	Japan	-0.18	(0.01)	0.50	(0.0)	0.11	(0.01)	0.39	(0.01)	78.0	(1.60)
	Korea	-0.20	(0.02)	0.47	(0.0)	0.10	(0.01)	0.37	(0.01)	78.9	(2.20)
	Latvia	-0.44	(0.02)	0.84	(0.0)	0.18	(0.02)	0.64	(0.02)	78.1	(2.28)
	Luxembourg	0.07	(0.01)	1.23	(0.0)	0.33	(0.06)	0.93	(0.04)	73.9	(3.97)
	Mexico	-1.22	(0.04)	1.48	(0.1)	0.59	(0.06)	0.89	(0.02)	60.3	(2.85)
	Netherlands	0.16	(0.02)	0.58	(0.0)	0.13	(0.02)	0.45	(0.01)	77.9	(2.28)
	New Zealand	0.17	(0.02)	0.61	(0.0)	0.10	(0.01)	0.50	(0.02)	83.0	(1.94)
	Norway	0.48	(0.02)	0.54	(0.0)	0.05	(0.01)	0.49	(0.02)	90.3	(1.27)
	Poland	-0.39	(0.02)	0.68	(0.0)	0.12	(0.02)	0.56	(0.02)	82.0	(2.50)
	Portugal	-0.39	(0.03)	1.32	(0.0)	0.35	(0.04)	0.98	(0.02)	73.9	(2.62)
	Slovak Republic	-0.11	(0.02)	0.90	(0.0)	0.28	(0.05)	0.61	(0.03)	68.1	(3.11)
	Slovenia	0.03	(0.01)	0.67	(0.0)	0.17	(0.02)	0.49	(0.01)	74.1	(2.47)
	Spain	-0.51	(0.04)	1.42	(0.0)	0.44	(0.04)	0.98	(0.02)	69.0	(2.41)
	Sweden	0.33	(0.02)	0.67	(0.0)	0.09	(0.01)	0.58	(0.02)	86.7	(1.45)
	Switzerland	0.14	(0.02)	0.84	(0.0)	0.16	(0.02)	0.69	(0.02)	81.5	(1.90)
	Turkey	-1.43	(0.05)	1.37	(0.1)	0.37	(0.05)	1.01	(0.03)	73.2	(2.84)
	United Kingdom	0.21	(0.02)	0.74	(0.0)	0.15	(0.01)	0.59	(0.02)	80.2	(1.79)
	United States	0.10	(0.04)	1.01	(0.0)	0.27	(0.04)	0.73	(0.02)	73.0	(2.89)
	OECD average	-0.04	(0.00)	0.82	(0.0)	0.20	(0.00)	0.61	(0.00)	76.5	(0.38)
Partners	Albania	-0.77	(0.03)	0.91	(0.0)	0.12	(0.02)	0.79	(0.02)	86.7	(1.82)
	Algeria	-1.28	(0.04)	1.06	(0.0)	0.20	(0.03)	0.87	(0.03)	81.6	(2.72)
	Brazil	-0.96	(0.03)	1.34	(0.0)	0.45	(0.04)	0.88	(0.02)	66.1	(2.05)
	B-S-J-G (China)	-1.07	(0.04)	1.22	(0.1)	0.51	(0.06)	0.71	(0.02)	58.2	(3.07)
	Bulgaria	-0.08	(0.03)	0.99	(0.0)	0.30	(0.03)	0.65	(0.02)	68.4	(2.30)
	CABA (Argentina)	0.01	(0.09)	1.36	(0.1)	0.71	(0.09)	0.63	(0.05)	46.9	(3.77)
	Colombia	-0.99	(0.04)	1.25	(0.0)	0.51	(0.06)	0.73	(0.02)	58.7	(3.04)
	Costa Rica	-0.80	(0.04)	1.34	(0.0)	0.49	(0.06)	0.83	(0.02)	62.8	(3.31)
	Croatia	-0.24	(0.02)	0.68	(0.0)	0.14	(0.02)	0.54	(0.01)	78.8	(2.19)
	Cyprus*	0.20	(0.01)	0.86	(0.0)	0.20	(0.04)	0.66	(0.02)	76.7	(3.71)
	Dominican Republic	-0.90	(0.03)	1.09	(0.0)	0.32	(0.04)	0.76	(0.02)	70.1	(3.11)
	FYROM	-0.23	(0.01)	0.81	(0.0)	0.14	(0.02)	0.68	(0.04)	83.2	(2.86)
	Georgia	-0.33	(0.02)	0.77	(0.0)	0.21	(0.02)	0.54	(0.01)	71.5	(2.27)
	Hong Kong (China)	-0.53	(0.03)	0.90	(0.0)	0.21	(0.03)	0.68	(0.02)	76.1	(2.72)
	Indonesia	-1.87	(0.04)	1.24	(0.0)	0.57	(0.07)	0.68	(0.02)	54.4	(3.19)
	Jordan	-0.42	(0.03)	1.02	(0.0)	0.24	(0.03)	0.77	(0.03)	76.0	(2.16)
	Kosovo	-0.14	(0.02)	0.76	(0.0)	0.09	(0.02)	0.66	(0.02)	87.6	(2.19)
	Lebanon	-0.60	(0.04)	1.15	(0.0)	0.42	(0.05)	0.72	(0.03)	63.1	(3.17)
	Lithuania	-0.06	(0.02)	0.75	(0.0)	0.18	(0.02)	0.55	(0.02)	75.7	(2.19)
	Macao (China)	-0.54	(0.01)	0.73	(0.0)	0.22	(0.05)	0.51	(0.01)	69.8	(4.64)
	Malta	-0.05	(0.01)	0.90	(0.0)	0.21	(0.04)	0.70	(0.02)	76.9	(3.29)
	Moldova	-0.69	(0.02)	0.81	(0.0)	0.23	(0.03)	0.58	(0.02)	72.0	(2.69)
	Montenegro	-0.18	(0.01)	0.69	(0.0)	0.10	(0.03)	0.59	(0.02)	85.3	(3.52)
	Peru	-1.08	(0.04)	1.45	(0.0)	0.74	(0.06)	0.71	(0.02)	49.1	(2.34)
	Qatar	0.58	(0.01)	0.60	(0.0)	0.12	(0.02)	0.42	(0.04)	77.7	(2.41)
	Romania	-0.58	(0.04)	0.75	(0.0)	0.24	(0.03)	0.50	(0.02)	68.0	(2.85)
	Russia	0.05	(0.02)	0.56	(0.0)	0.11	(0.01)	0.43	(0.01)	79.5	(2.10)
	Singapore	0.03	(0.01)	0.83	(0.0)	0.21	(0.02)	0.62	(0.02)	74.8	(2.29)
	Chinese Taipei	-0.21	(0.02)	0.69	(0.0)	0.15	(0.02)	0.54	(0.01)	78.2	(1.94)
	Thailand	-1.23	(0.04)	1.20	(0.0)	0.44	(0.05)	0.77	(0.02)	63.3	(3.02)
	Trinidad and Tobago	-0.23	(0.01)	0.87	(0.0)	0.15	(0.02)	0.72	(0.02)	82.8	(1.93)
	Tunisia	-0.83	(0.03)	1.35	(0.0)	0.41	(0.06)	0.94	(0.03)	69.6	(3.20)
	United Arab Emirates	0.50	(0.01)	0.55	(0.0)	0.11	(0.01)	0.42	(0.01)	79.1	(1.49)
	Uruguay	-0.78	(0.02)	1.20	(0.0)	0.41	(0.05)	0.80	(0.02)	66.1	(2.92)
	Viet Nam	-1.87	(0.05)	1.23	(0.1)	0.43	(0.06)	0.81	(0.03)	65.5	(2.96)
	Argentina**	-0.79	(0.04)	1.34	(0.0)	0.43	(0.04)	0.90	(0.02)	67.7	(2.29)
	Kazakhstan**	-0.19	(0.02)	0.49	(0.0)	0.11	(0.01)	0.38	(0.01)	77.8	(2.18)
	Malaysia**	-0.47	(0.04)	1.18	(0.0)	0.33	(0.04)	0.84	(0.02)	71.7	(2.34)

1. ESCS refers to the PISA index of economic, social and cultural status.
2. The total variation in student ESCS is equal to the square of the standard deviation of ESCS within each country/economy. Due to the unbalanced, clustered nature of the data, the sum of the between- and within-school variation components, as an estimate from a sample, does not necessarily add up to the total.
3. In some countries/economies, subunits within schools were sampled instead of schools; this may affect the estimation of between-school variation components (see Annex A3).
4. The index of social inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of socio-economic status. The intra-class correlation, in turn, is the variation in student socio-economic status between schools, divided by the sum of the variation in student socio-economic status between schools and the variation in student socio-economic status within schools, and multiplied by 100.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.11 Students' socio-economic status and performance in science, by schools' socio-economic status

Results based on students' self-reports

	Average socio-economic status of students						Mean performance in science of students					
	Attending socio-economically disadvantaged schools[1]		Attending socio-economically average schools[2]		Attending socio-economically advantaged schools[3]		Attending socio-economically disadvantaged schools		Attending socio-economically average schools		Attending socio-economically advantaged schools	
	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.
OECD												
Australia	-0.30	(0.02)	0.28	(0.01)	0.80	(0.01)	464	(3.0)	507	(2.4)	564	(3.4)
Austria	-0.48	(0.03)	0.07	(0.02)	0.71	(0.03)	423	(4.9)	499	(4.2)	559	(4.0)
Belgium	-0.49	(0.03)	0.18	(0.01)	0.79	(0.02)	425	(4.7)	503	(4.3)	578	(4.0)
Canada	0.05	(0.01)	0.54	(0.01)	0.99	(0.01)	493	(3.6)	528	(2.2)	562	(4.5)
Chile	-1.36	(0.04)	-0.55	(0.03)	0.51	(0.05)	397	(4.5)	442	(4.0)	506	(5.9)
Czech Republic	-0.73	(0.02)	-0.26	(0.01)	0.41	(0.03)	431	(4.7)	486	(3.4)	569	(6.2)
Denmark	0.09	(0.02)	0.60	(0.01)	1.08	(0.02)	473	(3.9)	500	(3.2)	534	(4.4)
Estonia	-0.44	(0.02)	0.04	(0.01)	0.56	(0.02)	509	(4.2)	527	(2.9)	573	(4.1)
Finland	-0.11	(0.02)	0.23	(0.01)	0.66	(0.03)	511	(5.0)	528	(3.3)	556	(4.7)
France	w	w	w	w	w	w	w	w	w	w	w	w
Germany	-0.52	(0.02)	0.08	(0.02)	0.75	(0.02)	437	(5.1)	510	(4.4)	581	(3.9)
Greece	-0.72	(0.03)	-0.07	(0.02)	0.56	(0.03)	391	(9.4)	462	(4.3)	503	(6.1)
Hungary	-1.03	(0.02)	-0.23	(0.03)	0.58	(0.03)	391	(4.2)	480	(3.9)	557	(4.2)
Iceland	0.35	(0.03)	0.75	(0.02)	1.07	(0.03)	460	(3.5)	473	(2.5)	487	(3.4)
Ireland	-0.29	(0.02)	0.13	(0.01)	0.66	(0.03)	468	(5.8)	503	(3.1)	536	(4.4)
Israel	-0.38	(0.05)	0.18	(0.02)	0.66	(0.02)	401	(8.8)	467	(5.4)	532	(6.9)
Italy	-0.69	(0.03)	-0.08	(0.02)	0.58	(0.03)	416	(6.1)	488	(3.8)	532	(5.1)
Japan	-0.63	(0.01)	-0.19	(0.01)	0.27	(0.01)	477	(4.9)	537	(5.2)	603	(5.8)
Korea	-0.59	(0.02)	-0.22	(0.01)	0.25	(0.03)	465	(5.5)	517	(3.6)	563	(7.3)
Latvia	-1.04	(0.02)	-0.45	(0.02)	0.20	(0.02)	458	(4.1)	487	(2.3)	528	(3.9)
Luxembourg	-0.58	(0.03)	0.00	(0.02)	0.92	(0.02)	421	(2.2)	476	(1.4)	560	(2.1)
Mexico	-2.22	(0.04)	-1.24	(0.03)	-0.18	(0.05)	380	(4.3)	412	(2.6)	459	(5.0)
Netherlands	-0.31	(0.03)	0.15	(0.01)	0.64	(0.02)	424	(5.4)	510	(3.9)	591	(3.6)
New Zealand	-0.28	(0.02)	0.15	(0.02)	0.62	(0.02)	461	(5.9)	514	(3.5)	564	(3.7)
Norway	0.14	(0.02)	0.48	(0.01)	0.83	(0.02)	479	(4.4)	499	(3.3)	519	(4.2)
Poland	-0.85	(0.02)	-0.41	(0.01)	0.11	(0.04)	480	(3.7)	493	(3.8)	540	(5.3)
Portugal	-1.15	(0.03)	-0.43	(0.02)	0.44	(0.04)	454	(4.9)	502	(4.0)	547	(4.6)
Slovak Republic	-0.82	(0.05)	-0.08	(0.01)	0.55	(0.03)	392	(5.7)	459	(3.4)	535	(6.1)
Slovenia	-0.52	(0.02)	0.00	(0.01)	0.64	(0.02)	441	(2.4)	513	(1.7)	584	(2.8)
Spain	-1.32	(0.03)	-0.60	(0.03)	0.47	(0.04)	459	(4.7)	493	(3.0)	526	(3.7)
Sweden	-0.09	(0.02)	0.31	(0.01)	0.78	(0.02)	452	(4.8)	489	(4.1)	543	(6.9)
Switzerland	-0.36	(0.02)	0.09	(0.02)	0.75	(0.03)	457	(5.9)	496	(5.3)	573	(5.3)
Turkey	-2.23	(0.03)	-1.44	(0.02)	-0.61	(0.07)	376	(5.6)	423	(6.8)	480	(9.1)
United Kingdom	-0.31	(0.02)	0.18	(0.02)	0.77	(0.03)	463	(4.3)	503	(3.9)	568	(4.9)
United States	-0.61	(0.06)	0.12	(0.02)	0.77	(0.02)	447	(6.7)	500	(4.6)	538	(5.1)
OECD average	-0.62	(0.00)	-0.05	(0.00)	0.57	(0.01)	442	(0.9)	492	(0.6)	546	(0.8)
Partners												
Albania	-1.24	(0.03)	-0.82	(0.01)	-0.22	(0.04)	m	m	m	m	m	m
Algeria	-1.81	(0.02)	-1.35	(0.02)	-0.61	(0.06)	363	(4.6)	365	(3.9)	409	(7.5)
Brazil	-1.76	(0.03)	-1.04	(0.02)	-0.01	(0.04)	362	(3.3)	388	(2.4)	466	(6.1)
B-S-J-G (China)	-1.89	(0.02)	-1.19	(0.03)	-0.04	(0.07)	437	(6.1)	521	(7.3)	593	(8.4)
Bulgaria	-0.86	(0.04)	-0.07	(0.03)	0.65	(0.03)	367	(8.0)	442	(6.0)	532	(7.3)
CABA (Argentina)	-1.17	(0.06)	0.09	(0.10)	1.01	(0.05)	412	(8.1)	478	(11.7)	530	(8.0)
Colombia	-1.82	(0.03)	-1.08	(0.02)	0.04	(0.06)	377	(5.2)	409	(3.2)	468	(5.8)
Costa Rica	-1.62	(0.03)	-0.90	(0.02)	0.22	(0.05)	389	(3.2)	412	(2.6)	465	(5.2)
Croatia	-0.70	(0.02)	-0.30	(0.02)	0.32	(0.03)	428	(6.2)	467	(5.2)	540	(5.0)
Cyprus*	-0.39	(0.02)	0.16	(0.02)	0.84	(0.02)	382	(2.5)	435	(1.8)	477	(2.7)
Dominican Republic	-1.57	(0.03)	-1.00	(0.03)	-0.06	(0.05)	298	(4.0)	321	(3.8)	387	(7.5)
FYROM	-0.71	(0.02)	-0.26	(0.02)	0.30	(0.02)	354	(2.7)	375	(1.9)	431	(2.8)
Georgia	-0.96	(0.02)	-0.35	(0.02)	0.33	(0.03)	374	(4.5)	407	(3.7)	456	(5.3)
Hong Kong (China)	-1.05	(0.02)	-0.63	(0.03)	0.16	(0.05)	485	(5.8)	522	(4.9)	564	(3.1)
Indonesia	-2.72	(0.03)	-1.97	(0.03)	-0.80	(0.07)	369	(6.3)	400	(3.1)	443	(6.6)
Jordan	-1.06	(0.03)	-0.45	(0.02)	0.26	(0.03)	372	(7.8)	412	(4.0)	439	(6.4)
Kosovo	-0.60	(0.02)	-0.15	(0.02)	0.32	(0.03)	346	(3.3)	377	(2.6)	414	(3.6)
Lebanon	-1.48	(0.05)	-0.60	(0.02)	0.27	(0.05)	352	(5.5)	374	(4.8)	446	(9.2)
Lithuania	-0.67	(0.03)	-0.05	(0.02)	0.52	(0.02)	429	(4.8)	471	(3.9)	532	(5.5)
Macao (China)	-1.06	(0.02)	-0.65	(0.02)	0.18	(0.02)	512	(2.2)	532	(1.4)	537	(2.2)
Malta	-0.61	(0.03)	-0.10	(0.02)	0.61	(0.03)	379	(3.2)	475	(2.2)	531	(3.4)
Moldova	-1.29	(0.03)	-0.72	(0.02)	-0.03	(0.03)	402	(4.4)	422	(3.0)	465	(5.4)
Montenegro	-0.61	(0.02)	-0.19	(0.01)	0.30	(0.02)	369	(2.5)	409	(1.4)	458	(2.2)
Peru	-2.19	(0.03)	-1.10	(0.04)	0.07	(0.05)	344	(3.3)	395	(3.1)	452	(5.7)
Qatar	0.09	(0.01)	0.63	(0.01)	1.00	(0.01)	367	(1.7)	422	(1.4)	459	(1.7)
Romania	-1.17	(0.03)	-0.64	(0.02)	0.13	(0.06)	394	(5.3)	427	(4.7)	492	(7.0)
Russia	-0.48	(0.03)	0.08	(0.01)	0.49	(0.02)	456	(6.1)	485	(4.0)	520	(5.2)
Singapore	-0.51	(0.02)	-0.04	(0.02)	0.72	(0.02)	497	(2.3)	548	(2.8)	629	(6.5)
Chinese Taipei	-0.72	(0.02)	-0.23	(0.02)	0.33	(0.03)	463	(5.7)	533	(3.4)	601	(7.8)
Thailand	-1.99	(0.02)	-1.33	(0.03)	-0.25	(0.08)	393	(4.8)	410	(4.3)	473	(7.5)
Trinidad and Tobago	-0.73	(0.03)	-0.28	(0.02)	0.34	(0.02)	366	(2.4)	411	(1.9)	512	(2.8)
Tunisia	-1.63	(0.05)	-0.88	(0.03)	0.06	(0.05)	355	(4.4)	383	(3.4)	424	(4.6)
United Arab Emirates	0.03	(0.02)	0.50	(0.01)	0.96	(0.01)	390	(5.6)	436	(4.0)	485	(5.5)
Uruguay	-1.46	(0.01)	-0.92	(0.02)	0.19	(0.06)	389	(4.1)	428	(3.5)	496	(5.1)
Viet Nam	-2.63	(0.06)	-1.95	(0.02)	-0.94	(0.08)	488	(6.6)	521	(4.1)	568	(10.1)
Argentina**	-1.62	(0.04)	-0.85	(0.03)	0.13	(0.04)	398	(5.1)	426	(5.0)	479	(5.3)
Kazakhstan**	-0.63	(0.02)	-0.21	(0.01)	0.28	(0.04)	425	(6.0)	456	(5.7)	490	(8.6)
Malaysia**	-1.21	(0.04)	-0.50	(0.02)	0.33	(0.04)	409	(3.8)	439	(4.4)	485	(7.0)

1. A socio-economically disadvantaged school is a school in the bottom quarter of the distribution of the school-level PISA index of economic, social and cultural status (ESCS) within each country/economy.
2. A socio-economically average school is a school in the second and third quarters of the distribution of the school-level PISA index of economic, social and cultural status (ESCS) within each country/economy.
3. A socio-economically advantaged school is a school in the top quarter of the distribution of the school-level PISA index of economic, social and cultural status (ESCS) within each country/economy.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.12a Relationship between science performance and socio-economic status, between and within schools[1]

Results based on students' self-reports

		Overall association of ESCS[2] and science performance		Within-school association of ESCS and science performance[3]		School ESCS and science performance[4]		Percentage of the variation in science performance explained by students' ESCS			Percentage of the variation in science performance explained by students' and schools' ESCS		
		Score-point difference per unit increase of the student ESCS index		Student-level score-point difference per unit increase of the student ESCS index		School-level score-point difference per unit increase of the school ESCS index		Overall	Between-school	Within-school	Overall	Between-school	Within-school
		Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	%	%	%	%	%	%
OECD	Australia	**44**	(1.5)	**26**	(1.5)	**61**	(4.0)	11.7	36.7	3.7	16.4	63.0	3.9
	Austria	**45**	(2.0)	**16**	(1.7)	**97**	(4.9)	15.9	19.7	2.5	31.2	68.8	2.5
	Belgium	**48**	(1.8)	**19**	(1.2)	**101**	(4.8)	19.3	25.0	4.0	36.8	78.7	4.0
	Canada	**34**	(1.5)	**23**	(1.5)	**50**	(3.8)	8.8	30.6	3.9	11.9	53.7	4.0
	Chile	**32**	(1.4)	**9**	(1.4)	**48**	(2.8)	16.9	24.7	1.3	26.3	66.5	1.3
	Czech Republic	**52**	(2.1)	**21**	(1.8)	**98**	(4.9)	18.8	23.7	3.1	33.5	75.4	3.0
	Denmark	**34**	(1.7)	**26**	(1.5)	**36**	(5.3)	10.4	35.4	6.3	12.3	50.7	6.3
	Estonia	**32**	(1.8)	**20**	(1.9)	**47**	(5.9)	7.8	24.0	2.7	11.0	48.2	2.6
	Finland	**40**	(2.3)	**35**	(2.3)	**35**	(8.5)	10.0	38.3	7.6	11.0	46.1	7.7
	France	w	w	w	w	w	w	w	w	w	w	w	w
	Germany	**42**	(1.9)	**15**	(1.4)	**101**	(4.3)	15.8	20.3	2.6	34.0	74.6	2.7
	Greece	**34**	(2.1)	**15**	(1.6)	**70**	(6.4)	12.5	20.9	2.7	23.3	60.1	2.8
	Hungary	**47**	(1.9)	**6**	(1.2)	**96**	(3.6)	21.4	11.6	0.4	43.5	80.1	0.3
	Iceland	**28**	(2.1)	**26**	(2.4)	**14**	(7.0)	4.9	40.4	4.6	5.1	49.7	4.6
	Ireland	**38**	(1.6)	**30**	(1.6)	**39**	(5.3)	12.7	44.2	7.6	14.9	61.5	7.6
	Israel	**42**	(2.3)	**18**	(1.8)	**101**	(10.2)	11.2	17.8	2.5	23.1	59.7	2.5
	Italy	**30**	(1.7)	**8**	(1.2)	**80**	(5.0)	9.6	11.3	1.0	23.5	52.5	1.0
	Japan	**42**	(2.2)	**10**	(1.7)	**131**	(7.1)	10.1	10.2	0.8	28.0	63.0	0.8
	Korea	**44**	(2.7)	**23**	(2.0)	**92**	(6.3)	10.1	24.8	2.7	17.9	63.7	2.7
	Latvia	**26**	(1.6)	**16**	(1.6)	**39**	(4.3)	8.7	31.6	2.4	12.5	58.7	2.5
	Luxembourg	**41**	(1.1)	**21**	(1.2)	**75**	(2.0)	20.8	36.7	6.6	34.4	90.3	6.6
	Mexico	**19**	(1.1)	**6**	(1.0)	**30**	(2.5)	10.9	22.7	1.1	17.3	54.5	1.2
	Netherlands	**47**	(2.6)	**9**	(1.6)	**154**	(11.8)	12.5	7.9	0.8	37.5	64.5	0.8
	New Zealand	**49**	(2.6)	**34**	(2.5)	**73**	(7.0)	13.6	43.2	6.7	18.7	73.0	6.8
	Norway	**37**	(2.2)	**34**	(2.3)	**23**	(7.4)	8.2	27.7	6.9	8.6	34.0	6.9
	Poland	**40**	(2.0)	**31**	(1.9)	**39**	(5.5)	13.4	45.0	7.9	15.6	63.5	7.9
	Portugal	**31**	(1.5)	**20**	(1.4)	**38**	(4.0)	14.9	39.9	6.0	19.6	65.2	6.1
	Slovak Republic	**41**	(2.3)	**13**	(1.8)	**82**	(7.2)	16.0	17.6	1.3	30.2	70.4	1.3
	Slovenia	**43**	(1.5)	**7**	(1.8)	**118**	(4.0)	13.5	9.4	0.3	35.4	74.0	0.3
	Spain	**27**	(1.1)	**22**	(1.2)	**15**	(2.5)	13.4	53.8	7.0	14.4	61.9	7.1
	Sweden	**44**	(2.2)	**32**	(1.9)	**67**	(7.4)	12.2	38.0	6.8	16.3	65.0	6.9
	Switzerland	**43**	(1.9)	**26**	(1.6)	**78**	(6.9)	15.6	24.2	7.5	24.4	55.4	7.4
	Turkey	**20**	(2.1)	**2**	(0.9)	**61**	(5.7)	9.0	3.8	0.1	26.3	49.2	0.1
	United Kingdom	**37**	(1.9)	**20**	(1.7)	**74**	(4.9)	10.5	30.7	3.2	17.8	69.2	3.3
	United States	**33**	(1.8)	**23**	(1.7)	**36**	(5.7)	11.4	36.2	4.8	14.2	54.0	4.9
	OECD average	**38**	(0.3)	**19**	(0.3)	**69**	(1.0)	12.9	27.2	3.8	22.4	62.6	3.8
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	**8**	(2.3)	-2	(1.1)	**46**	(6.4)	1.4	-1.7	0.1	9.5	30.8	0.1
	Brazil	**27**	(1.6)	**8**	(1.1)	**53**	(2.7)	12.5	17.5	1.2	23.3	58.0	1.3
	B-S-J-G (China)	**40**	(2.5)	**7**	(1.3)	**76**	(3.5)	18.5	12.6	0.7	34.7	65.0	0.7
	Bulgaria	**41**	(2.3)	**7**	(1.4)	**100**	(6.6)	16.4	11.4	0.7	38.3	74.6	0.6
	CABA (Argentina)	**37**	(2.6)	**17**	(2.4)	**38**	(4.9)	25.6	53.2	3.5	32.2	83.7	3.8
	Colombia	**27**	(1.8)	**9**	(1.1)	**40**	(3.0)	13.7	25.8	1.4	21.3	64.4	1.4
	Costa Rica	**24**	(1.3)	**11**	(1.1)	**32**	(2.9)	15.6	35.8	2.9	22.4	70.0	3.0
	Croatia	**38**	(1.9)	**16**	(1.5)	**95**	(6.1)	12.1	18.5	2.6	26.0	65.7	2.6
	Cyprus*	**31**	(1.5)	**14**	(1.8)	**63**	(3.1)	9.5	23.0	2.2	17.2	62.2	2.2
	Dominican Republic	**25**	(2.1)	**8**	(1.4)	**52**	(4.6)	12.9	22.0	1.9	25.5	66.4	1.9
	FYROM	**25**	(1.6)	**10**	(1.6)	**71**	(4.3)	6.9	11.8	1.1	16.0	54.5	1.1
	Georgia	**34**	(2.0)	**20**	(2.0)	**43**	(5.2)	11.1	29.7	3.2	14.9	53.0	3.2
	Hong Kong (China)	**19**	(1.9)	**5**	(1.3)	**54**	(4.9)	4.9	7.4	0.3	12.8	40.9	0.3
	Indonesia	**22**	(1.8)	**4**	(1.1)	**39**	(3.3)	13.2	13.7	0.3	23.4	55.7	0.4
	Jordan	**25**	(1.8)	**17**	(1.3)	**32**	(6.4)	9.4	20.3	4.4	12.4	33.7	4.4
	Kosovo	**18**	(1.6)	**7**	(1.5)	**64**	(5.3)	5.1	9.9	1.0	14.2	48.3	0.9
	Lebanon	**26**	(2.5)	**5**	(1.7)	**52**	(4.8)	9.7	9.7	0.5	18.9	39.9	0.5
	Lithuania	**36**	(2.1)	**15**	(1.8)	**73**	(5.4)	11.6	21.4	2.4	21.4	59.6	2.4
	Macao (China)	**12**	(1.7)	**8**	(2.0)	**14**	(2.9)	1.7	3.8	0.4	2.2	7.3	0.4
	Malta	**47**	(1.8)	**25**	(2.1)	**90**	(4.2)	14.5	29.3	4.9	24.4	69.2	4.9
	Moldova	**33**	(1.9)	**22**	(1.7)	**33**	(4.1)	11.6	36.9	4.6	14.1	55.7	4.6
	Montenegro	**23**	(1.5)	**7**	(1.6)	**97**	(3.4)	5.0	9.5	0.6	17.1	69.8	0.6
	Peru	**30**	(1.4)	**10**	(1.1)	**37**	(2.4)	21.6	40.3	2.0	30.0	79.3	2.1
	Qatar	**27**	(1.4)	**6**	(1.5)	**96**	(2.8)	4.4	6.3	0.7	13.9	34.3	0.7
	Romania	**34**	(2.4)	**13**	(1.5)	**58**	(4.7)	13.8	20.2	1.9	23.2	60.4	1.9
	Russia	**29**	(2.4)	**17**	(1.8)	**44**	(7.5)	6.7	21.5	2.4	9.7	43.5	2.3
	Singapore	**47**	(1.5)	**25**	(1.5)	**78**	(4.0)	16.8	29.3	5.5	26.1	64.9	5.6
	Chinese Taipei	**45**	(2.7)	**19**	(1.8)	**106**	(6.2)	14.1	22.3	3.2	28.3	72.3	3.2
	Thailand	**22**	(2.3)	**4**	(1.3)	**44**	(3.6)	9.0	12.2	0.3	18.0	55.0	0.3
	Trinidad and Tobago	**31**	(1.4)	**5**	(1.6)	**131**	(3.7)	10.0	6.2	0.5	37.5	70.1	0.5
	Tunisia	**17**	(1.7)	**4**	(0.9)	**39**	(3.9)	9.0	12.0	0.6	19.5	52.3	0.6
	United Arab Emirates	**30**	(1.8)	**6**	(1.3)	**98**	(6.9)	4.9	5.2	0.4	14.5	34.0	0.4
	Uruguay	**32**	(1.4)	**12**	(1.2)	**52**	(2.8)	16.1	28.7	2.8	26.3	68.8	2.9
	Viet Nam	**23**	(2.7)	**7**	(1.2)	**42**	(6.5)	10.8	14.4	1.2	19.6	45.8	1.2
	Argentina**	**25**	(1.5)	**12**	(1.2)	**37**	(3.4)	12.8	28.3	2.8	19.3	59.5	2.8
	Kazakhstan**	**23**	(2.9)	**10**	(1.8)	**51**	(8.6)	4.5	5.5	1.2	8.7	18.1	1.2
	Malaysia**	**25**	(1.6)	**14**	(1.1)	**36**	(4.3)	12.6	28.9	3.9	18.2	56.1	3.9

1. In some countries/economies, subunits within schools were sampled instead of schools as administrative units; this may affect the estimation of school-level effects (see Annex A3).
2. ESCS refers to the PISA index of economic, social and cultural status.
3. Two-level regression of science performance on student ESCS and school mean ESCS: within-school slope for ESCS and student-level variation explained by the model.
4. Two-level regression of science performance on student ESCS and school mean ESCS: between-school slope for ESCS and school-level variation explained by the model.

Note: Values that are statistically significant are indicated in bold (see Annex A3).

* See note at the beginning of this Annex.

** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.13 Differences in educational resources between advantaged and disadvantaged schools

Results based on students' self-reports

		Index of shortage of educational material[1]								Index of shortage of educational staff[2]							
		All schools		Disadvantaged schools[3]		Advantaged schools[4]		Difference between advantaged and disadvantaged schools		All schools		Disadvantaged schools		Advantaged schools		Difference between advantaged and disadvantaged schools	
		Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Dif.	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Dif.	S.E.
OECD	Australia	-0.39	(0.03)	-0.13	(0.07)	-0.77	(0.06)	**-0.64**	(0.09)	-0.35	(0.03)	0.13	(0.08)	-0.92	(0.08)	**-1.06**	(0.11)
	Austria	-0.27	(0.06)	-0.23	(0.13)	-0.21	(0.16)	0.02	(0.20)	0.18	(0.07)	0.23	(0.16)	0.35	(0.14)	0.12	(0.22)
	Belgium	0.11	(0.06)	0.24	(0.13)	-0.05	(0.11)	-0.29	(0.17)	0.23	(0.06)	0.35	(0.13)	0.15	(0.11)	-0.20	(0.16)
	Canada	-0.46	(0.04)	-0.46	(0.07)	-0.61	(0.08)	-0.15	(0.11)	-0.20	(0.06)	-0.05	(0.09)	-0.41	(0.15)	**-0.36**	(0.18)
	Chile	-0.32	(0.06)	-0.04	(0.13)	-0.65	(0.08)	**-0.62**	(0.16)	-0.23	(0.08)	-0.21	(0.17)	-0.69	(0.12)	**-0.48**	(0.19)
	Czech Republic	-0.13	(0.05)	-0.10	(0.09)	-0.33	(0.09)	-0.24	(0.12)	-0.44	(0.06)	-0.21	(0.10)	-0.77	(0.13)	**-0.56**	(0.18)
	Denmark	-0.21	(0.08)	-0.05	(0.22)	-0.38	(0.11)	-0.33	(0.26)	-0.70	(0.06)	-0.35	(0.16)	-0.90	(0.15)	**-0.55**	(0.21)
	Estonia	0.05	(0.05)	-0.03	(0.14)	0.22	(0.08)	0.25	(0.17)	0.07	(0.05)	0.18	(0.15)	0.29	(0.08)	0.11	(0.16)
	Finland	0.09	(0.07)	0.09	(0.16)	0.03	(0.14)	-0.06	(0.20)	0.00	(0.06)	0.00	(0.14)	-0.03	(0.13)	-0.04	(0.19)
	France	-0.17	(0.06)	w	w	w	w	w	w	0.17	(0.05)	w	w	w	w	w	w
	Germany	0.06	(0.07)	0.09	(0.13)	0.04	(0.13)	-0.05	(0.17)	0.41	(0.06)	0.64	(0.09)	0.39	(0.13)	-0.25	(0.15)
	Greece	0.39	(0.09)	0.33	(0.28)	0.12	(0.11)	-0.21	(0.30)	0.61	(0.07)	0.69	(0.17)	0.52	(0.17)	-0.17	(0.24)
	Hungary	0.51	(0.07)	0.61	(0.12)	0.34	(0.19)	-0.27	(0.22)	0.09	(0.05)	0.26	(0.09)	-0.13	(0.12)	**-0.39**	(0.15)
	Iceland	-0.40	(0.00)	-0.57	(0.01)	-0.28	(0.01)	**0.29**	(0.01)	-0.26	(0.01)	-0.33	(0.01)	-0.35	(0.01)	-0.02	(0.01)
	Ireland	0.25	(0.09)	0.48	(0.22)	0.10	(0.25)	-0.38	(0.33)	0.12	(0.07)	0.18	(0.15)	-0.03	(0.20)	-0.21	(0.25)
	Israel	0.44	(0.10)	0.73	(0.26)	0.39	(0.20)	-0.34	(0.34)	0.34	(0.09)	0.74	(0.27)	0.14	(0.19)	-0.59	(0.35)
	Italy	0.56	(0.08)	0.66	(0.20)	0.24	(0.16)	-0.43	(0.26)	0.35	(0.08)	0.49	(0.14)	0.26	(0.14)	-0.23	(0.20)
	Japan	0.72	(0.07)	0.98	(0.17)	0.36	(0.12)	**-0.62**	(0.21)	0.49	(0.05)	0.57	(0.09)	0.44	(0.09)	-0.13	(0.13)
	Korea	0.42	(0.08)	0.43	(0.18)	0.35	(0.13)	-0.08	(0.20)	0.19	(0.06)	0.11	(0.13)	0.35	(0.14)	0.24	(0.18)
	Latvia	-0.19	(0.04)	-0.34	(0.07)	0.13	(0.08)	**0.47**	(0.11)	-0.21	(0.06)	-0.11	(0.11)	-0.10	(0.10)	0.01	(0.16)
	Luxembourg	-0.16	(0.00)	0.06	(0.01)	-0.53	(0.00)	**-0.59**	(0.01)	0.39	(0.00)	0.30	(0.01)	-0.11	(0.00)	**-0.40**	(0.01)
	Mexico	0.46	(0.07)	1.28	(0.14)	-0.39	(0.12)	**-1.67**	(0.19)	0.10	(0.05)	0.27	(0.12)	-0.51	(0.11)	**-0.79**	(0.18)
	Netherlands	-0.20	(0.08)	-0.20	(0.21)	-0.30	(0.17)	-0.10	(0.26)	0.01	(0.07)	0.21	(0.22)	-0.16	(0.15)	-0.37	(0.26)
	New Zealand	-0.09	(0.06)	0.11	(0.17)	-0.29	(0.11)	-0.39	(0.21)	-0.42	(0.08)	-0.06	(0.18)	-0.70	(0.09)	**-0.64**	(0.21)
	Norway	0.00	(0.06)	0.15	(0.12)	-0.20	(0.11)	**-0.35**	(0.16)	-0.11	(0.06)	0.07	(0.11)	-0.36	(0.12)	**-0.43**	(0.16)
	Poland	-0.35	(0.07)	-0.43	(0.12)	-0.31	(0.17)	0.12	(0.20)	-1.09	(0.06)	-1.13	(0.10)	-1.17	(0.16)	-0.03	(0.19)
	Portugal	0.11	(0.07)	0.24	(0.19)	-0.30	(0.19)	**-0.54**	(0.25)	0.93	(0.05)	1.04	(0.10)	0.68	(0.08)	**-0.35**	(0.14)
	Slovak Republic	0.05	(0.06)	0.02	(0.09)	0.25	(0.12)	0.23	(0.14)	-0.81	(0.06)	-0.63	(0.12)	-1.00	(0.12)	**-0.38**	(0.18)
	Slovenia	-0.30	(0.01)	-0.22	(0.04)	-0.50	(0.01)	**-0.27**	(0.04)	-0.52	(0.01)	-0.52	(0.04)	-0.63	(0.01)	**-0.12**	(0.04)
	Spain	0.23	(0.08)	0.53	(0.18)	-0.39	(0.13)	**-0.92**	(0.23)	0.27	(0.06)	0.51	(0.12)	-0.33	(0.12)	**-0.84**	(0.17)
	Sweden	-0.28	(0.06)	-0.16	(0.17)	-0.49	(0.13)	-0.33	(0.22)	0.35	(0.08)	0.76	(0.13)	0.00	(0.19)	**-0.75**	(0.24)
	Switzerland	-0.38	(0.05)	-0.23	(0.14)	-0.28	(0.10)	-0.06	(0.17)	-0.43	(0.06)	-0.29	(0.14)	-0.55	(0.12)	-0.26	(0.19)
	Turkey	0.14	(0.10)	0.57	(0.21)	-0.39	(0.24)	**-0.96**	(0.33)	0.53	(0.08)	0.83	(0.13)	0.00	(0.19)	**-0.83**	(0.23)
	United Kingdom	0.04	(0.07)	-0.24	(0.14)	0.16	(0.15)	0.40	(0.21)	-0.12	(0.08)	0.01	(0.11)	-0.34	(0.11)	**-0.36**	(0.16)
	United States	-0.33	(0.06)	-0.01	(0.14)	-0.33	(0.11)	-0.32	(0.17)	-0.29	(0.08)	0.22	(0.17)	-0.62	(0.16)	**-0.84**	(0.22)
	OECD average	0.00	(0.01)	0.12	(0.03)	-0.15	(0.02)	**-0.27**	(0.03)	-0.01	(0.01)	0.15	(0.02)	-0.20	(0.02)	**-0.34**	(0.03)
Partners	Albania	0.64	(0.09)	0.54	(0.23)	0.70	(0.12)	0.16	(0.27)	-0.07	(0.09)	-0.09	(0.17)	-0.09	(0.16)	0.00	(0.23)
	Algeria	0.20	(0.09)	0.45	(0.22)	0.09	(0.17)	-0.37	(0.28)	0.41	(0.09)	0.57	(0.22)	0.43	(0.18)	-0.14	(0.28)
	Brazil	-0.05	(0.05)	0.42	(0.12)	-0.59	(0.10)	**-1.01**	(0.16)	-0.07	(0.06)	0.07	(0.13)	-0.58	(0.13)	**-0.64**	(0.19)
	B-S-J-G (China)	0.26	(0.09)	0.64	(0.19)	-0.08	(0.16)	**-0.71**	(0.23)	0.87	(0.08)	1.39	(0.18)	0.38	(0.13)	**-1.02**	(0.22)
	Bulgaria	-0.26	(0.07)	-0.28	(0.10)	-0.08	(0.18)	0.19	(0.21)	-1.14	(0.06)	-1.05	(0.10)	-1.23	(0.10)	-0.18	(0.13)
	CABA (Argentina)	-0.12	(0.15)	0.87	(0.34)	-1.04	(0.20)	**-1.91**	(0.40)	-0.16	(0.13)	0.26	(0.26)	-1.14	(0.26)	**-1.39**	(0.35)
	Colombia	0.64	(0.09)	0.89	(0.18)	-0.16	(0.13)	**-1.05**	(0.22)	0.47	(0.07)	0.80	(0.14)	-0.13	(0.16)	**-0.93**	(0.21)
	Costa Rica	1.03	(0.11)	0.99	(0.28)	1.36	(0.21)	0.36	(0.36)	0.91	(0.11)	0.93	(0.23)	1.17	(0.23)	0.24	(0.32)
	Croatia	0.87	(0.09)	1.12	(0.21)	0.74	(0.16)	-0.38	(0.26)	-0.02	(0.08)	0.03	(0.18)	-0.13	(0.14)	-0.15	(0.22)
	Cyprus*	-0.06	(0.00)	-0.10	(0.01)	-0.21	(0.00)	**-0.11**	(0.01)	0.06	(0.00)	0.04	(0.01)	-0.34	(0.00)	**-0.38**	(0.01)
	Dominican Republic	0.11	(0.09)	0.41	(0.21)	-0.41	(0.13)	**-0.82**	(0.25)	-0.22	(0.08)	0.13	(0.17)	-0.79	(0.15)	**-0.93**	(0.22)
	FYROM	-0.09	(0.00)	-0.15	(0.01)	-0.10	(0.01)	**0.05**	(0.01)	-0.90	(0.00)	-1.37	(0.01)	-0.86	(0.01)	**0.51**	(0.01)
	Georgia	0.35	(0.06)	0.72	(0.15)	-0.05	(0.14)	**-0.77**	(0.20)	-0.34	(0.06)	-0.25	(0.15)	-0.33	(0.13)	-0.07	(0.19)
	Hong Kong (China)	-0.24	(0.07)	-0.15	(0.17)	-0.19	(0.15)	-0.04	(0.22)	-0.20	(0.08)	-0.11	(0.22)	-0.10	(0.19)	0.01	(0.28)
	Indonesia	0.87	(0.08)	1.43	(0.24)	0.44	(0.17)	**-0.99**	(0.32)	-0.12	(0.06)	0.07	(0.16)	-0.44	(0.13)	**-0.51**	(0.20)
	Jordan	0.70	(0.09)	1.25	(0.20)	0.12	(0.15)	**-1.13**	(0.24)	0.88	(0.10)	1.40	(0.23)	0.43	(0.17)	**-0.98**	(0.26)
	Kosovo	0.54	(0.03)	0.44	(0.08)	0.32	(0.06)	-0.12	(0.10)	-0.16	(0.03)	-0.07	(0.07)	-0.23	(0.06)	-0.16	(0.09)
	Lebanon	0.02	(0.08)	0.67	(0.22)	-0.58	(0.12)	**-1.25**	(0.26)	-0.14	(0.07)	0.33	(0.15)	-0.48	(0.14)	**-0.81**	(0.22)
	Lithuania	0.29	(0.05)	0.26	(0.15)	0.51	(0.16)	0.25	(0.20)	-0.48	(0.05)	-0.42	(0.10)	-0.31	(0.10)	0.10	(0.15)
	Macao (China)	0.20	(0.00)	1.11	(0.00)	-0.52	(0.00)	**-1.63**	(0.00)	0.23	(0.00)	0.75	(0.00)	-0.30	(0.00)	**-1.05**	(0.00)
	Malta	-0.24	(0.00)	0.03	(0.01)	-0.48	(0.00)	**-0.52**	(0.01)	-0.20	(0.00)	0.37	(0.01)	-0.22	(0.01)	**-0.59**	(0.01)
	Moldova	0.17	(0.06)	0.34	(0.12)	0.04	(0.11)	-0.30	(0.16)	-0.35	(0.07)	-0.26	(0.11)	-0.34	(0.20)	-0.08	(0.23)
	Montenegro	0.35	(0.01)	0.37	(0.02)	0.25	(0.01)	**-0.12**	(0.03)	-1.01	(0.01)	-0.73	(0.03)	-0.97	(0.01)	**-0.24**	(0.03)
	Peru	0.51	(0.08)	1.10	(0.16)	-0.55	(0.17)	**-1.65**	(0.23)	0.34	(0.07)	0.79	(0.11)	-0.46	(0.16)	**-1.26**	(0.19)
	Qatar	-0.65	(0.00)	-0.56	(0.01)	-0.68	(0.00)	**-0.12**	(0.01)	-0.71	(0.00)	-0.71	(0.00)	-0.95	(0.01)	**-0.24**	(0.01)
	Romania	-0.03	(0.07)	-0.04	(0.15)	-0.18	(0.13)	-0.14	(0.20)	-0.42	(0.07)	-0.38	(0.15)	-0.26	(0.20)	0.13	(0.26)
	Russia	0.31	(0.10)	0.54	(0.18)	-0.03	(0.27)	-0.57	(0.33)	0.08	(0.10)	0.29	(0.19)	-0.04	(0.25)	-0.33	(0.31)
	Singapore	-0.73	(0.01)	-0.62	(0.01)	-0.85	(0.03)	**-0.23**	(0.03)	-0.48	(0.02)	-0.45	(0.01)	-0.61	(0.11)	-0.16	(0.11)
	Chinese Taipei	-0.11	(0.05)	-0.03	(0.12)	-0.29	(0.10)	-0.26	(0.15)	0.21	(0.05)	0.23	(0.12)	0.04	(0.10)	-0.19	(0.16)
	Thailand	0.34	(0.08)	0.65	(0.17)	-0.10	(0.15)	**-0.75**	(0.23)	0.27	(0.09)	0.46	(0.18)	0.12	(0.16)	-0.33	(0.23)
	Trinidad and Tobago	0.85	(0.01)	0.73	(0.01)	0.57	(0.01)	**-0.16**	(0.01)	0.63	(0.01)	0.66	(0.01)	0.50	(0.01)	**-0.16**	(0.02)
	Tunisia	1.59	(0.11)	1.53	(0.14)	1.32	(0.21)	-0.21	(0.26)	1.36	(0.10)	1.36	(0.12)	1.38	(0.23)	0.02	(0.26)
	United Arab Emirates	-0.05	(0.07)	0.58	(0.26)	-0.69	(0.08)	**-1.26**	(0.28)	0.16	(0.06)	0.88	(0.19)	-0.50	(0.12)	**-1.38**	(0.25)
	Uruguay	0.25	(0.07)	0.49	(0.13)	-0.28	(0.14)	**-0.77**	(0.18)	0.34	(0.07)	0.65	(0.13)	-0.34	(0.15)	**-0.99**	(0.19)
	Viet Nam	0.39	(0.08)	0.37	(0.14)	0.12	(0.17)	-0.24	(0.22)	0.05	(0.09)	0.00	(0.15)	0.02	(0.18)	0.02	(0.21)
	Argentina**	0.35	(0.09)	0.68	(0.19)	-0.26	(0.18)	**-0.94**	(0.25)	0.14	(0.08)	0.18	(0.15)	-0.01	(0.17)	-0.19	(0.22)
	Kazakhstan**	0.19	(0.08)	0.33	(0.19)	0.21	(0.19)	-0.12	(0.26)	-0.17	(0.09)	0.14	(0.19)	-0.16	(0.21)	-0.31	(0.28)
	Malaysia**	-0.02	(0.06)	0.15	(0.17)	-0.04	(0.15)	-0.20	(0.22)	-0.03	(0.06)	-0.02	(0.13)	-0.09	(0.12)	-0.08	(0.18)

1. This is measured by an index summarising school principals' agreement with four statements about whether the school's capacity to provide instruction is hindered by a lack of and/or inadequate educational materials, including physical infrastructure.
2. This is measured by an index summarising school principals' agreement with four statements about whether the school's capacity to provide instruction is hindered by a lack of and/or inadequate qualifications of the school staff.
3. A socio-economically disadvantaged school is a school in the bottom quarter of the distribution of the school-level PISA index of economic, social and cultural status (ESCS) within each country/economy.
4. A socio-economically advantaged school is a school in the top quarter of the distribution of the school-level PISA index of economic, social and cultural status (ESCS) within each country/economy.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.14 Grade repetition, by socio-economic status

Results based on students' self-reports

		Percentage of students having repeated a grade						Likelihood of disadvantaged students having repeated a grade, relative to advantaged students			
		All students		Disadvantaged students[1]		Advantaged students[2]		Before accounting for performance in science and reading		After accounting for performance in science and reading	
		%	S.E.	%	S.E.	%	S.E.	Odds ratio	S.E.	Odds ratio	S.E.
OECD	Australia	7.1	(0.3)	9.2	(0.6)	5.9	(0.6)	**1.5**	(0.2)	1.0	(0.1)
	Austria	15.2	(0.7)	20.6	(1.7)	10.8	(1.0)	**2.1**	(0.3)	1.0	(0.2)
	Belgium	34.0	(0.8)	53.3	(1.5)	15.7	(1.1)	**5.3**	(0.5)	**2.1**	(0.2)
	Canada	5.7	(0.4)	10.6	(0.8)	2.6	(0.3)	**4.3**	(0.6)	**2.3**	(0.3)
	Chile	24.6	(0.9)	33.9	(1.9)	16.0	(1.2)	**2.6**	(0.3)	0.9	(0.1)
	Czech Republic	4.8	(0.4)	10.0	(1.1)	1.2	(0.3)	**6.7**	(1.8)	**1.8**	(0.5)
	Denmark	3.4	(0.3)	5.3	(0.6)	2.0	(0.4)	**2.7**	(0.5)	1.4	(0.3)
	Estonia	4.0	(0.4)	7.2	(0.9)	2.5	(0.6)	**3.1**	(0.7)	1.5	(0.4)
	Finland	3.0	(0.2)	4.6	(0.6)	1.8	(0.3)	**2.4**	(0.6)	1.0	(0.3)
	France	22.1	(0.6)	38.1	(1.6)	7.3	(1.0)	**6.2**	(0.9)	**2.0**	(0.3)
	Germany	18.1	(0.8)	24.4	(1.7)	12.2	(1.1)	**1.9**	(0.2)	1.1	(0.1)
	Greece	5.0	(0.7)	9.4	(1.6)	1.7	(0.5)	**5.4**	(1.8)	2.0	(0.8)
	Hungary	9.5	(0.6)	17.1	(1.6)	3.3	(0.7)	**5.6**	(1.6)	1.8	(0.5)
	Iceland	1.1	(0.2)	1.7	(0.4)	1.0	(0.4)	1.4	(0.9)	0.9	(0.7)
	Ireland	7.2	(0.5)	11.0	(1.0)	3.9	(0.9)	**2.9**	(0.4)	**1.7**	(0.2)
	Israel	9.0	(0.6)	16.4	(1.3)	4.8	(0.6)	**3.5**	(0.6)	**1.9**	(0.3)
	Italy	15.1	(0.6)	24.2	(1.3)	7.5	(0.8)	**3.8**	(0.5)	**2.0**	(0.3)
	Japan	m	m	m	m	m	m	m	m	m	m
	Korea	4.7	(0.3)	4.5	(0.6)	5.2	(0.6)	0.8	(0.1)	**0.7**	(0.1)
	Latvia	5.0	(0.4)	9.1	(1.1)	2.1	(0.6)	**4.3**	(1.2)	**1.9**	(0.6)
	Luxembourg	30.9	(0.5)	44.0	(1.2)	13.1	(0.9)	**4.4**	(0.3)	**1.6**	(0.2)
	Mexico	15.8	(0.9)	23.5	(2.2)	9.6	(1.0)	**2.9**	(0.5)	1.4	(0.3)
	Netherlands	20.1	(0.5)	25.9	(1.4)	16.0	(1.0)	**1.8**	(0.2)	1.2	(0.1)
	New Zealand	4.9	(0.3)	5.9	(0.7)	3.9	(0.6)	1.5	(0.3)	1.0	(0.2)
	Norway	m	m	m	m	m	m	m	m	m	m
	Poland	5.3	(0.4)	10.3	(1.2)	1.5	(0.4)	**5.2**	(1.3)	**1.9**	(0.6)
	Portugal	31.2	(1.2)	52.2	(2.2)	8.7	(1.0)	**10.7**	(1.7)	**3.8**	(0.7)
	Slovak Republic	6.5	(0.5)	16.3	(1.8)	1.4	(0.3)	**12.0**	(2.6)	**4.7**	(1.2)
	Slovenia	1.9	(0.3)	3.4	(0.7)	0.8	(0.3)	**4.3**	(2.2)	1.9	(1.1)
	Spain	31.3	(1.0)	53.5	(1.7)	8.7	(1.1)	**10.9**	(1.2)	**5.6**	(0.7)
	Sweden	4.0	(0.4)	6.9	(0.8)	2.4	(0.4)	**2.4**	(0.5)	1.2	(0.2)
	Switzerland	20.0	(1.0)	28.7	(2.0)	13.5	(1.4)	**2.4**	(0.3)	1.2	(0.2)
	Turkey	10.9	(0.7)	13.2	(1.1)	6.8	(0.9)	**2.1**	(0.3)	1.0	(0.2)
	United Kingdom	2.8	(0.3)	4.0	(0.5)	2.0	(0.4)	**1.8**	(0.3)	1.0	(0.2)
	United States	11.0	(0.8)	17.4	(1.6)	4.0	(0.7)	**4.7**	(0.8)	**2.3**	(0.5)
	OECD average	12.0	(0.1)	18.7	(0.2)	6.1	(0.1)	**4.1**	(0.2)	**1.8**	(0.1)
Partners	Albania	2.6	(0.3)	5.8	(1.0)	1.5	(0.4)	m	m	m	m
	Algeria	68.5	(2.1)	80.2	(1.7)	53.1	(4.4)	**3.3**	(0.5)	**3.0**	(0.5)
	Brazil	36.4	(0.8)	45.4	(1.3)	26.5	(1.5)	**2.2**	(0.2)	1.1	(0.1)
	B-S-J-G (China)	20.8	(1.2)	29.2	(2.0)	9.9	(1.7)	**3.8**	(0.6)	**2.0**	(0.3)
	Bulgaria	4.8	(0.6)	9.0	(1.6)	1.7	(0.4)	**4.7**	(1.3)	1.4	(0.4)
	CABA (Argentina)	19.1	(2.7)	38.0	(4.3)	3.7	(1.6)	**13.7**	(6.1)	**4.2**	(2.1)
	Colombia	42.6	(1.0)	45.7	(1.9)	33.0	(1.9)	**1.7**	(0.2)	0.8	(0.1)
	Costa Rica	31.4	(1.4)	44.8	(2.3)	13.0	(1.6)	**5.4**	(0.5)	**2.5**	(0.3)
	Croatia	1.6	(0.2)	2.2	(0.4)	0.5	(0.2)	**4.6**	(2.4)	1.8	(1.0)
	Cyprus*	4.7	(0.3)	6.8	(0.6)	3.7	(0.5)	**1.7**	(0.3)	0.8	(0.1)
	Dominican Republic	33.9	(1.3)	43.2	(2.2)	20.0	(1.7)	**3.0**	(0.4)	**1.5**	(0.2)
	FYROM	3.1	(0.2)	2.9	(0.6)	2.3	(0.4)	1.1	(0.3)	0.6	(0.2)
	Georgia	1.5	(0.2)	2.6	(0.5)	0.8	(0.2)	**3.0**	(1.1)	1.3	(0.5)
	Hong Kong (China)	17.2	(0.7)	23.0	(1.1)	11.4	(1.1)	**2.1**	(0.2)	**1.6**	(0.2)
	Indonesia	16.2	(1.1)	22.8	(2.2)	7.9	(1.2)	**3.5**	(0.6)	**1.9**	(0.3)
	Jordan	7.6	(0.4)	10.4	(0.9)	4.9	(0.6)	**1.9**	(0.3)	1.0	(0.2)
	Kosovo	3.8	(0.4)	3.8	(0.8)	2.5	(0.5)	1.4	(0.4)	0.8	(0.3)
	Lebanon	26.5	(1.2)	39.1	(2.2)	16.0	(2.0)	**3.3**	(0.5)	**1.7**	(0.2)
	Lithuania	2.5	(0.2)	4.1	(0.6)	1.0	(0.3)	**4.0**	(1.3)	1.3	(0.5)
	Macao (China)	33.8	(0.4)	43.9	(1.2)	23.5	(1.2)	**2.5**	(0.2)	**2.1**	(0.2)
	Malta	7.0	(0.3)	6.3	(0.8)	5.7	(0.6)	1.1	(0.2)	**0.5**	(0.1)
	Moldova	3.0	(0.3)	4.4	(0.6)	2.0	(0.4)	**2.2**	(0.6)	0.9	(0.2)
	Montenegro	1.6	(0.2)	1.7	(0.4)	0.9	(0.2)	1.8	(0.6)	0.9	(0.4)
	Peru	25.6	(0.9)	36.5	(1.5)	12.8	(0.9)	**3.9**	(0.4)	**1.3**	(0.1)
	Qatar	17.4	(0.3)	24.1	(0.8)	13.9	(0.7)	**1.9**	(0.1)	**1.3**	(0.1)
	Romania	5.9	(0.5)	10.9	(1.4)	3.4	(0.7)	**3.4**	(1.0)	1.7	(0.5)
	Russia	1.5	(0.2)	2.8	(0.5)	1.0	(0.4)	**2.9**	(1.2)	2.0	(0.9)
	Singapore	5.4	(0.5)	7.5	(0.6)	5.9	(1.1)	1.3	(0.3)	**0.4**	(0.1)
	Chinese Taipei	0.6	(0.1)	0.7	(0.2)	0.6	(0.2)	1.2	(0.5)	0.7	(0.3)
	Thailand	6.0	(0.4)	6.1	(0.8)	4.4	(0.8)	1.3	(0.3)	0.8	(0.2)
	Trinidad and Tobago	33.4	(0.5)	42.6	(1.6)	21.7	(1.2)	**2.3**	(0.2)	**1.3**	(0.1)
	Tunisia	34.3	(1.7)	50.7	(2.9)	17.0	(1.7)	**4.8**	(0.7)	**2.7**	(0.4)
	United Arab Emirates	11.8	(0.5)	17.4	(1.2)	8.3	(0.6)	**2.2**	(0.2)	**1.4**	(0.1)
	Uruguay	35.3	(1.1)	57.2	(1.7)	12.6	(1.3)	**8.8**	(1.1)	**3.8**	(0.5)
	Viet Nam	7.2	(1.6)	11.3	(2.8)	1.5	(0.5)	**8.6**	(3.2)	**4.3**	(1.6)
	Argentina**	28.9	(1.3)	41.0	(2.3)	15.7	(1.6)	**3.7**	(0.6)	**2.1**	(0.3)
	Kazakhstan**	1.9	(0.3)	2.9	(0.6)	0.9	(0.4)	**3.2**	(1.3)	**2.4**	(1.1)
	Malaysia**	m	m	m	m	m	m	m	m	m	m

1. A socio-economically disadvantaged student is a student in the bottom quarter of the distribution of the PISA index of economic, social and cultural status (ESCS) within his or her each country/economy.
2. A socio-economically advantaged student is a student in the top quarter of the distribution of the PISA index of economic, social and cultural status (ESCS) within his or her each country/economy.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/2]

Table I.6.15 Differences in science learning time at school, by socio-economic status

Results based on students' self-reports

		Percentage of students who take at least one science lesson per week at school											
		By socio-economic status						By study programme					
		Disadvantaged students[1]		Advantaged students[2]		Difference between advantaged and disadvantaged students		Students enrolled in a vocational track		Students enrolled in an academic track		Difference between students enrolled in academic and vocational tracks	
		%	S.E.	%	S.E.	% dif.	S.E.	%	S.E.	%	S.E.	% dif.	S.E.
OECD	Australia	86.2	(0.9)	93.6	(0.5)	**7.4**	(1.0)	69.2	(2.1)	93.0	(0.4)	**23.7**	(2.2)
	Austria	85.1	(1.4)	96.5	(0.7)	**11.4**	(1.4)	87.3	(1.0)	99.4	(0.3)	**12.1**	(1.1)
	Belgium	75.3	(1.3)	95.0	(0.5)	**19.7**	(1.3)	68.4	(1.4)	97.9	(0.2)	**29.6**	(1.3)
	Canada	82.1	(0.9)	90.1	(0.7)	**8.0**	(1.1)	m	m	m	m	m	m
	Chile	97.8	(0.5)	99.8	(0.1)	**1.9**	(0.5)	23.6	(8.3)	99.3	(0.1)	**75.8**	(8.3)
	Czech Republic	99.2	(0.2)	99.9	(0.1)	**0.7**	(0.3)	98.9	(0.3)	99.9	(0.1)	**1.0**	(0.4)
	Denmark	99.1	(0.3)	99.6	(0.2)	0.5	(0.4)	m	m	99.0	(0.2)	m	m
	Estonia	99.7	(0.2)	99.7	(0.1)	0.0	(0.2)	100.0	c	99.6	(0.1)	**-0.4**	(0.1)
	Finland	94.5	(0.9)	97.9	(0.4)	**3.4**	(0.9)	m	m	96.1	(0.6)	m	m
	France	91.4	(1.2)	98.8	(0.3)	**7.4**	(1.2)	77.4	(2.9)	99.3	(0.1)	**21.9**	(3.0)
	Germany	90.3	(1.2)	98.3	(0.3)	**8.0**	(1.2)	66.7	(11.5)	95.7	(0.5)	**29.1**	(11.5)
	Greece	92.4	(0.9)	97.7	(0.4)	**5.3**	(1.0)	86.0	(1.7)	97.1	(0.3)	**11.1**	(1.7)
	Hungary	86.1	(1.6)	82.3	(2.8)	-3.7	(2.9)	64.5	(4.0)	89.7	(1.5)	**25.3**	(4.3)
	Iceland	97.6	(0.5)	95.1	(0.7)	**-2.5**	(1.0)	m	m	96.9	(0.2)	m	m
	Ireland	89.2	(1.6)	94.4	(0.9)	**5.2**	(1.6)	32.3	(14.1)	92.6	(0.9)	**60.3**	(14.1)
	Israel	91.7	(1.2)	95.7	(0.8)	**4.0**	(1.2)	m	m	92.8	(1.2)	m	m
	Italy	95.5	(0.6)	98.0	(0.3)	**2.5**	(0.7)	95.0	(0.4)	99.1	(0.3)	**4.1**	(0.5)
	Japan	95.9	(1.9)	98.8	(0.6)	2.8	(1.5)	91.1	(4.2)	99.5	(0.1)	**8.3**	(4.2)
	Korea	95.1	(1.0)	99.5	(0.2)	**4.3**	(0.9)	87.8	(3.1)	99.3	(0.1)	**11.5**	(3.1)
	Latvia	99.4	(0.3)	99.0	(0.4)	-0.4	(0.5)	59.7	(22.5)	99.7	(0.1)	39.9	(22.5)
	Luxembourg	89.1	(0.8)	97.1	(0.4)	**8.0**	(0.8)	64.6	(1.2)	99.2	(0.1)	**34.7**	(1.2)
	Mexico	97.3	(0.6)	96.5	(1.2)	-0.8	(1.1)	97.1	(1.6)	95.9	(1.1)	-1.2	(2.0)
	Netherlands	85.7	(1.2)	86.2	(1.4)	0.5	(1.7)	84.5	(2.1)	84.5	(0.9)	0.0	(2.1)
	New Zealand	90.8	(1.3)	96.1	(0.6)	**5.3**	(1.4)	m	m	94.2	(0.7)	m	m
	Norway	99.6	(0.2)	99.6	(0.2)	0.0	(0.3)	m	m	99.5	(0.1)	m	m
	Poland	99.7	(0.2)	99.4	(0.2)	-0.3	(0.3)	100.0	c	99.6	(0.1)	**-0.4**	(0.1)
	Portugal	73.5	(1.4)	68.7	(1.4)	**-4.8**	(1.9)	49.8	(2.7)	72.9	(0.9)	**23.2**	(2.8)
	Slovak Republic	86.3	(1.3)	92.2	(1.1)	**5.8**	(1.4)	58.8	(4.7)	98.2	(0.5)	**39.4**	(4.7)
	Slovenia	97.8	(0.3)	99.5	(0.1)	**1.7**	(0.3)	97.7	(0.2)	99.9	(0.1)	**2.3**	(0.2)
	Spain	84.0	(1.2)	86.3	(1.1)	2.3	(1.6)	78.5	(6.4)	83.7	(0.6)	5.2	(6.3)
	Sweden	98.8	(0.3)	99.4	(0.3)	0.5	(0.5)	c	c	1.0	(0.0)	c	c
	Switzerland	89.3	(1.5)	95.4	(0.6)	**6.1**	(1.3)	45.2	(5.4)	96.3	(0.6)	**51.1**	(5.4)
	Turkey	92.1	(0.9)	94.2	(0.7)	**2.2**	(1.0)	89.3	(1.0)	95.3	(0.6)	**6.0**	(1.1)
	United Kingdom	97.8	(0.3)	98.8	(0.2)	**1.0**	(0.3)	85.1	(4.1)	98.5	(0.1)	**13.4**	(4.1)
	United States	91.0	(1.2)	96.0	(0.7)	**5.0**	(1.2)	m	m	93.6	(0.8)	m	m
	OECD average	91.9	(0.2)	95.3	(0.1)	**3.4**	(0.2)	73.9	(1.1)	95.8	(0.1)	**21.2**	(1.1)
Partners	Albania	96.8	(0.6)	98.8	(0.4)	**2.0**	(0.7)	96.4	(0.6)	98.0	(0.2)	**1.7**	(0.7)
	Algeria	97.9	(0.5)	97.2	(0.5)	-0.7	(0.7)	62.1	(18.6)	97.8	(0.2)	35.7	(18.6)
	Brazil	89.8	(0.7)	94.3	(0.5)	**4.5**	(0.7)	87.8	(4.0)	92.2	(0.4)	4.3	(4.1)
	B-S-J-G (China)	95.4	(1.0)	94.3	(0.9)	-1.1	(1.1)	31.7	(3.6)	98.2	(0.4)	**66.5**	(3.6)
	Bulgaria	99.2	(0.3)	99.6	(0.2)	0.3	(0.4)	99.6	(0.1)	99.4	(0.1)	-0.2	(0.2)
	CABA (Argentina)	94.9	(1.2)	99.7	(0.3)	**4.8**	(1.2)	90.8	(1.4)	97.6	(0.6)	**6.8**	(1.4)
	Colombia	91.9	(0.8)	95.2	(0.5)	**3.3**	(0.8)	92.6	(1.1)	93.8	(0.5)	1.2	(1.2)
	Costa Rica	95.1	(0.6)	98.7	(0.3)	**3.6**	(0.7)	99.6	(0.2)	96.3	(0.3)	**-3.3**	(0.4)
	Croatia	75.0	(1.6)	94.2	(0.7)	**19.2**	(1.5)	76.5	(1.5)	99.9	(0.1)	**23.5**	(1.5)
	Cyprus*	96.2	(0.5)	95.7	(0.5)	-0.5	(0.7)	95.5	(0.7)	96.2	(0.3)	0.6	(0.7)
	Dominican Republic	96.1	(0.6)	96.7	(0.7)	0.5	(0.9)	100.0	c	96.5	(0.4)	**-3.5**	(0.4)
	FYROM	70.9	(1.4)	82.8	(1.1)	**11.8**	(1.9)	64.0	(1.0)	86.5	(0.8)	**22.4**	(1.4)
	Georgia	98.1	(0.6)	99.2	(0.3)	1.1	(0.6)	76.6	(5.6)	98.8	(0.2)	**22.2**	(5.6)
	Hong Kong (China)	74.7	(1.3)	80.2	(1.3)	**5.5**	(1.8)	m	m	76.2	(0.8)	m	m
	Indonesia	98.0	(0.6)	95.0	(1.1)	**-3.0**	(1.1)	86.1	(5.0)	97.7	(0.4)	**11.6**	(5.0)
	Jordan	97.9	(0.6)	97.8	(0.4)	-0.1	(0.6)	m	m	97.8	(0.3)	m	m
	Kosovo	89.2	(1.0)	93.5	(1.0)	**4.3**	(1.5)	81.3	(0.9)	96.2	(0.5)	**14.9**	(1.1)
	Lebanon	99.3	(0.3)	99.2	(0.3)	-0.2	(0.3)	m	m	99.2	(0.2)	m	m
	Lithuania	100.0	c	100.0	c	0.0	c	100.0	c	100.0	c	0.0	c
	Macao (China)	80.9	(1.2)	81.1	(1.1)	0.2	(1.7)	43.1	(5.2)	81.9	(0.5)	**38.7**	(5.2)
	Malta	89.1	(1.1)	96.2	(0.6)	**7.1**	(1.3)	m	m	94.2	(0.4)	m	m
	Moldova	93.5	(0.8)	94.9	(0.8)	1.4	(1.0)	m	m	94.3	(0.5)	m	m
	Montenegro	94.4	(0.4)	94.9	(0.5)	0.5	(0.7)	91.1	(0.3)	99.6	(0.1)	**8.5**	(0.4)
	Peru	98.9	(0.2)	99.0	(0.3)	0.1	(0.4)	m	m	98.7	(0.2)	m	m
	Qatar	92.9	(0.5)	96.2	(0.4)	**3.2**	(0.7)	m	m	94.6	(0.2)	m	m
	Romania	98.0	(0.5)	98.8	(0.4)	0.8	(0.6)	m	m	98.4	(0.3)	m	m
	Russia	99.7	(0.1)	99.1	(0.3)	-0.6	(0.3)	98.4	(0.9)	99.6	(0.2)	1.2	(0.9)
	Singapore	96.6	(0.4)	99.7	(0.1)	**3.1**	(0.5)	m	m	98.7	(0.1)	m	m
	Chinese Taipei	88.7	(1.4)	95.7	(0.9)	**7.0**	(1.4)	80.2	(2.8)	99.4	(0.2)	**19.3**	(2.8)
	Thailand	91.2	(1.2)	95.8	(0.8)	**4.6**	(1.3)	62.8	(4.7)	99.2	(0.2)	**36.4**	(4.7)
	Trinidad and Tobago	91.6	(0.7)	92.3	(0.9)	0.7	(1.2)	m	m	91.9	(0.4)	m	m
	Tunisia	96.5	(0.6)	97.2	(0.5)	0.6	(0.7)	m	m	96.6	(0.4)	m	m
	United Arab Emirates	92.2	(0.8)	95.1	(0.5)	**2.9**	(1.0)	88.1	(1.9)	93.2	(0.5)	**5.1**	(1.9)
	Uruguay	92.0	(0.9)	98.1	(0.4)	**6.1**	(0.8)	69.6	(5.0)	96.0	(0.4)	**26.4**	(5.1)
	Viet Nam	100.0	c	100.0	c	0.0	c	m	m	100.0	c	m	m
	Argentina**	92.9	(1.4)	97.3	(0.6)	**4.4**	(1.2)	89.0	(2.9)	95.7	(0.5)	**6.7**	(2.9)
	Kazakhstan**	99.6	(0.2)	99.7	(0.2)	0.1	(0.2)	99.4	(0.6)	99.8	(0.1)	0.4	(0.6)
	Malaysia**	98.1	(0.5)	97.5	(1.0)	-0.6	(0.9)	98.3	(1.0)	97.7	(0.6)	-0.5	(1.1)

1. A socio-economically disadvantaged student is a student in the bottom quarter of the distribution of the PISA index of economic, social and cultural status (ESCS) within his or her each country/economy.
2. A socio-economically advantaged student is a student in the top quarter of the distribution of the PISA index of economic, social and cultural status (ESCS) within his or her each country/economy.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 2/2]

Table I.6.15 Differences in science learning time at school, by socio-economic status

Results based on students' self-reports

	Average time per week in regular science lessons											
	By socio-economic status						By study programme					
	Disadvantaged students[1]		Advantaged students[2]		Difference between advantaged and disadvantaged students		Students enrolled in a vocational track		Students enrolled in an academic track		Difference between students enrolled in academic and vocational tracks	
	%	S.E.	%	S.E.	% dif.	S.E.	%	S.E.	%	S.E.	% dif.	S.E.
OECD												
Australia	3.3	(0.0)	3.7	(0.0)	**0.4**	(0.1)	2.6	(0.1)	3.6	(0.0)	**1.0**	(0.1)
Austria	4.5	(0.2)	5.1	(0.1)	**0.6**	(0.2)	4.9	(0.1)	4.9	(0.1)	0.1	(0.2)
Belgium	2.3	(0.1)	3.5	(0.1)	**1.2**	(0.1)	2.1	(0.1)	3.5	(0.0)	**1.4**	(0.1)
Canada	4.6	(0.1)	5.1	(0.1)	**0.5**	(0.1)	m	m	m	m	m	m
Chile	5.1	(0.1)	6.5	(0.2)	**1.3**	(0.2)	1.2	(0.5)	5.9	(0.1)	**4.7**	(0.5)
Czech Republic	3.6	(0.1)	4.7	(0.1)	**1.2**	(0.1)	3.2	(0.1)	4.6	(0.0)	**1.4**	(0.1)
Denmark	3.3	(0.1)	3.6	(0.1)	**0.2**	(0.1)	m	m	3.4	(0.0)	m	m
Estonia	3.6	(0.1)	3.7	(0.1)	0.1	(0.1)	3.2	(1.1)	3.6	(0.0)	0.5	(1.1)
Finland	2.6	(0.0)	3.1	(0.1)	**0.5**	(0.1)	m	m	2.8	(0.0)	m	m
France	2.3	(0.1)	3.8	(0.1)	**1.5**	(0.1)	1.6	(0.1)	3.3	(0.0)	**1.7**	(0.1)
Germany	3.0	(0.1)	4.4	(0.1)	**1.4**	(0.1)	1.7	(0.4)	3.8	(0.1)	**2.0**	(0.4)
Greece	3.4	(0.1)	4.2	(0.1)	**0.7**	(0.1)	2.7	(0.1)	4.0	(0.0)	**1.3**	(0.1)
Hungary	3.1	(0.1)	3.0	(0.1)	-0.2	(0.1)	2.4	(0.1)	3.2	(0.1)	**0.9**	(0.2)
Iceland	2.3	(0.0)	2.3	(0.0)	0.0	(0.1)	m	m	2.3	(0.0)	m	m
Ireland	2.2	(0.0)	2.5	(0.0)	**0.3**	(0.1)	0.4	(0.2)	2.4	(0.0)	**2.0**	(0.2)
Israel	3.2	(0.1)	3.8	(0.1)	**0.5**	(0.2)	m	m	3.4	(0.1)	m	m
Italy	2.5	(0.1)	2.6	(0.1)	0.1	(0.1)	2.8	(0.1)	2.3	(0.1)	**-0.5**	(0.1)
Japan	2.5	(0.1)	3.3	(0.1)	**0.7**	(0.1)	1.9	(0.1)	3.2	(0.1)	**1.3**	(0.1)
Korea	2.6	(0.1)	3.1	(0.1)	**0.5**	(0.1)	2.0	(0.1)	3.0	(0.0)	**1.0**	(0.1)
Latvia	4.1	(0.1)	4.5	(0.1)	**0.4**	(0.1)	1.4	(0.7)	4.3	(0.0)	**2.9**	(0.7)
Luxembourg	2.9	(0.1)	3.4	(0.0)	**0.5**	(0.1)	4.3	(0.1)	3.0	(0.0)	**-1.4**	(0.1)
Mexico	3.8	(0.1)	4.0	(0.1)	0.2	(0.1)	3.8	(0.1)	3.9	(0.1)	0.1	(0.1)
Netherlands	4.1	(0.1)	4.8	(0.1)	**0.7**	(0.1)	3.0	(0.1)	4.8	(0.1)	**1.8**	(0.2)
New Zealand	3.9	(0.1)	4.6	(0.1)	**0.7**	(0.1)	m	m	4.2	(0.0)	m	m
Norway	2.4	(0.0)	2.4	(0.0)	0.0	(0.0)	m	m	2.4	(0.0)	m	m
Poland	2.9	(0.1)	3.1	(0.1)	**0.2**	(0.1)	2.8	(0.1)	3.0	(0.0)	**0.3**	(0.1)
Portugal	3.0	(0.1)	4.7	(0.2)	**1.7**	(0.2)	1.6	(0.2)	4.1	(0.1)	**2.5**	(0.2)
Slovak Republic	2.6	(0.1)	3.8	(0.1)	**1.2**	(0.1)	1.2	(0.1)	3.8	(0.1)	**2.6**	(0.1)
Slovenia	3.1	(0.1)	4.1	(0.0)	**1.0**	(0.1)	3.0	(0.0)	4.2	(0.0)	**1.3**	(0.0)
Spain	3.0	(0.1)	3.7	(0.1)	**0.7**	(0.1)	3.1	(0.3)	3.3	(0.0)	0.1	(0.3)
Sweden	2.9	(0.1)	3.2	(0.1)	**0.2**	(0.1)	c	c	3.0	(0.1)	c	c
Switzerland	2.2	(0.1)	2.9	(0.1)	**0.7**	(0.1)	1.1	(0.2)	2.7	(0.1)	**1.6**	(0.2)
Turkey	3.1	(0.1)	3.6	(0.1)	**0.5**	(0.1)	3.0	(0.1)	3.6	(0.1)	**0.6**	(0.1)
United Kingdom	4.5	(0.1)	4.9	(0.1)	**0.4**	(0.1)	4.6	(0.4)	4.7	(0.0)	0.2	(0.4)
United States	3.5	(0.1)	4.4	(0.1)	**0.9**	(0.1)	m	m	4.0	(0.1)	m	m
OECD average	3.2	(0.0)	3.8	(0.0)	**0.6**	(0.0)	2.5	(0.0)	3.6	(0.0)	**1.2**	(0.0)
Partners												
Albania	m	m	m	m	m	m	m	m	m	m	m	m
Algeria	m	m	m	m	m	m	m	m	m	m	m	m
Brazil	2.4	(0.0)	3.7	(0.2)	**1.3**	(0.2)	3.4	(0.4)	2.8	(0.1)	-0.6	(0.4)
B-S-J-G (China)	5.3	(0.1)	5.9	(0.1)	**0.6**	(0.2)	1.1	(0.2)	5.9	(0.1)	**4.8**	(0.2)
Bulgaria	4.4	(0.1)	4.1	(0.1)	**-0.3**	(0.1)	4.5	(0.1)	4.1	(0.1)	**-0.4**	(0.1)
CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
Colombia	3.3	(0.1)	3.8	(0.1)	**0.5**	(0.1)	3.4	(0.1)	3.5	(0.1)	0.1	(0.1)
Costa Rica	3.5	(0.1)	4.4	(0.1)	**0.9**	(0.1)	4.0	(0.0)	3.8	(0.0)	**-0.2**	(0.1)
Croatia	2.5	(0.1)	4.0	(0.1)	**1.5**	(0.1)	2.5	(0.1)	4.6	(0.0)	**2.2**	(0.1)
Cyprus*	2.6	(0.0)	3.7	(0.1)	**1.1**	(0.1)	2.4	(0.1)	3.2	(0.0)	**0.8**	(0.1)
Dominican Republic	3.5	(0.1)	3.4	(0.1)	0.0	(0.2)	3.3	(0.2)	3.5	(0.1)	0.2	(0.2)
FYROM	m	m	m	m	m	m	m	m	m	m	m	m
Georgia	m	m	m	m	m	m	m	m	m	m	m	m
Hong Kong (China)	3.5	(0.1)	4.4	(0.1)	**0.9**	(0.2)	m	m	3.8	(0.1)	m	m
Indonesia	m	m	m	m	m	m	m	m	m	m	m	m
Jordan	m	m	m	m	m	m	m	m	m	m	m	m
Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
Lithuania	4.3	(0.0)	4.4	(0.0)	**0.1**	(0.0)	4.1	(0.1)	4.3	(0.0)	**0.2**	(0.1)
Macao (China)	3.4	(0.1)	4.2	(0.1)	**0.8**	(0.1)	1.6	(0.6)	3.8	(0.0)	**2.2**	(0.6)
Malta	m	m	m	m	m	m	m	m	m	m	m	m
Moldova	m	m	m	m	m	m	m	m	m	m	m	m
Montenegro	1.6	(0.0)	1.7	(0.0)	0.0	(0.0)	1.6	(0.0)	1.7	(0.0)	**0.1**	(0.0)
Peru	3.7	(0.1)	4.3	(0.1)	**0.6**	(0.2)	m	m	4.0	(0.1)	m	m
Qatar	4.7	(0.1)	5.2	(0.1)	**0.5**	(0.1)	m	m	5.1	(0.0)	m	m
Romania	m	m	m	m	m	m	m	m	m	m	m	m
Russia	4.9	(0.1)	5.4	(0.1)	**0.5**	(0.2)	5.4	(0.4)	5.2	(0.1)	-0.2	(0.4)
Singapore	4.9	(0.1)	6.0	(0.1)	**1.1**	(0.1)	m	m	5.5	(0.0)	m	m
Chinese Taipei	2.6	(0.1)	3.5	(0.1)	**0.9**	(0.1)	1.5	(0.1)	3.8	(0.1)	**2.3**	(0.1)
Thailand	4.1	(0.1)	5.1	(0.1)	**1.1**	(0.2)	1.9	(0.2)	4.9	(0.1)	**3.0**	(0.2)
Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
Tunisia	2.4	(0.1)	2.8	(0.1)	**0.3**	(0.1)	m	m	2.6	(0.0)	m	m
United Arab Emirates	4.5	(0.1)	5.7	(0.1)	**1.2**	(0.1)	5.5	(0.2)	5.3	(0.1)	-0.2	(0.2)
Uruguay	3.0	(0.1)	3.8	(0.1)	**0.8**	(0.2)	1.3	(0.2)	3.4	(0.1)	**2.2**	(0.2)
Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
Argentina**	m	m	m	m	m	m	m	m	m	m	m	m
Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
Malaysia**	4.2	(0.1)	5.0	(0.1)	**0.9**	(0.1)	3.2	(0.1)	4.6	(0.1)	**1.4**	(0.2)

1. A socio-economically disadvantaged student is a student in the bottom quarter of the distribution of the PISA index of economic, social and cultural status (ESCS) within his or her each country/economy.
2. A socio-economically advantaged student is a student in the top quarter of the distribution of the PISA index of economic, social and cultural status (ESCS) within his or her each country/economy.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/1]

Table I.6.16 Enrolment in vocational tracks, by socio-economic status

Results based on students' self-reports

	Percentage of students enrolled in a vocational track						Likelihood of disadvantaged students being enrolled in a vocational track, relative to advantaged students			
	All students		Disadvantaged students[1]		Advantaged students[2]		Before accounting for performance in science		After accounting for performance in science	
	%	S.E.	%	S.E.	%	S.E.	Odds ratio	S.E.	Odds ratio	S.E.
OECD										
Australia	13.0	(0.8)	17.3	(1.3)	8.9	(1.0)	**1.9**	(0.2)	**1.5**	(0.2)
Austria	71.4	(0.9)	84.9	(1.9)	46.1	(1.8)	**6.3**	(1.0)	**3.9**	(0.5)
Belgium	41.4	(1.3)	60.0	(2.4)	20.3	(1.4)	**4.9**	(0.6)	**2.5**	(0.3)
Canada	0.0	c	0.0	c	0.0	c	m	m	m	m
Chile	0.6	(0.1)	0.9	(0.3)	0.1	(0.1)	**7.0**	(6.8)	**9.1**	(9.0)
Czech Republic	33.3	(1.3)	35.7	(2.1)	24.4	(1.9)	**1.7**	(0.2)	**1.3**	(0.2)
Denmark	0.0	c	0.0	c	0.0	c	m	m	m	m
Estonia	0.3	(0.1)	0.7	(0.3)	0.2	(0.2)	3.6	(4.8)	3.9	(4.4)
Finland	0.0	c	0.0	c	0.0	c	m	m	m	m
France	18.7	(0.9)	35.0	(2.0)	4.0	(0.7)	**7.2**	(1.3)	**3.5**	(0.6)
Germany	2.7	(0.7)	3.5	(1.3)	1.2	(0.5)	1.1	(0.5)	0.8	(0.4)
Greece	16.4	(2.6)	27.5	(4.3)	4.1	(0.9)	**7.1**	(1.3)	**3.3**	(0.7)
Hungary	15.9	(0.6)	31.6	(1.6)	3.5	(0.5)	**9.6**	(1.6)	**4.0**	(0.8)
Iceland	0.0	c	0.0	c	0.0	c	m	m	m	m
Ireland	0.8	(0.2)	1.7	(0.7)	0.4	(0.2)	**3.9**	(1.5)	1.2	(0.5)
Israel	0.0	c	0.0	c	0.0	c	m	m	m	m
Italy	49.7	(1.2)	70.5	(2.0)	26.0	(1.7)	**5.7**	(0.7)	**4.1**	(0.5)
Japan	24.4	(0.9)	38.6	(2.1)	11.9	(1.1)	**4.2**	(0.6)	**3.4**	(0.5)
Korea	16.1	(0.4)	27.8	(1.9)	6.3	(1.2)	**5.5**	(1.3)	**3.5**	(0.8)
Latvia	0.8	(0.4)	0.8	(0.6)	0.9	(0.5)	0.9	(0.7)	1.0	(0.8)
Luxembourg	15.0	(0.1)	17.6	(0.9)	8.6	(0.6)	**2.3**	(0.2)	**2.7**	(0.4)
Mexico	25.3	(1.1)	18.5	(2.3)	21.4	(2.0)	0.8	(0.2)	1.1	(0.2)
Netherlands	26.1	(0.9)	42.9	(1.8)	9.2	(1.1)	**6.1**	(0.9)	**2.6**	(0.4)
New Zealand	0.0	c	0.0	c	0.0	c	m	m	m	m
Norway	0.0	c	0.0	c	0.0	c	m	m	m	m
Poland	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	1.0	(2.2)	2.1	(5.6)
Portugal	13.1	(1.1)	21.9	(1.4)	4.6	(1.7)	**5.1**	(1.9)	**3.1**	(1.0)
Slovak Republic	5.7	(0.7)	10.7	(1.3)	1.6	(0.4)	**6.0**	(1.3)	**3.0**	(0.8)
Slovenia	57.4	(0.2)	79.2	(1.5)	27.5	(1.0)	**9.4**	(1.0)	**5.7**	(0.7)
Spain	0.9	(0.1)	1.5	(0.3)	0.2	(0.1)	**5.2**	(3.4)	2.4	(2.0)
Sweden	0.1	(0.1)	0.0	c	0.0	c	m	m	m	m
Switzerland	9.2	(1.1)	9.7	(2.0)	4.8	(0.7)	**2.1**	(0.4)	**4.3**	(1.2)
Turkey	41.0	(1.9)	45.9	(3.3)	27.4	(3.4)	**2.2**	(0.4)	1.4	(0.3)
United Kingdom	0.8	(0.2)	0.7	(0.2)	0.8	(0.4)	0.9	(0.4)	0.8	(0.3)
United States	0.0	c	0.0	c	0.0	c	m	m	m	m
OECD average	14.3	(0.1)	19.6	(0.3)	7.6	(0.2)	**4.3**	(0.4)	**2.9**	(0.5)
Partners										
Albania	6.4	(1.5)	6.5	(1.6)	4.8	(1.4)	m	m	m	m
Algeria	0.6	(0.6)	0.8	(1.2)	0.2	(0.2)	5.6	(5.9)	5.1	(5.4)
Brazil	4.7	(1.0)	3.3	(0.8)	5.9	(1.4)	**0.6**	(0.1)	1.2	(0.3)
B-S-J-G (China)	6.2	(1.1)	3.0	(0.9)	6.8	(1.1)	**0.4**	(0.1)	**0.3**	(0.1)
Bulgaria	46.2	(2.0)	60.0	(2.9)	27.3	(3.0)	**3.4**	(0.6)	**2.1**	(0.4)
CABA (Argentina)	13.0	(4.3)	12.9	(5.7)	6.1	(2.8)	0.9	(0.8)	0.9	(0.9)
Colombia	20.8	(1.6)	19.9	(2.7)	16.9	(2.0)	1.2	(0.2)	**1.5**	(0.3)
Costa Rica	12.3	(1.4)	9.0	(1.4)	11.5	(2.0)	0.8	(0.2)	1.0	(0.2)
Croatia	67.3	(0.8)	85.4	(1.1)	37.6	(1.8)	**9.0**	(1.0)	**5.4**	(0.6)
Cyprus*	11.9	(0.1)	22.9	(1.0)	3.2	(0.5)	**7.5**	(1.0)	**4.4**	(0.7)
Dominican Republic	4.8	(0.5)	1.7	(0.2)	9.4	(1.3)	**0.2**	(0.0)	**0.3**	(0.1)
FYROM	55.1	(0.3)	66.8	(1.2)	37.7	(1.2)	**3.0**	(0.2)	**2.4**	(0.2)
Georgia	1.7	(0.8)	2.9	(1.4)	0.4	(0.3)	**6.2**	(3.3)	**3.2**	(1.7)
Hong Kong (China)	0.0	c	0.0	c	0.0	c	m	m	m	m
Indonesia	16.0	(1.3)	11.9	(2.2)	13.7	(2.4)	0.9	(0.3)	0.8	(0.3)
Jordan	0.0	c	0.0	c	0.0	c	m	m	m	m
Kosovo	35.3	(0.7)	37.4	(1.5)	28.2	(1.6)	**1.4**	(0.1)	1.1	(0.1)
Lebanon	0.0	c	0.0	c	0.0	c	m	m	m	m
Lithuania	1.5	(0.6)	2.7	(1.1)	0.4	(0.2)	3.1	(2.6)	1.2	(1.1)
Macao (China)	1.2	(0.1)	2.3	(0.2)	0.8	(0.2)	**2.8**	(0.9)	**2.4**	(0.8)
Malta	0.0	c	0.0	c	0.0	c	m	m	m	m
Moldova	0.0	c	0.0	c	0.0	c	m	m	m	m
Montenegro	66.0	(0.3)	80.1	(1.1)	47.7	(1.2)	**4.2**	(0.4)	**3.2**	(0.3)
Peru	0.0	c	0.0	c	0.0	c	m	m	m	m
Qatar	0.0	c	0.0	c	0.0	c	m	m	m	m
Romania	0.0	c	0.0	c	0.0	c	m	m	m	m
Russia	4.5	(1.5)	7.5	(2.9)	2.0	(0.8)	**3.1**	(1.3)	**2.7**	(1.3)
Singapore	0.0	c	0.0	c	0.0	c	m	m	m	m
Chinese Taipei	36.3	(1.3)	48.0	(2.2)	22.6	(2.0)	**3.1**	(0.4)	**1.8**	(0.2)
Thailand	17.7	(0.8)	21.4	(2.0)	9.4	(1.7)	**2.1**	(0.5)	1.5	(0.3)
Trinidad and Tobago	0.0	c	0.0	c	0.0	c	m	m	m	m
Tunisia	0.0	c	0.0	c	0.0	c	m	m	m	m
United Arab Emirates	3.9	(0.4)	2.8	(0.6)	4.9	(0.6)	**0.5**	(0.1)	**0.4**	(0.1)
Uruguay	1.7	(0.3)	1.9	(0.5)	0.7	(0.3)	2.4	(1.2)	2.7	(1.7)
Viet Nam	0.0	c	0.0	c	0.0	c	m	m	m	m
Argentina**	16.6	(2.6)	17.7	(3.6)	13.9	(2.5)	1.2	(0.3)	1.2	(0.2)
Kazakhstan**	14.0	(2.1)	14.0	(2.9)	12.5	(2.1)	1.1	(0.3)	0.8	(0.2)
Malaysia**	10.5	(1.2)	12.1	(1.8)	7.2	(1.3)	**1.7**	(0.4)	**1.6**	(0.3)

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2. A socio-economically advantaged student is a student in the top quarter of the distribution of the PISA index of economic, social and cultural status (ESCS) within his or her each country/economy.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/3]

Table I.6.17 Change between 2006 and 2015 in science performance and equity indicators

Results based on students' self-reports

		Average 3-year trend in science performance across PISA assessments		Change between 2006 and 2015 (PISA 2015 – PISA 2006)		PISA 2015: Percentage of variation in science performance explained by students' socio-economic status		PISA 2015: Score-point difference in science associated with one-unit increase on the ESCS[1]		PISA 2015: Percentage of students performing below Level 2 in science		PISA 2015: Percentage of resilient students[2]		PISA 2015: Index of academic inclusion[3]		PISA 2015: Index of social inclusion[4]	
		Score dif.	S.E.	Score dif.	S.E.	%	S.E.	Score dif.	S.E.	%	S.E.	%	S.E.	Index	S.E.	Index	S.E.
OECD	Australia	**-6**	(1.7)	**-17**	(5.2)	11.7	(0.8)	**44**	(1.5)	17.6	(0.6)	32.9	(1.2)	78.9	(1.3)	74.7	(1.2)
	Austria	**-5**	(2.2)	**-16**	(6.4)	15.9	(1.3)	**45**	(2.0)	20.8	(1.0)	25.9	(1.6)	56.2	(2.1)	73.0	(2.2)
	Belgium	-3	(1.8)	-8	(5.6)	19.3	(1.3)	**48**	(1.8)	19.8	(0.9)	27.2	(1.4)	55.6	(2.1)	72.9	(1.7)
	Canada	-2	(1.8)	-7	(5.3)	8.8	(0.7)	**34**	(1.5)	11.1	(0.5)	38.7	(1.4)	84.7	(1.3)	83.0	(1.1)
	Chile	2	(2.1)	9	(6.7)	16.9	(1.3)	**32**	(1.4)	34.8	(1.2)	14.6	(1.2)	61.5	(2.4)	54.9	(2.4)
	Czech Republic	**-5**	(2.0)	**-20**	(6.1)	18.8	(1.2)	**52**	(2.1)	20.7	(1.0)	24.9	(1.7)	55.6	(2.6)	72.1	(2.1)
	Denmark	2	(1.9)	6	(5.9)	10.4	(1.0)	**34**	(1.7)	15.9	(0.8)	27.5	(1.6)	86.1	(1.7)	84.0	(1.4)
	Estonia	2	(1.8)	3	(5.6)	7.8	(0.9)	**32**	(1.8)	8.8	(0.7)	48.3	(1.8)	81.1	(2.3)	79.1	(2.3)
	Finland	**-11**	(1.8)	**-33**	(5.5)	10.0	(1.0)	**40**	(2.3)	11.5	(0.7)	42.8	(1.9)	92.1	(1.4)	87.2	(1.6)
	France	0	(2.0)	0	(6.0)	20.3	(1.3)	**57**	(2.0)	22.1	(0.9)	26.6	(1.3)	w	w	w	w
	Germany	-2	(2.1)	-7	(6.5)	15.8	(1.2)	**42**	(1.9)	17.0	(1.0)	33.5	(1.8)	56.3	(1.9)	77.2	(1.6)
	Greece	**-6**	(2.2)	**-19**	(6.8)	12.5	(1.3)	**34**	(2.1)	32.7	(1.9)	18.1	(1.6)	64.5	(3.1)	76.7	(2.4)
	Hungary	**-9**	(1.9)	**-27**	(5.8)	21.4	(1.4)	**47**	(1.9)	26.0	(1.0)	19.3	(1.5)	44.6	(2.2)	62.6	(2.4)
	Iceland	**-7**	(1.7)	**-18**	(5.1)	4.9	(0.8)	**28**	(2.1)	25.3	(0.9)	17.0	(1.5)	96.2	(1.7)	89.2	(2.2)
	Ireland	0	(2.0)	-6	(6.0)	12.7	(1.0)	**38**	(1.6)	15.3	(1.0)	29.6	(1.8)	86.8	(1.6)	82.3	(2.1)
	Israel	**5**	(2.2)	13	(6.8)	11.2	(1.3)	**42**	(2.3)	31.4	(1.4)	15.7	(1.3)	63.1	(2.7)	78.2	(2.3)
	Italy	2	(1.8)	5	(5.5)	9.6	(1.0)	**30**	(1.7)	23.2	(1.0)	26.6	(1.7)	56.7	(2.2)	76.3	(2.0)
	Japan	3	(2.1)	7	(6.3)	10.1	(1.0)	**42**	(2.2)	9.6	(0.7)	48.8	(1.9)	56.1	(2.3)	78.0	(1.6)
	Korea	-2	(2.1)	-6	(6.4)	10.1	(1.3)	**44**	(2.7)	14.4	(0.9)	40.4	(1.9)	75.2	(2.4)	78.9	(2.2)
	Latvia	1	(1.8)	1	(5.6)	8.7	(1.0)	**26**	(1.6)	17.2	(0.8)	35.2	(1.7)	83.4	(2.0)	78.1	(2.3)
	Luxembourg	0	(1.6)	-4	(4.7)	20.8	(1.0)	**41**	(1.1)	25.9	(0.7)	20.7	(1.4)	66.1	(4.0)	73.9	(4.0)
	Mexico	2	(1.8)	6	(5.7)	10.9	(1.3)	**19**	(1.1)	47.8	(1.3)	12.8	(1.2)	70.0	(2.5)	60.3	(2.9)
	Netherlands	**-5**	(1.9)	**-16**	(5.7)	12.5	(1.3)	**47**	(2.6)	18.5	(1.0)	30.7	(1.7)	42.3	(2.0)	77.9	(2.3)
	New Zealand	**-7**	(1.9)	**-17**	(5.7)	13.6	(1.2)	**49**	(2.6)	17.4	(0.9)	30.4	(1.9)	82.6	(2.1)	83.0	(1.9)
	Norway	3	(1.9)	**12**	(5.9)	8.2	(0.9)	**37**	(2.2)	18.7	(0.8)	26.5	(1.4)	92.1	(1.1)	90.3	(1.3)
	Poland	3	(1.9)	4	(5.6)	13.4	(1.3)	**40**	(2.0)	16.3	(0.8)	34.6	(1.9)	85.7	(2.2)	82.0	(2.5)
	Portugal	**8**	(1.9)	**27**	(5.9)	14.9	(1.4)	**31**	(1.5)	17.4	(0.9)	38.1	(1.9)	76.8	(2.1)	73.9	(2.6)
	Slovak Republic	**-10**	(1.9)	**-28**	(5.8)	16.0	(1.4)	**41**	(2.3)	30.7	(1.1)	17.5	(1.4)	55.6	(2.5)	68.1	(3.1)
	Slovenia	-2	(1.6)	-6	(4.8)	13.5	(0.9)	**43**	(1.5)	15.0	(0.5)	34.6	(1.5)	51.6	(2.5)	74.1	(2.5)
	Spain	2	(1.8)	4	(5.6)	13.4	(1.1)	**27**	(1.1)	18.3	(0.8)	39.2	(1.4)	86.6	(1.4)	69.0	(2.4)
	Sweden	**-4**	(2.0)	-10	(6.2)	12.2	(1.1)	**44**	(2.2)	21.6	(1.1)	24.7	(1.5)	84.5	(1.8)	86.7	(1.5)
	Switzerland	-2	(2.0)	-6	(6.2)	15.6	(1.2)	**43**	(1.9)	18.5	(1.1)	29.1	(1.8)	62.3	(2.7)	81.5	(1.9)
	Turkey	2	(2.3)	2	(7.1)	9.0	(1.9)	**20**	(2.1)	44.5	(2.1)	21.8	(2.5)	46.7	(2.7)	73.2	(2.8)
	United Kingdom	-1	(1.9)	-6	(5.6)	10.5	(1.0)	**37**	(1.9)	17.4	(0.8)	35.4	(1.5)	77.9	(1.8)	80.2	(1.8)
	United States	2	(2.3)	7	(6.9)	11.4	(1.1)	**33**	(1.8)	20.3	(1.1)	31.6	(1.9)	80.8	(2.0)	73.0	(2.9)
	OECD average	-1	(1.5)	-5	(4.5)	12.9	(0.2)	**38**	(0.3)	21.2	(0.2)	29.2	(0.3)	69.9	(0.4)	76.5	(0.4)
Partners	Albania	**18**	(3.4)	m	m	0.0	(0.1)	0	(1.9)	41.7	(1.7)	25.0	(2.6)	76.0	(2.4)	86.7	(1.8)
	Algeria	m	m	m	m	1.4	(0.8)	**8**	(2.3)	70.8	(1.4)	7.4	(1.1)	68.8	(2.9)	81.6	(2.7)
	Brazil	3	(1.9)	10	(5.8)	12.5	(1.3)	**27**	(1.6)	56.6	(1.1)	9.4	(0.7)	60.7	(2.3)	66.1	(2.0)
	B-S-J-G (China)	m	m	m	m	18.5	(2.4)	**40**	(2.5)	16.2	(1.3)	45.3	(2.5)	47.0	(2.6)	58.2	(3.1)
	Bulgaria	4	(2.8)	12	(8.7)	16.4	(1.5)	**41**	(2.3)	37.9	(1.9)	13.6	(1.5)	48.7	(2.6)	68.4	(2.3)
	CABA (Argentina)	**52**	(11.2)	m	m	25.6	(2.9)	**37**	(2.6)	22.7	(2.4)	14.9	(1.9)	64.7	(3.9)	46.9	(3.8)
	Colombia	**8**	(2.0)	**28**	(6.1)	13.7	(1.7)	**27**	(1.8)	49.0	(1.3)	11.4	(1.0)	67.4	(2.7)	58.7	(3.0)
	Costa Rica	-7	(3.4)	m	m	15.6	(1.4)	**24**	(1.3)	46.4	(1.2)	9.4	(1.0)	71.3	(2.9)	62.8	(3.3)
	Croatia	**-5**	(1.9)	**-18**	(5.7)	12.1	(1.1)	**38**	(1.9)	24.6	(1.2)	24.4	(1.7)	62.6	(2.6)	78.8	(2.2)
	Cyprus*	-5	(4.4)	m	m	9.5	(0.9)	**31**	(1.5)	42.1	(0.8)	10.1	(1.1)	75.9	(4.1)	76.7	(3.7)
	Dominican Republic	m	m	m	m	12.9	(1.7)	**25**	(2.1)	85.7	(1.1)	0.4	(0.2)	63.2	(3.8)	70.1	(3.1)
	FYROM	m	m	m	m	6.9	(0.8)	**25**	(1.6)	62.9	(0.8)	4.1	(0.7)	71.8	(3.9)	83.2	(2.9)
	Georgia	**23**	(3.5)	m	m	11.1	(1.1)	**34**	(2.0)	50.8	(1.3)	7.5	(1.2)	77.1	(2.7)	71.5	(2.3)
	Hong Kong (China)	**-5**	(1.9)	**-19**	(5.7)	4.9	(0.9)	**19**	(1.9)	9.4	(0.7)	61.8	(1.8)	69.2	(2.4)	76.1	(2.7)
	Indonesia	3	(2.5)	10	(7.7)	13.2	(2.0)	**22**	(1.8)	56.0	(1.6)	10.9	(1.3)	58.3	(3.2)	54.4	(3.2)
	Jordan	**-5**	(2.0)	**-13**	(5.9)	9.4	(1.3)	**25**	(1.8)	49.8	(1.4)	7.7	(0.9)	73.0	(2.4)	76.0	(2.2)
	Kosovo	m	m	m	m	5.1	(0.8)	**18**	(1.6)	67.7	(1.1)	2.5	(0.8)	70.4	(3.0)	87.6	(2.2)
	Lebanon	m	m	m	m	9.7	(1.8)	**26**	(2.5)	62.6	(1.7)	6.1	(1.2)	52.3	(2.8)	63.1	(3.2)
	Lithuania	-3	(1.9)	**-13**	(5.9)	11.6	(1.3)	**36**	(2.1)	24.7	(1.1)	23.1	(1.5)	66.4	(3.0)	75.7	(2.2)
	Macao (China)	**6**	(1.6)	**18**	(4.7)	1.7	(0.4)	**12**	(1.7)	8.1	(0.4)	64.6	(1.4)	76.7	(4.5)	69.8	(4.6)
	Malta	2	(3.0)	m	m	14.5	(1.0)	**47**	(1.8)	32.5	(0.8)	21.8	(1.6)	70.0	(4.3)	76.9	(3.3)
	Moldova	**9**	(3.4)	m	m	11.6	(1.3)	**33**	(1.9)	42.2	(1.1)	13.4	(1.3)	80.7	(2.1)	72.0	(2.7)
	Montenegro	1	(1.6)	0	(4.7)	5.0	(0.6)	**23**	(1.5)	51.0	(0.7)	9.4	(0.9)	74.5	(3.8)	85.3	(3.5)
	Peru	**14**	(3.0)	m	m	21.6	(1.8)	**30**	(1.4)	58.5	(1.4)	3.2	(0.5)	63.5	(2.3)	49.1	(2.3)
	Qatar	**21**	(1.6)	**68**	(4.7)	4.4	(0.4)	**27**	(1.4)	49.8	(0.5)	5.7	(0.5)	60.6	(3.4)	77.7	(2.4)
	Romania	**6**	(2.2)	**16**	(6.9)	13.8	(1.8)	**34**	(2.4)	38.5	(1.8)	11.3	(1.4)	61.3	(2.6)	68.0	(2.8)
	Russia	3	(2.1)	7	(6.5)	6.7	(1.0)	**29**	(2.4)	18.2	(1.1)	25.5	(2.0)	81.2	(2.0)	79.5	(2.1)
	Singapore	**7**	(2.4)	m	m	16.8	(1.0)	**47**	(1.5)	9.6	(0.4)	48.8	(1.5)	65.2	(3.0)	74.8	(2.3)
	Chinese Taipei	0	(2.0)	0	(6.3)	14.1	(1.4)	**45**	(2.7)	12.4	(0.8)	46.3	(1.8)	63.7	(2.8)	78.2	(1.9)
	Thailand	2	(1.9)	0	(5.7)	9.0	(1.9)	**22**	(2.3)	46.7	(1.5)	18.4	(1.6)	66.3	(2.8)	63.3	(3.0)
	Trinidad and Tobago	**7**	(2.5)	m	m	10.0	(0.9)	**31**	(1.4)	45.8	(0.8)	12.9	(1.2)	46.5	(2.6)	82.8	(1.9)
	Tunisia	0	(1.9)	1	(5.8)	9.0	(1.5)	**17**	(1.7)	65.9	(1.3)	4.7	(0.8)	62.4	(4.0)	69.6	(3.2)
	United Arab Emirates	**-12**	(5.4)	m	m	4.9	(0.6)	**30**	(1.8)	41.8	(1.1)	7.7	(0.7)	58.3	(2.0)	79.1	(1.5)
	Uruguay	1	(1.9)	7	(5.7)	16.1	(1.3)	**32**	(1.4)	40.8	(1.1)	14.0	(1.1)	64.5	(2.4)	66.1	(2.9)
	Viet Nam	-4	(7.0)	m	m	10.8	(2.2)	**23**	(2.7)	5.9	(0.8)	75.5	(2.7)	59.8	(3.9)	65.5	(3.0)
	Argentina**	**13**	(2.6)	**41**	(8.1)	12.8	(1.4)	**25**	(1.5)	39.7	(1.5)	16.4	(1.5)	70.2	(2.1)	67.7	(2.3)
	Kazakhstan**	**28**	(3.3)	m	m	4.5	(1.1)	**23**	(2.9)	28.1	(1.6)	16.6	(1.8)	54.4	(3.6)	77.8	(2.2)
	Malaysia**	**13**	(3.6)	m	m	12.6	(1.5)	**25**	(1.6)	33.7	(1.5)	15.5	(1.5)	72.6	(2.6)	71.7	(2.3)

1. ESCS refers to the PISA index of economic, social and cultural status.
2. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and performs in the top quarter of students among all countries/economies, after accounting for socio-economic status.
3. The index of academic inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of performance.
4. The index of social inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of socio-economic status.

Notes: Values that are statistically significant are indicated in bold (see Annex A3).

Average 3-year trend is the average change between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average 3-year trend is calculated with a linear regression model. This model considers that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

* See note at the beginning of this Annex.

** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433214

[Part 2/3]

Table I.6.17 Change between 2006 and 2015 in science performance and equity indicators

Results based on students' self-reports

		PISA 2006											
		Percentage of variation in science performance explained by students' socio-economic status		Score-point difference in science associated with one-unit increase on the ESCS[1]		Percentage of students performing below Level 2 in science		Percentage of resilient students[2]		Index of academic inclusion[3]		Index of social inclusion[4]	
		%	S.E.	Score dif.	S.E.	%	S.E.	%	S.E.	Index	S.E.	Index	S.E.
OECD	Australia	12.0	(0.7)	**42**	(1.4)	12.9	(0.6)	33.1	(1.1)	82.3	(1.7)	77.1	(1.7)
	Austria	15.8	(2.0)	**46**	(3.0)	16.3	(1.4)	28.1	(2.4)	48.0	(2.6)	70.3	(2.7)
	Belgium	20.0	(1.3)	**46**	(1.8)	17.0	(1.0)	25.8	(1.3)	48.7	(2.3)	73.4	(1.8)
	Canada	8.5	(0.7)	**32**	(1.4)	10.0	(0.6)	38.0	(1.3)	82.2	(1.7)	80.5	(1.4)
	Chile	23.3	(1.8)	**39**	(1.7)	39.7	(2.1)	15.0	(1.5)	56.7	(2.9)	47.5	(3.5)
	Czech Republic	16.1	(1.3)	**50**	(2.4)	15.5	(1.2)	28.8	(2.0)	51.9	(3.0)	76.6	(2.5)
	Denmark	14.0	(1.5)	**40**	(2.2)	18.4	(1.1)	19.6	(1.3)	86.0	(2.2)	87.8	(1.7)
	Estonia	8.9	(1.1)	**31**	(2.0)	7.7	(0.6)	46.2	(2.3)	79.8	(2.4)	81.0	(2.3)
	Finland	8.2	(0.9)	**31**	(1.6)	4.1	(0.5)	53.1	(1.6)	94.4	(1.0)	89.9	(1.5)
	France	22.3	(1.8)	**52**	(2.3)	21.2	(1.4)	23.6	(1.6)	w	w	w	w
	Germany	19.8	(1.5)	**46**	(2.1)	15.4	(1.3)	24.8	(1.8)	45.6	(2.4)	74.8	(2.1)
	Greece	14.6	(1.7)	**35**	(2.2)	24.0	(1.3)	20.4	(1.8)	60.4	(3.5)	72.1	(3.3)
	Hungary	21.1	(1.6)	**45**	(1.9)	15.0	(1.0)	26.0	(2.1)	46.0	(2.7)	62.6	(2.7)
	Iceland	7.5	(0.8)	**30**	(1.8)	20.6	(0.8)	18.8	(1.4)	93.4	(1.6)	88.0	(1.7)
	Ireland	13.2	(1.4)	**36**	(2.1)	15.5	(1.1)	29.2	(2.0)	83.7	(2.0)	79.4	(2.6)
	Israel	10.3	(1.0)	**42**	(2.5)	36.1	(1.4)	13.4	(1.6)	71.2	(2.7)	78.1	(2.0)
	Italy	10.3	(1.0)	**31**	(1.6)	25.3	(0.9)	23.7	(1.1)	51.7	(1.7)	75.4	(1.7)
	Japan	8.5	(1.0)	**40**	(2.7)	12.0	(1.0)	40.5	(2.4)	53.8	(2.3)	74.8	(1.9)
	Korea	7.0	(1.4)	**31**	(3.4)	11.2	(1.1)	43.6	(2.2)	65.4	(3.3)	76.8	(2.4)
	Latvia	9.3	(1.4)	**30**	(2.4)	17.4	(1.2)	29.3	(1.9)	81.7	(2.0)	79.4	(2.2)
	Luxembourg	22.5	(1.1)	**40**	(1.1)	22.1	(0.5)	19.2	(1.4)	71.1	(4.6)	76.5	(3.8)
	Mexico	16.2	(1.7)	**24**	(1.3)	50.9	(1.4)	14.7	(1.4)	54.4	(2.3)	55.8	(2.3)
	Netherlands	16.3	(1.7)	**44**	(2.3)	13.0	(1.0)	32.0	(2.0)	39.2	(2.4)	76.4	(2.3)
	New Zealand	15.7	(1.0)	**49**	(1.6)	13.7	(0.7)	35.1	(1.8)	84.8	(2.1)	83.1	(2.0)
	Norway	8.6	(1.1)	**37**	(2.5)	21.1	(1.3)	17.2	(1.2)	89.2	(2.1)	88.8	(1.8)
	Poland	14.7	(1.1)	**41**	(1.8)	17.0	(0.8)	31.4	(2.0)	87.9	(1.5)	79.3	(1.8)
	Portugal	16.3	(1.5)	**28**	(1.4)	24.5	(1.4)	33.7	(2.0)	67.4	(3.0)	69.3	(3.2)
	Slovak Republic	19.6	(1.9)	**46**	(2.6)	20.2	(1.0)	20.3	(1.7)	57.4	(3.0)	68.5	(3.2)
	Slovenia	17.5	(1.1)	**47**	(1.6)	13.9	(0.6)	30.3	(1.3)	40.7	(2.2)	74.1	(2.3)
	Spain	12.4	(1.1)	**24**	(1.0)	19.6	(0.9)	28.5	(1.3)	82.0	(1.6)	71.7	(2.3)
	Sweden	11.0	(1.0)	**37**	(2.0)	16.4	(0.8)	24.0	(1.5)	90.0	(1.8)	88.1	(1.4)
	Switzerland	16.3	(1.2)	**43**	(1.7)	16.1	(0.9)	27.9	(1.5)	61.6	(3.0)	81.0	(1.6)
	Turkey	15.1	(2.8)	**28**	(3.0)	46.6	(1.6)	23.2	(2.0)	46.5	(4.1)	72.6	(3.5)
	United Kingdom	13.4	(1.2)	**45**	(1.9)	16.7	(0.8)	30.5	(1.7)	77.5	(2.5)	80.3	(1.9)
	United States	17.4	(1.6)	**46**	(2.3)	24.4	(1.6)	19.3	(1.6)	75.6	(3.2)	73.8	(2.7)
	OECD average	14.4	(0.2)	**39**	(0.4)	19.8	(0.2)	27.7	(0.3)	67.2	(0.4)	75.8	(0.4)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	16.9	(1.8)	**28**	(1.8)	61.0	(1.4)	10.3	(1.3)	53.3	(2.7)	59.8	(2.6)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	22.6	(2.6)	**48**	(3.4)	42.6	(2.4)	9.4	(1.3)	47.7	(3.0)	60.0	(3.1)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	10.6	(1.5)	**23**	(1.5)	60.2	(1.8)	11.1	(1.5)	71.6	(3.4)	66.1	(3.7)
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	12.3	(1.2)	**35**	(1.9)	17.0	(0.9)	24.9	(2.0)	61.4	(2.8)	77.6	(2.0)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	6.4	(1.2)	**27**	(2.5)	8.7	(0.8)	62.5	(1.9)	62.3	(2.5)	76.5	(2.6)
	Indonesia	9.7	(2.2)	**21**	(2.7)	61.6	(3.4)	15.1	(2.5)	46.5	(3.9)	63.8	(3.0)
	Jordan	11.0	(1.3)	**26**	(1.7)	44.3	(1.2)	14.3	(1.3)	75.7	(3.3)	73.1	(3.2)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	14.1	(1.3)	**37**	(2.1)	20.3	(1.0)	25.2	(1.9)	72.8	(2.9)	75.0	(2.4)
	Macao (China)	1.8	(0.5)	**13**	(1.6)	10.3	(0.5)	58.7	(1.9)	81.0	(4.8)	78.9	(4.3)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	7.6	(0.9)	**24**	(1.4)	50.2	(0.9)	7.6	(0.9)	71.0	(6.5)	82.3	(3.9)
	Peru	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	2.0	(0.3)	**12**	(1.0)	79.1	(0.4)	0.8	(0.3)	54.4	(5.3)	76.2	(2.9)
	Romania	15.4	(3.1)	**35**	(3.6)	46.9	(2.4)	6.5	(1.2)	51.0	(3.3)	67.8	(3.8)
	Russia	7.6	(1.2)	**28**	(2.3)	22.2	(1.4)	26.5	(2.3)	75.5	(2.5)	81.9	(2.1)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	13.1	(1.2)	**43**	(2.3)	11.6	(1.0)	44.3	(2.4)	52.1	(2.7)	77.6	(1.8)
	Thailand	15.5	(2.0)	**27**	(1.6)	46.1	(1.2)	23.6	(1.8)	66.4	(2.8)	54.0	(3.1)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	8.9	(2.1)	**19**	(2.3)	62.8	(1.4)	16.4	(1.4)	58.5	(3.2)	63.0	(3.5)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	17.7	(1.2)	**34**	(1.4)	42.1	(1.4)	15.8	(1.6)	58.7	(2.7)	63.1	(2.6)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	18.6	(2.2)	**37**	(2.3)	56.3	(2.5)	7.4	(1.1)	52.4	(3.2)	64.2	(3.3)
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m

1. ESCS refers to the PISA index of economic, social and cultural status.
2. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and performs in the top quarter of students among all countries/economies, after accounting for socio-economic status.
3. The index of academic inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of performance.
4. The index of social inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of socio-economic status.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Average 3-year trend is the average change between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average 3-year trend is calculated with a linear regression model. This model considers that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433214

[Part 3/3]

Table I.6.17 Change between 2006 and 2015 in science performance and equity indicators

Results based on students' self-reports

		Difference between PISA 2006 and PISA 2015 (PISA 2015 – PISA 2006)											
		Percentage of variation in science performance explained by students' socio-economic status		Score-point difference in science associated with one-unit increase on the ESCS[1]		Percentage of students performing below Level 2 in science		Percentage of resilient students[2]		Index of academic inclusion[3]		Index of social inclusion[4]	
		% dif.	S.E.	Score dif.	S.E.	% dif.	S.E.	% dif.	S.E.	Dif.	S.E.	Dif.	S.E.
OECD	Australia	-0.4	(1.1)	2	(2.0)	**4.8**	(1.4)	-0.2	(1.6)	-3.4	(2.2)	-2.5	(2.1)
	Austria	0.1	(2.4)	0	(3.6)	4.5	(2.5)	-2.2	(2.8)	**8.2**	(3.4)	2.7	(3.5)
	Belgium	-0.7	(1.8)	2	(2.5)	2.7	(2.0)	1.4	(2.0)	**6.9**	(3.1)	-0.5	(2.5)
	Canada	0.3	(1.0)	1	(2.0)	1.1	(1.0)	0.7	(1.9)	2.5	(2.1)	2.5	(1.8)
	Chile	**-6.4**	(2.3)	**-6**	(2.2)	-4.9	(4.3)	-0.4	(1.9)	4.8	(3.8)	7.5	(4.2)
	Czech Republic	2.7	(1.8)	1	(3.2)	**5.1**	(2.5)	-3.9	(2.6)	3.8	(4.0)	-4.5	(3.3)
	Denmark	**-3.6**	(1.8)	**-7**	(2.8)	-2.6	(2.0)	**7.9**	(2.0)	0.1	(2.7)	-3.9	(2.2)
	Estonia	-1.0	(1.4)	2	(2.7)	1.1	(1.2)	2.0	(2.9)	1.3	(3.3)	-1.9	(3.2)
	Finland	1.8	(1.4)	**10**	(2.8)	**7.4**	(1.2)	**-10.4**	(2.5)	-2.3	(1.7)	-2.8	(2.2)
	France	-1.9	(2.2)	5	(3.1)	0.9	(2.3)	3.0	(2.1)	w	w	w	w
	Germany	**-4.0**	(2.0)	-5	(2.8)	1.6	(2.0)	**8.7**	(2.5)	**10.7**	(3.1)	2.5	(2.6)
	Greece	-2.1	(2.1)	-2	(3.0)	**8.7**	(3.6)	-2.3	(2.4)	4.1	(4.7)	4.6	(4.1)
	Hungary	0.3	(2.1)	2	(2.7)	**11.0**	(2.5)	**-6.7**	(2.6)	-1.4	(3.5)	0.0	(3.6)
	Iceland	**-2.6**	(1.1)	-3	(2.8)	4.8	(2.5)	-1.8	(2.0)	2.8	(2.4)	1.1	(2.8)
	Ireland	-0.5	(1.7)	1	(2.6)	-0.2	(2.2)	0.4	(2.7)	3.1	(2.6)	2.9	(3.4)
	Israel	0.9	(1.6)	0	(3.4)	-4.7	(3.1)	2.3	(2.1)	**-8.1**	(3.8)	0.1	(3.1)
	Italy	-0.6	(1.4)	-1	(2.3)	-2.0	(2.5)	2.8	(2.0)	5.0	(2.8)	0.9	(2.6)
	Japan	1.6	(1.4)	2	(3.5)	-2.4	(1.3)	**8.2**	(3.1)	2.3	(3.3)	3.2	(2.5)
	Korea	3.1	(1.9)	**13**	(4.3)	3.1	(1.7)	-3.2	(2.9)	**9.8**	(4.1)	2.1	(3.3)
	Latvia	-0.5	(1.7)	-4	(2.9)	-0.2	(2.0)	**6.0**	(2.6)	1.7	(2.9)	-1.3	(3.2)
	Luxembourg	-1.7	(1.5)	2	(1.6)	3.8	(2.0)	1.5	(2.0)	-5.0	(6.1)	-2.6	(5.5)
	Mexico	**-5.2**	(2.1)	**-5**	(1.7)	-3.2	(7.3)	-1.9	(1.8)	**15.6**	(3.4)	4.5	(3.7)
	Netherlands	-3.8	(2.1)	3	(3.5)	**5.6**	(2.1)	-1.3	(2.7)	3.1	(3.1)	1.5	(3.2)
	New Zealand	-2.0	(1.6)	0	(3.0)	**3.7**	(1.7)	-4.7	(2.6)	-2.3	(2.9)	-0.2	(2.8)
	Norway	-0.4	(1.4)	1	(3.3)	-2.4	(2.3)	**9.3**	(1.9)	2.9	(2.4)	1.4	(2.2)
	Poland	-1.4	(1.7)	0	(2.7)	-0.7	(2.3)	3.2	(2.7)	-2.2	(2.7)	2.7	(3.1)
	Portugal	-1.4	(2.0)	3	(2.0)	**-7.1**	(2.4)	4.4	(2.7)	**9.3**	(3.7)	4.6	(4.2)
	Slovak Republic	-3.6	(2.4)	-4	(3.5)	**10.5**	(2.5)	-2.8	(2.2)	-1.8	(3.9)	-0.4	(4.4)
	Slovenia	**-4.0**	(1.4)	**-5**	(2.3)	1.1	(1.4)	**4.3**	(2.0)	**10.9**	(3.4)	0.0	(3.4)
	Spain	0.9	(1.6)	**3**	(1.5)	-1.4	(2.1)	**10.7**	(1.9)	**4.6**	(2.1)	-2.7	(3.4)
	Sweden	1.2	(1.5)	**6**	(3.0)	**5.3**	(2.2)	0.6	(2.1)	**-5.6**	(2.6)	-1.4	(2.0)
	Switzerland	-0.7	(1.7)	0	(2.6)	2.4	(2.0)	1.2	(2.3)	0.7	(4.0)	0.5	(2.5)
	Turkey	-6.1	(3.4)	**-7**	(3.7)	-2.1	(5.4)	-1.4	(3.2)	0.2	(4.9)	0.6	(4.5)
	United Kingdom	-2.9	(1.6)	**-8**	(2.7)	0.7	(1.8)	**5.0**	(2.3)	0.5	(3.1)	-0.1	(2.6)
	United States	**-6.0**	(2.0)	**-13**	(2.9)	-4.1	(2.5)	**12.3**	(2.5)	5.3	(3.8)	-0.8	(4.0)
	OECD average	**-1.4**	(0.3)	0	(0.5)	1.5	(1.8)	**1.5**	(0.4)	**2.7**	(0.6)	0.7	(0.6)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	**-4.5**	(2.3)	-1	(2.4)	-4.4	(4.3)	-0.9	(1.5)	**7.3**	(3.5)	6.2	(3.3)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	**-6.3**	(3.0)	-7	(4.1)	-4.8	(3.9)	**4.1**	(2.0)	1.1	(4.0)	**8.4**	(3.8)
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	3.1	(2.3)	4	(2.3)	**-11.2**	(5.2)	0.3	(1.8)	-4.2	(4.4)	-7.3	(4.8)
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	-0.1	(1.7)	3	(2.7)	**7.7**	(3.5)	-0.5	(2.6)	1.2	(3.8)	1.2	(3.0)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	-1.5	(1.5)	**-8**	(3.1)	0.7	(1.3)	-0.7	(2.6)	**6.9**	(3.5)	-0.4	(3.8)
	Indonesia	3.5	(3.0)	1	(3.2)	-5.7	(8.2)	-4.1	(2.9)	**11.8**	(5.1)	**-9.4**	(4.4)
	Jordan	-1.6	(1.8)	0	(2.5)	5.4	(4.9)	**-6.6**	(1.6)	-2.7	(4.1)	2.9	(3.8)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	-2.6	(1.8)	-2	(3.0)	4.4	(3.0)	-2.1	(2.4)	-6.3	(4.2)	0.7	(3.3)
	Macao (China)	-0.1	(0.6)	0	(2.3)	**-2.2**	(0.9)	**5.8**	(2.3)	-4.3	(6.5)	-9.1	(6.3)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	**-2.6**	(1.1)	-1	(2.1)	0.8	(4.7)	1.8	(1.3)	3.4	(7.6)	3.0	(5.2)
	Peru	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	**2.4**	(0.6)	**15**	(1.7)	**-29.3**	(3.0)	**4.9**	(0.5)	6.1	(6.3)	1.6	(3.8)
	Romania	-1.5	(3.6)	-1	(4.3)	-8.4	(5.1)	**4.8**	(1.9)	**10.3**	(4.2)	0.2	(4.7)
	Russia	-0.9	(1.6)	0	(3.3)	-4.0	(3.0)	-1.0	(3.0)	5.7	(3.2)	-2.3	(3.0)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	1.0	(1.9)	2	(3.5)	0.8	(1.5)	2.0	(3.0)	**11.6**	(3.9)	0.6	(2.7)
	Thailand	**-6.5**	(2.8)	-5	(2.8)	0.7	(6.2)	**-5.2**	(2.4)	-0.1	(4.0)	**9.2**	(4.3)
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	0.1	(2.6)	-2	(2.8)	3.1	(6.2)	**-11.7**	(1.6)	4.0	(5.1)	6.6	(4.8)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	-1.6	(1.8)	-2	(2.0)	-1.4	(4.6)	-1.8	(2.0)	5.8	(3.6)	2.9	(3.9)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	**-5.8**	(2.6)	**-12**	(2.7)	**-16.5**	(4.9)	**8.9**	(1.9)	**17.8**	(3.8)	3.5	(4.0)
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m

1. ESCS refers to the PISA index of economic, social and cultural status.
2. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and performs in the top quarter of students among all countries/economies, after accounting for socio-economic status.
3. The index of academic inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of performance.
4. The index of social inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of socio-economic status.

Notes: Values that are statistically significant are indicated in bold (see Annex A3).

Average 3-year trend is the average change between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average 3-year trend is calculated with a linear regression model. This model considers that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

* See note at the beginning of this Annex.

** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433214

[Part 1/2]

Table I.7.1 Change between 2006 and 2015 in the percentage of students with an immigrant background

Results based on students' self-reports

		PISA 2015								PISA 2006							
		Percentage of students								Percentage of students							
		Non-immigrant students		Immigrant students		Second-generation immigrants		First-generation immigrants		Non-immigrant students		Immigrant students		Second-generation immigrants		First-generation immigrants	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	75.0	(0.7)	25.0	(0.7)	12.7	(0.6)	12.3	(0.4)	78.1	(1.2)	21.9	(1.2)	12.8	(0.7)	9.0	(0.6)
	Austria	79.7	(1.1)	20.3	(1.1)	12.7	(0.7)	7.6	(0.6)	86.8	(1.2)	13.2	(1.2)	5.3	(0.7)	7.9	(0.7)
	Belgium	82.3	(0.9)	17.7	(0.9)	9.0	(0.6)	8.7	(0.6)	86.7	(1.0)	13.3	(1.0)	7.0	(0.7)	6.3	(0.7)
	Canada	69.9	(1.3)	30.1	(1.3)	15.9	(0.9)	14.2	(0.7)	78.9	(1.2)	21.1	(1.2)	11.2	(0.7)	9.9	(0.7)
	Chile	97.9	(0.5)	2.1	(0.5)	0.5	(0.2)	1.6	(0.4)	99.4	(0.1)	0.6	(0.1)	0.2	(0.1)	0.4	(0.1)
	Czech Republic	96.6	(0.3)	3.4	(0.3)	1.7	(0.2)	1.7	(0.2)	98.1	(0.2)	1.9	(0.2)	0.7	(0.1)	1.2	(0.2)
	Denmark	89.3	(0.6)	10.7	(0.6)	7.9	(0.5)	2.8	(0.2)	92.4	(0.8)	7.6	(0.8)	4.2	(0.6)	3.4	(0.4)
	Estonia	90.0	(0.5)	10.0	(0.5)	9.3	(0.5)	0.7	(0.1)	88.4	(0.6)	11.6	(0.6)	10.5	(0.6)	1.1	(0.2)
	Finland	96.0	(0.4)	4.0	(0.4)	1.8	(0.3)	2.2	(0.3)	98.5	(0.3)	1.5	(0.3)	0.2	(0.1)	1.3	(0.3)
	France	86.8	(1.0)	13.2	(1.0)	8.7	(0.8)	4.5	(0.4)	87.0	(1.0)	13.0	(1.0)	9.6	(0.9)	3.4	(0.3)
	Germany	83.1	(0.9)	16.9	(0.9)	13.2	(0.7)	3.7	(0.4)	85.8	(1.0)	14.2	(1.0)	7.7	(0.7)	6.6	(0.5)
	Greece	89.2	(0.7)	10.8	(0.7)	7.0	(0.5)	3.8	(0.4)	92.4	(0.7)	7.6	(0.7)	1.2	(0.2)	6.4	(0.7)
	Hungary	97.3	(0.2)	2.7	(0.2)	1.5	(0.2)	1.1	(0.2)	98.3	(0.3)	1.7	(0.3)	0.4	(0.1)	1.3	(0.2)
	Iceland	95.9	(0.3)	4.1	(0.3)	1.2	(0.2)	2.8	(0.3)	98.2	(0.2)	1.8	(0.2)	0.4	(0.1)	1.4	(0.2)
	Ireland	85.6	(1.0)	14.4	(1.0)	3.4	(0.3)	11.0	(0.8)	94.4	(0.5)	5.6	(0.5)	1.1	(0.1)	4.5	(0.5)
	Israel	82.5	(1.0)	17.5	(1.0)	13.0	(0.8)	4.5	(0.6)	77.0	(1.2)	23.0	(1.2)	11.5	(0.6)	11.5	(1.1)
	Italy	92.0	(0.5)	8.0	(0.5)	3.2	(0.3)	4.8	(0.4)	96.2	(0.3)	3.8	(0.3)	0.7	(0.1)	3.1	(0.3)
	Japan	99.5	(0.1)	0.5	(0.1)	0.3	(0.1)	0.2	(0.1)	99.6	(0.1)	0.4	(0.1)	0.1	(0.0)	0.3	(0.1)
	Korea	99.9	(0.0)	0.1	(0.0)	0.0	c	0.1	(0.0)	100.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	c
	Latvia	95.0	(0.4)	5.0	(0.4)	4.0	(0.4)	1.0	(0.1)	92.9	(0.6)	7.1	(0.6)	6.6	(0.6)	0.5	(0.1)
	Luxembourg	48.0	(0.6)	52.0	(0.6)	30.6	(0.6)	21.4	(0.5)	63.9	(0.6)	36.1	(0.6)	19.5	(0.5)	16.6	(0.5)
	Mexico	98.8	(0.1)	1.2	(0.1)	0.4	(0.1)	0.9	(0.1)	97.6	(0.3)	2.4	(0.3)	0.6	(0.1)	1.9	(0.3)
	Netherlands	89.3	(0.9)	10.7	(0.9)	8.6	(0.8)	2.2	(0.3)	88.7	(1.1)	11.3	(1.1)	7.8	(0.8)	3.5	(0.4)
	New Zealand	72.9	(1.2)	27.1	(1.2)	11.0	(0.7)	16.2	(0.7)	78.7	(1.0)	21.3	(1.0)	6.9	(0.6)	14.3	(0.7)
	Norway	88.0	(1.0)	12.0	(1.0)	6.0	(0.7)	6.1	(0.4)	93.9	(0.7)	6.1	(0.7)	3.0	(0.5)	3.1	(0.3)
	Poland	99.7	(0.1)	0.3	(0.1)	0.1	(0.1)	0.2	(0.1)	99.8	(0.1)	0.2	(0.1)	0.1	(0.0)	0.1	(0.0)
	Portugal	92.7	(0.4)	7.3	(0.4)	3.3	(0.2)	4.1	(0.3)	94.1	(0.8)	5.9	(0.8)	2.4	(0.4)	3.5	(0.6)
	Slovak Republic	98.8	(0.2)	1.2	(0.2)	0.6	(0.1)	0.6	(0.1)	99.5	(0.1)	0.5	(0.1)	0.3	(0.1)	0.1	(0.1)
	Slovenia	92.2	(0.5)	7.8	(0.5)	4.5	(0.3)	3.3	(0.4)	89.7	(0.5)	10.3	(0.5)	8.5	(0.4)	1.8	(0.2)
	Spain	89.0	(0.8)	11.0	(0.8)	1.9	(0.2)	9.1	(0.7)	93.1	(0.7)	6.9	(0.7)	0.8	(0.1)	6.1	(0.7)
	Sweden	82.6	(1.2)	17.4	(1.2)	9.8	(0.8)	7.6	(0.7)	89.2	(0.9)	10.8	(0.9)	6.2	(0.6)	4.7	(0.6)
	Switzerland	68.9	(1.2)	31.1	(1.2)	20.7	(1.0)	10.4	(0.5)	77.6	(0.7)	22.4	(0.7)	11.8	(0.5)	10.6	(0.4)
	Turkey	99.2	(0.2)	0.8	(0.2)	0.5	(0.1)	0.3	(0.1)	98.5	(0.4)	1.5	(0.4)	0.8	(0.3)	0.6	(0.2)
	United Kingdom	83.3	(1.0)	16.7	(1.0)	8.0	(0.7)	8.8	(0.7)	91.4	(0.9)	8.6	(0.9)	5.0	(0.6)	3.7	(0.5)
	United States	76.9	(1.5)	23.1	(1.5)	15.7	(1.0)	7.4	(0.7)	84.8	(1.2)	15.2	(1.2)	9.4	(0.9)	5.8	(0.5)
	OECD average	87.5	(0.1)	12.5	(0.1)	7.1	(0.1)	5.4	(0.1)	90.6	(0.1)	9.4	(0.1)	5.0	(0.1)	4.4	(0.1)
Partners	Albania	99.4	(0.1)	0.6	(0.1)	0.4	(0.1)	0.2	(0.1)	m	m	m	m	m	m	m	m
	Algeria	99.0	(0.2)	1.0	(0.2)	1.0	(0.2)	0.0	c	m	m	m	m	m	m	m	m
	Brazil	99.2	(0.1)	0.8	(0.1)	0.5	(0.1)	0.3	(0.1)	97.6	(0.2)	2.4	(0.2)	2.2	(0.2)	0.2	(0.1)
	B-S-J-G (China)	99.7	(0.1)	0.3	(0.1)	0.1	(0.0)	0.2	(0.1)	m	m	m	m	m	m	m	m
	Bulgaria	99.0	(0.1)	1.0	(0.1)	0.5	(0.1)	0.5	(0.1)	99.8	(0.1)	0.2	(0.1)	0.1	(0.0)	0.1	(0.0)
	CABA (Argentina)	83.0	(2.0)	17.0	(2.0)	10.8	(1.2)	6.2	(1.1)	m	m	m	m	m	m	m	m
	Colombia	99.4	(0.1)	0.6	(0.1)	0.4	(0.1)	0.2	(0.1)	99.6	(0.1)	0.4	(0.1)	0.2	(0.1)	0.1	(0.1)
	Costa Rica	92.0	(0.6)	8.0	(0.6)	5.4	(0.4)	2.6	(0.3)	m	m	m	m	m	m	m	m
	Croatia	89.2	(0.6)	10.8	(0.6)	9.0	(0.5)	1.8	(0.2)	88.0	(0.7)	12.0	(0.7)	4.8	(0.4)	7.2	(0.6)
	Cyprus*	88.7	(0.4)	11.3	(0.4)	3.2	(0.3)	8.0	(0.3)	m	m	m	m	m	m	m	m
	Dominican Republic	98.2	(0.3)	1.8	(0.3)	1.0	(0.2)	0.8	(0.2)	m	m	m	m	m	m	m	m
	FYROM	98.0	(0.2)	2.0	(0.2)	1.4	(0.2)	0.7	(0.1)	m	m	m	m	m	m	m	m
	Georgia	97.8	(0.3)	2.2	(0.3)	1.9	(0.3)	0.3	(0.1)	m	m	m	m	m	m	m	m
	Hong Kong (China)	64.9	(1.3)	35.1	(1.3)	21.3	(1.0)	13.8	(0.8)	56.2	(1.4)	43.8	(1.4)	24.6	(0.8)	19.2	(1.1)
	Indonesia	99.9	(0.1)	0.1	(0.1)	0.0	(0.0)	0.1	(0.0)	99.8	(0.1)	0.2	(0.1)	0.0	(0.0)	0.1	(0.1)
	Jordan	87.9	(0.7)	12.1	(0.7)	9.0	(0.6)	3.1	(0.3)	83.2	(0.9)	16.8	(0.9)	10.4	(0.7)	6.4	(0.4)
	Kosovo	98.5	(0.2)	1.5	(0.2)	0.8	(0.1)	0.7	(0.2)	m	m	m	m	m	m	m	m
	Lebanon	96.6	(0.4)	3.4	(0.4)	1.6	(0.2)	1.8	(0.3)	m	m	m	m	m	m	m	m
	Lithuania	98.2	(0.2)	1.8	(0.2)	1.4	(0.1)	0.4	(0.1)	97.9	(0.4)	2.1	(0.4)	1.7	(0.3)	0.4	(0.1)
	Macao (China)	37.8	(0.7)	62.2	(0.7)	43.4	(0.6)	18.9	(0.5)	26.4	(0.6)	73.6	(0.6)	57.8	(0.7)	15.8	(0.5)
	Malta	95.0	(0.4)	5.0	(0.4)	1.5	(0.2)	3.5	(0.3)	m	m	m	m	m	m	m	m
	Moldova	98.6	(0.2)	1.4	(0.2)	1.0	(0.2)	0.4	(0.1)	m	m	m	m	m	m	m	m
	Montenegro	94.4	(0.3)	5.6	(0.3)	3.7	(0.3)	1.9	(0.2)	92.8	(0.5)	7.2	(0.5)	1.8	(0.2)	5.4	(0.4)
	Peru	99.5	(0.1)	0.5	(0.1)	0.3	(0.1)	0.1	(0.0)	m	m	m	m	m	m	m	m
	Qatar	44.8	(0.4)	55.2	(0.4)	15.2	(0.3)	40.0	(0.4)	59.5	(0.5)	40.5	(0.5)	22.0	(0.6)	18.5	(0.5)
	Romania	99.6	(0.1)	0.4	(0.1)	0.2	(0.1)	0.1	(0.1)	99.9	(0.0)	0.1	(0.0)	0.0	c	0.1	(0.0)
	Russia	93.1	(0.5)	6.9	(0.5)	3.8	(0.3)	3.1	(0.3)	91.3	(0.5)	8.7	(0.5)	4.0	(0.3)	4.8	(0.5)
	Singapore	79.1	(1.0)	20.9	(1.0)	6.7	(0.3)	14.1	(0.9)	m	m	m	m	m	m	m	m
	Chinese Taipei	99.7	(0.1)	0.3	(0.1)	0.2	(0.1)	0.1	(0.0)	99.4	(0.1)	0.6	(0.1)	0.4	(0.1)	0.2	(0.1)
	Thailand	99.2	(0.3)	0.8	(0.3)	0.7	(0.2)	0.1	(0.1)	99.7	(0.1)	0.3	(0.1)	0.3	(0.1)	0.0	(0.0)
	Trinidad and Tobago	96.5	(0.4)	3.5	(0.4)	2.0	(0.2)	1.5	(0.2)	m	m	m	m	m	m	m	m
	Tunisia	98.5	(0.2)	1.5	(0.2)	1.0	(0.2)	0.5	(0.1)	99.2	(0.1)	0.8	(0.1)	0.5	(0.1)	0.3	(0.1)
	United Arab Emirates	42.4	(0.9)	57.6	(0.9)	23.1	(0.7)	34.4	(0.9)	m	m	m	m	m	m	m	m
	Uruguay	99.4	(0.1)	0.6	(0.1)	0.3	(0.1)	0.3	(0.1)	99.6	(0.1)	0.4	(0.1)	0.1	(0.1)	0.3	(0.1)
	Viet Nam	99.9	(0.0)	0.1	(0.0)	0.1	(0.0)	0.0	(0.0)	m	m	m	m	m	m	m	m
	Argentina**	95.6	(0.4)	4.4	(0.4)	3.0	(0.3)	1.4	(0.2)	97.3	(0.3)	2.7	(0.3)	1.6	(0.2)	1.1	(0.2)
	Kazakhstan**	87.0	(1.0)	13.0	(1.0)	9.4	(0.8)	3.6	(0.5)	m	m	m	m	m	m	m	m
	Malaysia**	99.1	(0.2)	0.9	(0.2)	0.8	(0.2)	0.1	(0.0)	m	m	m	m	m	m	m	m

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Germany should be interpreted with caution due to missing rates on the student immigrant background and language spoken at home variables (see Tables A1.3 and A5.10).
For Switzerland the increase in the weighted share of students with an immigrant background between previous rounds of PISA and PISA 2015 samples is larger than the corresponding shift in the target population according to official statistics for this country.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 2/2]

Table I.7.1 Change between 2006 and 2015 in the percentage of students with an immigrant background

Results based on students' self-reports

		Change between PISA 2006 and PISA 2015 (PISA 2015 - PISA 2006)							
		Percentage of students							
		Non-immigrant students		Immigrant students		Second-generation immigrants		First-generation immigrants	
		% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	**-3.2**	(1.4)	**3.2**	(1.4)	-0.2	(0.9)	**3.3**	(0.7)
	Austria	**-7.1**	(1.7)	**7.1**	(1.7)	**7.4**	(1.0)	-0.3	(0.9)
	Belgium	**-4.4**	(1.3)	**4.4**	(1.3)	**2.0**	(0.9)	**2.4**	(0.9)
	Canada	**-9.0**	(1.8)	**9.0**	(1.8)	**4.7**	(1.1)	**4.3**	(1.0)
	Chile	**-1.5**	(0.5)	**1.5**	(0.5)	**0.4**	(0.2)	**1.2**	(0.4)
	Czech Republic	**-1.5**	(0.4)	**1.5**	(0.4)	**0.9**	(0.3)	0.5	(0.3)
	Denmark	**-3.1**	(1.0)	**3.1**	(1.0)	**3.7**	(0.8)	-0.6	(0.4)
	Estonia	**1.6**	(0.8)	**-1.6**	(0.8)	-1.2	(0.7)	-0.4	(0.2)
	Finland	**-2.4**	(0.5)	**2.4**	(0.5)	**1.6**	(0.3)	**0.9**	(0.4)
	France	-0.2	(1.4)	0.2	(1.4)	-0.9	(1.2)	**1.1**	(0.5)
	Germany	**-2.7**	(1.4)	**2.7**	(1.4)	**5.5**	(1.0)	**-2.8**	(0.6)
	Greece	**-3.2**	(1.0)	**3.2**	(1.0)	**5.8**	(0.6)	**-2.6**	(0.8)
	Hungary	**-1.0**	(0.3)	**1.0**	(0.3)	**1.2**	(0.2)	-0.2	(0.3)
	Iceland	**-2.3**	(0.4)	**2.3**	(0.4)	**0.8**	(0.2)	**1.5**	(0.4)
	Ireland	**-8.8**	(1.1)	**8.8**	(1.1)	**2.3**	(0.3)	**6.5**	(0.9)
	Israel	**5.5**	(1.6)	**-5.5**	(1.6)	1.6	(1.0)	**-7.1**	(1.2)
	Italy	**-4.2**	(0.6)	**4.2**	(0.6)	**2.5**	(0.3)	**1.7**	(0.5)
	Japan	-0.2	(0.2)	0.2	(0.2)	**0.2**	(0.1)	-0.1	(0.1)
	Korea	-0.1	(0.0)	0.1	(0.0)	0.0	(0.0)	**0.1**	(0.0)
	Latvia	**2.0**	(0.7)	**-2.0**	(0.7)	**-2.5**	(0.7)	**0.5**	(0.2)
	Luxembourg	**-15.9**	(0.9)	**15.9**	(0.9)	**11.1**	(0.8)	**4.8**	(0.7)
	Mexico	**1.2**	(0.3)	**-1.2**	(0.3)	-0.2	(0.1)	**-1.0**	(0.3)
	Netherlands	0.5	(1.4)	-0.5	(1.4)	0.8	(1.1)	**-1.3**	(0.5)
	New Zealand	**-5.8**	(1.5)	**5.8**	(1.5)	**4.0**	(0.9)	1.8	(1.0)
	Norway	**-5.9**	(1.2)	**5.9**	(1.2)	**3.0**	(0.9)	**2.9**	(0.5)
	Poland	-0.1	(0.1)	0.1	(0.1)	0.0	(0.1)	0.1	(0.1)
	Portugal	-1.4	(0.9)	1.4	(0.9)	0.9	(0.5)	0.5	(0.7)
	Slovak Republic	**-0.7**	(0.2)	**0.7**	(0.2)	**0.3**	(0.1)	**0.5**	(0.1)
	Slovenia	**2.5**	(0.7)	**-2.5**	(0.7)	**-4.0**	(0.5)	**1.6**	(0.4)
	Spain	**-4.1**	(1.0)	**4.1**	(1.0)	**1.1**	(0.2)	**3.0**	(1.0)
	Sweden	**-6.5**	(1.5)	**6.5**	(1.5)	**3.6**	(1.0)	**2.9**	(0.9)
	Switzerland	**-8.7**	(1.4)	**8.7**	(1.4)	**8.9**	(1.1)	-0.2	(0.7)
	Turkey	0.7	(0.5)	-0.7	(0.5)	-0.4	(0.3)	-0.3	(0.2)
	United Kingdom	**-8.1**	(1.3)	**8.1**	(1.3)	**3.0**	(0.9)	**5.1**	(0.9)
	United States	**-7.8**	(1.9)	**7.8**	(1.9)	**6.3**	(1.4)	1.5	(0.9)
	OECD average	**-3.0**	(0.2)	**3.0**	(0.2)	**2.1**	(0.1)	**0.9**	(0.1)
Partners	Albania	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m
	Brazil	**1.6**	(0.3)	**-1.6**	(0.3)	**-1.7**	(0.2)	0.1	(0.1)
	B-S-J-G (China)	m	m	m	m	m	m	m	m
	Bulgaria	**-0.8**	(0.2)	**0.8**	(0.2)	**0.4**	(0.1)	**0.4**	(0.1)
	CABA (Argentina)	m	m	m	m	m	m	m	m
	Colombia	-0.3	(0.2)	0.3	(0.2)	0.1	(0.1)	0.1	(0.1)
	Costa Rica	m	m	m	m	m	m	m	m
	Croatia	1.2	(0.9)	-1.2	(0.9)	**4.2**	(0.6)	**-5.4**	(0.6)
	Cyprus*	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m
	Hong Kong (China)	**8.7**	(1.9)	**-8.7**	(1.9)	**-3.3**	(1.2)	**-5.4**	(1.4)
	Indonesia	0.0	(0.1)	0.0	(0.1)	0.0	(0.0)	0.0	(0.1)
	Jordan	**4.7**	(1.1)	**-4.7**	(1.1)	-1.4	(0.9)	**-3.3**	(0.5)
	Kosovo	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m
	Lithuania	0.3	(0.4)	-0.3	(0.4)	-0.3	(0.3)	0.0	(0.2)
	Macao (China)	**11.4**	(1.0)	**-11.4**	(1.0)	**-14.5**	(0.9)	**3.1**	(0.7)
	Malta	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m
	Montenegro	**1.6**	(0.5)	**-1.6**	(0.5)	**1.9**	(0.3)	**-3.4**	(0.4)
	Peru	m	m	m	m	m	m	m	m
	Qatar	**-14.7**	(0.6)	**14.7**	(0.6)	**-6.7**	(0.7)	**21.5**	(0.6)
	Romania	**-0.3**	(0.1)	**0.3**	(0.1)	**0.2**	(0.1)	0.1	(0.1)
	Russia	**1.9**	(0.7)	**-1.9**	(0.7)	-0.2	(0.5)	**-1.7**	(0.5)
	Singapore	m	m	m	m	m	m	m	m
	Chinese Taipei	**0.3**	(0.1)	**-0.3**	(0.1)	**-0.2**	(0.1)	**-0.1**	(0.1)
	Thailand	-0.5	(0.3)	0.5	(0.3)	0.4	(0.2)	0.1	(0.1)
	Trinidad and Tobago	m	m	m	m	m	m	m	m
	Tunisia	**-0.7**	(0.2)	**0.7**	(0.2)	**0.5**	(0.2)	0.2	(0.1)
	United Arab Emirates	m	m	m	m	m	m	m	m
	Uruguay	-0.2	(0.1)	0.2	(0.1)	0.1	(0.1)	0.1	(0.1)
	Viet Nam	m	m	m	m	m	m	m	m
	Argentina**	**-1.7**	(0.5)	**1.7**	(0.5)	**1.4**	(0.4)	0.3	(0.3)
	Kazakhstan**	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for Germany should be interpreted with caution due to missing rates on the student immigrant background and language spoken at home variables (see Tables A1.3 and A5.10).
For Switzerland the increase in the weighted share of students with an immigrant background between previous rounds of PISA and PISA 2015 samples is larger than the corresponding shift in the target population according to official statistics for this country.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/3]

Table I.7.2 Change between 2006 and 2015 in socio-economic status and language spoken at home, by immigrant background

Results based on students' self-reports

		Percentage of immigrant students in PISA 2015		PISA 2015															
				PISA index of economic, social and cultural status (ESCS)						Percentage of students with educated parents[1]				Students who speak another language at home					
				Non-immigrant students		Second-generation immigrants		First-generation immigrants		Second-generation immigrants		First-generation immigrants		Non-immigrant students		Second-generation immigrants		First-generation immigrants	
		%	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	25.0	(0.7)	0.29	(0.01)	0.19	(0.03)	0.26	(0.03)	62.1	(1.6)	72.3	(1.4)	2.3	(0.2)	28.5	(1.7)	48.5	(1.7)
	Austria	20.3	(1.1)	0.21	(0.02)	-0.41	(0.03)	-0.33	(0.08)	42.2	(1.6)	50.1	(2.6)	4.5	(0.3)	72.7	(1.8)	76.8	(2.5)
	Belgium	17.7	(0.9)	0.26	(0.02)	-0.25	(0.05)	-0.23	(0.07)	56.3	(2.1)	64.2	(2.5)	8.3	(0.6)	49.5	(2.0)	56.6	(3.1)
	Canada	30.1	(1.3)	0.54	(0.02)	0.43	(0.04)	0.64	(0.03)	54.6	(1.8)	74.4	(1.1)	4.8	(0.3)	39.9	(1.8)	60.2	(1.7)
	Chile	2.1	(0.5)	-0.48	(0.03)	-0.34	(0.23)	-0.91	(0.28)	67.5	(9.0)	48.5	(9.6)	1.0	(0.2)	c	c	c	c
	Czech Republic	3.4	(0.3)	-0.20	(0.01)	-0.40	(0.10)	-0.22	(0.10)	44.8	(5.1)	56.9	(5.8)	2.5	(0.2)	52.5	(5.3)	78.7	(4.4)
	Denmark	10.7	(0.6)	0.66	(0.02)	-0.02	(0.05)	0.24	(0.08)	47.5	(2.1)	62.1	(3.3)	2.4	(0.3)	44.3	(2.3)	68.4	(3.1)
	Estonia	10.0	(0.5)	0.05	(0.02)	0.01	(0.03)	0.25	(0.09)	66.9	(2.6)	77.5	(9.2)	4.9	(0.5)	13.0	(2.1)	c	c
	Finland	4.0	(0.4)	0.27	(0.02)	-0.23	(0.09)	-0.13	(0.09)	55.7	(5.0)	61.8	(4.5)	2.9	(0.3)	74.2	(5.0)	79.2	(4.0)
	France	13.2	(1.0)	-0.06	(0.02)	-0.58	(0.05)	-0.71	(0.06)	46.3	(2.4)	47.3	(3.2)	3.4	(0.4)	32.3	(2.2)	59.4	(3.5)
	Germany	16.9	(0.9)	0.21	(0.02)	-0.37	(0.04)	-0.16	(0.08)	48.6	(2.1)	64.5	(2.9)	2.9	(0.3)	48.0	(2.0)	76.6	(2.9)
	Greece	10.8	(0.7)	0.00	(0.03)	-0.60	(0.05)	-0.85	(0.08)	43.5	(3.3)	33.4	(3.7)	2.0	(0.5)	23.2	(2.5)	58.3	(3.8)
	Hungary	2.7	(0.2)	-0.23	(0.02)	0.29	(0.08)	-0.29	(0.16)	72.8	(4.7)	60.6	(7.5)	1.8	(0.2)	c	c	c	c
	Iceland	4.1	(0.3)	0.76	(0.01)	0.35	(0.16)	0.16	(0.10)	65.5	(7.7)	48.9	(4.9)	2.2	(0.3)	c	c	89.4	(3.2)
	Ireland	14.4	(1.0)	0.15	(0.03)	0.18	(0.06)	0.24	(0.06)	72.0	(3.4)	74.4	(2.0)	c	c	20.5	(3.3)	58.3	(2.4)
	Israel	17.5	(1.0)	0.22	(0.02)	0.04	(0.06)	-0.35	(0.18)	67.9	(2.4)	60.9	(4.5)	5.2	(0.4)	34.1	(2.6)	66.7	(3.2)
	Italy	8.0	(0.5)	-0.03	(0.02)	-0.37	(0.09)	-0.59	(0.06)	46.8	(3.9)	42.5	(3.3)	12.7	(0.6)	42.8	(4.3)	69.8	(3.0)
	Japan	0.5	(0.1)	-0.18	(0.01)	c	c	c	c	47.1	(10.6)	71.6	(10.2)	c	c	c	c	c	c
	Korea	0.1	(0.0)	-0.20	(0.02)	m	m	c	c	m	m	73.2	(23.1)	c	c	m	m	c	c
	Latvia	5.0	(0.4)	-0.45	(0.02)	-0.24	(0.07)	-0.03	(0.18)	72.2	(3.2)	80.2	(6.7)	9.3	(0.9)	20.6	(2.8)	c	c
	Luxembourg	52.0	(0.6)	0.45	(0.02)	-0.34	(0.02)	-0.15	(0.03)	45.4	(1.1)	55.4	(1.2)	93.4	(0.5)	79.3	(1.0)	72.6	(1.3)
	Mexico	1.2	(0.1)	-1.21	(0.04)	c	c	-2.20	(0.17)	41.0	(10.2)	32.7	(6.9)	3.1	(0.4)	c	c	c	c
	Netherlands	10.7	(0.9)	0.23	(0.02)	-0.38	(0.05)	-0.38	(0.08)	49.0	(2.3)	44.9	(4.0)	1.9	(0.3)	43.3	(2.9)	65.4	(4.1)
	New Zealand	27.1	(1.2)	0.16	(0.02)	0.06	(0.05)	0.30	(0.03)	64.3	(2.8)	78.4	(1.6)	2.3	(0.3)	33.1	(2.6)	46.5	(2.2)
	Norway	12.0	(1.0)	0.54	(0.02)	0.09	(0.05)	0.02	(0.07)	33.6	(2.8)	42.6	(3.4)	2.0	(0.2)	43.1	(2.9)	74.2	(2.6)
	Poland	0.3	(0.1)	-0.39	(0.02)	c	c	c	c	60.3	(25.2)	41.7	(21.3)	0.9	(0.2)	c	c	c	c
	Portugal	7.3	(0.4)	-0.39	(0.03)	-0.17	(0.09)	-0.58	(0.08)	73.9	(3.9)	62.0	(4.1)	0.9	(0.2)	c	c	38.3	(3.0)
	Slovak Republic	1.2	(0.2)	-0.10	(0.02)	-0.28	(0.20)	0.08	(0.19)	54.7	(9.4)	57.4	(9.7)	7.8	(0.6)	c	c	c	c
	Slovenia	7.8	(0.5)	0.08	(0.01)	-0.53	(0.05)	-0.60	(0.06)	37.4	(2.9)	38.3	(3.7)	1.8	(0.2)	59.9	(3.5)	92.0	(2.1)
	Spain	11.0	(0.8)	-0.44	(0.04)	-0.95	(0.13)	-1.00	(0.05)	31.0	(4.6)	36.9	(2.5)	14.3	(0.9)	51.5	(4.8)	52.4	(3.1)
	Sweden	17.4	(1.2)	0.42	(0.02)	0.00	(0.06)	-0.16	(0.07)	51.4	(2.7)	55.9	(3.4)	4.3	(0.6)	58.3	(2.4)	80.7	(2.5)
	Switzerland	31.1	(1.2)	0.34	(0.02)	-0.34	(0.03)	-0.14	(0.07)	30.0	(1.8)	38.0	(2.7)	8.0	(0.8)	64.5	(1.6)	66.3	(2.2)
	Turkey	0.8	(0.2)	-1.43	(0.05)	-0.58	(0.22)	c	c	83.8	(7.8)	91.7	(6.0)	6.9	(1.0)	c	c	c	c
	United Kingdom	16.7	(1.0)	0.24	(0.02)	0.06	(0.06)	0.13	(0.07)	62.8	(2.3)	72.4	(2.8)	1.6	(0.2)	27.3	(2.1)	59.3	(3.0)
	United States	23.1	(1.5)	0.29	(0.03)	-0.47	(0.08)	-0.59	(0.11)	29.5	(2.6)	32.1	(3.5)	3.5	(0.4)	60.2	(2.0)	81.4	(2.3)
	OECD average	12.5	(0.1)	0.02	(0.00)	-0.20	(0.02)	-0.27	(0.02)	53.8	(1.1)	57.3	(1.2)	7.1	(0.1)	44.7	(0.6)	67.0	(0.6)
Partners	Albania	0.6	(0.1)	-0.77	(0.03)	c	c	c	c	46.6	(13.6)	81.9	(11.1)	1.8	(0.2)	c	c	c	c
	Algeria	1.0	(0.2)	-1.28	(0.04)	-1.10	(0.14)	m	m	73.3	(6.7)	m	m	11.6	(1.4)	c	c	m	m
	Brazil	0.8	(0.1)	-0.96	(0.03)	-1.07	(0.18)	-0.78	(0.27)	64.1	(6.3)	73.3	(7.0)	1.2	(0.1)	c	c	c	c
	B-S-J-G (China)	0.3	(0.1)	-1.07	(0.04)	c	c	c	c	37.7	(23.0)	64.9	(12.3)	1.6	(0.2)	c	c	c	c
	Bulgaria	1.0	(0.1)	-0.07	(0.03)	c	c	c	c	50.8	(10.2)	63.2	(9.1)	8.0	(0.9)	c	c	c	c
	CABA (Argentina)	17.0	(2.0)	0.24	(0.09)	-1.08	(0.09)	-1.10	(0.17)	23.5	(4.0)	29.6	(6.0)	c	c	c	c	c	c
	Colombia	0.6	(0.1)	-0.99	(0.04)	-0.89	(0.20)	c	c	64.1	(9.6)	75.5	(9.2)	0.9	(0.1)	c	c	c	c
	Costa Rica	8.0	(0.6)	-0.75	(0.04)	-1.48	(0.08)	-1.09	(0.14)	33.0	(3.3)	56.9	(4.0)	2.0	(0.2)	c	c	c	c
	Croatia	10.8	(0.6)	-0.21	(0.02)	-0.49	(0.04)	-0.44	(0.10)	48.1	(2.2)	54.3	(4.9)	2.3	(0.3)	6.6	(1.5)	c	c
	Cyprus*	11.3	(0.4)	0.21	(0.01)	0.21	(0.08)	0.01	(0.04)	69.2	(3.9)	62.4	(2.4)	15.8	(0.3)	46.0	(3.7)	56.0	(2.5)
	Dominican Republic	1.8	(0.3)	-0.89	(0.03)	-1.52	(0.18)	-0.90	(0.28)	46.0	(9.3)	62.3	(8.8)	2.6	(0.3)	c	c	c	c
	FYROM	2.0	(0.2)	-0.23	(0.01)	-0.17	(0.12)	-0.25	(0.18)	62.2	(5.7)	78.3	(7.1)	5.0	(0.3)	c	c	c	c
	Georgia	2.2	(0.3)	-0.32	(0.02)	-0.22	(0.08)	c	c	63.9	(4.6)	61.4	(13.6)	4.9	(0.8)	c	c	c	c
	Hong Kong (China)	35.1	(1.3)	-0.34	(0.03)	-0.84	(0.03)	-0.98	(0.04)	46.1	(1.9)	46.1	(2.0)	2.3	(0.3)	8.0	(2.6)	7.0	(2.0)
	Indonesia	0.1	(0.1)	-1.87	(0.04)	c	c	c	c	46.7	(45.2)	14.7	(15.4)	64.3	(2.0)	c	c	c	c
	Jordan	12.1	(0.7)	-0.43	(0.03)	-0.28	(0.05)	-0.43	(0.10)	63.0	(2.0)	56.2	(3.8)	4.3	(0.3)	6.0	(1.4)	c	c
	Kosovo	1.5	(0.2)	-0.14	(0.02)	-0.25	(0.17)	0.21	(0.16)	56.0	(7.7)	69.2	(8.3)	0.9	(0.2)	c	c	c	c
	Lebanon	3.4	(0.4)	-0.59	(0.04)	-0.25	(0.11)	-0.84	(0.23)	70.5	(6.0)	42.8	(7.2)	98.7	(0.2)	97.4	(2.6)	98.2	(1.7)
	Lithuania	1.8	(0.2)	-0.07	(0.02)	0.16	(0.10)	-0.35	(0.47)	79.7	(3.6)	63.7	(9.2)	4.9	(0.5)	18.5	(3.7)	c	c
	Macao (China)	62.2	(0.7)	-0.33	(0.02)	-0.69	(0.02)	-0.62	(0.02)	21.4	(0.9)	31.1	(1.3)	23.9	(0.7)	14.1	(0.6)	14.1	(1.1)
	Malta	5.0	(0.4)	-0.07	(0.01)	0.12	(0.12)	0.56	(0.09)	54.6	(7.8)	76.6	(4.1)	88.8	(0.5)	c	c	64.0	(4.0)
	Moldova	1.4	(0.2)	-0.68	(0.02)	-0.46	(0.12)	c	c	59.5	(8.2)	54.0	(13.7)	9.3	(0.9)	c	c	c	c
	Montenegro	5.6	(0.3)	-0.19	(0.01)	0.12	(0.05)	-0.02	(0.09)	81.7	(2.8)	79.0	(3.4)	2.3	(0.3)	c	c	c	c
	Peru	0.5	(0.1)	-1.08	(0.04)	c	c	c	c	40.2	(11.9)	63.7	(15.8)	7.2	(0.8)	c	c	c	c
	Qatar	55.2	(0.4)	0.58	(0.01)	0.39	(0.02)	0.65	(0.01)	70.2	(1.1)	87.8	(0.4)	23.2	(0.4)	36.3	(1.1)	52.3	(0.6)
	Romania	0.4	(0.1)	-0.58	(0.04)	c	c	c	c	61.2	(16.1)	70.6	(19.7)	2.7	(0.3)	c	c	c	c
	Russia	6.9	(0.5)	0.05	(0.02)	-0.02	(0.05)	-0.02	(0.07)	53.6	(3.9)	57.7	(4.4)	4.5	(1.4)	c	c	18.6	(3.5)
	Singapore	20.9	(1.0)	-0.07	(0.02)	0.24	(0.05)	0.49	(0.02)	62.5	(2.7)	74.8	(2.1)	44.0	(0.8)	65.7	(2.6)	72.1	(2.4)
	Chinese Taipei	0.3	(0.1)	-0.21	(0.02)	c	c	c	c	65.9	(13.7)	33.2	(20.0)	0.4	(0.1)	c	c	c	c
	Thailand	0.8	(0.3)	-1.22	(0.04)	-1.75	(0.23)	c	c	43.3	(8.9)	15.6	(10.2)	2.0	(0.5)	c	c	c	c
	Trinidad and Tobago	3.5	(0.4)	-0.24	(0.01)	-0.32	(0.10)	-0.23	(0.17)	67.2	(6.6)	55.1	(7.3)	2.4	(0.3)	c	c	c	c
	Tunisia	1.5	(0.2)	-0.84	(0.03)	-0.72	(0.19)	c	c	49.8	(7.2)	53.7	(9.2)	6.1	(0.4)	c	c	c	c
	United Arab Emirates	57.6	(0.9)	0.48	(0.02)	0.44	(0.02)	0.57	(0.02)	76.2	(1.2)	85.9	(1.0)	21.3	(1.2)	42.7	(1.6)	52.6	(1.6)
	Uruguay	0.6	(0.1)	-0.78	(0.02)	c	c	c	c	84.0	(9.6)	76.2	(14.0)	3.7	(0.6)	c	c	c	c
	Viet Nam	0.1	(0.0)	-1.86	(0.04)	c	c	c	c	61.7	(26.8)	100.0	c	5.6	(1.7)	c	c	c	c
	Argentina**	4.4	(0.4)	-0.77	(0.04)	-1.33	(0.10)	-1.21	(0.10)	29.5	(3.9)	40.3	(5.8)	1.7	(0.3)	9.4	(2.3)	c	c
	Kazakhstan**	13.0	(1.0)	-0.18	(0.02)	-0.20	(0.03)	-0.41	(0.05)	50.8	(2.3)	43.0	(3.7)	8.7	(0.7)	5.7	(1.1)	c	c
	Malaysia**	0.9	(0.2)	-0.46	(0.04)	-1.23	(0.15)	c	c	24.2	(6.6)	92.5	(6.8)	29.9	(2.3)	c	c	c	c

1. Students with educated parents are students with at least one parent as educated as the average parent of non-immigrant students in the host country, as measured by the average number of years of schooling.

Notes: Values that are statistically significant are indicated in bold (see Annex A3).

Results for Germany should be interpreted with caution due to missing rates on the student immigrant background and language spoken at home variables (see Tables A1.3 and A5.10).

For Switzerland the increase in the weighted share of students with an immigrant background between previous rounds of PISA and PISA 2015 samples is larger than the corresponding shift in the target population according to official statistics for this country.

* See note at the beginning of this Annex.

** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433226

[Part 2/3]

Table I.7.2 Change between 2006 and 2015 in socio-economic status and language spoken at home, by immigrant background

Results based on students' self-reports

		PISA 2006															
		PISA index of economic, social and cultural status (ESCS)						Percentage of students with educated parents				Students who speak another language at home					
		Non-immigrant students		Second-generation immigrants		First-generation immigrants		Second-generation immigrants		First-generation immigrants		Non-immigrant students		Second-generation immigrants		First-generation immigrants	
		Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	0.07	(0.01)	0.01	(0.04)	0.11	(0.04)	56.1	(1.9)	67.9	(1.9)	0.8	(0.1)	26.7	(1.6)	46.1	(2.3)
	Austria	-0.04	(0.02)	-0.70	(0.12)	-0.53	(0.09)	44.4	(4.8)	49.7	(3.6)	c	c	75.9	(4.5)	79.3	(2.8)
	Belgium	0.05	(0.02)	-0.74	(0.06)	-0.48	(0.09)	39.5	(2.9)	51.4	(2.6)	14.6	(0.7)	45.0	(3.6)	43.0	(5.4)
	Canada	0.21	(0.02)	0.10	(0.05)	0.25	(0.04)	68.0	(2.0)	79.1	(1.8)	3.0	(0.2)	32.7	(1.7)	70.5	(2.4)
	Chile	-1.01	(0.06)	c	c	c	c	55.7	(19.1)	31.4	(12.7)	c	c	c	c	c	c
	Czech Republic	-0.36	(0.02)	-0.62	(0.14)	-0.55	(0.17)	51.9	(8.8)	44.3	(8.7)	0.9	(0.2)	c	c	60.8	(7.8)
	Denmark	0.37	(0.03)	-0.47	(0.09)	-0.50	(0.10)	41.9	(3.7)	46.6	(4.0)	c	c	45.8	(5.5)	70.2	(3.7)
	Estonia	-0.28	(0.02)	-0.32	(0.05)	-0.26	(0.13)	61.5	(2.3)	61.1	(8.2)	3.0	(0.6)	12.7	(2.3)	c	c
	Finland	0.08	(0.02)	c	c	-0.52	(0.17)	39.1	(15.4)	40.2	(7.1)	1.3	(0.4)	c	c	76.4	(6.1)
	France	-0.35	(0.03)	-0.98	(0.08)	-0.86	(0.14)	31.0	(2.5)	43.0	(5.0)	2.3	(0.3)	31.4	(2.7)	63.3	(3.8)
	Germany	0.15	(0.03)	-0.69	(0.06)	-0.43	(0.06)	34.8	(2.4)	56.7	(3.6)	1.4	(0.2)	54.7	(4.5)	59.5	(3.0)
	Greece	-0.36	(0.04)	-0.25	(0.13)	-0.90	(0.07)	64.4	(7.0)	40.6	(4.2)	1.3	(0.3)	c	c	40.4	(4.0)
	Hungary	-0.47	(0.03)	c	c	-0.46	(0.13)	42.1	(11.6)	26.1	(7.2)	0.8	(0.1)	c	c	c	c
	Iceland	0.51	(0.01)	c	c	-0.16	(0.15)	74.7	(11.9)	41.4	(7.7)	1.0	(0.2)	c	c	79.1	(5.5)
	Ireland	-0.05	(0.03)	0.02	(0.13)	0.03	(0.12)	46.4	(7.2)	61.8	(4.6)	2.4	(0.8)	c	c	38.8	(4.5)
	Israel	-0.01	(0.02)	-0.10	(0.05)	-0.34	(0.05)	71.5	(2.6)	78.6	(2.4)	3.6	(0.7)	15.3	(2.0)	73.3	(2.7)
	Italy	-0.45	(0.02)	-0.48	(0.09)	-0.92	(0.06)	79.8	(3.5)	71.8	(2.3)	12.3	(0.6)	24.5	(6.9)	79.1	(2.7)
	Japan	-0.29	(0.02)	c	c	c	c	67.5	(20.0)	64.2	(18.0)	c	c	c	c	c	c
	Korea	-0.38	(0.02)	c	c	m	m	0.0	c	m	m	c	c	c	c	m	m
	Latvia	-0.50	(0.02)	-0.37	(0.05)	c	c	62.8	(2.9)	86.2	(7.0)	5.8	(0.5)	11.1	(2.3)	c	c
	Luxembourg	0.21	(0.02)	-0.79	(0.04)	-0.70	(0.04)	30.1	(1.6)	40.7	(1.9)	96.7	(0.4)	79.7	(1.4)	76.3	(1.6)
	Mexico	-1.34	(0.04)	-1.89	(0.22)	-2.08	(0.13)	36.1	(8.1)	30.7	(5.5)	3.0	(0.9)	c	c	11.9	(4.9)
	Netherlands	0.17	(0.02)	-0.68	(0.08)	-0.36	(0.10)	31.3	(2.5)	53.9	(4.5)	c	c	38.8	(3.4)	66.5	(3.9)
	New Zealand	-0.07	(0.02)	-0.32	(0.07)	0.15	(0.04)	54.4	(2.7)	74.6	(1.8)	c	c	23.4	(3.0)	47.7	(1.9)
	Norway	0.33	(0.02)	-0.10	(0.08)	-0.22	(0.10)	51.0	(4.3)	65.8	(4.5)	1.9	(0.2)	55.3	(3.7)	78.8	(4.1)
	Poland	-0.74	(0.02)	c	c	c	c	60.5	(23.5)	36.7	(22.5)	c	c	c	c	c	c
	Portugal	-0.99	(0.04)	-0.63	(0.20)	-0.99	(0.09)	62.6	(7.5)	71.4	(5.8)	0.8	(0.1)	c	c	34.7	(3.9)
	Slovak Republic	-0.40	(0.02)	c	c	c	c	15.4	(9.0)	68.1	(19.6)	14.8	(1.4)	c	c	c	c
	Slovenia	-0.21	(0.01)	-0.77	(0.04)	-0.60	(0.10)	24.2	(2.2)	30.7	(5.0)	1.1	(0.2)	50.0	(2.6)	57.6	(5.9)
	Spain	-0.31	(0.04)	-0.28	(0.22)	-0.54	(0.11)	72.4	(7.1)	70.2	(2.8)	14.0	(0.8)	c	c	45.3	(3.7)
	Sweden	0.21	(0.02)	-0.11	(0.07)	-0.25	(0.09)	72.4	(3.7)	68.9	(3.4)	1.5	(0.5)	55.9	(3.0)	79.9	(3.5)
	Switzerland	0.04	(0.02)	-0.47	(0.03)	-0.55	(0.06)	40.7	(1.7)	44.7	(2.4)	3.3	(0.5)	55.1	(2.1)	72.3	(1.8)
	Turkey	-1.68	(0.05)	-1.05	(0.17)	c	c	66.8	(7.7)	74.7	(7.0)	2.4	(0.4)	c	c	c	c
	United Kingdom	-0.05	(0.01)	-0.30	(0.07)	-0.11	(0.11)	51.4	(4.2)	71.5	(4.8)	1.5	(0.5)	25.1	(3.1)	61.0	(5.0)
	United States	0.15	(0.04)	-0.48	(0.09)	-0.57	(0.10)	42.1	(2.9)	40.6	(3.8)	1.4	(0.2)	55.0	(2.3)	75.2	(3.1)
	OECD average	-0.22	(0.00)	-0.50	(0.02)	-0.48	(0.02)	49.8	(1.4)	55.4	(1.3)	7.3	(0.1)	40.7	(0.8)	61.0	(0.8)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	-1.38	(0.03)	-1.79	(0.12)	c	c	45.6	(4.9)	56.0	(13.0)	c	c	c	c	c	c
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	-0.62	(0.05)	c	c	c	c	44.4	(22.2)	100.0	c	10.2	(1.3)	c	c	c	c
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	-1.43	(0.05)	c	c	c	c	60.5	(10.5)	0.0	c	c	c	c	c	c	c
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	-0.45	(0.02)	-0.67	(0.06)	-0.88	(0.05)	40.7	(3.0)	37.3	(2.5)	1.2	(0.4)	c	c	c	c
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	-0.81	(0.03)	-1.31	(0.03)	-1.49	(0.03)	44.6	(1.8)	37.4	(1.5)	3.3	(0.6)	5.6	(1.3)	20.1	(1.8)
	Indonesia	-1.97	(0.05)	c	c	c	c	70.8	(23.3)	42.4	(6.9)	65.9	(3.5)	c	c	c	c
	Jordan	-0.84	(0.04)	-0.64	(0.06)	-0.23	(0.06)	55.6	(2.3)	71.7	(2.2)	2.6	(0.3)	c	c	5.5	(1.7)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	-0.44	(0.03)	-0.41	(0.12)	c	c	60.8	(6.4)	86.4	(5.8)	2.8	(0.8)	c	c	c	c
	Macao (China)	-0.91	(0.02)	-1.34	(0.02)	-1.33	(0.03)	40.6	(1.1)	42.0	(2.1)	99.2	(0.2)	99.6	(0.1)	97.9	(0.4)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	-0.52	(0.01)	-0.27	(0.13)	-0.38	(0.07)	62.4	(7.1)	69.9	(3.6)	42.0	(0.7)	c	c	60.6	(3.9)
	Peru	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	0.14	(0.02)	-0.06	(0.02)	0.31	(0.03)	55.1	(1.3)	78.1	(1.5)	25.5	(0.6)	23.2	(0.9)	27.3	(1.2)
	Romania	-0.83	(0.03)	m	m	c	c	m	m	100.0	c	2.8	(0.8)	m	m	c	c
	Russia	-0.58	(0.03)	-0.68	(0.07)	-0.54	(0.07)	42.3	(3.3)	47.1	(3.3)	8.8	(2.1)	c	c	20.4	(4.1)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	-0.56	(0.02)	-0.62	(0.18)	c	c	25.2	(7.3)	25.0	(13.8)	23.6	(1.4)	c	c	c	c
	Thailand	-1.85	(0.03)	c	c	c	c	24.6	(17.2)	100.0	c	51.6	(1.9)	c	c	c	c
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	-1.52	(0.07)	c	c	c	c	59.2	(7.9)	55.5	(14.2)	4.6	(0.5)	c	c	c	c
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	-0.93	(0.03)	c	c	c	c	8.9	(7.4)	71.2	(11.3)	1.2	(0.3)	c	c	c	c
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	-0.96	(0.07)	-1.37	(0.13)	-1.45	(0.26)	36.0	(7.3)	46.1	(7.6)	c	c	c	c	c	c
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m

1. Students with educated parents are students with at least one parent as educated as the average parent of non-immigrant students in the host country, as measured by the average number of years of schooling.

Notes: Values that are statistically significant are indicated in bold (see Annex A3).

Results for Germany should be interpreted with caution due to missing rates on the student immigrant background and language spoken at home variables (see Tables A1.3 and A5.10).

For Switzerland the increase in the weighted share of students with an immigrant background between previous rounds of PISA and PISA 2015 samples is larger than the corresponding shift in the target population according to official statistics for this country.

* See note at the beginning of this Annex.

** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433226

[Part 3/3]

Table I.7.2 Change between 2006 and 2015 in socio-economic status and language spoken at home, by immigrant background

Results based on students' self-reports

		Change between PISA 2006 and PISA 2015 (PISA 2015 – PISA 2006)															
		PISA index of economic, social and cultural status (ESCS)						Percentage of students with educated parents[1]				Students who speak another language at home					
		Non-immigrant students		Second-generation immigrants		First-generation immigrants		Second-generation immigrants		First-generation immigrants		Non-immigrant students		Second-generation immigrants		First-generation immigrants	
		Dif.	S.E.	Dif.	S.E.	Dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.	% dif.	S.E.
OECD	Australia	**0.22**	(0.02)	**0.18**	(0.05)	**0.15**	(0.05)	**6.0**	(2.5)	4.4	(2.4)	**1.5**	(0.2)	1.8	(2.4)	2.4	(2.9)
	Austria	**0.25**	(0.03)	**0.29**	(0.12)	0.19	(0.12)	-2.3	(5.1)	0.4	(4.4)	m	m	-3.2	(4.9)	-2.5	(3.8)
	Belgium	**0.21**	(0.03)	**0.48**	(0.08)	**0.25**	(0.11)	**16.7**	(3.6)	**12.7**	(3.6)	**-6.3**	(0.9)	4.4	(4.2)	**13.7**	(6.3)
	Canada	**0.32**	(0.03)	**0.33**	(0.06)	**0.39**	(0.05)	**-13.4**	(2.7)	**-4.7**	(2.1)	**1.9**	(0.4)	**7.2**	(2.5)	**-10.3**	(3.0)
	Chile	**0.54**	(0.07)	m	m	m	m	11.7	(21.1)	17.2	(16.0)	m	m	m	m	m	m
	Czech Republic	**0.16**	(0.02)	0.23	(0.17)	0.33	(0.20)	-7.2	(10.2)	12.6	(10.5)	**1.6**	(0.3)	m	m	**17.9**	(9.0)
	Denmark	**0.29**	(0.03)	**0.45**	(0.10)	**0.74**	(0.12)	5.5	(4.2)	**15.5**	(5.2)	m	m	-1.5	(6.0)	-1.8	(4.8)
	Estonia	**0.33**	(0.03)	**0.32**	(0.06)	**0.51**	(0.16)	5.4	(3.5)	16.4	(12.4)	**1.9**	(0.8)	0.3	(3.1)	m	m
	Finland	**0.19**	(0.03)	m	m	**0.39**	(0.19)	16.6	(16.2)	**21.6**	(8.4)	**1.7**	(0.5)	m	m	2.8	(7.3)
	France	**0.29**	(0.03)	**0.40**	(0.09)	0.15	(0.15)	**15.3**	(3.5)	4.3	(5.9)	**1.1**	(0.5)	0.9	(3.5)	-3.9	(5.2)
	Germany	0.07	(0.03)	**0.32**	(0.08)	**0.28**	(0.10)	**13.8**	(3.2)	7.8	(4.6)	**1.5**	(0.4)	-6.7	(4.9)	**17.1**	(4.2)
	Greece	**0.36**	(0.05)	**-0.34**	(0.14)	0.05	(0.10)	**-20.9**	(7.7)	-7.2	(5.6)	0.7	(0.6)	m	m	**17.9**	(5.6)
	Hungary	**0.23**	(0.04)	m	m	0.17	(0.21)	**30.7**	(12.5)	**34.5**	(10.4)	**1.1**	(0.3)	m	m	m	m
	Iceland	**0.25**	(0.02)	m	m	0.32	(0.18)	-9.2	(14.2)	7.5	(9.1)	**1.2**	(0.3)	m	m	10.3	(6.4)
	Ireland	**0.21**	(0.04)	0.17	(0.15)	0.20	(0.13)	**25.7**	(8.0)	**12.6**	(5.1)	m	m	m	m	**19.5**	(5.1)
	Israel	**0.23**	(0.03)	0.13	(0.08)	-0.01	(0.19)	-3.6	(3.5)	**-17.7**	(5.2)	**1.7**	(0.8)	**18.8**	(3.3)	-6.6	(4.2)
	Italy	**0.42**	(0.03)	0.11	(0.13)	**0.33**	(0.08)	**-33.0**	(5.3)	**-29.3**	(4.0)	0.4	(0.9)	**18.3**	(8.1)	**-9.3**	(4.0)
	Japan	**0.11**	(0.02)	m	m	m	m	-20.4	(22.6)	7.5	(20.7)	m	m	m	m	m	m
	Korea	**0.19**	(0.03)	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Latvia	0.05	(0.03)	0.13	(0.09)	m	m	**9.4**	(4.3)	-6.0	(9.7)	**3.5**	(1.0)	**9.5**	(3.6)	m	m
	Luxembourg	**0.24**	(0.02)	**0.45**	(0.05)	**0.54**	(0.05)	**15.3**	(2.0)	**14.7**	(2.2)	**-3.3**	(0.6)	-0.5	(1.8)	-3.7	(2.1)
	Mexico	**0.13**	(0.06)	m	m	-0.12	(0.21)	4.8	(13.0)	2.1	(8.8)	0.1	(1.0)	m	m	m	m
	Netherlands	**0.07**	(0.03)	**0.30**	(0.09)	-0.02	(0.12)	**17.6**	(3.4)	-9.0	(6.0)	m	m	4.5	(4.4)	-1.1	(5.7)
	New Zealand	**0.23**	(0.03)	**0.37**	(0.08)	**0.15**	(0.05)	**9.8**	(3.9)	3.7	(2.4)	m	m	**9.7**	(4.0)	-1.3	(2.9)
	Norway	**0.21**	(0.03)	**0.19**	(0.10)	**0.24**	(0.12)	**-17.4**	(5.2)	**-23.2**	(5.6)	0.2	(0.3)	**-12.2**	(4.7)	-4.6	(4.8)
	Poland	**0.35**	(0.03)	m	m	m	m	-0.3	(34.4)	5.0	(30.9)	m	m	m	m	m	m
	Portugal	**0.60**	(0.05)	**0.46**	(0.22)	**0.41**	(0.12)	11.3	(8.4)	-9.4	(7.1)	0.1	(0.2)	m	m	3.6	(5.0)
	Slovak Republic	**0.30**	(0.03)	m	m	m	m	**39.3**	(13.0)	-10.7	(21.9)	**-7.0**	(1.5)	m	m	m	m
	Slovenia	**0.30**	(0.02)	**0.25**	(0.06)	0.00	(0.12)	**13.2**	(3.7)	7.7	(6.2)	**0.7**	(0.2)	**9.9**	(4.4)	**34.5**	(6.3)
	Spain	**-0.13**	(0.05)	**-0.67**	(0.26)	**-0.46**	(0.12)	**-41.3**	(8.4)	**-33.3**	(3.8)	0.2	(1.2)	m	m	7.1	(4.9)
	Sweden	**0.21**	(0.03)	0.10	(0.09)	0.09	(0.11)	**-21.0**	(4.6)	**-13.0**	(4.8)	**2.8**	(0.8)	2.5	(3.8)	0.8	(4.2)
	Switzerland	**0.30**	(0.03)	**0.13**	(0.05)	**0.42**	(0.09)	**-10.6**	(2.5)	-6.8	(3.6)	**4.7**	(1.0)	**9.4**	(2.7)	**-5.9**	(2.8)
	Turkey	**0.24**	(0.07)	0.46	(0.28)	m	m	17.0	(10.9)	17.0	(9.2)	**4.5**	(1.1)	m	m	m	m
	United Kingdom	**0.29**	(0.03)	**0.36**	(0.10)	0.24	(0.13)	**11.4**	(4.7)	0.9	(5.6)	0.2	(0.5)	2.2	(3.8)	-1.7	(5.8)
	United States	**0.15**	(0.05)	0.01	(0.12)	-0.02	(0.15)	**-12.6**	(3.9)	-8.4	(5.1)	**2.1**	(0.5)	5.2	(3.0)	6.2	(3.8)
	OECD average	**0.24**	(0.01)	**0.22**	(0.02)	**0.21**	(0.03)	2.5	(1.8)	1.4	(1.7)	**0.7**	(0.1)	**4.0**	(0.9)	**4.0**	(1.0)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	**0.43**	(0.04)	**0.72**	(0.21)	m	m	**18.5**	(8.0)	17.3	(14.8)	m	m	m	m	m	m
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	**0.55**	(0.06)	m	m	m	m	6.5	(24.4)	**-36.8**	(9.1)	-2.2	(1.6)	m	m	m	m
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	**0.44**	(0.06)	m	m	m	m	3.5	(14.2)	**75.5**	(9.2)	m	m	m	m	m	m
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	**0.24**	(0.02)	**0.18**	(0.07)	**0.44**	(0.11)	**7.4**	(3.7)	**17.1**	(5.5)	**1.2**	(0.5)	m	m	m	m
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	**0.48**	(0.04)	**0.47**	(0.05)	**0.51**	(0.05)	1.5	(2.6)	**8.7**	(2.5)	-1.0	(0.7)	2.3	(2.9)	**-13.2**	(2.7)
	Indonesia	0.10	(0.07)	m	m	m	m	-24.1	(50.9)	-27.7	(16.9)	-1.7	(4.0)	m	m	m	m
	Jordan	**0.41**	(0.05)	**0.36**	(0.08)	-0.20	(0.12)	**7.5**	(3.1)	**-15.5**	(4.4)	**1.8**	(0.4)	m	m	m	m
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	**0.37**	(0.04)	**0.58**	(0.15)	m	m	**18.9**	(7.3)	**-22.6**	(10.8)	**2.1**	(0.9)	m	m	m	m
	Macao (China)	**0.57**	(0.03)	**0.64**	(0.02)	**0.72**	(0.04)	**-19.1**	(1.4)	**-10.9**	(2.5)	**-75.2**	(0.7)	**-85.5**	(0.6)	**-83.8**	(1.1)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	**0.33**	(0.02)	**0.40**	(0.14)	**0.36**	(0.11)	**19.3**	(7.6)	9.1	(5.0)	**-39.7**	(0.7)	m	m	m	m
	Peru	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	**0.43**	(0.02)	**0.45**	(0.03)	**0.34**	(0.03)	**15.1**	(1.7)	**9.7**	(1.6)	**-2.3**	(0.7)	**13.0**	(1.4)	**24.9**	(1.4)
	Romania	**0.25**	(0.05)	m	m	m	m	m	m	-29.4	(19.7)	-0.1	(0.8)	m	m	m	m
	Russia	**0.63**	(0.04)	**0.66**	(0.09)	**0.52**	(0.10)	**11.3**	(5.1)	10.6	(5.5)	-4.3	(2.5)	m	m	-1.8	(5.4)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	**0.35**	(0.03)	m	m	m	m	**40.7**	(15.5)	8.2	(24.3)	**-23.1**	(1.4)	m	m	m	m
	Thailand	**0.63**	(0.05)	m	m	m	m	18.8	(19.3)	**-84.4**	(10.2)	**-49.6**	(1.9)	m	m	m	m
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	**0.69**	(0.08)	m	m	m	m	-9.4	(10.6)	-1.8	(16.9)	**1.4**	(0.6)	m	m	m	m
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	**0.15**	(0.04)	m	m	m	m	**75.2**	(12.1)	5.0	(18.0)	**2.5**	(0.7)	m	m	m	m
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	**0.19**	(0.08)	0.04	(0.16)	0.23	(0.28)	-6.5	(8.3)	-5.8	(9.6)	m	m	m	m	m	m
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m

1. Students with educated parents are students with at least one parent as educated as the average parent of non-immigrant students in the host country, as measured by the average number of years of schooling.

Notes: Values that are statistically significant are indicated in bold (see Annex A3).

Results for Germany should be interpreted with caution due to missing rates on the student immigrant background and language spoken at home variables (see Tables A1.3 and A5.10).

For Switzerland the increase in the weighted share of students with an immigrant background between previous rounds of PISA and PISA 2015 samples is larger than the corresponding shift in the target population according to official statistics for this country.

* See note at the beginning of this Annex.

** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/1]

Table I.7.3 Average performance in science and percentage of immigrant students, by socio-economic status

Results based on students' self-reports

		Performance in science		Percentage of immigrant students					
				All		Disadvantaged immigrant students[1]		Advantaged immigrant students[2]	
		Mean score	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	510	(1.5)	25.0	(0.7)	0.5	(0.1)	10.7	(0.4)
	Austria	495	(2.4)	20.3	(1.1)	1.1	(0.2)	4.0	(0.3)
	Belgium	502	(2.3)	17.7	(0.9)	1.2	(0.2)	4.8	(0.3)
	Canada	528	(2.1)	30.1	(1.3)	0.2	(0.1)	16.5	(0.8)
	Chile	447	(2.4)	2.1	(0.5)	0.5	(0.3)	0.4	(0.1)
	Czech Republic	493	(2.3)	3.4	(0.3)	0.1	(0.0)	0.6	(0.1)
	Denmark	502	(2.4)	10.7	(0.6)	0.4	(0.1)	4.0	(0.3)
	Estonia	534	(2.1)	10.0	(0.5)	0.1	(0.0)	2.8	(0.2)
	Finland	531	(2.4)	4.0	(0.4)	0.2	(0.1)	1.0	(0.2)
	France	495	(2.1)	13.2	(1.0)	1.2	(0.2)	1.7	(0.2)
	Germany	509	(2.7)	16.9	(0.9)	0.8	(0.1)	3.2	(0.3)
	Greece	455	(3.9)	10.8	(0.7)	0.7	(0.1)	1.3	(0.2)
	Hungary	477	(2.4)	2.7	(0.2)	0.0	(0.0)	0.8	(0.1)
	Iceland	473	(1.7)	4.1	(0.3)	0.1	(0.0)	1.4	(0.2)
	Ireland	503	(2.4)	14.4	(1.0)	0.2	(0.1)	5.7	(0.6)
	Israel	467	(3.4)	17.5	(1.0)	1.2	(0.3)	6.1	(0.5)
	Italy	481	(2.5)	8.0	(0.5)	0.7	(0.1)	1.2	(0.2)
	Japan	538	(3.0)	0.5	(0.1)	0.0	(0.0)	0.1	(0.0)
	Korea	516	(3.1)	0.1	(0.0)	0.0	c	0.0	c
	Latvia	490	(1.6)	5.0	(0.4)	0.2	(0.1)	1.2	(0.2)
	Luxembourg	483	(1.1)	52.0	(0.6)	5.2	(0.3)	15.3	(0.4)
	Mexico	416	(2.1)	1.2	(0.1)	0.7	(0.1)	0.0	(0.0)
	Netherlands	509	(2.3)	10.7	(0.9)	0.8	(0.1)	1.7	(0.2)
	New Zealand	513	(2.4)	27.1	(1.2)	0.2	(0.1)	11.0	(0.6)
	Norway	498	(2.3)	12.0	(1.0)	0.3	(0.1)	4.0	(0.3)
	Poland	501	(2.5)	0.3	(0.1)	0.0	(0.0)	0.1	(0.1)
	Portugal	501	(2.4)	7.3	(0.4)	0.6	(0.1)	1.7	(0.2)
	Slovak Republic	461	(2.6)	1.2	(0.2)	0.1	(0.0)	0.3	(0.1)
	Slovenia	513	(1.3)	7.8	(0.5)	0.3	(0.1)	0.8	(0.1)
	Spain	493	(2.1)	11.0	(0.8)	2.5	(0.3)	1.1	(0.1)
	Sweden	493	(3.6)	17.4	(1.2)	0.9	(0.1)	5.3	(0.5)
	Switzerland	506	(2.9)	31.1	(1.2)	1.4	(0.2)	7.2	(0.4)
	Turkey	425	(3.9)	0.8	(0.2)	0.1	(0.0)	0.1	(0.1)
	United Kingdom	509	(2.6)	16.7	(1.0)	0.3	(0.1)	6.3	(0.6)
	United States	496	(3.2)	23.1	(1.5)	3.0	(0.5)	5.2	(0.6)
	OECD average	493	(0.4)	12.5	(0.1)	0.7	(0.0)	3.7	(0.1)
Partners	Albania	427	(3.3)	0.6	(0.1)	0.1	(0.0)	0.1	(0.0)
	Algeria	376	(2.6)	1.0	(0.2)	0.1	(0.1)	0.1	(0.0)
	Brazil	401	(2.3)	0.8	(0.1)	0.2	(0.0)	0.1	(0.0)
	B-S-J-G (China)	518	(4.6)	0.3	(0.1)	0.1	(0.0)	0.0	(0.0)
	Bulgaria	446	(4.4)	1.0	(0.1)	0.1	(0.0)	0.3	(0.1)
	CABA (Argentina)	475	(6.3)	17.0	(2.0)	4.4	(0.8)	1.5	(0.4)
	Colombia	416	(2.4)	0.6	(0.1)	0.1	(0.0)	0.1	(0.0)
	Costa Rica	420	(2.1)	8.0	(0.6)	2.6	(0.3)	0.5	(0.1)
	Croatia	475	(2.5)	10.8	(0.6)	0.3	(0.1)	1.3	(0.1)
	Cyprus*	433	(1.4)	11.3	(0.4)	0.4	(0.1)	4.2	(0.3)
	Dominican Republic	332	(2.6)	1.8	(0.3)	0.5	(0.1)	0.1	(0.1)
	FYROM	384	(1.2)	2.0	(0.2)	0.1	(0.0)	0.6	(0.1)
	Georgia	411	(2.4)	2.2	(0.3)	0.1	(0.0)	0.4	(0.1)
	Hong Kong (China)	523	(2.5)	35.1	(1.3)	4.7	(0.3)	2.9	(0.3)
	Indonesia	403	(2.6)	0.1	(0.1)	0.1	(0.0)	0.0	c
	Jordan	409	(2.7)	12.1	(0.7)	0.8	(0.1)	2.6	(0.3)
	Kosovo	378	(1.7)	1.5	(0.2)	0.1	(0.0)	0.5	(0.1)
	Lebanon	386	(3.4)	3.4	(0.4)	0.4	(0.2)	0.5	(0.1)
	Lithuania	475	(2.7)	1.8	(0.2)	0.1	(0.1)	0.7	(0.1)
	Macao (China)	529	(1.1)	62.2	(0.7)	4.1	(0.3)	5.6	(0.3)
	Malta	465	(1.6)	5.0	(0.4)	0.1	(0.1)	2.7	(0.3)
	Moldova	428	(2.0)	1.4	(0.2)	0.1	(0.0)	0.3	(0.1)
	Montenegro	411	(1.0)	5.6	(0.3)	0.0	(0.0)	1.9	(0.2)
	Peru	397	(2.4)	0.5	(0.1)	0.1	(0.0)	0.1	(0.0)
	Qatar	418	(1.0)	55.2	(0.4)	0.4	(0.1)	32.1	(0.5)
	Romania	435	(3.2)	0.4	(0.1)	0.0	c	0.1	(0.0)
	Russia	487	(2.9)	6.9	(0.5)	0.0	(0.0)	1.8	(0.2)
	Singapore	556	(1.2)	20.9	(1.0)	0.2	(0.1)	11.3	(0.5)
	Chinese Taipei	532	(2.7)	0.3	(0.1)	0.0	(0.0)	0.1	(0.0)
	Thailand	421	(2.8)	0.8	(0.3)	0.5	(0.2)	0.1	(0.0)
	Trinidad and Tobago	425	(1.4)	3.5	(0.4)	0.2	(0.1)	0.7	(0.1)
	Tunisia	386	(2.1)	1.5	(0.2)	0.2	(0.1)	0.3	(0.1)
	United Arab Emirates	437	(2.4)	57.6	(0.9)	0.3	(0.1)	31.2	(0.9)
	Uruguay	435	(2.2)	0.6	(0.1)	0.1	(0.0)	0.1	(0.0)
	Viet Nam	525	(3.9)	0.1	(0.0)	0.0	(0.0)	0.0	c
	Argentina**	432	(2.9)	4.4	(0.4)	1.3	(0.2)	0.3	(0.1)
	Kazakhstan**	456	(3.7)	13.0	(1.0)	0.2	(0.1)	2.1	(0.3)
	Malaysia**	443	(3.0)	0.9	(0.2)	0.2	(0.1)	0.2	(0.0)

1. Disadvantaged immigrant students are defined as those immigrant students whose value on the PISA index of economic, social and cultural status (ESCS) is in the bottom quarter of all students across all countries and economies.
2. Advantaged immigrant students are defined as those immigrant students whose value on the PISA index of economic, social and cultural status (ESCS) is in the top quarter of all students across all countries and economies.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/2]

Table I.7.4a Differences in science performance between immigrant and non-immigrant students, and socio-economic status

Results based on students' self-reports

		Percentage of immigrant students in PISA 2015		Science performance							
				Non-immigrant students		Immigrant students		Second-generation immigrants		First-generation immigrants	
		%	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.
OECD	Australia	25.0	(0.7)	512	(1.5)	514	(3.5)	523	(4.0)	505	(4.3)
	Austria	20.3	(1.1)	510	(2.4)	440	(4.5)	447	(4.4)	428	(6.9)
	Belgium	17.7	(0.9)	516	(2.0)	450	(4.9)	454	(5.8)	447	(5.9)
	Canada	30.1	(1.3)	530	(2.2)	531	(3.1)	533	(3.6)	530	(3.4)
	Chile	2.1	(0.5)	449	(2.4)	418	(14.3)	447	(28.2)	408	(13.2)
	Czech Republic	3.4	(0.3)	495	(2.1)	463	(10.5)	477	(13.8)	450	(11.7)
	Denmark	10.7	(0.6)	510	(2.6)	441	(4.1)	441	(4.8)	441	(7.7)
	Estonia	10.0	(0.5)	539	(2.2)	507	(3.9)	507	(4.0)	510	(18.6)
	Finland	4.0	(0.4)	535	(2.2)	452	(8.5)	464	(10.4)	443	(10.5)
	France	13.2	(1.0)	506	(2.0)	444	(6.9)	456	(8.4)	419	(7.7)
	Germany	16.9	(0.9)	527	(2.6)	455	(6.1)	461	(5.8)	434	(10.5)
	Greece	10.8	(0.7)	461	(4.0)	417	(5.4)	424	(7.8)	404	(7.6)
	Hungary	2.7	(0.2)	477	(2.5)	494	(10.2)	507	(12.4)	476	(15.2)
	Iceland	4.1	(0.3)	478	(1.7)	398	(7.1)	424	(14.5)	387	(8.3)
	Ireland	14.4	(1.0)	505	(2.5)	500	(4.1)	501	(8.4)	500	(4.1)
	Israel	17.5	(1.0)	473	(3.4)	456	(7.0)	471	(6.2)	414	(13.8)
	Italy	8.0	(0.5)	485	(2.6)	452	(4.0)	463	(6.4)	444	(5.8)
	Japan	0.5	(0.1)	539	(2.9)	447	(31.6)	c	c	c	c
	Korea	0.1	(0.0)	516	(3.1)	c	c	m	m	c	c
	Latvia	5.0	(0.4)	492	(1.6)	478	(6.6)	481	(7.0)	466	(16.8)
	Luxembourg	52.0	(0.6)	505	(1.6)	464	(1.6)	463	(2.5)	466	(3.0)
	Mexico	1.2	(0.1)	418	(2.1)	340	(8.7)	c	c	331	(11.2)
	Netherlands	10.7	(0.9)	517	(2.4)	457	(8.2)	462	(8.2)	438	(12.2)
	New Zealand	27.1	(1.2)	519	(2.5)	513	(4.6)	507	(6.6)	517	(5.2)
	Norway	12.0	(1.0)	507	(2.3)	455	(4.2)	464	(5.6)	446	(6.4)
	Poland	0.3	(0.1)	503	(2.5)	c	c	c	c	c	c
	Portugal	7.3	(0.4)	503	(2.4)	488	(5.9)	503	(9.1)	475	(6.3)
	Slovak Republic	1.2	(0.2)	465	(2.4)	395	(13.5)	400	(19.4)	389	(16.9)
	Slovenia	7.8	(0.5)	520	(1.3)	449	(5.8)	464	(7.3)	427	(9.9)
	Spain	11.0	(0.8)	499	(2.0)	457	(4.5)	471	(9.7)	454	(4.6)
	Sweden	17.4	(1.2)	508	(3.2)	438	(6.7)	454	(8.1)	417	(9.5)
	Switzerland	31.1	(1.2)	527	(2.6)	464	(4.1)	462	(4.6)	467	(6.0)
	Turkey	0.8	(0.2)	427	(3.9)	414	(15.4)	436	(17.8)	c	c
	United Kingdom	16.7	(1.0)	516	(2.4)	493	(5.9)	503	(6.3)	485	(7.7)
	United States	23.1	(1.5)	506	(3.3)	474	(4.9)	482	(6.0)	456	(5.7)
	OECD average	12.5	(0.1)	500	(0.4)	456	(1.6)	469	(1.8)	447	(1.8)
Partners	Albania	0.6	(0.1)	m	m	m	m	m	m	m	m
	Algeria	1.0	(0.2)	377	(2.7)	335	(16.4)	335	(16.4)	m	m
	Brazil	0.8	(0.1)	404	(2.3)	338	(10.3)	335	(10.3)	342	(20.8)
	B-S-J-G (China)	0.3	(0.1)	521	(4.6)	376	(18.0)	c	c	c	c
	Bulgaria	1.0	(0.1)	450	(4.2)	376	(14.6)	c	c	c	c
	CABA (Argentina)	17.0	(2.0)	485	(6.3)	423	(7.2)	429	(7.1)	414	(11.8)
	Colombia	0.6	(0.1)	418	(2.3)	365	(14.8)	347	(16.6)	c	c
	Costa Rica	8.0	(0.6)	422	(2.1)	401	(4.9)	398	(4.5)	409	(9.6)
	Croatia	10.8	(0.6)	480	(2.4)	454	(4.7)	454	(5.0)	455	(10.2)
	Cyprus*	11.3	(0.4)	434	(1.4)	433	(4.5)	447	(8.8)	428	(5.2)
	Dominican Republic	1.8	(0.3)	336	(2.7)	295	(10.9)	282	(10.1)	313	(19.2)
	FYROM	2.0	(0.2)	387	(1.3)	362	(10.5)	375	(13.0)	335	(14.7)
	Georgia	2.2	(0.3)	414	(2.4)	408	(11.3)	408	(11.8)	c	c
	Hong Kong (China)	35.1	(1.3)	529	(2.6)	516	(4.0)	518	(4.8)	513	(4.3)
	Indonesia	0.1	(0.1)	405	(2.6)	c	c	c	c	c	c
	Jordan	12.1	(0.7)	412	(2.6)	417	(4.5)	418	(5.3)	414	(6.4)
	Kosovo	1.5	(0.2)	380	(1.6)	353	(10.2)	333	(12.1)	374	(12.0)
	Lebanon	3.4	(0.4)	392	(3.6)	372	(9.2)	343	(10.8)	398	(14.1)
	Lithuania	1.8	(0.2)	477	(2.6)	469	(8.5)	478	(8.5)	438	(22.8)
	Macao (China)	62.2	(0.7)	519	(1.9)	535	(1.6)	536	(2.1)	535	(3.1)
	Malta	5.0	(0.4)	468	(1.7)	501	(8.7)	472	(18.2)	514	(10.1)
	Moldova	1.4	(0.2)	430	(2.0)	435	(11.0)	438	(13.3)	c	c
	Montenegro	5.6	(0.3)	412	(1.0)	423	(5.6)	425	(6.7)	420	(9.2)
	Peru	0.5	(0.1)	398	(2.3)	367	(20.7)	c	c	c	c
	Qatar	55.2	(0.4)	377	(1.4)	458	(1.3)	427	(2.5)	470	(1.6)
	Romania	0.4	(0.1)	435	(3.2)	c	c	c	c	c	c
	Russia	6.9	(0.5)	489	(3.0)	480	(6.1)	481	(7.4)	478	(9.9)
	Singapore	20.9	(1.0)	550	(1.4)	579	(3.9)	589	(5.6)	573	(4.7)
	Chinese Taipei	0.3	(0.1)	533	(2.7)	c	c	c	c	c	c
	Thailand	0.8	(0.3)	424	(2.8)	410	(14.6)	407	(17.1)	c	c
	Trinidad and Tobago	3.5	(0.4)	432	(1.5)	403	(10.7)	381	(12.4)	432	(17.4)
	Tunisia	1.5	(0.2)	390	(2.1)	340	(10.4)	330	(10.3)	c	c
	United Arab Emirates	57.6	(0.9)	394	(2.5)	474	(2.9)	461	(3.1)	482	(3.5)
	Uruguay	0.6	(0.1)	437	(2.2)	431	(21.1)	c	c	c	c
	Viet Nam	0.1	(0.0)	525	(3.9)	c	c	c	c	c	c
	Argentina**	4.4	(0.4)	433	(2.9)	419	(5.8)	422	(7.1)	413	(9.1)
	Kazakhstan**	13.0	(1.0)	457	(3.9)	455	(4.8)	457	(5.4)	449	(8.4)
	Malaysia**	0.9	(0.2)	445	(3.0)	431	(13.3)	421	(13.5)	c	c

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 2/2]

Table I.7.4a Differences in science performance between immigrant and non-immigrant students, and socio-economic status

Results based on students' self-reports

		Differences in science performance										
		Before accounting for students' socio-economic status						After accounting for students' socio-economic status				
		Between non-immigrants and immigrants		Between non-immigrants and second-generation immigrants		Between non-immigrants and first-generation immigrants		Between non-immigrants and immigrants		Between non-immigrants and second-generation immigrants		Between non-immigrants and first-generation immigrants	
		Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	-2	(3.6)	**-10**	(4.0)	7	(4.5)	-5	(3.2)	**-14**	(3.8)	5	(3.8)
	Austria	**70**	(5.2)	**63**	(4.9)	**82**	(7.5)	**46**	(4.5)	**38**	(4.9)	**57**	(6.2)
	Belgium	**66**	(4.5)	**62**	(5.3)	**69**	(5.8)	**43**	(4.1)	**38**	(4.6)	**46**	(5.5)
	Canada	-2	(3.0)	-3	(3.5)	0	(3.3)	-2	(2.7)	**-7**	(3.0)	4	(3.1)
	Chile	**31**	(14.2)	2	(27.9)	**41**	(13.4)	**23**	(10.0)	7	(23.1)	**28**	(10.3)
	Czech Republic	**32**	(10.1)	18	(13.2)	**45**	(11.7)	**24**	(8.8)	2	(11.3)	**45**	(11.7)
	Denmark	**69**	(4.7)	**69**	(5.1)	**70**	(8.5)	**51**	(5.2)	**48**	(6.0)	**56**	(8.4)
	Estonia	**32**	(4.2)	**32**	(4.3)	29	(18.7)	**31**	(4.0)	**31**	(4.1)	**36**	(17.9)
	Finland	**83**	(8.2)	**71**	(10.0)	**92**	(10.4)	**65**	(8.1)	**50**	(9.1)	**77**	(10.6)
	France	**62**	(7.5)	**50**	(8.8)	**87**	(8.4)	**32**	(7.3)	**21**	(8.3)	**51**	(8.6)
	Germany	**72**	(6.2)	**66**	(5.9)	**93**	(10.5)	**50**	(5.8)	**42**	(5.5)	**76**	(10.0)
	Greece	**45**	(5.3)	**38**	(7.4)	**58**	(8.1)	**23**	(5.8)	**18**	(7.6)	**30**	(9.0)
	Hungary	-17	(9.9)	**-30**	(12.1)	1	(15.1)	-4	(9.8)	-5	(12.2)	-2	(15.1)
	Iceland	**80**	(7.3)	**54**	(14.7)	**91**	(8.3)	**66**	(7.5)	**43**	(15.9)	**76**	(8.6)
	Ireland	5	(4.4)	4	(8.6)	5	(4.4)	8	(4.2)	6	(8.8)	8	(4.2)
	Israel	**16**	(6.8)	2	(6.1)	**58**	(13.6)	4	(5.1)	-6	(5.3)	**33**	(9.0)
	Italy	**33**	(4.0)	**21**	(6.7)	**40**	(5.5)	**19**	(4.1)	11	(7.5)	**24**	(6.1)
	Japan	**93**	(30.7)	m	m	m	m	**83**	(28.1)	m	m	m	m
	Korea	m	m	m	m	m	m	m	m	m	m	m	m
	Latvia	13	(6.9)	10	(7.4)	26	(16.8)	**20**	(6.4)	**16**	(7.0)	**37**	(16.2)
	Luxembourg	**41**	(2.3)	**42**	(3.3)	**39**	(3.1)	**13**	(2.7)	**13**	(3.6)	**13**	(3.1)
	Mexico	**77**	(9.1)	m	m	**87**	(11.6)	**63**	(8.9)	m	m	**68**	(11.7)
	Netherlands	**60**	(8.8)	**55**	(8.8)	**79**	(12.6)	**33**	(8.4)	**28**	(8.5)	**50**	(12.0)
	New Zealand	6	(4.9)	11	(6.6)	2	(5.6)	6	(4.5)	3	(5.8)	8	(5.3)
	Norway	**52**	(4.4)	**43**	(5.7)	**61**	(6.6)	**35**	(4.6)	**28**	(6.0)	**42**	(6.3)
	Poland	m	m	m	m	m	m	m	m	m	m	m	m
	Portugal	**16**	(5.6)	0	(8.8)	**28**	(6.2)	**16**	(5.2)	7	(8.6)	**23**	(5.9)
	Slovak Republic	**70**	(13.6)	**65**	(19.4)	**76**	(16.9)	**73**	(13.3)	**58**	(19.3)	**89**	(17.1)
	Slovenia	**71**	(6.0)	**55**	(7.5)	**93**	(10.0)	**45**	(6.2)	**29**	(6.9)	**66**	(10.6)
	Spain	**42**	(4.4)	**28**	(9.7)	**45**	(4.6)	**28**	(4.2)	16	(9.7)	**31**	(4.6)
	Sweden	**70**	(6.4)	**54**	(7.4)	**90**	(9.8)	**49**	(6.3)	**37**	(6.9)	**64**	(9.5)
	Switzerland	**63**	(4.1)	**65**	(4.5)	**60**	(6.0)	**41**	(4.1)	**40**	(4.7)	**41**	(5.5)
	Turkey	13	(15.2)	-9	(17.5)	m	m	**31**	(14.6)	9	(15.5)	m	m
	United Kingdom	**23**	(5.7)	**14**	(5.9)	**32**	(7.6)	**18**	(4.6)	7	(4.6)	**28**	(6.2)
	United States	**32**	(5.2)	**24**	(6.4)	**50**	(5.5)	6	(4.9)	-3	(6.2)	**20**	(5.8)
	OECD average	**43**	(1.6)	**31**	(1.8)	**53**	(1.8)	**31**	(1.4)	**20**	(1.7)	**40**	(1.7)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	**42**	(15.9)	**42**	(15.9)	m	m	**43**	(16.4)	**43**	(16.4)	m	m
	Brazil	**66**	(10.3)	**69**	(10.5)	**62**	(20.7)	**66**	(9.7)	**66**	(10.7)	**66**	(19.7)
	B-S-J-G (China)	**145**	(18.4)	m	m	m	m	**143**	(19.9)	m	m	m	m
	Bulgaria	**74**	(14.5)	m	m	m	m	**68**	(14.9)	m	m	m	m
	CABA (Argentina)	**62**	(6.8)	**57**	(6.8)	**71**	(11.4)	**16**	(6.2)	10	(7.6)	**24**	(10.9)
	Colombia	**53**	(14.5)	**70**	(16.3)	m	m	**63**	(13.5)	**73**	(15.8)	m	m
	Costa Rica	**20**	(4.7)	**24**	(4.4)	13	(9.5)	6	(4.3)	7	(4.3)	5	(7.9)
	Croatia	**26**	(4.5)	**26**	(4.8)	**24**	(10.0)	**15**	(4.2)	**15**	(4.5)	16	(9.2)
	Cyprus*	1	(4.6)	-13	(9.0)	6	(5.2)	-4	(4.5)	-12	(8.4)	0	(5.3)
	Dominican Republic	**40**	(11.7)	**54**	(10.7)	23	(19.9)	**31**	(10.1)	**38**	(11.9)	22	(17.0)
	FYROM	**25**	(10.7)	12	(13.1)	**52**	(15.1)	**29**	(10.2)	14	(13.0)	**61**	(12.2)
	Georgia	7	(11.4)	6	(11.9)	m	m	9	(11.8)	8	(12.4)	m	m
	Hong Kong (China)	**13**	(4.3)	**11**	(4.9)	**16**	(4.8)	3	(4.3)	1	(4.8)	3	(4.8)
	Indonesia	m	m	m	m	m	m	m	m	m	m	m	m
	Jordan	-5	(4.2)	-6	(4.9)	-2	(6.6)	-2	(3.9)	-2	(4.5)	-1	(6.7)
	Kosovo	**27**	(10.0)	**47**	(11.9)	6	(11.9)	**28**	(9.7)	**43**	(12.4)	12	(11.7)
	Lebanon	**20**	(8.3)	**49**	(10.5)	-5	(13.4)	**20**	(8.4)	**57**	(10.5)	-12	(11.7)
	Lithuania	8	(8.4)	-1	(8.6)	39	(22.3)	13	(7.7)	8	(8.4)	30	(17.0)
	Macao (China)	**-17**	(2.7)	**-17**	(3.2)	**-17**	(3.4)	**-22**	(2.8)	**-22**	(3.3)	**-21**	(3.5)
	Malta	**-34**	(8.9)	-4	(18.3)	**-46**	(10.2)	-12	(8.5)	5	(16.6)	**-19**	(9.8)
	Moldova	-5	(11.2)	-8	(13.4)	m	m	4	(10.8)	-1	(13.1)	m	m
	Montenegro	-11	(5.7)	-12	(6.7)	-8	(9.3)	-4	(5.5)	-5	(6.5)	-2	(9.3)
	Peru	31	(19.9)	m	m	m	m	**33**	(16.2)	m	m	m	m
	Qatar	**-82**	(1.7)	**-51**	(2.8)	**-93**	(1.8)	**-81**	(1.7)	**-54**	(2.8)	**-92**	(1.9)
	Romania	m	m	m	m	m	m	m	m	m	m	m	m
	Russia	10	(6.5)	8	(8.3)	11	(9.5)	7	(6.4)	6	(8.5)	9	(9.2)
	Singapore	**-28**	(4.4)	**-39**	(5.9)	**-23**	(5.0)	-6	(4.1)	**-24**	(5.3)	4	(4.9)
	Chinese Taipei	m	m	m	m	m	m	m	m	m	m	m	m
	Thailand	14	(14.4)	16	(16.7)	m	m	-3	(18.8)	5	(18.3)	m	m
	Trinidad and Tobago	**29**	(11.0)	**51**	(12.4)	0	(17.8)	**28**	(10.4)	**48**	(12.2)	1	(16.1)
	Tunisia	**50**	(10.4)	**60**	(10.4)	m	m	**55**	(10.2)	**62**	(10.0)	m	m
	United Arab Emirates	**-80**	(3.4)	**-67**	(3.8)	**-88**	(3.9)	**-79**	(3.3)	**-68**	(3.8)	**-86**	(3.7)
	Uruguay	5	(20.8)	m	m	m	m	18	(17.6)	m	m	m	m
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	**14**	(5.7)	11	(7.0)	**20**	(9.0)	1	(5.3)	-3	(6.5)	9	(9.2)
	Kazakhstan**	2	(4.7)	0	(5.6)	8	(7.9)	0	(4.5)	-1	(5.4)	3	(7.8)
	Malaysia**	14	(13.2)	24	(13.4)	c	c	2	(12.2)	5	(13.1)	c	c

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/2]

Table I.7.5a Low and top performance in science, by immigrant background

Results based on students' self-reports

	Percentage of immigrant students in PISA 2015		Non-immigrant students: Percentage of low performers in science (below Level 2)		Non-immigrant students: Percentage of top performers in science (Level 5 or above)		Immigrant students: Percentage of low performers in science (below Level 2)		Immigrant students: Percentage of top performers in science (Level 5 or above)	
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD										
Australia	25.0	(0.7)	16.5	(0.5)	11.1	(0.5)	17.4	(1.2)	13.0	(1.1)
Austria	20.3	(1.1)	15.6	(0.9)	9.3	(0.7)	40.1	(2.3)	1.9	(0.4)
Belgium	17.7	(0.9)	15.0	(0.8)	10.5	(0.5)	36.9	(2.2)	2.9	(0.6)
Canada	30.1	(1.3)	10.3	(0.6)	12.5	(0.7)	10.5	(0.8)	13.5	(1.0)
Chile	2.1	(0.5)	33.7	(1.2)	1.3	(0.2)	52.3	(8.6)	1.9	(1.4)
Czech Republic	3.4	(0.3)	19.8	(0.9)	7.5	(0.5)	33.6	(4.7)	4.5	(1.4)
Denmark	10.7	(0.6)	12.6	(0.9)	7.6	(0.7)	39.3	(2.0)	3.3	(0.9)
Estonia	10.0	(0.5)	8.0	(0.7)	14.6	(0.8)	13.1	(1.8)	6.5	(1.2)
Finland	4.0	(0.4)	10.2	(0.7)	14.9	(0.7)	36.2	(3.6)	4.6	(1.8)
France	13.2	(1.0)	18.0	(0.8)	9.0	(0.6)	40.2	(3.2)	2.9	(0.9)
Germany	16.9	(0.9)	11.8	(0.8)	13.5	(0.8)	33.6	(2.7)	3.5	(0.8)
Greece	10.8	(0.7)	29.6	(1.9)	2.3	(0.3)	51.0	(3.0)	1.5	(0.6)
Hungary	2.7	(0.2)	25.8	(1.0)	4.6	(0.5)	22.0	(5.4)	7.4	(2.9)
Iceland	4.1	(0.3)	23.3	(0.9)	4.1	(0.4)	56.9	(4.5)	0.2	(0.6)
Ireland	14.4	(1.0)	14.4	(0.9)	7.3	(0.5)	16.9	(1.8)	6.8	(1.1)
Israel	17.5	(1.0)	29.2	(1.4)	6.2	(0.5)	34.7	(2.9)	5.1	(0.9)
Italy	8.0	(0.5)	21.7	(1.0)	4.5	(0.4)	33.0	(2.4)	1.3	(0.6)
Japan	0.5	(0.1)	9.3	(0.7)	15.4	(1.0)	46.2	(12.7)	5.8	(5.9)
Korea	0.1	(0.0)	14.2	(0.9)	10.7	(0.8)	m	m	m	m
Latvia	5.0	(0.4)	16.6	(0.8)	3.9	(0.4)	22.2	(3.1)	3.0	(1.6)
Luxembourg	52.0	(0.6)	16.4	(0.8)	7.7	(0.7)	33.5	(1.1)	6.3	(0.5)
Mexico	1.2	(0.1)	46.7	(1.3)	0.1	(0.1)	85.5	(4.6)	0.0	c
Netherlands	10.7	(0.9)	15.9	(0.9)	12.4	(0.7)	34.3	(4.0)	2.8	(0.9)
New Zealand	27.1	(1.2)	15.3	(0.9)	13.3	(0.9)	19.3	(1.5)	14.2	(1.5)
Norway	12.0	(1.0)	15.9	(0.8)	8.9	(0.6)	32.9	(2.5)	3.2	(0.9)
Poland	0.3	(0.1)	15.7	(0.8)	7.4	(0.6)	m	m	m	m
Portugal	7.3	(0.4)	16.8	(0.9)	7.7	(0.6)	20.8	(3.8)	6.0	(1.3)
Slovak Republic	1.2	(0.2)	28.8	(1.0)	3.7	(0.4)	59.1	(7.0)	0.9	(1.4)
Slovenia	7.8	(0.5)	12.6	(0.4)	11.5	(0.6)	36.4	(3.2)	2.6	(1.3)
Spain	11.0	(0.8)	16.1	(0.8)	5.4	(0.4)	30.4	(2.4)	2.2	(0.8)
Sweden	17.4	(1.2)	16.7	(1.0)	10.0	(0.8)	40.6	(2.6)	2.7	(1.0)
Switzerland	31.1	(1.2)	11.3	(0.9)	12.1	(0.8)	32.1	(1.8)	5.1	(0.8)
Turkey	0.8	(0.2)	43.5	(2.1)	0.3	(0.1)	52.3	(9.7)	0.3	(1.6)
United Kingdom	16.7	(1.0)	15.5	(0.8)	12.0	(0.7)	21.6	(2.0)	8.2	(1.6)
United States	23.1	(1.5)	17.1	(1.0)	10.0	(0.8)	27.1	(2.1)	4.8	(0.9)
OECD average	12.5	(0.1)	18.9	(0.2)	8.4	(0.1)	35.2	(0.8)	4.5	(0.3)
Partners										
Albania	0.6	(0.1)	m	m	m	m	m	m	m	m
Algeria	1.0	(0.2)	70.3	(1.5)	0.0	(0.0)	83.3	(7.1)	0.0	c
Brazil	0.8	(0.1)	55.0	(1.1)	0.7	(0.1)	83.7	(4.8)	0.6	(0.9)
B-S-J-G (China)	0.3	(0.1)	15.3	(1.2)	13.9	(1.4)	62.3	(11.0)	0.0	(0.1)
Bulgaria	1.0	(0.1)	36.0	(1.8)	3.0	(0.5)	64.9	(6.7)	0.3	(1.0)
CABA (Argentina)	17.0	(2.0)	18.5	(2.2)	3.1	(0.9)	43.7	(4.4)	0.7	(0.7)
Colombia	0.6	(0.1)	48.1	(1.3)	0.4	(0.1)	77.4	(6.8)	1.6	(2.0)
Costa Rica	8.0	(0.6)	45.0	(1.2)	0.2	(0.1)	58.0	(3.2)	0.2	(0.2)
Croatia	10.8	(0.6)	23.1	(1.2)	4.3	(0.4)	31.5	(2.7)	1.9	(0.6)
Cyprus*	11.3	(0.4)	41.1	(0.8)	1.4	(0.2)	44.7	(2.4)	3.6	(0.9)
Dominican Republic	1.8	(0.3)	84.8	(1.2)	0.0	(0.0)	92.4	(3.6)	0.0	c
FYROM	2.0	(0.2)	61.3	(0.8)	0.2	(0.1)	72.6	(5.9)	0.0	(0.2)
Georgia	2.2	(0.3)	49.5	(1.3)	0.9	(0.2)	50.2	(5.8)	0.2	(0.6)
Hong Kong (China)	35.1	(1.3)	8.1	(0.7)	8.4	(0.8)	11.1	(1.4)	6.1	(0.8)
Indonesia	0.1	(0.1)	55.1	(1.7)	0.1	(0.1)	m	m	m	m
Jordan	12.1	(0.7)	48.4	(1.5)	0.2	(0.1)	46.3	(3.1)	0.2	(0.2)
Kosovo	1.5	(0.2)	67.0	(1.1)	0.0	(0.0)	79.6	(8.1)	0.0	c
Lebanon	3.4	(0.4)	60.0	(1.9)	0.5	(0.2)	68.4	(5.1)	0.0	(0.2)
Lithuania	1.8	(0.2)	23.9	(1.0)	4.4	(0.5)	27.7	(4.7)	2.2	(2.1)
Macao (China)	62.2	(0.7)	10.5	(0.8)	7.7	(0.8)	6.4	(0.5)	10.2	(0.8)
Malta	5.0	(0.4)	31.3	(0.9)	7.5	(0.5)	24.4	(3.6)	14.9	(2.8)
Moldova	1.4	(0.2)	41.5	(1.1)	0.8	(0.2)	40.1	(7.4)	1.3	(1.9)
Montenegro	5.6	(0.3)	50.5	(0.7)	0.5	(0.1)	45.6	(3.0)	0.7	(0.6)
Peru	0.5	(0.1)	58.0	(1.4)	0.1	(0.1)	74.0	(9.5)	0.0	c
Qatar	55.2	(0.4)	68.4	(0.7)	0.2	(0.1)	31.7	(0.6)	3.1	(0.3)
Romania	0.4	(0.1)	38.5	(1.8)	0.7	(0.2)	m	m	m	m
Russia	6.9	(0.5)	17.4	(1.1)	3.9	(0.4)	20.6	(2.9)	3.7	(1.4)
Singapore	20.9	(1.0)	10.4	(0.5)	22.6	(0.6)	5.8	(0.9)	31.2	(1.7)
Chinese Taipei	0.3	(0.1)	12.2	(0.8)	15.5	(1.1)	m	m	m	m
Thailand	0.8	(0.3)	45.5	(1.5)	0.5	(0.2)	51.6	(9.1)	0.3	(1.0)
Trinidad and Tobago	3.5	(0.4)	42.5	(0.9)	1.6	(0.3)	56.3	(6.0)	0.7	(1.0)
Tunisia	1.5	(0.2)	63.9	(1.3)	0.0	(0.1)	86.4	(5.0)	0.0	c
United Arab Emirates	57.6	(0.9)	59.0	(1.3)	0.2	(0.1)	26.6	(1.3)	4.9	(0.4)
Uruguay	0.6	(0.1)	40.0	(1.1)	1.3	(0.2)	46.1	(10.6)	1.7	(3.0)
Viet Nam	0.1	(0.0)	5.7	(0.7)	8.3	(1.2)	m	m	m	m
Argentina**	4.4	(0.4)	39.4	(1.5)	0.7	(0.2)	44.4	(4.2)	0.4	(0.4)
Kazakhstan**	13.0	(1.0)	28.4	(1.7)	1.9	(0.6)	26.1	(2.6)	1.2	(0.7)
Malaysia**	0.9	(0.2)	32.6	(1.5)	0.6	(0.2)	42.5	(7.9)	0.1	(0.5)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 2/2]

Table I.7.5a Low and top performance in science, by immigrant background

Results based on students' self-reports

		Second-generation immigrants				First-generation immigrants				Likelihood of immigrant students scoring below Level 2 in science, relative to non-immigrant students			
		Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)		Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)		Before accounting for students' socio-economic status		After accounting for students' socio-economic status	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	Odds ratio	S.E.	Odds ratio	S.E.
OECD	Australia	14.0	(1.4)	13.8	(1.5)	20.8	(1.6)	12.3	(1.2)	1.1	(0.1)	1.0	(0.1)
	Austria	35.9	(2.3)	1.6	(0.5)	47.1	(3.8)	2.3	(0.9)	**3.6**	(0.4)	**2.5**	(0.3)
	Belgium	33.8	(2.7)	2.9	(0.7)	40.2	(2.7)	3.0	(0.8)	**3.3**	(0.3)	**2.4**	(0.2)
	Canada	9.8	(1.0)	13.5	(1.2)	11.3	(1.1)	13.5	(1.2)	1.0	(0.1)	1.0	(0.1)
	Chile	43.4	(15.0)	5.7	(5.1)	55.3	(9.3)	0.6	(0.5)	**2.2**	(0.8)	**2.0**	(0.5)
	Czech Republic	31.2	(6.6)	6.0	(2.1)	35.9	(5.8)	3.0	(1.8)	**2.0**	(0.4)	**1.9**	(0.4)
	Denmark	39.8	(2.2)	2.9	(1.1)	37.8	(4.2)	4.5	(1.8)	**4.5**	(0.5)	**3.4**	(0.5)
	Estonia	12.7	(1.9)	6.1	(1.2)	18.5	(7.9)	12.4	(6.2)	**1.7**	(0.3)	**1.8**	(0.4)
	Finland	31.4	(5.0)	4.6	(2.4)	40.2	(4.8)	4.6	(2.5)	**5.0**	(0.9)	**3.8**	(0.7)
	France	35.2	(3.9)	3.7	(1.2)	50.0	(4.4)	1.5	(1.0)	**3.1**	(0.5)	**1.9**	(0.3)
	Germany	31.1	(2.7)	3.5	(0.9)	42.5	(4.9)	3.4	(1.5)	**3.8**	(0.5)	**2.7**	(0.4)
	Greece	47.3	(4.3)	1.9	(0.9)	57.9	(4.5)	0.7	(0.6)	**2.5**	(0.3)	**1.7**	(0.2)
	Hungary	17.9	(4.6)	9.4	(4.2)	27.6	(9.0)	4.7	(3.0)	0.8	(0.3)	1.1	(0.4)
	Iceland	47.1	(9.1)	0.6	(1.8)	61.1	(4.9)	0.0	c	**4.4**	(0.8)	**3.6**	(0.7)
	Ireland	18.6	(3.4)	7.7	(2.5)	16.3	(1.9)	6.6	(1.2)	1.2	(0.2)	**1.3**	(0.2)
	Israel	29.1	(2.8)	5.9	(1.1)	51.0	(5.9)	2.7	(1.2)	1.3	(0.2)	1.1	(0.1)
	Italy	26.6	(4.0)	0.9	(0.7)	37.1	(3.4)	1.6	(1.0)	**1.8**	(0.2)	**1.4**	(0.2)
	Japan	m	m	m	m	m	m	m	m	**8.4**	(4.3)	**8.4**	(4.7)
	Korea	m	m	m	m	m	m	m	m	5.2	(11.9)	3.9	(4.8)
	Latvia	19.4	(3.4)	3.0	(1.6)	33.4	(8.9)	3.3	(5.0)	1.4	(0.3)	**1.7**	(0.4)
	Luxembourg	31.9	(1.6)	4.6	(0.6)	35.7	(1.6)	8.9	(0.9)	**2.6**	(0.2)	**1.7**	(0.1)
	Mexico	m	m	m	m	90.1	(5.8)	0.0	c	**6.8**	(2.8)	**5.4**	(2.6)
	Netherlands	32.2	(4.0)	3.2	(1.0)	42.7	(6.2)	1.3	(1.4)	**2.8**	(0.5)	**1.8**	(0.4)
	New Zealand	22.3	(2.6)	14.6	(2.0)	17.3	(1.7)	13.8	(1.8)	**1.3**	(0.1)	**1.4**	(0.2)
	Norway	30.6	(3.4)	3.3	(1.3)	35.2	(3.3)	3.0	(1.1)	**2.6**	(0.3)	**2.0**	(0.3)
	Poland	m	m	m	m	m	m	m	m	0.9	(0.8)	1.3	(1.2)
	Portugal	19.6	(4.6)	8.6	(2.5)	21.8	(4.5)	3.8	(1.3)	1.3	(0.3)	1.4	(0.3)
	Slovak Republic	53.9	(9.5)	1.5	(2.4)	64.6	(9.8)	0.2	(1.0)	**3.6**	(1.1)	**4.4**	(1.5)
	Slovenia	30.6	(3.7)	3.3	(1.9)	44.3	(5.8)	1.7	(1.5)	**4.0**	(0.6)	**2.7**	(0.5)
	Spain	25.4	(4.6)	4.2	(2.4)	31.5	(2.6)	1.8	(0.7)	**2.3**	(0.3)	**1.8**	(0.2)
	Sweden	33.3	(3.1)	3.1	(1.5)	50.0	(3.9)	2.3	(1.1)	**3.4**	(0.4)	**2.6**	(0.3)
	Switzerland	30.9	(2.2)	4.3	(0.8)	34.4	(2.8)	6.8	(1.3)	**3.7**	(0.4)	**2.6**	(0.3)
	Turkey	40.2	(12.5)	0.5	(2.5)	m	m	m	m	1.4	(0.6)	2.2	(0.9)
	United Kingdom	17.5	(2.4)	8.7	(2.3)	25.3	(2.6)	7.8	(1.7)	**1.5**	(0.2)	**1.4**	(0.2)
	United States	23.2	(2.6)	5.4	(1.1)	35.3	(3.0)	3.3	(1.3)	**1.8**	(0.2)	1.2	(0.2)
	OECD average	29.5	(1.0)	5.1	(0.4)	39.1	(0.9)	4.4	(0.3)	**2.8**	(0.4)	**2.3**	(0.2)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	83.3	(7.1)	0.0	c	m	m	m	m	2.3	(1.5)	2.3	(2.6)
	Brazil	85.9	(5.7)	0.7	(1.1)	79.7	(8.1)	0.5	(1.8)	**4.3**	(1.6)	**5.0**	(1.4)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	**9.5**	(4.9)	**12.6**	(8.5)
	Bulgaria	m	m	m	m	m	m	m	m	**3.3**	(1.0)	**3.5**	(1.3)
	CABA (Argentina)	41.0	(4.7)	0.9	(1.0)	48.3	(6.8)	0.3	(0.8)	**3.4**	(0.6)	1.4	(0.3)
	Colombia	83.5	(7.6)	0.0	c	m	m	m	m	**3.8**	(1.5)	**5.3**	(2.5)
	Costa Rica	59.1	(3.4)	0.0	c	55.7	(5.7)	0.5	(0.6)	**1.7**	(0.2)	1.3	(0.2)
	Croatia	31.6	(2.8)	2.0	(0.7)	30.7	(6.0)	1.3	(1.2)	**1.5**	(0.2)	**1.3**	(0.2)
	Cyprus*	36.9	(4.7)	3.6	(1.8)	47.9	(2.7)	3.6	(1.1)	1.2	(0.1)	1.1	(0.1)
	Dominican Republic	99.5	(2.1)	0.0	c	83.1	(6.7)	0.0	c	2.2	(1.3)	1.8	(1.0)
	FYROM	67.3	(7.8)	0.1	(0.3)	83.4	(8.3)	0.0	c	1.7	(0.5)	**1.9**	(0.4)
	Georgia	49.3	(5.9)	0.3	(0.7)	m	m	m	m	1.0	(0.2)	1.1	(0.3)
	Hong Kong (China)	10.9	(1.8)	6.5	(1.0)	11.5	(1.4)	5.6	(1.1)	**1.4**	(0.2)	1.1	(0.2)
	Indonesia	m	m	m	m	m	m	m	m	m	m	m	m
	Jordan	45.7	(3.4)	0.1	(0.2)	48.3	(5.1)	0.4	(0.5)	0.9	(0.1)	1.0	(0.1)
	Kosovo	87.4	(6.1)	0.0	c	70.8	(13.8)	0.0	c	2.1	(1.1)	2.2	(1.2)
	Lebanon	80.9	(6.6)	0.1	(0.3)	57.5	(8.1)	0.0	c	1.4	(0.3)	1.5	(0.3)
	Lithuania	24.7	(4.7)	2.6	(2.3)	38.4	(13.7)	0.6	(2.2)	1.2	(0.3)	1.3	(0.3)
	Macao (China)	6.5	(0.6)	10.2	(0.9)	6.2	(1.0)	10.2	(1.2)	**0.6**	(0.1)	**0.5**	(0.1)
	Malta	32.7	(6.4)	10.8	(5.2)	20.9	(4.0)	16.6	(3.3)	0.7	(0.1)	1.0	(0.2)
	Moldova	39.9	(8.9)	1.8	(2.7)	m	m	m	m	1.0	(0.3)	1.1	(0.4)
	Montenegro	46.0	(3.9)	0.7	(0.9)	45.0	(5.0)	0.6	(1.0)	0.8	(0.1)	0.9	(0.1)
	Peru	m	m	m	m	m	m	m	m	2.1	(1.2)	**2.7**	(1.1)
	Qatar	43.4	(1.3)	1.1	(0.3)	27.2	(0.7)	3.8	(0.4)	**0.2**	(0.0)	**0.2**	(0.0)
	Romania	m	m	m	m	m	m	m	m	1.3	(0.7)	1.5	(1.2)
	Russia	18.8	(3.5)	4.2	(1.9)	22.8	(5.1)	3.1	(1.8)	1.2	(0.2)	1.2	(0.2)
	Singapore	4.7	(1.3)	36.4	(3.0)	6.3	(1.1)	28.7	(2.3)	**0.5**	(0.1)	0.8	(0.1)
	Chinese Taipei	m	m	m	m	m	m	m	m	0.4	(0.5)	0.4	(0.4)
	Thailand	53.1	(10.5)	0.3	(1.2)	m	m	m	m	1.3	(0.5)	0.9	(0.4)
	Trinidad and Tobago	65.3	(7.3)	0.1	(0.6)	44.3	(9.9)	1.5	(2.0)	**1.8**	(0.4)	**1.8**	(0.5)
	Tunisia	92.5	(4.5)	0.0	c	m	m	m	m	**3.7**	(1.9)	**4.8**	(1.8)
	United Arab Emirates	30.5	(1.6)	3.5	(0.5)	24.0	(1.5)	5.8	(0.5)	**0.3**	(0.0)	**0.2**	(0.0)
	Uruguay	m	m	m	m	m	m	m	m	1.3	(0.6)	1.8	(1.2)
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	42.0	(5.1)	0.5	(0.6)	50.0	(6.9)	0.1	(0.3)	1.2	(0.2)	1.0	(0.2)
	Kazakhstan**	24.4	(3.0)	1.1	(0.7)	30.7	(4.6)	1.4	(1.4)	0.9	(0.1)	0.9	(0.1)
	Malaysia**	46.5	(8.4)	0.1	(0.6)	m	m	m	m	1.5	(0.5)	1.2	(0.4)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/1]

Table I.7.6 **Percentage of resilient students, by immigrant background**

		Percentage of immigrant students in PISA 2015		Percentage of resilient students among disadvantaged students[1]							
				All students		Non-immigrant students		Immigrant students		Difference between non-immigrant and immigrant students	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	% dif.	S.E.
OECD	Australia	25.0	(0.7)	32.9	(1.2)	33.4	(1.4)	34.0	(2.3)	-0.6	(2.6)
	Austria	20.3	(1.1)	25.9	(1.6)	31.3	(2.0)	17.5	(2.4)	**13.8**	(3.1)
	Belgium	17.7	(0.9)	27.2	(1.4)	31.1	(1.6)	18.7	(2.3)	**12.5**	(2.6)
	Canada	30.1	(1.3)	38.7	(1.4)	38.3	(1.6)	42.1	(2.4)	-3.9	(2.7)
	Chile	2.1	(0.5)	14.6	(1.2)	15.3	(1.2)	3.5	(3.1)	**11.7**	(3.6)
	Czech Republic	3.4	(0.3)	24.9	(1.7)	25.0	(1.8)	29.2	(6.5)	-4.2	(6.6)
	Denmark	10.7	(0.6)	27.5	(1.6)	30.3	(1.9)	16.7	(1.9)	**13.6**	(2.7)
	Estonia	10.0	(0.5)	48.3	(1.8)	48.9	(2.0)	46.4	(4.8)	2.5	(5.5)
	Finland	4.0	(0.4)	42.8	(1.9)	44.9	(1.9)	18.4	(4.4)	**26.5**	(4.4)
	France	13.2	(1.0)	26.6	(1.3)	27.6	(1.8)	25.7	(2.9)	1.9	(3.8)
	Germany	16.9	(0.9)	33.5	(1.8)	36.7	(1.9)	25.4	(3.0)	**11.3**	(3.2)
	Greece	10.8	(0.7)	18.1	(1.6)	19.3	(1.8)	15.1	(2.7)	4.2	(3.1)
	Hungary	2.7	(0.2)	19.3	(1.5)	19.2	(1.5)	m	m	m	m
	Iceland	4.1	(0.3)	17.0	(1.5)	18.0	(1.6)	9.6	(4.0)	8.4	(4.4)
	Ireland	14.4	(1.0)	29.6	(1.8)	28.9	(2.1)	37.4	(4.3)	-8.5	(4.9)
	Israel	17.5	(1.0)	15.7	(1.3)	14.6	(1.4)	20.2	(2.7)	-5.6	(2.9)
	Italy	8.0	(0.5)	26.6	(1.7)	27.0	(1.8)	23.7	(4.0)	3.3	(4.2)
	Japan	0.5	(0.1)	48.8	(1.9)	49.2	(1.9)	m	m	m	m
	Korea	0.1	(0.0)	40.4	(1.9)	40.5	(1.9)	m	m	m	m
	Latvia	5.0	(0.4)	35.2	(1.7)	35.8	(1.8)	23.9	(7.6)	11.9	(7.8)
	Luxembourg	52.0	(0.6)	20.7	(1.4)	22.8	(2.7)	20.4	(1.5)	2.5	(2.9)
	Mexico	1.2	(0.1)	12.8	(1.2)	13.3	(1.3)	1.6	(3.1)	**11.7**	(3.4)
	Netherlands	10.7	(0.9)	30.7	(1.7)	31.9	(1.9)	27.6	(4.7)	4.3	(5.3)
	New Zealand	27.1	(1.2)	30.4	(1.9)	31.9	(2.3)	27.8	(3.1)	4.1	(3.8)
	Norway	12.0	(1.0)	26.5	(1.4)	29.2	(1.7)	19.1	(3.0)	**10.0**	(3.5)
	Poland	0.3	(0.1)	34.6	(1.9)	35.0	(1.9)	m	m	m	m
	Portugal	7.3	(0.4)	38.1	(1.9)	39.0	(1.9)	27.4	(5.7)	**11.6**	(5.7)
	Slovak Republic	1.2	(0.2)	17.5	(1.4)	18.2	(1.4)	m	m	m	m
	Slovenia	7.8	(0.5)	34.6	(1.5)	36.6	(1.7)	26.1	(3.9)	**10.5**	(4.2)
	Spain	11.0	(0.8)	39.2	(1.4)	42.0	(1.6)	27.4	(4.2)	**14.6**	(4.6)
	Sweden	17.4	(1.2)	24.7	(1.5)	27.9	(1.7)	17.8	(2.8)	**10.1**	(3.2)
	Switzerland	31.1	(1.2)	29.1	(1.8)	37.6	(2.5)	23.2	(2.4)	**14.5**	(3.3)
	Turkey	0.8	(0.2)	21.8	(2.5)	22.3	(2.5)	m	m	m	m
	United Kingdom	16.7	(1.0)	35.4	(1.5)	36.8	(1.6)	33.7	(3.7)	3.1	(4.1)
	United States	23.1	(1.5)	31.6	(1.9)	28.9	(2.3)	35.2	(2.7)	-6.3	(3.3)
	OECD average	12.5	(0.1)	29.2	(0.3)	30.5	(0.3)	24.0	(0.7)	**6.5**	(0.8)
Partners	Albania	0.6	(0.1)	m	m	m	m	m	m	m	m
	Algeria	1.0	(0.2)	7.4	(1.1)	7.5	(1.1)	m	m	m	m
	Brazil	0.8	(0.1)	9.4	(0.7)	9.8	(0.7)	0.2	(0.5)	**9.6**	(0.8)
	B-S-J-G (China)	0.3	(0.1)	45.3	(2.5)	46.4	(2.6)	m	m	m	m
	Bulgaria	1.0	(0.1)	13.6	(1.5)	14.1	(1.5)	m	m	m	m
	CABA (Argentina)	17.0	(2.0)	14.9	(1.9)	15.4	(3.1)	14.5	(3.2)	0.8	(5.0)
	Colombia	0.6	(0.1)	11.4	(1.0)	11.5	(1.0)	m	m	m	m
	Costa Rica	8.0	(0.6)	9.4	(1.0)	9.6	(1.1)	8.9	(2.7)	0.6	(2.9)
	Croatia	10.8	(0.6)	24.4	(1.7)	25.8	(1.8)	18.7	(3.3)	**7.1**	(3.3)
	Cyprus*	11.3	(0.4)	10.1	(1.1)	10.4	(1.2)	9.6	(3.0)	0.8	(3.2)
	Dominican Republic	1.8	(0.3)	0.4	(0.2)	0.4	(0.3)	m	m	m	m
	FYROM	2.0	(0.2)	4.1	(0.7)	4.3	(0.7)	m	m	m	m
	Georgia	2.2	(0.3)	7.5	(1.2)	7.6	(1.2)	m	m	m	m
	Hong Kong (China)	35.1	(1.3)	61.8	(1.8)	60.5	(2.6)	64.0	(2.4)	-3.5	(3.4)
	Indonesia	0.1	(0.1)	10.9	(1.3)	11.1	(1.4)	m	m	m	m
	Jordan	12.1	(0.7)	7.7	(0.9)	8.0	(1.0)	7.3	(2.2)	0.7	(2.4)
	Kosovo	1.5	(0.2)	2.5	(0.8)	2.5	(0.8)	m	m	m	m
	Lebanon	3.4	(0.4)	6.1	(1.2)	6.6	(1.3)	m	m	m	m
	Lithuania	1.8	(0.2)	23.1	(1.5)	23.4	(1.5)	18.6	(8.9)	4.8	(9.1)
	Macao (China)	62.2	(0.7)	64.6	(1.4)	55.9	(2.9)	68.5	(1.8)	**-12.6**	(3.6)
	Malta	5.0	(0.4)	21.8	(1.6)	22.8	(1.7)	m	m	m	m
	Moldova	1.4	(0.2)	13.4	(1.3)	13.7	(1.3)	m	m	m	m
	Montenegro	5.6	(0.3)	9.4	(0.9)	9.7	(0.9)	7.0	(4.0)	2.7	(4.1)
	Peru	0.5	(0.1)	3.2	(0.5)	3.2	(0.5)	m	m	m	m
	Qatar	55.2	(0.4)	5.7	(0.5)	1.6	(0.4)	10.4	(0.9)	**-8.8**	(1.0)
	Romania	0.4	(0.1)	11.3	(1.4)	11.1	(1.4)	m	m	m	m
	Russia	6.9	(0.5)	25.5	(2.0)	26.0	(2.1)	22.5	(5.2)	3.5	(5.5)
	Singapore	20.9	(1.0)	48.8	(1.5)	47.7	(1.6)	59.8	(4.9)	**-12.2**	(5.2)
	Chinese Taipei	0.3	(0.1)	46.3	(1.8)	46.6	(1.7)	m	m	m	m
	Thailand	0.8	(0.3)	18.4	(1.6)	18.4	(1.6)	m	m	m	m
	Trinidad and Tobago	3.5	(0.4)	12.9	(1.2)	13.5	(1.2)	10.3	(6.4)	3.2	(6.4)
	Tunisia	1.5	(0.2)	4.7	(0.8)	4.9	(0.8)	m	m	m	m
	United Arab Emirates	57.6	(0.9)	7.7	(0.7)	3.4	(0.7)	12.6	(1.3)	**-9.2**	(1.5)
	Uruguay	0.6	(0.1)	14.0	(1.1)	14.3	(1.1)	m	m	m	m
	Viet Nam	0.1	(0.0)	75.5	(2.7)	76.0	(2.7)	m	m	m	m
	Argentina**	4.4	(0.4)	16.4	(1.5)	16.5	(1.5)	17.8	(4.6)	-1.3	(4.8)
	Kazakhstan**	13.0	(1.0)	16.6	(1.8)	16.4	(1.9)	16.9	(3.9)	-0.5	(4.1)
	Malaysia**	0.9	(0.2)	15.5	(1.5)	15.8	(1.6)	26.0	(9.4)	-10.3	(9.5)

1. A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country/economy of assessment and performs in the top quarter of students among all countries/economies, after accounting for socio-economic status.
Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/1]

Table I.7.7 Students' expectations of pursuing a science-related career, by immigrant background

				Expectation of pursuing a science-related career					
	Percentage of immigrant students in PISA 2015		Non-immigrant students		Immigrant students		Immigrant students' likelihood of expecting a career in science (relative to non-immigrant students), after accounting for science performance		
	%	S.E.	%	S.E.	%	S.E.	Odds ratio	S.E.
OECD								
Australia	25.0	(0.7)	27.5	(0.6)	37.6	(1.3)	**1.6**	(0.1)
Austria	20.3	(1.1)	21.9	(1.2)	24.9	(1.6)	**1.7**	(0.2)
Belgium	17.7	(0.9)	24.2	(1.2)	27.4	(2.1)	**1.7**	(0.2)
Canada	30.1	(1.3)	30.5	(0.7)	45.5	(1.1)	**1.9**	(0.1)
Chile	2.1	(0.5)	38.3	(0.8)	41.0	(5.4)	1.3	(0.3)
Czech Republic	3.4	(0.3)	17.2	(0.7)	14.2	(3.0)	0.9	(0.2)
Denmark	10.7	(0.6)	14.2	(0.6)	21.4	(1.5)	**2.2**	(0.2)
Estonia	10.0	(0.5)	24.9	(0.6)	26.7	(2.3)	**1.3**	(0.2)
Finland	4.0	(0.4)	17.0	(0.6)	20.7	(3.4)	**2.3**	(0.6)
France	13.2	(1.0)	21.4	(0.7)	23.9	(1.8)	**2.0**	(0.2)
Germany	16.9	(0.9)	17.1	(0.6)	17.7	(1.2)	**1.7**	(0.1)
Greece	10.8	(0.7)	26.2	(0.8)	20.9	(1.9)	1.0	(0.1)
Hungary	2.7	(0.2)	18.5	(0.9)	21.5	(3.6)	1.1	(0.2)
Iceland	4.1	(0.3)	24.7	(0.8)	15.6	(3.2)	0.8	(0.2)
Ireland	14.4	(1.0)	26.1	(0.7)	38.2	(2.1)	**1.8**	(0.2)
Israel	17.5	(1.0)	29.0	(0.8)	24.2	(1.8)	**0.8**	(0.1)
Italy	8.0	(0.5)	23.3	(1.0)	21.8	(2.6)	1.1	(0.2)
Japan	0.5	(0.1)	18.1	(0.7)	11.0	(5.5)	0.8	(0.4)
Korea	0.1	(0.0)	19.4	(0.7)	m	m	c	c
Latvia	5.0	(0.4)	21.3	(0.7)	24.7	(3.2)	1.3	(0.2)
Luxembourg	52.0	(0.6)	22.4	(0.8)	20.3	(0.8)	1.1	(0.1)
Mexico	1.2	(0.1)	41.0	(0.8)	47.3	(6.5)	**1.7**	(0.4)
Netherlands	10.7	(0.9)	15.8	(0.6)	23.0	(2.4)	**2.4**	(0.4)
New Zealand	27.1	(1.2)	22.8	(0.9)	32.1	(1.6)	**1.7**	(0.1)
Norway	12.0	(1.0)	28.3	(0.8)	37.4	(2.2)	**1.9**	(0.2)
Poland	0.3	(0.1)	21.1	(0.8)	m	m	c	c
Portugal	7.3	(0.4)	27.9	(0.8)	26.9	(2.4)	1.1	(0.1)
Slovak Republic	1.2	(0.2)	19.2	(0.8)	10.1	(4.0)	0.7	(0.4)
Slovenia	7.8	(0.5)	31.5	(0.7)	26.5	(2.5)	1.0	(0.1)
Spain	11.0	(0.8)	28.6	(0.7)	31.8	(2.1)	**1.6**	(0.2)
Sweden	17.4	(1.2)	19.0	(0.6)	28.4	(2.0)	**2.7**	(0.3)
Switzerland	31.1	(1.2)	19.8	(0.8)	19.6	(1.2)	**1.4**	(0.1)
Turkey	0.8	(0.2)	30.0	(1.4)	34.9	(8.5)	1.4	(0.5)
United Kingdom	16.7	(1.0)	27.5	(0.7)	41.1	(2.1)	**2.1**	(0.2)
United States	23.1	(1.5)	37.4	(0.9)	42.0	(1.4)	**1.4**	(0.1)
OECD average	12.5	(0.1)	24.4	(0.1)	27.3	(0.5)	**1.5**	(0.0)
Partners								
Albania	0.6	(0.1)	25.6	(0.7)	18.8	(8.2)	m	m
Algeria	1.0	(0.2)	26.2	(0.8)	29.9	(6.4)	1.4	(0.4)
Brazil	0.8	(0.1)	41.6	(0.6)	21.8	(4.0)	**0.5**	(0.1)
B-S-J-G (China)	0.3	(0.1)	17.1	(0.7)	9.3	(6.8)	1.0	(0.9)
Bulgaria	1.0	(0.1)	28.6	(1.4)	13.2	(4.0)	0.5	(0.2)
CABA (Argentina)	17.0	(2.0)	27.2	(1.3)	35.6	(3.2)	**1.8**	(0.3)
Colombia	0.6	(0.1)	40.5	(0.8)	40.1	(7.5)	1.1	(0.3)
Costa Rica	8.0	(0.6)	45.5	(0.9)	42.9	(3.0)	0.9	(0.1)
Croatia	10.8	(0.6)	25.0	(1.2)	22.1	(2.2)	1.0	(0.1)
Cyprus*	11.3	(0.4)	31.0	(0.7)	27.4	(1.9)	0.8	(0.1)
Dominican Republic	1.8	(0.3)	46.4	(1.0)	47.4	(5.7)	1.1	(0.3)
FYROM	2.0	(0.2)	24.8	(0.6)	17.9	(4.2)	0.7	(0.2)
Georgia	2.2	(0.3)	17.5	(0.6)	14.3	(4.3)	0.8	(0.3)
Hong Kong (China)	35.1	(1.3)	25.5	(0.8)	21.7	(1.2)	0.9	(0.1)
Indonesia	0.1	(0.1)	15.4	(0.7)	m	m	c	c
Jordan	12.1	(0.7)	44.7	(1.3)	47.2	(2.1)	1.1	(0.1)
Kosovo	1.5	(0.2)	26.9	(0.7)	13.5	(3.7)	0.5	(0.2)
Lebanon	3.4	(0.4)	40.7	(1.1)	39.5	(4.0)	1.1	(0.2)
Lithuania	1.8	(0.2)	24.6	(0.7)	23.6	(3.5)	1.0	(0.2)
Macao (China)	62.2	(0.7)	21.3	(1.1)	20.7	(0.7)	0.9	(0.1)
Malta	5.0	(0.4)	25.7	(0.7)	27.0	(3.8)	0.8	(0.2)
Moldova	1.4	(0.2)	22.3	(0.8)	20.5	(5.2)	0.9	(0.3)
Montenegro	5.6	(0.3)	21.8	(0.5)	18.6	(2.5)	0.8	(0.1)
Peru	0.5	(0.1)	38.9	(0.8)	23.7	(7.4)	0.5	(0.2)
Qatar	55.2	(0.4)	26.1	(0.7)	49.5	(0.7)	**2.0**	(0.1)
Romania	0.4	(0.1)	23.1	(1.0)	m	m	c	c
Russia	6.9	(0.5)	24.4	(0.7)	27.1	(3.0)	1.2	(0.2)
Singapore	20.9	(1.0)	27.3	(0.7)	31.5	(1.3)	**1.1**	(0.1)
Chinese Taipei	0.3	(0.1)	20.9	(0.8)	m	m	c	c
Thailand	0.8	(0.3)	20.4	(0.7)	11.8	(5.3)	0.5	(0.3)
Trinidad and Tobago	3.5	(0.4)	28.9	(0.7)	28.6	(4.4)	1.2	(0.3)
Tunisia	1.5	(0.2)	36.6	(0.9)	20.4	(4.8)	0.6	(0.2)
United Arab Emirates	57.6	(0.9)	35.7	(0.8)	47.5	(0.7)	**1.2**	(0.1)
Uruguay	0.6	(0.1)	28.7	(0.7)	25.0	(6.8)	0.8	(0.3)
Viet Nam	0.1	(0.0)	19.7	(0.8)	m	m	c	c
Argentina**	4.4	(0.4)	23.4	(0.9)	33.4	(2.7)	**1.8**	(0.2)
Kazakhstan**	13.0	(1.0)	29.1	(1.1)	27.4	(1.9)	0.9	(0.1)
Malaysia**	0.9	(0.2)	29.5	(0.9)	28.1	(7.6)	1.0	(0.4)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/2]

Table I.7.8a Differences in science performance, by language spoken at home and immigrant background

Results based on students' self-reports

		Percentage of immigrant students in PISA 2015		Science performance											
				Students who speak mainly the test language at home						Students who speak mainly another language at home					
				All		Non-immigrant students		Immigrant students		All		Non-immigrant students		Immigrant students	
		%	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.
OECD	Australia	25.0	(0.7)	515	(1.5)	515	(1.5)	522	(3.5)	487	(5.0)	423	(7.7)	502	(5.6)
	Austria	20.3	(1.1)	510	(2.3)	513	(2.4)	474	(6.2)	431	(4.5)	450	(6.7)	428	(5.1)
	Belgium	17.7	(0.9)	514	(2.0)	520	(2.0)	472	(6.0)	445	(6.1)	470	(9.0)	431	(5.3)
	Canada	30.1	(1.3)	530	(2.1)	531	(2.2)	535	(3.4)	522	(3.2)	504	(5.9)	528	(3.6)
	Chile	2.1	(0.5)	448	(2.4)	449	(2.4)	418	(14.0)	416	(12.9)	420	(13.5)	c	c
	Czech Republic	3.4	(0.3)	495	(2.1)	496	(2.0)	444	(17.2)	451	(7.5)	437	(9.2)	473	(11.1)
	Denmark	10.7	(0.6)	508	(2.4)	512	(2.5)	448	(5.5)	442	(5.4)	464	(10.2)	435	(5.7)
	Estonia	10.0	(0.5)	537	(2.1)	541	(2.2)	510	(4.3)	493	(7.6)	497	(9.1)	488	(13.0)
	Finland	4.0	(0.4)	535	(2.2)	536	(2.2)	476	(15.1)	469	(8.4)	501	(11.3)	445	(9.3)
	France	13.2	(1.0)	503	(1.9)	509	(2.1)	450	(7.3)	430	(7.2)	429	(10.7)	435	(8.8)
	Germany	16.9	(0.9)	524	(2.6)	530	(2.6)	475	(6.0)	437	(6.6)	444	(8.8)	438	(7.8)
	Greece	10.8	(0.7)	459	(3.9)	462	(3.8)	426	(7.0)	402	(7.5)	418	(20.0)	400	(7.9)
	Hungary	2.7	(0.2)	478	(2.5)	478	(2.5)	501	(11.7)	450	(12.2)	446	(13.9)	465	(21.4)
	Iceland	4.1	(0.3)	477	(1.7)	478	(1.7)	c	c	419	(7.5)	464	(12.7)	392	(8.0)
	Ireland	14.4	(1.0)	504	(2.5)	505	(2.5)	508	(5.3)	491	(5.2)	c	c	493	(5.2)
	Israel	17.5	(1.0)	472	(3.5)	475	(3.5)	462	(7.1)	438	(6.7)	426	(6.5)	452	(9.7)
	Italy	8.0	(0.5)	487	(2.6)	489	(2.7)	463	(6.6)	452	(3.8)	457	(4.4)	445	(5.3)
	Japan	0.5	(0.1)	539	(2.9)	539	(2.8)	c	c	458	(33.0)	c	c	c	c
	Korea	0.1	(0.0)	516	(3.1)	517	(3.2)	c	c	c	c	c	c	c	c
	Latvia	5.0	(0.4)	495	(1.6)	496	(1.6)	492	(7.1)	452	(5.3)	454	(5.9)	441	(14.0)
	Luxembourg	52.0	(0.6)	529	(3.6)	513	(7.9)	536	(4.1)	474	(1.3)	505	(1.7)	443	(1.9)
	Mexico	1.2	(0.1)	418	(2.1)	420	(2.1)	346	(9.2)	354	(7.2)	357	(7.2)	c	c
	Netherlands	10.7	(0.9)	514	(2.2)	518	(2.4)	466	(8.4)	451	(8.4)	470	(12.9)	449	(10.2)
	New Zealand	27.1	(1.2)	518	(2.5)	521	(2.5)	521	(5.9)	488	(5.4)	435	(9.9)	501	(6.4)
	Norway	12.0	(1.0)	505	(2.2)	508	(2.3)	463	(6.0)	449	(5.8)	464	(15.1)	449	(5.9)
	Poland	0.3	(0.1)	502	(2.5)	503	(2.5)	c	c	458	(16.3)	451	(16.8)	c	c
	Portugal	7.3	(0.4)	503	(2.5)	504	(2.5)	492	(7.3)	465	(9.9)	457	(14.5)	474	(12.0)
	Slovak Republic	1.2	(0.2)	471	(2.3)	474	(2.3)	392	(19.2)	366	(6.9)	369	(7.4)	398	(18.8)
	Slovenia	7.8	(0.5)	520	(1.3)	521	(1.3)	474	(10.8)	438	(5.7)	446	(11.8)	439	(6.8)
	Spain	11.0	(0.8)	496	(2.1)	499	(2.1)	466	(5.2)	479	(4.5)	497	(4.2)	449	(6.2)
	Sweden	17.4	(1.2)	504	(3.3)	509	(3.2)	450	(7.9)	444	(8.2)	488	(15.9)	432	(7.4)
	Switzerland	31.1	(1.2)	526	(2.6)	532	(2.6)	498	(5.2)	450	(4.3)	475	(7.1)	446	(4.7)
	Turkey	0.8	(0.2)	429	(3.9)	431	(3.9)	420	(20.3)	377	(7.2)	377	(7.2)	c	c
	United Kingdom	16.7	(1.0)	512	(2.4)	517	(2.4)	493	(6.2)	485	(7.5)	465	(11.3)	494	(8.6)
	United States	23.1	(1.5)	506	(3.2)	508	(3.3)	491	(5.9)	459	(5.1)	442	(9.8)	465	(5.6)
	OECD average	12.5	(0.1)	500	(0.4)	502	(0.5)	470	(1.7)	448	(1.6)	450	(1.9)	453	(1.7)
Partners	Albania	0.6	(0.1)	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	1.0	(0.2)	374	(2.6)	375	(2.7)	347	(14.5)	390	(7.4)	392	(7.6)	c	c
	Brazil	0.8	(0.1)	402	(2.3)	405	(2.3)	327	(9.8)	378	(9.4)	383	(10.4)	c	c
	B-S-J-G (China)	0.3	(0.1)	519	(4.7)	522	(4.6)	c	c	452	(10.1)	461	(10.4)	c	c
	Bulgaria	1.0	(0.1)	454	(4.2)	457	(4.1)	c	c	375	(6.4)	378	(6.6)	386	(21.5)
	CABA (Argentina)	17.0	(2.0)	477	(6.5)	485	(6.4)	428	(7.6)	427	(18.3)	c	c	400	(15.6)
	Colombia	0.6	(0.1)	416	(2.4)	418	(2.3)	358	(14.4)	393	(14.4)	391	(15.4)	c	c
	Costa Rica	8.0	(0.6)	420	(2.1)	422	(2.1)	400	(4.7)	411	(11.2)	413	(11.7)	c	c
	Croatia	10.8	(0.6)	477	(2.5)	480	(2.4)	455	(4.9)	436	(8.7)	443	(10.4)	438	(14.7)
	Cyprus*	11.3	(0.4)	428	(1.4)	428	(1.4)	441	(6.2)	455	(3.3)	468	(3.6)	427	(5.8)
	Dominican Republic	1.8	(0.3)	333	(2.7)	336	(2.7)	301	(14.4)	318	(7.2)	330	(8.2)	c	c
	FYROM	2.0	(0.2)	387	(1.3)	390	(1.3)	351	(10.1)	343	(6.1)	344	(6.5)	c	c
	Georgia	2.2	(0.3)	416	(2.6)	418	(2.5)	419	(11.3)	369	(9.5)	372	(9.5)	c	c
	Hong Kong (China)	35.1	(1.3)	527	(2.4)	530	(2.7)	524	(3.3)	441	(9.6)	477	(12.2)	423	(10.4)
	Indonesia	0.1	(0.1)	405	(3.6)	407	(3.7)	c	c	403	(3.0)	404	(3.0)	c	c
	Jordan	12.1	(0.7)	412	(2.6)	413	(2.6)	421	(4.7)	387	(6.9)	399	(7.7)	373	(12.3)
	Kosovo	1.5	(0.2)	379	(1.7)	380	(1.7)	352	(10.7)	366	(12.5)	373	(14.1)	c	c
	Lebanon	3.4	(0.4)	404	(17.6)	423	(20.3)	c	c	390	(3.5)	395	(3.7)	376	(10.8)
	Lithuania	1.8	(0.2)	479	(2.6)	480	(2.5)	479	(8.7)	422	(7.3)	423	(7.2)	443	(20.3)
	Macao (China)	62.2	(0.7)	534	(1.1)	523	(2.1)	541	(1.6)	502	(2.6)	504	(4.1)	501	(3.7)
	Malta	5.0	(0.4)	528	(5.9)	532	(6.1)	527	(16.0)	457	(1.9)	460	(2.0)	487	(11.8)
	Moldova	1.4	(0.2)	430	(2.2)	431	(2.3)	441	(12.4)	427	(4.0)	428	(4.1)	c	c
	Montenegro	5.6	(0.3)	413	(1.1)	413	(1.0)	425	(5.8)	388	(7.2)	388	(8.4)	412	(16.1)
	Peru	0.5	(0.1)	402	(2.4)	403	(2.4)	c	c	335	(4.2)	337	(4.0)	c	c
	Qatar	55.2	(0.4)	406	(1.3)	373	(1.6)	449	(1.8)	443	(1.6)	389	(2.6)	468	(1.9)
	Romania	0.4	(0.1)	435	(3.2)	435	(3.2)	c	c	426	(8.7)	425	(8.6)	c	c
	Russia	6.9	(0.5)	490	(3.0)	491	(3.1)	487	(6.2)	456	(8.8)	461	(10.2)	440	(12.0)
	Singapore	20.9	(1.0)	578	(1.7)	576	(1.7)	593	(5.4)	533	(2.1)	518	(2.3)	572	(5.2)
	Chinese Taipei	0.3	(0.1)	532	(2.7)	533	(2.7)	c	c	522	(15.8)	525	(16.1)	c	c
	Thailand	0.8	(0.3)	423	(2.8)	425	(2.8)	401	(14.5)	385	(12.3)	381	(13.2)	c	c
	Trinidad and Tobago	3.5	(0.4)	428	(1.5)	433	(1.6)	408	(11.4)	388	(9.1)	395	(10.5)	c	c
	Tunisia	1.5	(0.2)	388	(2.2)	391	(2.1)	340	(13.6)	374	(4.8)	382	(5.0)	c	c
	United Arab Emirates	57.6	(0.9)	424	(2.4)	391	(2.6)	468	(3.1)	460	(4.1)	406	(6.0)	480	(4.3)
	Uruguay	0.6	(0.1)	437	(2.2)	439	(2.2)	c	c	395	(6.4)	397	(6.0)	c	c
	Viet Nam	0.1	(0.0)	527	(4.0)	527	(4.0)	c	c	494	(8.8)	494	(8.8)	c	c
	Argentina**	4.4	(0.4)	433	(2.9)	434	(2.9)	421	(6.4)	400	(11.1)	403	(14.9)	404	(15.8)
	Kazakhstan**	13.0	(1.0)	457	(3.7)	457	(3.9)	455	(5.1)	456	(6.8)	458	(7.1)	445	(11.6)
	Malaysia**	0.9	(0.2)	447	(2.9)	448	(2.9)	427	(15.4)	435	(5.8)	439	(5.7)	c	c

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 2/2]

Table I.7.8a Differences in science performance, by language spoken at home and immigrant background

Results based on students' self-reports

		Differences in science performance									
		Between students who speak mainly the test language at home and students who speak mainly another language at home		Between non-immigrant and immigrant students who speak mainly the test language at home		Between non-immigrant and immigrant students who speak mainly another language at home		Between immigrant students who speak mainly the test language at home and immigrant students who speak mainly another language at home		Between non-immigrant students who speak the test language at home and immigrant students who speak mainly another language at home	
		Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	**28**	(5.0)	**-7**	(3.5)	**-79**	(9.9)	**20**	(5.6)	**13**	(5.8)
	Austria	**79**	(4.9)	**39**	(6.8)	**22**	(7.9)	**46**	(7.1)	**85**	(5.7)
	Belgium	**69**	(5.9)	**48**	(5.9)	**39**	(8.3)	**41**	(6.0)	**89**	(5.2)
	Canada	**9**	(2.8)	-3	(3.4)	**-24**	(6.5)	6	(3.3)	3	(3.5)
	Chile	**31**	(12.5)	**32**	(13.9)	m	m	m	m	m	m
	Czech Republic	**44**	(7.1)	**52**	(16.8)	**-36**	(14.3)	-29	(18.9)	**24**	(10.9)
	Denmark	**66**	(5.4)	**64**	(5.9)	**29**	(10.7)	13	(7.5)	**77**	(6.2)
	Estonia	**44**	(7.7)	**31**	(4.5)	9	(15.6)	22	(14.1)	**53**	(13.2)
	Finland	**66**	(7.8)	**60**	(15.3)	**56**	(14.1)	32	(16.6)	**91**	(8.9)
	France	**73**	(7.4)	**58**	(8.2)	-5	(13.6)	16	(8.3)	**74**	(9.2)
	Germany	**88**	(6.4)	**54**	(6.1)	6	(10.4)	**37**	(7.6)	**92**	(7.9)
	Greece	**57**	(7.0)	**36**	(6.4)	18	(22.2)	**26**	(10.3)	**63**	(8.4)
	Hungary	**27**	(12.4)	**-23**	(11.6)	-20	(25.1)	35	(24.6)	12	(21.2)
	Iceland	**59**	(7.4)	m	m	**71**	(14.7)	m	m	**86**	(8.0)
	Ireland	**13**	(5.3)	-3	(5.6)	m	m	**15**	(6.8)	**12**	(5.5)
	Israel	**34**	(6.5)	**14**	(6.6)	**-26**	(11.5)	10	(8.9)	**24**	(9.7)
	Italy	**35**	(4.0)	**26**	(7.0)	**12**	(6.1)	**19**	(8.8)	**44**	(5.2)
	Japan	**81**	(32.4)	m	m	m	m	m	m	m	m
	Korea	m	m	m	m	m	m	m	m	m	m
	Latvia	**43**	(5.6)	4	(7.4)	13	(15.5)	**50**	(16.0)	**54**	(14.1)
	Luxembourg	**54**	(4.1)	**-23**	(8.8)	**62**	(2.4)	**93**	(4.8)	**70**	(8.3)
	Mexico	**64**	(7.4)	**73**	(9.5)	m	m	m	m	m	m
	Netherlands	**63**	(8.5)	**52**	(9.1)	21	(15.5)	17	(9.1)	**69**	(10.7)
	New Zealand	**30**	(5.8)	0	(5.8)	**-66**	(12.5)	**20**	(8.0)	**19**	(7.1)
	Norway	**56**	(6.0)	**45**	(6.1)	15	(15.8)	14	(8.5)	**59**	(6.1)
	Poland	**44**	(16.0)	m	m	m	m	m	m	m	m
	Portugal	**38**	(10.2)	12	(6.8)	-17	(16.4)	18	(15.1)	**30**	(12.4)
	Slovak Republic	**106**	(6.6)	**81**	(19.0)	-29	(20.3)	-6	(26.0)	**75**	(19.1)
	Slovenia	**81**	(5.9)	**47**	(11.0)	7	(13.4)	**35**	(12.9)	**82**	(7.0)
	Spain	**17**	(4.6)	**34**	(5.1)	**48**	(7.3)	**17**	(7.3)	**51**	(6.3)
	Sweden	**60**	(7.9)	**59**	(7.5)	**56**	(15.5)	**18**	(7.7)	**76**	(7.3)
	Switzerland	**76**	(4.3)	**34**	(5.3)	**29**	(7.9)	**52**	(6.2)	**86**	(4.8)
	Turkey	**53**	(7.5)	10	(20.0)	m	m	m	m	m	m
	United Kingdom	**27**	(7.0)	**24**	(6.1)	**-28**	(14.4)	-1	(8.6)	**23**	(8.3)
	United States	**47**	(5.4)	**17**	(5.8)	**-23**	(10.2)	**26**	(6.7)	**43**	(6.2)
	OECD average	**52**	(1.6)	**31**	(1.7)	**6**	(2.6)	**24**	(2.2)	**54**	(1.8)
Partners	Albania	m	m	m	m	m	m	m	m	m	m
	Algeria	**-15**	(7.5)	28	(14.5)	m	m	m	m	m	m
	Brazil	**24**	(9.2)	**78**	(10.0)	m	m	m	m	m	m
	B-S-J-G (China)	**67**	(11.1)	m	m	m	m	m	m	m	m
	Bulgaria	**79**	(7.0)	m	m	-7	(22.4)	m	m	**71**	(21.3)
	CABA (Argentina)	**50**	(18.7)	**57**	(7.3)	m	m	28	(17.0)	**86**	(15.5)
	Colombia	23	(14.5)	**60**	(14.0)	m	m	m	m	m	m
	Costa Rica	9	(10.9)	**22**	(4.6)	m	m	m	m	m	m
	Croatia	**41**	(8.8)	**25**	(4.6)	5	(15.8)	17	(15.1)	**42**	(15.0)
	Cyprus*	**-27**	(3.4)	**-13**	(6.3)	**40**	(6.4)	13	(8.0)	0	(5.8)
	Dominican Republic	**15**	(7.5)	**35**	(15.2)	m	m	m	m	m	m
	FYROM	**44**	(6.5)	**39**	(10.3)	m	m	m	m	m	m
	Georgia	**46**	(10.3)	-2	(11.2)	m	m	m	m	m	m
	Hong Kong (China)	**86**	(10.1)	7	(3.6)	**54**	(13.2)	**100**	(10.5)	**107**	(11.2)
	Indonesia	1	(4.1)	m	m	m	m	m	m	m	m
	Jordan	**25**	(6.4)	-8	(4.4)	27	(14.5)	**49**	(12.7)	**41**	(12.2)
	Kosovo	13	(12.7)	**28**	(10.5)	m	m	m	m	m	m
	Lebanon	13	(17.3)	m	m	19	(10.0)	m	m	**46**	(21.9)
	Lithuania	**57**	(6.5)	1	(9.1)	-20	(19.0)	36	(22.1)	38	(19.6)
	Macao (China)	**32**	(2.7)	**-18**	(3.1)	3	(5.8)	**40**	(3.9)	**22**	(4.0)
	Malta	**71**	(6.5)	6	(16.8)	**-27**	(11.8)	39	(21.4)	**45**	(12.6)
	Moldova	3	(4.7)	-10	(12.5)	m	m	m	m	m	m
	Montenegro	**25**	(7.3)	**-12**	(5.9)	-24	(18.2)	13	(16.9)	1	(16.2)
	Peru	**67**	(4.6)	m	m	m	m	m	m	m	m
	Qatar	**-38**	(1.9)	**-76**	(2.3)	**-79**	(3.0)	**-19**	(2.5)	**-95**	(2.2)
	Romania	10	(8.5)	m	m	m	m	m	m	m	m
	Russia	**34**	(9.0)	4	(6.6)	21	(17.9)	**46**	(12.4)	**50**	(11.8)
	Singapore	**45**	(2.9)	**-17**	(5.7)	**-55**	(5.6)	**20**	(7.5)	4	(5.5)
	Chinese Taipei	10	(15.9)	m	m	m	m	m	m	m	m
	Thailand	**38**	(12.1)	24	(14.3)	m	m	m	m	m	m
	Trinidad and Tobago	**40**	(9.3)	**26**	(11.6)	m	m	m	m	m	m
	Tunisia	**14**	(4.9)	**51**	(13.6)	m	m	m	m	m	m
	United Arab Emirates	**-36**	(4.1)	**-77**	(3.8)	**-74**	(6.3)	**-12**	(4.6)	**-89**	(5.0)
	Uruguay	**42**	(6.6)	m	m	m	m	m	m	m	m
	Viet Nam	**33**	(8.7)	m	m	m	m	m	m	m	m
	Argentina**	**33**	(10.8)	**12**	(6.2)	-1	(23.0)	17	(17.4)	30	(16.1)
	Kazakhstan**	0	(5.9)	1	(5.0)	13	(12.0)	10	(12.8)	11	(12.1)
	Malaysia**	**12**	(5.8)	21	(15.1)	m	m	m	m	m	m

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/1]

Table I.7.9 Concentration, in schools, of students with an immigrant background

Results based on students' self-reports

		Percentage of immigrant students in PISA 2015		Index of current concentration of immigrant students in schools[1]		Index of maximum potential concentration of immigrant students in schools[2]		Distance between maximum and current concentration (Index of maximum potential concentration – Index of current concentration)	
		%	S.E.	%	S.E.	%	S.E.	% dif.	S.E.
OECD	Australia	25.0	(0.7)	18.1	(0.5)	44.9	(1.0)	**26.7**	(1.0)
	Austria	20.3	(1.1)	15.8	(1.0)	38.6	(2.1)	**22.9**	(2.3)
	Belgium	17.7	(0.9)	15.0	(0.6)	33.4	(1.8)	**18.4**	(1.8)
	Canada	30.1	(1.3)	25.0	(0.7)	56.5	(0.5)	**31.5**	(0.9)
	Denmark	10.7	(0.6)	11.3	(0.5)	26.2	(2.3)	**14.9**	(2.5)
	Estonia	10.0	(0.5)	9.8	(0.3)	19.6	(0.2)	**9.8**	(0.3)
	France	13.2	(1.0)	11.8	(0.7)	24.4	(1.8)	**12.6**	(2.1)
	Germany	16.9	(0.9)	13.4	(0.6)	31.2	(2.0)	**17.8**	(2.1)
	Greece	10.8	(0.7)	8.7	(0.5)	23.1	(2.6)	**14.3**	(2.6)
	Ireland	14.4	(1.0)	8.7	(0.6)	27.9	(2.1)	**19.1**	(2.1)
	Israel	17.5	(1.0)	12.5	(0.7)	33.9	(1.9)	**21.4**	(2.0)
	Italy	8.0	(0.5)	6.5	(0.4)	28.2	(2.3)	**21.7**	(2.3)
	Luxembourg	52.0	(0.6)	17.4	(0.0)	49.4	(0.0)	**32.0**	(0.0)
	Netherlands	10.7	(0.9)	10.2	(0.7)	22.6	(2.1)	**12.4**	(2.2)
	New Zealand	27.1	(1.2)	16.2	(0.7)	41.1	(1.2)	**24.9**	(1.4)
	Norway	12.0	(1.0)	9.3	(0.6)	21.9	(2.0)	**12.6**	(2.3)
	Portugal	7.3	(0.4)	6.3	(0.3)	18.8	(1.9)	**12.5**	(1.9)
	Slovenia	7.8	(0.5)	7.0	(0.2)	26.0	(0.1)	**19.0**	(0.3)
	Spain	11.0	(0.8)	9.6	(0.6)	22.5	(1.8)	**12.9**	(1.9)
	Sweden	17.4	(1.2)	13.8	(0.9)	30.1	(1.9)	**16.3**	(2.2)
	Switzerland	31.1	(1.2)	15.0	(0.9)	47.8	(1.4)	**32.8**	(1.7)
	United Kingdom	16.7	(1.0)	15.7	(0.7)	49.9	(1.9)	**34.2**	(2.1)
	United States	23.1	(1.5)	18.7	(1.0)	39.6	(1.6)	**20.9**	(2.0)
	OECD average	17.9	(0.2)	12.9	(0.1)	32.9	(0.4)	**20.1**	(0.4)
Partners	CABA (Argentina)	17.0	(2.0)	15.7	(1.5)	32.8	(4.8)	**17.1**	(5.2)
	Costa Rica	8.0	(0.6)	6.9	(0.4)	19.0	(2.7)	**12.1**	(2.8)
	Croatia	10.8	(0.6)	6.8	(0.5)	21.4	(2.4)	**14.7**	(2.5)
	Cyprus*	11.3	(0.4)	9.8	(0.1)	23.6	(0.1)	**13.8**	(0.1)
	Hong Kong (China)	35.1	(1.3)	13.3	(0.8)	47.9	(0.9)	**34.6**	(1.2)
	Jordan	12.1	(0.7)	9.5	(0.5)	27.3	(2.6)	**17.8**	(2.6)
	Macao (China)	62.2	(0.7)	13.6	(0.0)	47.0	(0.0)	**33.4**	(0.0)
	Qatar	55.2	(0.4)	28.0	(0.0)	49.2	(0.0)	**21.2**	(0.0)
	Russia	6.9	(0.5)	5.1	(0.4)	18.5	(3.0)	**13.4**	(3.0)
	Singapore	20.9	(1.0)	10.4	(0.7)	37.3	(0.7)	**26.9**	(0.9)
	United Arab Emirates	57.6	(0.9)	33.3	(0.8)	45.3	(0.1)	**12.0**	(0.7)
	Kazakhstan**	13.0	(1.0)	10.4	(0.5)	29.0	(2.1)	**18.6**	(2.2)

1. The index of current concentration is the percentage of students, both immigrant and non-immigrant, that would have to be relocated across schools so that all schools within the country/economy would have an identical percentage of immigrant students.
2. The index of maximum potential concentration is the highest percentage of the student population, both immigrant and non-immigrant, that would have to be moved across schools if all immigrant students were allocated to the largest schools within the country/economy.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results include only countries and economies where the overall percentage of immigrant students is above 6.25%. The OECD average is calculated accordingly.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/1]

Table I.7.10 Performance in science of students attending schools with low and high concentrations of immigrant students, and socio-economic status

Results based on students' self-reports

		Percentage of immigrant students in PISA 2015		Cutpoint below (above) which half of the students attend schools with the smallest (largest) percentage of immigrants	Percentage of students in schools with a low concentration of immigrant students[1]	Percentage of students in schools with a high concentration of immigrant students[2]	Score-point difference in science between students attending schools with high and low concentrations of immigrant students			
							Before accounting for students' and schools' ESCS[3] and immigrant background		After accounting for students' and schools' ESCS and immigrant background	
		%	S.E.	%	%	%	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	25.0	(0.7)	16.6	50.3	49.7	**11**	(3.5)	3	(2.6)
	Austria	20.3	(1.1)	11.5	50.3	49.7	**-26**	(6.8)	-2	(4.9)
	Belgium	17.7	(0.9)	10.0	50.3	49.7	**-41**	(7.4)	**-12**	(3.9)
	Canada	30.1	(1.3)	10.7	50.3	49.7	**17**	(3.6)	0	(3.2)
	Denmark	10.7	(0.6)	11.1	50.3	49.7	**-22**	(5.6)	2	(4.6)
	Estonia	10.0	(0.5)	5.1	50.5	49.5	**-14**	(3.3)	**-8**	(3.2)
	France	13.2	(1.0)	6.8	50.3	49.7	**-37**	(8.5)	-2	(5.7)
	Germany	16.9	(0.9)	12.0	50.2	49.8	**-45**	(8.4)	-7	(4.3)
	Greece	10.8	(0.7)	6.2	50.4	49.6	**-32**	(8.0)	-2	(5.5)
	Ireland	14.4	(1.0)	10.9	50.1	49.9	-1	(5.7)	5	(3.9)
	Israel	17.5	(1.0)	13.2	50.4	49.6	13	(8.4)	**23**	(5.8)
	Italy	8.0	(0.5)	5.3	50.5	49.5	-6	(6.6)	6	(5.3)
	Luxembourg	52.0	(0.6)	49.4	51.1	48.9	**-55**	(2.1)	**-7**	(2.7)
	Netherlands	10.7	(0.9)	4.5	50.2	49.8	**-45**	(10.8)	-9	(6.7)
	New Zealand	27.1	(1.2)	20.8	50.0	50.0	11	(6.2)	2	(4.5)
	Norway	12.0	(1.0)	8.0	50.5	49.5	-6	(4.4)	4	(3.9)
	Portugal	7.3	(0.4)	3.2	50.3	49.7	13	(6.7)	-6	(4.6)
	Slovenia	7.8	(0.5)	4.0	50.1	49.9	**-32**	(2.6)	**-10**	(2.3)
	Spain	11.0	(0.8)	5.8	50.5	49.5	**-16**	(4.2)	4	(3.3)
	Sweden	17.4	(1.2)	11.4	50.1	49.9	**-18**	(6.0)	**10**	(4.4)
	Switzerland	31.1	(1.2)	28.5	50.4	49.6	**-54**	(8.6)	**-19**	(6.4)
	United Kingdom	16.7	(1.0)	6.2	50.5	49.5	-9	(7.1)	1	(4.3)
	United States	23.1	(1.5)	14.5	50.3	49.7	-13	(7.2)	9	(5.9)
	OECD average	17.9	(0.2)	12.0	50.3	49.7	**-18**	(1.4)	-1	(1.0)
Partners	CABA (Argentina)	17.0	(2.0)	9.2	52.3	47.7	**-64**	(10.6)	14	(12.1)
	Costa Rica	8.0	(0.6)	5.2	50.3	49.7	-11	(6.4)	0	(3.6)
	Croatia	10.8	(0.6)	8.7	50.6	49.4	**-20**	(7.6)	-7	(5.5)
	Cyprus*	11.3	(0.4)	5.8	50.4	49.6	**7**	(2.4)	-3	(2.5)
	Hong Kong (China)	35.1	(1.3)	32.9	50.0	50.0	**-27**	(7.1)	3	(7.1)
	Jordan	12.1	(0.7)	11.5	50.0	50.0	10	(6.4)	1	(5.3)
	Macao (China)	62.2	(0.7)	68.1	50.1	49.9	**16**	(2.1)	**32**	(2.4)
	Qatar	55.2	(0.4)	48.7	50.2	49.8	**78**	(1.7)	**35**	(2.4)
	Russia	6.9	(0.5)	5.3	51.0	49.0	4	(6.2)	-6	(5.0)
	Singapore	20.9	(1.0)	17.1	50.5	49.5	**47**	(3.1)	**10**	(2.6)
	United Arab Emirates	57.6	(0.9)	54.9	50.3	49.7	**74**	(4.9)	**32**	(4.5)
	Kazakhstan**	13.0	(1.0)	11.4	50.3	49.7	1	(8.2)	8	(7.6)

1. Schools with a low concentration of immigrant students are defined as those schools in bottom half of the concentration distribution. Country-specific thresholds are indicated by the cutpoint in the previous column of the table.
2. Schools with a high concentration of immigrant students are defined as those schools in top half of the concentration distribution. Country-specific thresholds are indicated by the cutpoint in the previous column of the table.
3. ESCS refers to the PISA index of economic, social and cultural status.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results include only countries and economies where the overall percentage of immigrant students is above 6.25%. The OECD average is calculated accordingly.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/1]

Table I.7.11 Differences in educational resources between schools with low and high concentrations of immigrant students

Results based on students' self-reports

	Percentage of immigrant students in PISA 2015		Cutpoint below (above) which half of the students attend schools with the smallest (largest) percentage of immigrants	Index of shortage of educational material[1]								Index of shortage of educational staff[2]							
				All schools		Schools with low concentration of immigrant students[3]		Schools with high concentration of immigrant students[4]		Difference between schools with high and low concentration of immigrant students		All schools		Schools with low concentration of immigrant students[1]		Schools with high concentration of immigrant students[2]		Difference between schools with high and low concentration of immigrant students	
	%	S.E.	%	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Dif.	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Dif.	S.E.
OECD																			
Australia	25.0	(0.7)	16.6	-0.39	(0.03)	-0.30	(0.05)	-0.46	(0.04)	**-0.17**	(0.07)	-0.35	(0.03)	-0.20	(0.06)	-0.48	(0.06)	**-0.27**	(0.09)
Austria	20.3	(1.1)	11.5	-0.27	(0.06)	-0.27	(0.09)	-0.26	(0.10)	0.01	(0.14)	0.18	(0.07)	0.00	(0.11)	0.36	(0.10)	**0.36**	(0.15)
Belgium	17.7	(0.9)	10.0	0.11	(0.06)	0.16	(0.08)	0.07	(0.08)	-0.08	(0.10)	0.23	(0.06)	0.21	(0.08)	0.26	(0.08)	0.06	(0.10)
Canada	30.1	(1.3)	10.7	-0.46	(0.04)	-0.50	(0.05)	-0.44	(0.06)	0.05	(0.07)	-0.20	(0.06)	-0.18	(0.08)	-0.21	(0.08)	-0.02	(0.12)
Denmark	10.7	(0.6)	11.1	-0.21	(0.08)	-0.23	(0.10)	-0.17	(0.12)	0.06	(0.16)	-0.70	(0.06)	-0.71	(0.08)	-0.68	(0.11)	0.04	(0.13)
Estonia	10.0	(0.5)	5.1	0.05	(0.05)	0.21	(0.07)	-0.12	(0.06)	**-0.33**	(0.10)	0.07	(0.05)	0.21	(0.07)	-0.07	(0.08)	**-0.28**	(0.11)
France	13.2	(1.0)	6.8	-0.17	(0.06)	-0.19	(0.08)	-0.14	(0.09)	0.05	(0.10)	0.17	(0.05)	0.18	(0.07)	0.16	(0.09)	-0.02	(0.12)
Germany	16.9	(0.9)	12.0	0.06	(0.07)	-0.08	(0.09)	0.20	(0.10)	**0.27**	(0.13)	0.41	(0.06)	0.34	(0.09)	0.48	(0.08)	0.14	(0.11)
Greece	10.8	(0.7)	6.2	0.39	(0.09)	0.38	(0.11)	0.40	(0.11)	0.02	(0.15)	0.61	(0.07)	0.53	(0.12)	0.68	(0.09)	0.15	(0.15)
Ireland	14.4	(1.0)	10.9	0.25	(0.09)	0.41	(0.14)	0.10	(0.12)	-0.32	(0.19)	0.12	(0.07)	0.17	(0.11)	0.08	(0.11)	-0.09	(0.16)
Israel	17.5	(1.0)	13.2	0.44	(0.10)	0.47	(0.17)	0.42	(0.13)	-0.05	(0.22)	0.34	(0.09)	0.44	(0.17)	0.25	(0.10)	-0.19	(0.20)
Italy	8.0	(0.5)	5.3	0.56	(0.08)	0.75	(0.12)	0.36	(0.11)	**-0.39**	(0.16)	0.35	(0.08)	0.35	(0.14)	0.35	(0.09)	-0.01	(0.16)
Luxembourg	52.0	(0.6)	49.4	-0.16	(0.00)	-0.19	(0.00)	-0.13	(0.00)	**0.05**	(0.00)	0.39	(0.00)	0.53	(0.00)	0.27	(0.00)	**-0.26**	(0.00)
Netherlands	10.7	(0.9)	4.5	-0.20	(0.08)	-0.32	(0.12)	-0.08	(0.10)	0.24	(0.15)	0.01	(0.07)	-0.05	(0.09)	0.08	(0.12)	0.13	(0.15)
New Zealand	27.1	(1.2)	20.8	-0.09	(0.06)	-0.15	(0.08)	-0.03	(0.09)	0.12	(0.12)	-0.42	(0.08)	-0.24	(0.10)	-0.59	(0.11)	**-0.36**	(0.16)
Norway	12.0	(1.0)	8.0	0.00	(0.06)	-0.01	(0.07)	0.01	(0.08)	0.02	(0.10)	-0.11	(0.06)	-0.14	(0.08)	-0.07	(0.09)	0.07	(0.13)
Portugal	7.3	(0.4)	3.2	0.11	(0.07)	0.02	(0.09)	0.17	(0.09)	0.16	(0.12)	0.93	(0.05)	0.82	(0.08)	1.01	(0.07)	0.19	(0.11)
Slovenia	7.8	(0.5)	4.0	-0.30	(0.01)	-0.30	(0.01)	-0.30	(0.01)	0.00	(0.02)	-0.52	(0.01)	-0.56	(0.01)	-0.47	(0.01)	**0.09**	(0.02)
Spain	11.0	(0.8)	5.8	0.23	(0.08)	-0.06	(0.10)	0.50	(0.12)	**0.56**	(0.17)	0.27	(0.06)	-0.03	(0.09)	0.55	(0.09)	**0.58**	(0.13)
Sweden	17.4	(1.2)	11.4	-0.28	(0.06)	-0.32	(0.09)	-0.24	(0.07)	0.09	(0.12)	0.35	(0.08)	0.20	(0.11)	0.49	(0.10)	**0.29**	(0.14)
Switzerland	31.1	(1.2)	28.5	-0.38	(0.05)	-0.29	(0.08)	-0.48	(0.09)	-0.19	(0.13)	-0.43	(0.06)	-0.51	(0.08)	-0.34	(0.10)	0.18	(0.14)
United Kingdom	16.7	(1.0)	6.2	0.04	(0.07)	0.07	(0.11)	0.02	(0.10)	-0.05	(0.15)	-0.12	(0.08)	-0.24	(0.11)	-0.02	(0.10)	0.22	(0.14)
United States	23.1	(1.5)	14.5	-0.33	(0.06)	-0.33	(0.08)	-0.33	(0.08)	0.00	(0.11)	-0.29	(0.08)	-0.20	(0.11)	-0.37	(0.11)	-0.17	(0.15)
OECD average	17.9	(0.2)	12.0	-0.04	(0.01)	-0.05	(0.02)	-0.04	(0.02)	0.00	(0.03)	0.06	(0.01)	0.04	(0.02)	0.07	(0.02)	0.04	(0.03)
Partners																			
CABA (Argentina)	17.0	(2.0)	9.2	-0.12	(0.15)	-0.88	(0.10)	0.61	(0.25)	**1.49**	(0.29)	-0.16	(0.13)	-0.67	(0.14)	0.32	(0.19)	**0.99**	(0.24)
Costa Rica	8.0	(0.6)	5.2	1.03	(0.11)	1.14	(0.16)	0.91	(0.15)	-0.23	(0.22)	0.91	(0.11)	0.97	(0.15)	0.85	(0.16)	-0.12	(0.23)
Croatia	10.8	(0.6)	8.7	0.87	(0.09)	0.77	(0.12)	0.98	(0.13)	0.21	(0.17)	-0.02	(0.08)	-0.25	(0.11)	0.21	(0.10)	**0.46**	(0.15)
Cyprus*	11.3	(0.4)	5.8	-0.06	(0.00)	-0.28	(0.00)	0.16	(0.00)	**0.44**	(0.01)	0.06	(0.00)	-0.13	(0.00)	0.27	(0.00)	**0.40**	(0.01)
Hong Kong (China)	35.1	(1.3)	32.9	-0.24	(0.07)	-0.22	(0.09)	-0.27	(0.11)	-0.06	(0.14)	-0.20	(0.08)	-0.11	(0.12)	-0.31	(0.11)	-0.20	(0.17)
Jordan	12.1	(0.7)	11.5	0.70	(0.09)	0.89	(0.13)	0.47	(0.12)	**-0.42**	(0.17)	0.88	(0.10)	1.01	(0.13)	0.73	(0.15)	-0.29	(0.20)
Macao (China)	62.2	(0.7)	68.1	0.20	(0.00)	-0.10	(0.00)	0.49	(0.00)	**0.59**	(0.00)	0.23	(0.00)	0.18	(0.00)	0.29	(0.00)	**0.12**	(0.00)
Qatar	55.2	(0.4)	48.7	-0.65	(0.00)	-0.53	(0.00)	-0.77	(0.00)	**-0.23**	(0.00)	-0.71	(0.00)	-0.57	(0.00)	-0.86	(0.00)	**-0.29**	(0.00)
Russia	6.9	(0.5)	5.3	0.31	(0.10)	0.48	(0.10)	0.16	(0.15)	-0.32	(0.17)	0.08	(0.10)	0.27	(0.13)	-0.09	(0.13)	**-0.36**	(0.15)
Singapore	20.9	(1.0)	17.1	-0.73	(0.01)	-0.73	(0.01)	-0.74	(0.01)	-0.01	(0.01)	-0.48	(0.02)	-0.51	(0.01)	-0.44	(0.05)	0.07	(0.06)
United Arab Emirates	57.6	(0.9)	54.9	-0.05	(0.07)	0.39	(0.12)	-0.44	(0.08)	**-0.83**	(0.15)	0.16	(0.06)	0.81	(0.09)	-0.42	(0.08)	**-1.23**	(0.12)
Kazakhstan**	13.0	(1.0)	11.4	0.19	(0.08)	0.18	(0.11)	0.20	(0.10)	0.02	(0.15)	-0.17	(0.09)	-0.07	(0.13)	-0.30	(0.10)	-0.23	(0.15)

1. This is measured by an index summarising school principals' agreement with four statements about whether the school's capacity to provide instruction is hindered by a lack of and/or inadequate educational materials, including physical infrastructure.
2. This is measured by an index summarising school principals' agreement with four statements about whether the school's capacity to provide instruction is hindered by a lack of and/or inadequate qualification of the school staff.
3. Schools with a low concentration of immigrant students are defined as those schools in bottom half of the concentration distribution. Country-specific concentration thresholds are indicated by the cutpoint in the previous column of the table.
4. Schools with a high concentration of immigrant students are defined as those schools in top half of the concentration distribution. Country-specific concentration thresholds are indicated by the cutpoint in the previous column of the table.

Notes: Values that are statistically significant are indicated in bold (see Annex A3).

Results include only countries and economies where the overall percentage of immigrant students is above 6.25%. The OECD average is calculated accordingly.

* See note at the beginning of this Annex.

** Coverage is too small to ensure comparability (see Annex A4).

StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/1]

Table I.7.12 Differences in grade repetition between immigrant and non-immigrant students, and socio-economic status and performance

Results based on students' self-reports

		Percentage of immigrant students in PISA 2015		Percentage of students having repeated a grade: Non-immigrant students		Immigrant students		Second-generation immigrants		First-generation immigrants		Likelihood of immigrant students having repeated a grade, relative to non-immigrant students: Before accounting for students' socio-economic status and performance in science and reading		After accounting for students' socio-economic status		After accounting for students' socio-economic status and performance in science and reading	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	Odds ratio	S.E.	Odds ratio	S.E.	Odds ratio	S.E.
OECD	Australia	25.0	(0.7)	6.6	(0.3)	8.4	(0.7)	6.3	(0.6)	10.6	(1.0)	**1.31**	(0.13)	**1.29**	(0.12)	**1.36**	(0.13)
	Austria	20.3	(1.1)	12.1	(0.6)	26.5	(2.0)	21.1	(1.8)	35.6	(3.5)	**2.61**	(0.31)	**2.27**	(0.27)	**1.78**	(0.22)
	Belgium	17.7	(0.9)	29.8	(0.8)	51.2	(1.7)	55.2	(2.0)	46.8	(3.0)	**2.47**	(0.18)	**1.81**	(0.14)	**1.19**	(0.10)
	Canada	30.1	(1.3)	5.7	(0.4)	5.2	(0.6)	3.7	(0.6)	6.9	(0.8)	0.90	(0.13)	0.88	(0.12)	0.95	(0.13)
	Chile	2.1	(0.5)	24.3	(1.0)	27.5	(6.8)	25.8	(11.8)	28.2	(6.0)	1.19	(0.42)	1.07	(0.37)	0.84	(0.31)
	Czech Republic	3.4	(0.3)	4.4	(0.4)	14.8	(3.7)	10.5	(5.0)	18.6	(4.8)	**3.75**	(1.12)	**3.87**	(1.37)	**3.77**	(1.62)
	Denmark	10.7	(0.6)	2.7	(0.3)	8.7	(0.9)	6.8	(0.8)	14.2	(2.4)	**3.39**	(0.51)	**2.63**	(0.42)	**1.64**	(0.26)
	Estonia	10.0	(0.5)	3.8	(0.4)	4.4	(1.1)	4.6	(1.2)	2.1	(2.0)	1.17	(0.30)	1.16	(0.30)	0.91	(0.26)
	Finland	4.0	(0.4)	2.6	(0.2)	12.0	(2.7)	5.1	(1.8)	17.6	(3.9)	**5.17**	(1.27)	**3.83**	(1.12)	1.59	(0.54)
	France	13.2	(1.0)	20.8	(0.8)	28.3	(2.4)	23.8	(3.0)	37.2	(3.1)	**1.50**	(0.23)	0.92	(0.16)	**0.60**	(0.10)
	Germany	16.9	(0.9)	16.6	(0.8)	25.1	(2.2)	24.6	(2.1)	26.9	(4.0)	**1.69**	(0.20)	**1.37**	(0.17)	0.98	(0.13)
	Greece	10.8	(0.7)	3.7	(0.6)	13.9	(2.3)	12.5	(2.9)	16.6	(3.0)	**4.21**	(0.83)	**3.15**	(0.74)	**2.80**	(0.62)
	Hungary	2.7	(0.2)	9.3	(0.6)	11.4	(4.1)	7.1	(3.5)	17.2	(7.6)	1.25	(0.52)	1.57	(0.72)	1.73	(0.80)
	Iceland	4.1	(0.3)	0.9	(0.1)	5.4	(1.9)	2.4	(2.4)	6.6	(2.6)	**6.33**	(2.62)	**5.21**	(2.58)	2.00	(0.99)
	Ireland	14.4	(1.0)	6.4	(0.4)	9.9	(1.1)	10.2	(2.4)	9.8	(1.2)	**1.60**	(0.21)	**1.63**	(0.22)	**1.48**	(0.21)
	Israel	17.5	(1.0)	9.3	(0.7)	6.3	(1.1)	3.7	(1.0)	14.2	(2.4)	**0.66**	(0.13)	**0.50**	(0.10)	**0.45**	(0.09)
	Italy	8.0	(0.5)	13.5	(0.6)	30.3	(2.0)	32.3	(3.7)	29.0	(2.6)	**2.78**	(0.31)	**2.30**	(0.27)	**1.94**	(0.24)
	Japan	0.5	(0.1)	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Korea	0.1	(0.0)	4.7	(0.3)	m	m	m	m	m	m	m	m	m	m	m	m
	Latvia	5.0	(0.4)	4.8	(0.5)	5.9	(2.0)	3.9	(1.7)	13.9	(6.3)	1.23	(0.49)	1.45	(0.56)	0.95	(0.42)
	Luxembourg	52.0	(0.6)	26.0	(0.8)	35.2	(0.8)	33.9	(1.2)	37.0	(1.5)	**1.55**	(0.10)	1.07	(0.08)	0.90	(0.08)
	Mexico	1.2	(0.1)	15.2	(0.8)	41.6	(6.5)	m	m	46.3	(8.3)	**3.98**	(1.03)	**3.21**	(0.77)	1.57	(0.46)
	Netherlands	10.7	(0.9)	19.3	(0.5)	25.9	(2.0)	24.9	(2.1)	30.3	(4.2)	**1.46**	(0.16)	1.23	(0.14)	1.05	(0.12)
	New Zealand	27.1	(1.2)	5.0	(0.4)	4.7	(0.6)	2.8	(0.8)	6.0	(0.8)	0.94	(0.15)	0.89	(0.15)	0.83	(0.14)
	Norway	12.0	(1.0)	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Poland	0.3	(0.1)	5.2	(0.3)	m	m	m	m	m	m	1.64	(1.74)	2.21	(1.91)	1.85	(1.43)
	Portugal	7.3	(0.4)	30.2	(1.2)	42.3	(2.8)	32.4	(3.7)	50.4	(3.2)	**1.70**	(0.20)	**1.83**	(0.24)	**1.83**	(0.35)
	Slovak Republic	1.2	(0.2)	5.8	(0.5)	30.9	(5.9)	28.4	(8.6)	33.4	(8.6)	**7.31**	(2.13)	**10.47**	(4.71)	**4.65**	(2.51)
	Slovenia	7.8	(0.5)	1.4	(0.3)	6.9	(1.9)	6.2	(2.2)	7.9	(2.6)	**5.05**	(1.36)	**3.50**	(0.94)	**2.40**	(0.70)
	Spain	11.0	(0.8)	28.3	(0.9)	50.3	(1.9)	41.5	(4.9)	52.2	(2.2)	**2.56**	(0.21)	**2.00**	(0.17)	**1.53**	(0.16)
	Sweden	17.4	(1.2)	2.2	(0.3)	12.0	(1.4)	4.8	(1.0)	21.6	(2.5)	**6.05**	(1.14)	**4.92**	(0.93)	**3.88**	(0.79)
	Switzerland	31.1	(1.2)	16.1	(1.0)	28.1	(1.6)	24.6	(2.0)	35.1	(2.3)	**2.03**	(0.17)	**1.63**	(0.14)	**1.25**	(0.11)
	Turkey	0.8	(0.2)	10.5	(0.7)	24.0	(7.7)	16.8	(8.0)	m	m	**2.70**	(1.15)	**3.42**	(1.53)	2.27	(1.05)
	United Kingdom	16.7	(1.0)	2.0	(0.2)	5.3	(0.6)	3.2	(0.8)	7.3	(1.1)	**2.76**	(0.44)	**2.67**	(0.45)	**2.46**	(0.43)
	United States	23.1	(1.5)	10.1	(0.7)	13.0	(1.5)	10.6	(1.6)	18.0	(2.0)	**1.33**	(0.17)	0.83	(0.13)	0.79	(0.12)
	OECD average	12.5	(0.1)	10.9	(0.1)	19.9	(0.5)	16.3	(0.7)	23.2	(0.7)	**2.63**	(0.16)	**2.40**	(0.20)	**1.69**	(0.13)
Partners	Albania	0.6	(0.1)	2.3	(0.3)	2.1	(1.8)	m	m	m	m	0.91	(0.79)	0.81	(0.73)	m	m
	Algeria	1.0	(0.2)	68.0	(2.2)	80.3	(7.4)	80.3	(7.4)	m	m	1.92	(1.09)	2.11	(1.20)	1.35	(0.70)
	Brazil	0.8	(0.1)	35.5	(0.8)	65.7	(4.9)	66.5	(6.1)	64.3	(8.4)	**3.48**	(0.77)	**3.60**	(0.82)	1.56	(0.42)
	B-S-J-G (China)	0.3	(0.1)	20.5	(1.2)	48.3	(10.1)	m	m	m	m	**3.63**	(1.50)	**3.86**	(1.55)	1.81	(0.69)
	Bulgaria	1.0	(0.1)	4.2	(0.6)	20.9	(5.5)	m	m	m	m	**6.05**	(2.21)	**6.31**	(2.85)	**2.93**	(1.40)
	CABA (Argentina)	17.0	(2.0)	16.3	(2.7)	31.9	(3.4)	29.7	(4.1)	36.0	(4.9)	**2.40**	(0.51)	0.94	(0.20)	0.78	(0.20)
	Colombia	0.6	(0.1)	41.9	(1.0)	66.2	(6.3)	64.6	(9.2)	m	m	**2.71**	(0.77)	**2.91**	(0.84)	1.72	(0.56)
	Costa Rica	8.0	(0.6)	29.3	(1.4)	52.2	(3.1)	52.3	(3.5)	52.0	(4.9)	**2.63**	(0.31)	**2.09**	(0.26)	**2.07**	(0.26)
	Croatia	10.8	(0.6)	1.4	(0.2)	2.8	(0.9)	3.0	(1.0)	1.6	(1.1)	**2.04**	(0.66)	1.80	(0.60)	1.60	(0.56)
	Cyprus*	11.3	(0.4)	3.5	(0.2)	12.4	(1.2)	6.2	(1.8)	14.8	(1.4)	**3.93**	(0.49)	**3.74**	(0.47)	**3.94**	(0.59)
	Dominican Republic	1.8	(0.3)	32.5	(1.3)	47.3	(5.8)	45.7	(7.1)	49.5	(9.0)	**1.86**	(0.46)	**1.65**	(0.42)	1.18	(0.34)
	FYROM	2.0	(0.2)	2.1	(0.2)	19.0	(3.5)	8.9	(3.6)	41.0	(7.2)	**10.87**	(2.92)	**11.22**	(3.04)	**8.50**	(2.63)
	Georgia	2.2	(0.3)	1.3	(0.2)	4.1	(2.3)	3.1	(2.4)	m	m	**3.38**	(2.05)	**3.72**	(2.27)	**3.47**	(2.18)
	Hong Kong (China)	35.1	(1.3)	14.5	(0.8)	22.3	(1.0)	13.5	(1.2)	36.0	(1.9)	**1.70**	(0.13)	**1.49**	(0.12)	**1.53**	(0.13)
	Indonesia	0.1	(0.1)	15.6	(1.1)	m	m	m	m	m	m	4.85	(4.29)	3.12	(3.36)	2.39	(2.79)
	Jordan	12.1	(0.7)	6.6	(0.4)	6.4	(1.0)	6.1	(1.1)	7.3	(2.0)	0.97	(0.17)	1.04	(0.18)	1.19	(0.23)
	Kosovo	1.5	(0.2)	3.5	(0.4)	7.6	(3.5)	14.4	(6.3)	0.0	c	2.29	(1.13)	2.43	(1.21)	1.72	(0.92)
	Lebanon	3.4	(0.4)	24.4	(1.2)	41.7	(5.4)	48.9	(7.1)	35.3	(9.8)	**2.22**	(0.49)	**2.31**	(0.52)	**2.14**	(0.64)
	Lithuania	1.8	(0.2)	2.1	(0.2)	7.5	(3.0)	3.2	(1.7)	22.6	(12.6)	**3.73**	(1.69)	**3.67**	(1.27)	**3.72**	(1.49)
	Macao (China)	62.2	(0.7)	37.4	(1.0)	31.5	(0.6)	30.5	(0.8)	33.9	(1.5)	**0.77**	(0.05)	**0.66**	(0.05)	**0.83**	(0.06)
	Malta	5.0	(0.4)	6.1	(0.3)	15.5	(2.6)	12.4	(4.4)	16.8	(3.3)	**2.81**	(0.58)	**3.09**	(0.66)	**3.32**	(0.79)
	Moldova	1.4	(0.2)	2.7	(0.3)	10.3	(3.9)	5.0	(2.5)	m	m	**4.14**	(1.79)	**4.72**	(2.04)	**4.26**	(2.05)
	Montenegro	5.6	(0.3)	1.2	(0.2)	6.5	(1.4)	6.6	(1.7)	6.4	(2.4)	**5.92**	(1.70)	**6.70**	(1.91)	**8.26**	(2.68)
	Peru	0.5	(0.1)	24.9	(0.9)	71.2	(8.4)	m	m	m	m	**7.45**	(3.14)	**8.54**	(3.45)	**6.66**	(2.77)
	Qatar	55.2	(0.4)	23.7	(0.5)	11.5	(0.4)	13.2	(0.8)	10.9	(0.6)	**0.42**	(0.02)	**0.42**	(0.02)	**0.85**	(0.05)
	Romania	0.4	(0.1)	5.7	(0.5)	m	m	m	m	m	m	2.77	(1.84)	3.74	(2.84)	3.01	(2.41)
	Russia	6.9	(0.5)	1.4	(0.2)	2.8	(1.0)	1.7	(0.8)	4.2	(2.1)	2.05	(0.82)	1.94	(0.77)	1.90	(0.78)
	Singapore	20.9	(1.0)	3.9	(0.3)	10.6	(1.4)	3.3	(0.9)	14.1	(1.9)	**2.90**	(0.43)	**3.46**	(0.44)	**4.03**	(0.52)
	Chinese Taipei	0.3	(0.1)	0.5	(0.1)	m	m	m	m	m	m	**13.37**	(10.60)	**13.83**	(10.46)	**17.39**	(14.29)
	Thailand	0.8	(0.3)	5.5	(0.4)	23.8	(6.0)	22.6	(7.0)	m	m	**5.37**	(1.70)	**4.43**	(1.54)	**5.03**	(1.86)
	Trinidad and Tobago	3.5	(0.4)	31.7	(0.7)	46.6	(5.0)	52.1	(6.5)	39.4	(8.2)	**1.88**	(0.40)	**1.93**	(0.40)	1.52	(0.34)
	Tunisia	1.5	(0.2)	32.8	(1.6)	54.7	(6.8)	60.5	(7.8)	m	m	**2.48**	(0.70)	**3.11**	(0.97)	0.83	(0.37)
	United Arab Emirates	57.6	(0.9)	15.3	(0.8)	8.3	(0.5)	8.5	(0.7)	8.1	(0.6)	**0.50**	(0.04)	**0.51**	(0.04)	0.96	(0.08)
	Uruguay	0.6	(0.1)	35.1	(1.1)	35.6	(10.0)	m	m	m	m	1.02	(0.46)	1.35	(0.63)	0.85	(0.50)
	Viet Nam	0.1	(0.0)	7.1	(1.6)	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	4.4	(0.4)	28.5	(1.3)	32.3	(3.6)	33.8	(4.6)	28.8	(5.0)	1.20	(0.20)	0.97	(0.16)	0.99	(0.17)
	Kazakhstan**	13.0	(1.0)	1.8	(0.3)	3.0	(0.8)	2.9	(0.9)	3.2	(1.3)	1.69	(0.46)	1.59	(0.44)	1.61	(0.44)
	Malaysia**	0.9	(0.2)	m	m	m	m	m	m	m	m	m	m	m	m	m	m

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/1]

Table I.7.14 Differences in science learning time at school, by immigrant background

Results based on students' self-reports

		Percentage of students who take at least one science lesson per week at school						Average time per week in regular science lessons					
		Immigrant students		Non-immigrant students		Difference between non-immigrant and immigrant students		Immigrant students		Non-immigrant students		Difference between non-immigrant and immigrant students	
		%	S.E.	%	S.E.	% dif.	S.E.	Hours	S.E.	Hours	S.E.	Dif.	S.E.
OECD	Australia	90.6	(0.7)	89.9	(0.5)	-0.8	(0.8)	3.6	(0.0)	3.5	(0.0)	**-0.1**	(0.1)
	Austria	91.5	(1.5)	90.7	(0.8)	-0.8	(1.5)	4.6	(0.1)	4.9	(0.1)	0.3	(0.2)
	Belgium	84.8	(1.6)	87.1	(0.6)	2.3	(1.6)	2.7	(0.1)	3.0	(0.0)	**0.4**	(0.1)
	Canada	88.1	(0.8)	85.5	(0.6)	**-2.6**	(0.9)	4.9	(0.1)	4.8	(0.1)	-0.1	(0.1)
	Chile	98.8	(1.2)	98.9	(0.2)	0.0	(1.2)	4.7	(0.4)	5.9	(0.1)	**1.1**	(0.4)
	Czech Republic	99.1	(0.6)	99.6	(0.1)	0.5	(0.6)	4.3	(0.3)	4.1	(0.1)	-0.1	(0.3)
	Denmark	98.4	(0.6)	99.0	(0.2)	0.7	(0.6)	3.5	(0.1)	3.4	(0.0)	0.0	(0.1)
	Estonia	99.3	(0.4)	99.6	(0.1)	0.3	(0.4)	3.7	(0.1)	3.6	(0.0)	0.0	(0.1)
	Finland	94.9	(1.6)	96.2	(0.6)	1.3	(1.5)	2.5	(0.1)	2.8	(0.0)	**0.4**	(0.1)
	France	93.4	(1.3)	95.8	(0.5)	**2.4**	(1.2)	2.7	(0.1)	3.1	(0.0)	**0.4**	(0.1)
	Germany	91.9	(1.3)	95.8	(0.4)	**3.9**	(1.2)	3.1	(0.1)	3.9	(0.1)	**0.7**	(0.1)
	Greece	94.0	(1.3)	95.6	(0.4)	1.6	(1.2)	3.6	(0.1)	3.8	(0.0)	0.3	(0.2)
	Hungary	90.4	(2.1)	85.8	(1.4)	-4.5	(2.3)	3.4	(0.2)	3.1	(0.1)	-0.3	(0.2)
	Iceland	95.4	(1.9)	96.9	(0.2)	1.5	(1.9)	2.2	(0.1)	2.3	(0.0)	0.0	(0.1)
	Ireland	89.8	(1.5)	92.6	(0.9)	**2.8**	(1.2)	2.5	(0.1)	2.4	(0.0)	**-0.2**	(0.1)
	Israel	91.8	(1.6)	93.1	(1.2)	1.3	(1.0)	3.2	(0.1)	3.4	(0.1)	0.2	(0.1)
	Italy	97.5	(0.7)	97.0	(0.3)	-0.5	(0.7)	2.4	(0.1)	2.6	(0.1)	0.2	(0.1)
	Japan	m	m	97.4	(1.1)	m	m	c	c	2.9	(0.1)	m	m
	Korea	m	m	97.5	(0.5)	m	m	c	c	2.8	(0.0)	m	m
	Latvia	98.6	(0.8)	99.4	(0.2)	0.7	(0.8)	4.4	(0.3)	4.3	(0.0)	-0.1	(0.3)
	Luxembourg	91.7	(0.5)	94.7	(0.4)	**3.0**	(0.7)	3.3	(0.0)	3.1	(0.0)	**-0.2**	(0.1)
	Mexico	96.9	(2.4)	96.3	(1.0)	-0.6	(2.5)	3.8	(0.4)	3.9	(0.1)	0.1	(0.4)
	Netherlands	83.2	(2.1)	84.6	(0.9)	1.4	(2.1)	4.6	(0.2)	4.4	(0.1)	-0.2	(0.2)
	New Zealand	94.9	(0.9)	94.1	(0.7)	-0.7	(0.9)	4.5	(0.1)	4.1	(0.1)	**-0.4**	(0.1)
	Norway	99.5	(0.3)	99.6	(0.1)	0.1	(0.3)	2.4	(0.1)	2.4	(0.0)	0.0	(0.1)
	Poland	m	m	99.6	(0.1)	m	m	c	c	3.0	(0.0)	m	m
	Portugal	75.6	(2.7)	69.5	(0.9)	**-6.2**	(2.8)	3.1	(0.2)	3.8	(0.1)	**0.7**	(0.2)
	Slovak Republic	91.4	(4.0)	88.6	(1.0)	-2.8	(4.0)	3.5	(0.5)	3.1	(0.1)	-0.4	(0.5)
	Slovenia	98.4	(0.8)	98.7	(0.1)	0.3	(0.8)	3.2	(0.1)	3.5	(0.0)	**0.3**	(0.1)
	Spain	86.3	(1.4)	83.2	(0.7)	-3.1	(1.6)	3.0	(0.1)	3.3	(0.0)	**0.3**	(0.1)
	Sweden	98.7	(0.5)	99.1	(0.2)	0.4	(0.5)	3.2	(0.1)	3.0	(0.0)	-0.2	(0.1)
	Switzerland	91.5	(1.3)	91.4	(1.0)	-0.1	(1.2)	2.5	(0.1)	2.5	(0.1)	0.0	(0.1)
	Turkey	88.4	(6.0)	92.9	(0.5)	4.5	(6.0)	3.4	(0.3)	3.4	(0.1)	-0.1	(0.3)
	United Kingdom	98.9	(0.3)	98.4	(0.1)	-0.6	(0.3)	4.6	(0.1)	4.8	(0.0)	0.2	(0.1)
	United States	93.9	(1.1)	93.5	(0.9)	-0.4	(1.1)	3.9	(0.1)	4.0	(0.1)	0.1	(0.1)
	OECD average	93.0	(0.3)	93.6	(0.1)	0.2	(0.3)	3.5	(0.0)	3.5	(0.0)	**0.1**	(0.0)
Partners	Albania	m	m	98.0	(0.2)	m	m	c	c	c	c	m	m
	Algeria	93.1	(4.2)	97.7	(0.3)	4.5	(4.2)	c	c	c	c	m	m
	Brazil	93.8	(2.6)	91.9	(0.4)	-1.9	(2.6)	2.5	(0.3)	2.9	(0.1)	0.3	(0.3)
	B-S-J-G (China)	97.6	(1.7)	94.1	(0.9)	-3.5	(1.9)	4.8	(0.7)	5.6	(0.1)	0.8	(0.7)
	Bulgaria	100.0	c	99.5	(0.1)	**-0.5**	(0.1)	5.1	(0.8)	4.3	(0.1)	-0.8	(0.8)
	CABA (Argentina)	93.9	(1.7)	97.4	(0.7)	3.5	(1.8)	c	c	c	c	m	m
	Colombia	94.0	(4.9)	93.7	(0.4)	-0.4	(4.9)	3.2	(0.4)	3.4	(0.1)	0.3	(0.4)
	Costa Rica	95.8	(0.9)	96.8	(0.3)	1.0	(1.0)	3.5	(0.1)	3.8	(0.0)	**0.3**	(0.1)
	Croatia	81.3	(2.1)	85.0	(1.0)	**3.7**	(1.9)	3.0	(0.1)	3.2	(0.1)	**0.2**	(0.1)
	Cyprus*	95.3	(0.9)	96.3	(0.3)	1.0	(1.0)	3.2	(0.1)	3.1	(0.0)	0.0	(0.1)
	Dominican Republic	94.9	(3.0)	96.8	(0.4)	1.9	(3.0)	3.1	(0.2)	3.5	(0.1)	0.5	(0.3)
	FYROM	82.4	(5.2)	75.1	(0.6)	-7.3	(5.3)	c	c	c	c	m	m
	Georgia	98.1	(1.4)	98.6	(0.3)	0.5	(1.4)	c	c	c	c	m	m
	Hong Kong (China)	77.5	(1.2)	75.5	(1.0)	-2.0	(1.5)	3.7	(0.1)	3.9	(0.1)	0.2	(0.1)
	Indonesia	m	m	95.8	(0.9)	m	m	c	c	c	c	m	m
	Jordan	98.4	(0.6)	97.9	(0.3)	-0.5	(0.6)	c	c	c	c	m	m
	Kosovo	92.3	(3.2)	91.2	(0.5)	-1.1	(3.2)	c	c	c	c	m	m
	Lebanon	99.4	(0.6)	99.2	(0.2)	-0.2	(0.6)	c	c	c	c	m	m
	Lithuania	100.0	c	100.0	c	0.0	c	4.3	(0.1)	4.3	(0.0)	0.0	(0.1)
	Macao (China)	82.4	(0.6)	80.1	(0.9)	**-2.4**	(1.2)	3.8	(0.1)	3.7	(0.1)	-0.1	(0.1)
	Malta	98.3	(1.0)	94.3	(0.4)	**-4.0**	(1.0)	c	c	c	c	m	m
	Moldova	91.5	(4.1)	94.4	(0.5)	2.9	(4.0)	c	c	c	c	m	m
	Montenegro	91.7	(1.6)	94.3	(0.2)	2.7	(1.7)	1.7	(0.1)	1.7	(0.0)	0.0	(0.1)
	Peru	m	m	98.7	(0.2)	m	m	c	c	4.0	(0.1)	m	m
	Qatar	95.6	(0.3)	93.4	(0.4)	**-2.1**	(0.6)	5.4	(0.0)	4.5	(0.0)	**-0.9**	(0.1)
	Romania	m	m	98.4	(0.3)	m	m	c	c	c	c	m	m
	Russia	98.5	(0.8)	99.6	(0.2)	1.1	(0.8)	4.9	(0.2)	5.2	(0.1)	0.3	(0.2)
	Singapore	99.5	(0.2)	98.5	(0.2)	**-1.0**	(0.3)	5.7	(0.1)	5.4	(0.0)	**-0.3**	(0.1)
	Chinese Taipei	m	m	92.5	(0.9)	m	m	c	c	3.0	(0.0)	m	m
	Thailand	78.3	(9.3)	93.4	(0.7)	15.1	(9.2)	3.4	(0.5)	4.4	(0.1)	**1.0**	(0.5)
	Trinidad and Tobago	90.0	(3.1)	92.0	(0.4)	2.0	(3.1)	c	c	c	c	m	m
	Tunisia	90.3	(5.3)	96.8	(0.4)	6.4	(5.2)	2.6	(0.5)	2.6	(0.0)	0.0	(0.5)
	United Arab Emirates	92.8	(0.7)	93.2	(0.6)	0.4	(0.9)	5.7	(0.1)	4.8	(0.1)	**-0.8**	(0.1)
	Uruguay	92.9	(4.9)	95.4	(0.4)	2.5	(4.9)	3.6	(0.6)	3.4	(0.1)	-0.2	(0.6)
	Viet Nam	m	m	100.0	c	m	m	c	c	c	c	m	m
	Argentina**	95.4	(1.2)	94.5	(0.7)	-0.9	(1.4)	c	c	c	c	m	m
	Kazakhstan**	99.6	(0.2)	99.7	(0.1)	0.1	(0.2)	c	c	c	c	m	m
	Malaysia**	94.7	(4.1)	97.9	(0.5)	3.2	(4.1)	4.7	(0.8)	4.5	(0.1)	-0.2	(0.8)

Note: Values that are statistically significant are indicated in bold (see Annex A3).
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 1/1]

Table I.7.15a Change between 2006 and 2015 in the science performance gap related to immigrant background, and socio-economic status and language spoken at home

Results based on students' self-reports

		Science performance in PISA 2015									
		Percentage of immigrant students in PISA 2015		Non-immigrant students		Immigrant students		Difference in performance between immigrant and non-immigrant students			
								Before accounting for students' socio-economic status and language spoken at home		After accounting for students' socio-economic status and language spoken at home	
		%	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	25.0	(0.7)	512	(1.5)	514	(3.5)	-2	(3.6)	**-13**	(3.3)
	Austria	20.3	(1.1)	510	(2.4)	440	(4.5)	**70**	(5.2)	**18**	(4.9)
	Belgium	17.7	(0.9)	516	(2.0)	450	(4.9)	**66**	(4.5)	**28**	(4.5)
	Canada	30.1	(1.3)	530	(2.2)	531	(3.1)	-2	(3.0)	-5	(3.0)
	Chile	2.1	(0.5)	449	(2.4)	418	(14.3)	**31**	(14.2)	**21**	(9.9)
	Czech Republic	3.4	(0.3)	495	(2.1)	463	(10.5)	**32**	(10.1)	2	(11.3)
	Denmark	10.7	(0.6)	510	(2.6)	441	(4.1)	**69**	(4.7)	**38**	(6.2)
	Estonia	10.0	(0.5)	539	(2.2)	507	(3.9)	**32**	(4.2)	**28**	(4.1)
	Finland	4.0	(0.4)	535	(2.2)	452	(8.5)	**83**	(8.2)	**36**	(9.7)
	France	13.2	(1.0)	506	(2.0)	444	(6.9)	**62**	(7.5)	**20**	(7.1)
	Germany	16.9	(0.9)	527	(2.6)	455	(6.1)	**72**	(6.2)	**28**	(5.5)
	Greece	10.8	(0.7)	461	(4.0)	417	(5.4)	**45**	(5.3)	**14**	(6.1)
	Hungary	2.7	(0.2)	477	(2.5)	494	(10.2)	-17	(9.9)	-11	(9.3)
	Iceland	4.1	(0.3)	478	(1.7)	398	(7.1)	**80**	(7.3)	**53**	(11.4)
	Ireland	14.4	(1.0)	505	(2.5)	500	(4.1)	5	(4.4)	3	(5.2)
	Israel	17.5	(1.0)	473	(3.4)	456	(7.0)	**16**	(6.8)	-9	(5.5)
	Italy	8.0	(0.5)	485	(2.6)	452	(4.0)	**33**	(4.0)	**11**	(4.2)
	Japan	0.5	(0.1)	539	(2.9)	447	(31.6)	**93**	(30.7)	**53**	(26.3)
	Korea	0.1	(0.0)	516	(3.1)	c	c	m	m	m	m
	Latvia	5.0	(0.4)	492	(1.6)	478	(6.6)	13	(6.9)	**14**	(6.2)
	Luxembourg	52.0	(0.6)	505	(1.6)	464	(1.6)	**41**	(2.3)	**22**	(2.8)
	Mexico	1.2	(0.1)	418	(2.1)	340	(8.7)	**77**	(9.1)	**57**	(8.8)
	Netherlands	10.7	(0.9)	517	(2.4)	457	(8.2)	**60**	(8.8)	**23**	(8.0)
	New Zealand	27.1	(1.2)	519	(2.5)	513	(4.6)	6	(4.9)	-3	(4.9)
	Norway	12.0	(1.0)	507	(2.3)	455	(4.2)	**52**	(4.4)	**23**	(6.6)
	Poland	0.3	(0.1)	503	(2.5)	c	c	m	m	m	m
	Portugal	7.3	(0.4)	503	(2.4)	488	(5.9)	**16**	(5.6)	8	(6.1)
	Slovak Republic	1.2	(0.2)	465	(2.4)	395	(13.5)	**70**	(13.6)	**40**	(14.8)
	Slovenia	7.8	(0.5)	520	(1.3)	449	(5.8)	**71**	(6.0)	14	(8.0)
	Spain	11.0	(0.8)	499	(2.0)	457	(4.5)	**42**	(4.4)	**26**	(4.4)
	Sweden	17.4	(1.2)	508	(3.2)	438	(6.7)	**70**	(6.4)	**40**	(6.8)
	Switzerland	31.1	(1.2)	527	(2.6)	464	(4.1)	**63**	(4.1)	**16**	(4.1)
	Turkey	0.8	(0.2)	427	(3.9)	414	(15.4)	13	(15.2)	22	(15.0)
	United Kingdom	16.7	(1.0)	516	(2.4)	493	(5.9)	**23**	(5.7)	**15**	(4.6)
	United States	23.1	(1.5)	506	(3.3)	474	(4.9)	**32**	(5.2)	-5	(4.8)
	OECD average	12.5	(0.1)	500	(0.4)	456	(1.6)	**43**	(1.6)	**19**	(1.5)
Partners	Albania	0.6	(0.1)	m	m	m	m	m	m	m	m
	Algeria	1.0	(0.2)	377	(2.7)	335	(16.4)	**42**	(15.9)	**33**	(13.9)
	Brazil	0.8	(0.1)	404	(2.3)	338	(10.3)	**66**	(10.3)	**64**	(9.7)
	B-S-J-G (China)	0.3	(0.1)	521	(4.6)	376	(18.0)	**145**	(18.4)	**135**	(19.9)
	Bulgaria	1.0	(0.1)	450	(4.2)	376	(14.6)	**74**	(14.5)	**49**	(15.4)
	CABA (Argentina)	17.0	(2.0)	485	(6.3)	423	(7.2)	**62**	(6.8)	**15**	(6.4)
	Colombia	0.6	(0.1)	418	(2.3)	365	(14.8)	**53**	(14.5)	**60**	(13.8)
	Costa Rica	8.0	(0.6)	422	(2.1)	401	(4.9)	**20**	(4.7)	6	(4.3)
	Croatia	10.8	(0.6)	480	(2.4)	454	(4.7)	**26**	(4.5)	**14**	(4.3)
	Cyprus*	11.3	(0.4)	434	(1.4)	433	(4.5)	1	(4.6)	1	(4.9)
	Dominican Republic	1.8	(0.3)	336	(2.7)	295	(10.9)	**40**	(11.7)	**26**	(10.3)
	FYROM	2.0	(0.2)	387	(1.3)	362	(10.5)	**25**	(10.7)	**23**	(10.6)
	Georgia	2.2	(0.3)	414	(2.4)	408	(11.3)	7	(11.4)	4	(11.7)
	Hong Kong (China)	35.1	(1.3)	529	(2.6)	516	(4.0)	**13**	(4.3)	-1	(3.5)
	Indonesia	0.1	(0.1)	405	(2.6)	c	c	m	m	m	m
	Jordan	12.1	(0.7)	412	(2.6)	417	(4.5)	-5	(4.2)	-2	(4.0)
	Kosovo	1.5	(0.2)	380	(1.6)	353	(10.2)	**27**	(10.0)	**28**	(10.1)
	Lebanon	3.4	(0.4)	392	(3.6)	372	(9.2)	**20**	(8.3)	18	(9.3)
	Lithuania	1.8	(0.2)	477	(2.6)	469	(8.5)	8	(8.4)	2	(8.1)
	Macao (China)	62.2	(0.7)	519	(1.9)	535	(1.6)	**-17**	(2.7)	**-19**	(2.8)
	Malta	5.0	(0.4)	468	(1.7)	501	(8.7)	**-34**	(8.9)	-5	(8.4)
	Moldova	1.4	(0.2)	430	(2.0)	435	(11.0)	-5	(11.2)	0	(10.8)
	Montenegro	5.6	(0.3)	412	(1.0)	423	(5.6)	-11	(5.7)	-7	(5.5)
	Peru	0.5	(0.1)	398	(2.3)	367	(20.7)	31	(19.9)	29	(16.6)
	Qatar	55.2	(0.4)	377	(1.4)	458	(1.3)	**-82**	(1.7)	**-77**	(1.8)
	Romania	0.4	(0.1)	435	(3.2)	c	c	m	m	m	m
	Russia	6.9	(0.5)	489	(3.0)	480	(6.1)	10	(6.5)	5	(6.3)
	Singapore	20.9	(1.0)	550	(1.4)	579	(3.9)	**-28**	(4.4)	**-13**	(4.2)
	Chinese Taipei	0.3	(0.1)	533	(2.7)	c	c	m	m	m	m
	Thailand	0.8	(0.3)	424	(2.8)	410	(14.6)	14	(14.4)	-8	(19.5)
	Trinidad and Tobago	3.5	(0.4)	432	(1.5)	403	(10.7)	**29**	(11.0)	19	(10.3)
	Tunisia	1.5	(0.2)	390	(2.1)	340	(10.4)	**50**	(10.4)	**50**	(10.1)
	United Arab Emirates	57.6	(0.9)	394	(2.5)	474	(2.9)	**-80**	(3.4)	**-77**	(3.5)
	Uruguay	0.6	(0.1)	437	(2.2)	431	(21.1)	5	(20.8)	11	(17.9)
	Viet Nam	0.1	(0.0)	525	(3.9)	c	c	m	m	m	m
	Argentina**	4.4	(0.4)	433	(2.9)	419	(5.8)	**14**	(5.7)	-1	(5.5)
	Kazakhstan**	13.0	(1.0)	457	(3.9)	455	(4.8)	2	(4.7)	0	(4.5)
	Malaysia**	0.9	(0.2)	445	(3.0)	431	(13.3)	14	(13.2)	3	(12.1)

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Switzerland, the increase in the weighted share of students with an immigrant background between previous rounds of PISA and PISA 2015 samples is larger than the corresponding shift in the target population according to official statistics for this country.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

[Part 2/2]

Table I.7.15a Change between 2006 and 2015 in the science performance gap related to immigrant background, and socio-economic status and language spoken at home

Results based on students' self-reports

		Science performance in PISA 2006								Change between 2006 and 2015 (PISA 2015 – PISA 2006)			
						Difference in performance between immigrant and non-immigrant students				Difference between non-immigrant and immigrant students			
		Non-immigrant students		Immigrant students		Before accounting for students' socio-economic status and language spoken at home		After accounting for students' socio-economic status and language spoken at home		Before accounting for students' socio-economic status and language spoken at home		After accounting for students' socio-economic status and language spoken at home	
		Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	Australia	529	(2.0)	527	(5.2)	2	(5.0)	-6	(3.9)	-4	(6.2)	-8	(5.1)
	Austria	523	(3.5)	433	(10.9)	**90**	(11.1)	**35**	(8.2)	-20	(12.3)	-17	(9.6)
	Belgium	523	(2.4)	437	(6.4)	**86**	(6.5)	**59**	(5.6)	**-21**	(7.9)	**-32**	(7.2)
	Canada	541	(1.8)	524	(4.5)	**17**	(4.5)	6	(4.6)	**-18**	(5.4)	**-11**	(5.4)
	Chile	440	(4.4)	c	c	m	m	m	m	m	m	m	m
	Czech Republic	515	(3.5)	455	(13.5)	**60**	(13.5)	22	(14.8)	-28	(16.9)	-20	(18.6)
	Denmark	503	(2.9)	416	(7.9)	**87**	(7.7)	**31**	(8.6)	-18	(9.0)	7	(10.6)
	Estonia	537	(2.6)	504	(4.8)	**33**	(4.9)	**30**	(4.9)	-1	(6.5)	-2	(6.4)
	Finland	566	(2.0)	472	(15.4)	**94**	(15.4)	**47**	(18.3)	-11	(17.4)	-11	(20.7)
	France	505	(3.5)	451	(8.6)	**53**	(9.2)	10	(8.2)	9	(11.9)	10	(10.8)
	Germany	532	(3.2)	446	(7.4)	**85**	(6.7)	**21**	(7.2)	-13	(9.1)	7	(9.1)
	Greece	478	(3.2)	433	(9.7)	**44**	(9.6)	9	(10.4)	0	(11.0)	5	(12.0)
	Hungary	505	(2.7)	501	(12.6)	4	(12.7)	1	(12.8)	-20	(16.1)	-13	(15.8)
	Iceland	494	(1.7)	419	(13.4)	**75**	(13.5)	28	(16.0)	4	(15.4)	24	(19.7)
	Ireland	510	(3.0)	500	(12.3)	11	(11.7)	-3	(9.0)	-6	(12.5)	6	(10.4)
	Israel	462	(3.6)	456	(6.0)	6	(5.4)	**-11**	(5.3)	11	(8.6)	1	(7.7)
	Italy	479	(2.0)	421	(7.8)	**58**	(7.8)	**43**	(8.3)	**-25**	(8.7)	**-32**	(9.3)
	Japan	532	(3.4)	c	c	m	m	m	m	m	m	m	m
	Korea	523	(3.3)	c	c	m	m	m	m	m	m	m	m
	Latvia	492	(3.0)	489	(6.1)	3	(6.2)	6	(5.8)	10	(9.3)	7	(8.5)
	Luxembourg	511	(1.6)	445	(2.4)	**67**	(3.3)	**39**	(4.4)	**-26**	(4.0)	**-16**	(5.2)
	Mexico	415	(2.6)	319	(7.3)	**96**	(6.9)	**77**	(7.6)	-19	(11.4)	-21	(11.6)
	Netherlands	534	(2.3)	459	(9.5)	**75**	(9.7)	**33**	(9.4)	-16	(13.1)	-10	(12.3)
	New Zealand	536	(2.6)	520	(5.8)	**16**	(6.0)	6	(4.9)	-10	(7.8)	-9	(6.9)
	Norway	493	(2.5)	434	(9.2)	**59**	(8.5)	14	(10.3)	-6	(9.6)	8	(12.2)
	Poland	499	(2.3)	c	c	m	m	m	m	m	m	m	m
	Portugal	479	(2.9)	424	(11.0)	**55**	(10.8)	**57**	(9.2)	**-39**	(12.2)	**-49**	(11.1)
	Slovak Republic	490	(2.6)	c	c	m	m	m	m	m	m	m	m
	Slovenia	525	(1.2)	469	(5.0)	**56**	(5.5)	**13**	(6.5)	15	(8.1)	1	(10.4)
	Spain	494	(2.4)	434	(7.3)	**60**	(6.9)	**50**	(6.5)	**-17**	(8.2)	**-23**	(7.8)
	Sweden	512	(2.3)	451	(5.6)	**61**	(5.1)	**27**	(7.3)	9	(8.2)	13	(10.0)
	Switzerland	531	(2.9)	449	(5.0)	**81**	(4.2)	**36**	(4.8)	**-18**	(5.9)	**-20**	(6.3)
	Turkey	425	(3.8)	440	(15.7)	-16	(14.9)	1	(14.0)	29	(21.3)	21	(20.5)
	United Kingdom	519	(2.0)	487	(9.3)	**33**	(9.0)	6	(6.0)	-9	(10.6)	9	(7.6)
	United States	499	(4.3)	451	(6.2)	**48**	(6.4)	5	(6.1)	-16	(8.2)	-10	(7.7)
	OECD average	504	(0.5)	456	(1.7)	**50**	(1.6)	**23**	(1.7)	**-9**	(2.0)	**-6**	(2.1)
Partners	Albania	m	m	m	m	m	m	m	m	m	m	m	m
	Algeria	m	m	m	m	m	m	m	m	m	m	m	m
	Brazil	393	(2.8)	348	(8.3)	**44**	(8.4)	**34**	(8.3)	22	(13.3)	**30**	(12.8)
	B-S-J-G (China)	m	m	m	m	m	m	m	m	m	m	m	m
	Bulgaria	436	(6.1)	c	c	m	m	m	m	m	m	m	m
	CABA (Argentina)	m	m	m	m	m	m	m	m	m	m	m	m
	Colombia	391	(3.3)	c	c	m	m	m	m	m	m	m	m
	Costa Rica	m	m	m	m	m	m	m	m	m	m	m	m
	Croatia	497	(2.6)	477	(4.2)	**19**	(4.4)	7	(4.3)	6	(6.3)	7	(6.1)
	Cyprus*	m	m	m	m	m	m	m	m	m	m	m	m
	Dominican Republic	m	m	m	m	m	m	m	m	m	m	m	m
	FYROM	m	m	m	m	m	m	m	m	m	m	m	m
	Georgia	m	m	m	m	m	m	m	m	m	m	m	m
	Hong Kong (China)	547	(3.0)	538	(3.3)	**9**	(4.1)	**-12**	(3.8)	4	(6.0)	**10**	(5.2)
	Indonesia	395	(5.7)	296	(7.2)	**99**	(9.1)	**91**	(9.4)	m	m	m	m
	Jordan	422	(2.9)	447	(4.3)	**-26**	(4.5)	**-15**	(4.1)	**20**	(6.1)	**13**	(5.8)
	Kosovo	m	m	m	m	m	m	m	m	m	m	m	m
	Lebanon	m	m	m	m	m	m	m	m	m	m	m	m
	Lithuania	489	(2.9)	488	(12.4)	2	(13.0)	-9	(12.4)	6	(15.5)	11	(14.8)
	Macao (China)	504	(2.2)	515	(1.3)	**-11**	(2.6)	**-17**	(2.6)	-6	(3.7)	-2	(3.8)
	Malta	m	m	m	m	m	m	m	m	m	m	m	m
	Moldova	m	m	m	m	m	m	m	m	m	m	m	m
	Montenegro	411	(1.2)	428	(5.6)	**-17**	(5.9)	**-19**	(6.0)	6	(8.2)	12	(8.1)
	Peru	m	m	m	m	m	m	m	m	m	m	m	m
	Qatar	330	(1.1)	388	(1.9)	**-58**	(2.4)	**-58**	(2.4)	**-24**	(3.0)	**-19**	(3.0)
	Romania	418	(4.2)	c	c	m	m	m	m	m	m	m	m
	Russia	481	(3.8)	468	(5.6)	**14**	(6.0)	9	(4.9)	-4	(8.8)	-4	(8.0)
	Singapore	m	m	m	m	m	m	m	m	m	m	m	m
	Chinese Taipei	535	(3.5)	485	(16.0)	**50**	(16.0)	**49**	(14.4)	m	m	m	m
	Thailand	422	(2.1)	c	c	m	c	m	c	m	m	m	m
	Trinidad and Tobago	m	m	m	m	m	m	m	m	m	m	m	m
	Tunisia	387	(2.9)	316	(12.8)	**71**	(12.7)	**70**	(12.6)	-21	(16.4)	-20	(16.2)
	United Arab Emirates	m	m	m	m	m	m	m	m	m	m	m	m
	Uruguay	430	(2.7)	c	c	m	m	m	m	m	m	m	m
	Viet Nam	m	m	m	m	m	m	m	m	m	m	m	m
	Argentina**	393	(6.2)	379	(9.5)	14	(9.4)	-8	(9.2)	0	(11.0)	6	(10.8)
	Kazakhstan**	m	m	m	m	m	m	m	m	m	m	m	m
	Malaysia**	m	m	m	m	m	m	m	m	m	m	m	m

Notes: Values that are statistically significant are indicated in bold (see Annex A3).
For Switzerland, the increase in the weighted share of students with an immigrant background between previous rounds of PISA and PISA 2015 samples is larger than the corresponding shift in the target population according to official statistics for this country.
* See note at the beginning of this Annex.
** Coverage is too small to ensure comparability (see Annex A4).
StatLink http://dx.doi.org/10.1787/888933433226

ANNEX B2

RESULTS FOR REGIONS WITHIN COUNTRIES

[Part 1/1]

Table B2.I.2 Mean score and variation in student performance in science

	Mean score		Standard deviation		Percentiles													
					5th		10th		25th		Median (50th)		75th		90th		95th	
	Mean	S.E.	S.D.	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
OECD																		
Belgium																		
Flemish community•	515	(2.6)	102	(1.7)	338	(4.5)	372	(5.0)	443	(4.1)	524	(3.1)	592	(2.8)	642	(2.7)	668	(2.8)
French community	485	(4.5)	96	(1.6)	324	(5.6)	355	(5.1)	416	(5.8)	490	(5.6)	557	(4.4)	609	(4.2)	635	(4.1)
German-speaking community	505	(4.8)	85	(2.8)	365	(12.8)	392	(9.2)	445	(7.0)	509	(6.7)	567	(5.8)	614	(9.0)	639	(9.9)
Canada																		
Alberta	541	(4.0)	92	(1.8)	384	(6.2)	419	(5.7)	479	(5.7)	544	(5.1)	605	(4.5)	657	(5.1)	685	(4.9)
British Columbia	539	(4.3)	91	(2.1)	381	(6.9)	417	(7.6)	478	(5.3)	541	(5.1)	601	(5.1)	654	(5.8)	686	(6.9)
Manitoba	499	(4.7)	91	(2.4)	347	(8.9)	379	(6.5)	435	(6.2)	502	(5.1)	564	(6.0)	619	(7.1)	647	(7.7)
New Brunswick	506	(4.5)	90	(2.7)	355	(9.5)	387	(9.4)	443	(7.2)	509	(5.8)	571	(5.4)	623	(5.8)	652	(6.7)
Newfoundland and Labrador	506	(3.2)	90	(1.8)	352	(7.4)	382	(6.8)	444	(5.3)	508	(4.0)	571	(4.6)	622	(4.8)	651	(6.9)
Nova Scotia	517	(4.5)	90	(2.3)	366	(9.6)	397	(7.2)	455	(6.5)	520	(5.0)	580	(5.0)	632	(6.7)	662	(6.4)
Ontario	524	(3.9)	94	(1.6)	364	(5.8)	398	(5.1)	460	(4.8)	527	(4.5)	591	(4.3)	643	(5.1)	674	(5.3)
Prince Edward Island	515	(5.4)	84	(3.8)	370	(15.7)	404	(10.3)	459	(7.6)	516	(7.5)	571	(8.7)	627	(13.1)	654	(10.2)
Quebec	537	(4.7)	87	(2.0)	383	(6.9)	419	(7.0)	479	(6.5)	543	(5.1)	598	(5.6)	645	(5.8)	673	(6.7)
Saskatchewan	496	(3.1)	88	(2.1)	352	(6.9)	383	(5.2)	435	(4.7)	495	(4.1)	557	(4.2)	611	(4.4)	643	(6.0)
Italy																		
Bolzano	515	(2.5)	84	(1.4)	371	(6.5)	401	(4.4)	458	(3.7)	519	(3.3)	576	(3.2)	623	(4.5)	649	(4.7)
Campania	445	(5.0)	85	(2.6)	313	(5.1)	338	(5.1)	383	(5.5)	440	(6.0)	503	(7.4)	560	(7.5)	594	(8.8)
Lombardia	503	(5.0)	89	(2.4)	349	(10.3)	382	(7.4)	440	(7.3)	507	(6.0)	567	(4.6)	615	(5.3)	643	(4.9)
Trento	511	(2.5)	83	(1.7)	364	(4.9)	397	(5.1)	454	(4.2)	517	(3.2)	571	(3.4)	615	(3.9)	638	(4.7)
Portugal																		
Região Autónoma dos Açores	470	(2.3)	90	(2.0)	333	(4.5)	357	(4.5)	402	(4.7)	465	(4.4)	532	(4.5)	589	(5.5)	623	(7.3)
Spain																		
Andalusia•	473	(4.1)	89	(1.7)	328	(5.7)	355	(5.2)	408	(5.5)	474	(5.0)	538	(4.9)	590	(5.6)	617	(5.8)
Aragon•	508	(4.6)	86	(1.6)	358	(6.0)	390	(7.5)	448	(6.8)	513	(4.9)	569	(4.6)	616	(5.5)	643	(5.1)
Asturias•	501	(3.9)	89	(1.8)	347	(6.3)	381	(6.4)	440	(5.2)	507	(4.6)	565	(4.5)	611	(5.3)	640	(6.3)
Balearic Islands•	485	(4.5)	87	(1.6)	340	(7.1)	370	(6.4)	423	(5.4)	487	(5.4)	546	(4.7)	598	(5.4)	625	(6.5)
Basque Country•	483	(3.0)	85	(1.1)	341	(5.0)	370	(4.2)	424	(3.6)	485	(3.5)	544	(3.5)	593	(3.2)	620	(3.6)
Canary Islands•	475	(3.6)	88	(1.9)	330	(5.3)	361	(4.7)	413	(4.5)	474	(4.7)	540	(4.7)	592	(5.4)	619	(6.3)
Cantabria•	496	(5.6)	85	(2.0)	353	(6.8)	381	(5.9)	435	(6.5)	498	(6.3)	557	(6.2)	605	(7.2)	631	(7.1)
Castile and Leon•	519	(3.5)	84	(1.7)	377	(6.2)	408	(5.3)	462	(4.6)	521	(3.9)	577	(4.3)	627	(4.4)	653	(4.9)
Castile-La Mancha•	497	(4.0)	85	(1.9)	354	(6.6)	385	(5.7)	438	(5.2)	501	(5.0)	558	(4.2)	606	(5.0)	633	(6.0)
Catalonia•	504	(4.7)	89	(2.0)	350	(7.1)	383	(7.6)	444	(6.2)	509	(5.7)	568	(5.0)	618	(4.6)	644	(6.0)
Comunidad Valenciana•	494	(3.3)	81	(1.5)	360	(5.7)	388	(4.6)	438	(5.1)	495	(3.8)	551	(3.7)	599	(5.1)	627	(4.9)
Extremadura•	474	(3.8)	88	(1.9)	328	(6.9)	359	(6.4)	412	(5.3)	475	(4.6)	538	(4.8)	588	(5.0)	617	(6.2)
Galicia•	512	(3.1)	87	(2.0)	358	(7.6)	392	(5.8)	455	(5.2)	518	(3.5)	574	(3.8)	621	(3.9)	646	(4.3)
La Rioja•	498	(5.5)	91	(1.9)	339	(9.5)	375	(7.5)	438	(5.8)	502	(6.4)	562	(6.4)	613	(6.4)	639	(7.8)
Madrid•	516	(3.5)	87	(1.9)	366	(8.6)	399	(6.2)	456	(5.1)	522	(4.1)	579	(3.9)	623	(3.7)	648	(4.4)
Murcia•	484	(3.8)	88	(1.5)	338	(5.9)	368	(5.0)	422	(4.6)	485	(4.3)	547	(5.1)	597	(4.7)	624	(6.1)
Navarre•	512	(4.1)	84	(2.0)	371	(6.4)	401	(5.2)	454	(4.6)	516	(4.7)	572	(5.3)	618	(5.5)	645	(6.3)
United Kingdom																		
England	512	(3.0)	101	(1.2)	345	(3.5)	378	(3.8)	440	(3.6)	515	(3.7)	584	(3.4)	642	(3.9)	674	(3.9)
Northern Ireland	500	(2.8)	90	(2.0)	352	(4.8)	379	(4.5)	434	(4.0)	502	(3.5)	565	(4.0)	618	(4.5)	644	(4.6)
Scotland	497	(2.4)	95	(1.6)	342	(4.3)	372	(3.3)	428	(3.3)	498	(3.0)	565	(3.3)	619	(3.9)	651	(5.2)
Wales	485	(2.8)	89	(1.3)	341	(4.3)	368	(3.5)	420	(3.6)	484	(3.3)	549	(3.9)	602	(4.0)	631	(4.0)
United States																		
Massachusetts•	529	(6.6)	96	(2.3)	363	(7.4)	397	(8.8)	465	(8.3)	533	(7.3)	597	(7.0)	650	(7.7)	683	(9.7)
North Carolina•	502	(4.9)	96	(2.0)	347	(7.3)	377	(6.1)	433	(6.3)	502	(6.8)	573	(5.6)	629	(5.7)	659	(4.8)
Puerto Rico•	403	(6.1)	86	(2.5)	270	(7.0)	295	(7.3)	340	(6.4)	397	(7.3)	460	(7.7)	521	(9.4)	554	(10.3)
Partners																		
Colombia																		
Bogotá	458	(4.8)	79	(2.6)	330	(6.6)	358	(5.2)	403	(4.4)	455	(5.6)	512	(7.0)	562	(7.0)	589	(8.3)
Cali	421	(4.6)	76	(2.5)	303	(7.3)	328	(5.0)	366	(4.7)	416	(5.2)	473	(6.9)	524	(8.3)	553	(7.8)
Manizales	434	(4.2)	76	(2.3)	314	(5.9)	339	(4.6)	381	(4.7)	433	(4.8)	486	(6.1)	535	(7.2)	563	(9.5)
Medellín	433	(4.1)	80	(2.0)	307	(6.0)	332	(5.3)	376	(4.9)	429	(5.5)	490	(5.5)	540	(5.6)	570	(6.3)
United Arab Emirates																		
Abu Dhabi•	423	(4.5)	95	(2.0)	278	(4.9)	305	(4.4)	355	(4.5)	416	(5.1)	486	(6.0)	553	(6.8)	591	(6.3)
Ajman	402	(3.4)	84	(2.6)	268	(9.1)	296	(7.1)	342	(5.2)	397	(4.9)	461	(5.3)	516	(4.9)	544	(7.5)
Dubai•	480	(1.3)	101	(1.1)	311	(3.8)	345	(2.6)	407	(2.2)	483	(2.0)	554	(2.2)	610	(3.3)	643	(3.9)
Fujairah	401	(5.3)	90	(3.7)	263	(9.7)	289	(6.6)	339	(5.1)	397	(6.2)	459	(9.4)	521	(10.9)	556	(12.0)
Ras Al Khaimah	400	(8.5)	84	(4.7)	273	(10.8)	298	(7.8)	341	(7.0)	394	(8.8)	456	(10.9)	514	(12.3)	545	(16.7)
Sharjah	432	(9.5)	93	(4.4)	285	(14.1)	314	(10.6)	368	(9.7)	429	(10.3)	497	(13.4)	555	(14.6)	590	(14.2)
Umm Al Quwain	387	(4.1)	83	(3.2)	264	(9.6)	288	(7.1)	329	(5.9)	377	(5.4)	440	(7.5)	504	(10.0)	540	(15.4)

• PISA adjudicated region.
Notes: Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.2.3 for national data.
StatLink http://dx.doi.org/10.1787/888933433235

[Part 1/1]

Table B2.I.6 **Mean score and variation in student performance in reading**

	Mean score		Standard deviation		Percentiles													
					5th		10th		25th		Median (50th)		75th		90th		95th	
	Mean	S.E.	S.D.	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
OECD																		
Belgium																		
Flemish community•	511	(2.8)	101	(1.9)	331	(5.3)	369	(5.2)	442	(4.6)	521	(3.1)	586	(2.9)	634	(3.1)	661	(3.3)
French community	483	(4.8)	98	(2.1)	315	(7.5)	350	(7.0)	416	(6.4)	491	(6.3)	557	(4.6)	605	(3.8)	631	(4.0)
German-speaking community	501	(4.2)	85	(3.4)	343	(13.5)	383	(9.0)	447	(7.1)	509	(6.4)	562	(6.8)	606	(9.0)	628	(10.7)
Canada																		
Alberta	533	(5.2)	91	(2.1)	377	(8.6)	412	(7.5)	474	(6.3)	538	(5.8)	597	(6.1)	647	(5.8)	675	(7.5)
British Columbia	536	(5.6)	90	(2.6)	381	(8.7)	419	(7.6)	477	(6.1)	539	(6.2)	597	(7.0)	648	(7.1)	678	(6.9)
Manitoba	498	(5.0)	91	(2.7)	345	(8.8)	378	(7.5)	436	(6.8)	502	(6.2)	563	(5.3)	613	(6.4)	642	(7.4)
New Brunswick	505	(5.2)	90	(2.9)	350	(11.0)	383	(12.0)	444	(7.8)	510	(6.1)	570	(5.4)	619	(6.3)	645	(7.0)
Newfoundland and Labrador	505	(3.5)	87	(2.3)	353	(9.7)	387	(7.5)	448	(4.9)	508	(4.2)	567	(5.4)	616	(6.8)	641	(7.3)
Nova Scotia	517	(4.9)	89	(2.6)	366	(9.4)	401	(8.4)	458	(5.9)	521	(5.3)	579	(5.3)	628	(6.5)	657	(8.6)
Ontario	527	(4.4)	94	(2.1)	364	(7.1)	401	(6.2)	465	(5.5)	532	(4.7)	593	(4.7)	645	(4.5)	675	(5.8)
Prince Edward Island	515	(6.1)	85	(4.0)	367	(20.6)	404	(10.4)	461	(8.7)	518	(8.2)	575	(8.4)	622	(9.8)	648	(14.1)
Quebec	532	(4.7)	92	(2.7)	368	(9.0)	410	(7.7)	474	(5.9)	538	(5.5)	596	(5.1)	644	(5.7)	672	(7.0)
Saskatchewan	496	(3.6)	86	(2.1)	355	(7.3)	384	(5.9)	437	(5.4)	497	(4.2)	556	(4.7)	605	(4.5)	633	(5.8)
Italy																		
Bolzano	503	(8.4)	84	(1.8)	359	(8.8)	392	(8.9)	446	(8.8)	508	(8.9)	563	(8.5)	609	(10.7)	636	(9.7)
Campania	455	(5.5)	92	(3.2)	305	(9.8)	338	(7.5)	391	(6.1)	454	(6.6)	517	(7.5)	576	(9.2)	608	(9.2)
Lombardia	505	(4.5)	91	(2.7)	346	(8.5)	382	(8.2)	445	(6.2)	510	(5.3)	570	(5.1)	618	(5.2)	646	(7.0)
Trento	512	(2.8)	84	(1.9)	362	(7.8)	400	(6.1)	459	(4.0)	518	(4.3)	572	(3.9)	614	(4.1)	637	(6.4)
Portugal																		
Região Autónoma dos Açores	470	(2.8)	90	(2.0)	324	(5.5)	352	(5.1)	404	(3.6)	470	(3.6)	533	(3.8)	586	(5.2)	618	(7.8)
Spain																		
Andalusia•	479	(4.3)	92	(1.9)	322	(8.2)	356	(5.9)	416	(6.1)	483	(5.1)	545	(4.7)	595	(5.2)	623	(5.2)
Aragon•	506	(6.3)	87	(2.2)	351	(7.4)	386	(7.8)	451	(7.7)	513	(7.1)	569	(7.2)	613	(6.8)	640	(7.8)
Asturias•	498	(6.4)	89	(2.0)	341	(7.4)	376	(7.9)	441	(8.0)	504	(6.4)	560	(6.6)	606	(7.5)	634	(9.2)
Balearic Islands•	485	(8.1)	87	(2.2)	334	(8.3)	369	(8.7)	427	(8.9)	489	(7.6)	546	(8.7)	594	(9.5)	620	(9.1)
Basque Country•	491	(4.7)	88	(1.7)	340	(7.6)	373	(6.4)	433	(5.8)	496	(4.8)	553	(5.1)	602	(5.8)	629	(5.8)
Canary Islands•	483	(4.1)	91	(1.9)	329	(5.7)	361	(6.5)	419	(5.2)	486	(4.6)	549	(5.3)	598	(4.8)	626	(6.6)
Cantabria•	501	(5.6)	87	(1.9)	349	(7.6)	383	(7.1)	443	(6.4)	507	(5.9)	563	(5.9)	609	(6.3)	634	(6.0)
Castile and Leon•	522	(4.2)	83	(1.9)	378	(8.2)	413	(6.4)	468	(5.0)	525	(4.5)	579	(5.4)	625	(4.7)	651	(7.0)
Castile-La Mancha•	499	(4.0)	85	(2.1)	351	(7.5)	387	(5.6)	442	(5.0)	504	(4.9)	559	(4.6)	607	(5.3)	633	(5.9)
Catalonia•	500	(4.5)	87	(2.0)	345	(9.5)	381	(7.4)	442	(6.3)	507	(4.8)	561	(4.9)	607	(5.1)	633	(5.3)
Comunidad Valenciana•	499	(3.7)	84	(2.1)	355	(6.3)	386	(6.2)	444	(5.1)	503	(3.8)	558	(5.2)	604	(5.0)	630	(5.7)
Extremadura•	475	(4.3)	91	(2.0)	319	(9.1)	354	(6.9)	414	(5.7)	479	(4.5)	541	(4.4)	589	(5.4)	616	(6.9)
Galicia•	509	(4.6)	88	(2.2)	351	(9.2)	389	(8.7)	452	(6.0)	517	(4.8)	573	(4.8)	616	(5.4)	641	(7.5)
La Rioja•	491	(9.5)	91	(2.2)	329	(11.9)	369	(11.0)	433	(10.0)	498	(9.7)	556	(9.7)	601	(10.7)	628	(13.6)
Madrid•	520	(4.2)	86	(2.4)	368	(10.1)	404	(5.7)	464	(5.5)	527	(4.9)	582	(4.7)	625	(5.9)	651	(5.9)
Murcia•	486	(4.9)	88	(1.9)	333	(8.8)	368	(6.9)	426	(5.1)	491	(5.6)	550	(5.5)	597	(6.8)	622	(5.8)
Navarre•	514	(5.2)	84	(2.2)	368	(8.5)	401	(8.0)	459	(5.2)	519	(6.1)	574	(6.2)	618	(6.8)	644	(6.5)
United Kingdom																		
England	500	(3.2)	98	(1.3)	335	(5.1)	371	(4.8)	433	(3.8)	502	(3.7)	568	(3.5)	625	(4.1)	657	(4.7)
Northern Ireland	497	(4.6)	84	(2.0)	356	(7.0)	385	(6.1)	439	(5.0)	499	(5.2)	557	(5.7)	605	(5.3)	632	(6.8)
Scotland	493	(2.3)	91	(1.6)	340	(6.0)	373	(4.5)	431	(3.1)	497	(2.5)	557	(2.9)	608	(3.6)	637	(5.1)
Wales	477	(3.6)	85	(1.5)	337	(5.6)	368	(4.2)	419	(4.2)	477	(3.4)	536	(3.8)	588	(5.1)	615	(5.9)
United States																		
Massachusetts•	527	(6.0)	94	(2.4)	363	(8.8)	400	(7.4)	467	(7.7)	532	(6.7)	593	(6.5)	644	(6.6)	673	(7.7)
North Carolina•	500	(5.4)	96	(2.2)	342	(8.1)	373	(6.4)	433	(6.7)	502	(6.9)	569	(6.6)	624	(5.4)	652	(5.5)
Puerto Rico•	410	(7.1)	96	(3.3)	257	(10.6)	287	(9.5)	343	(8.5)	406	(8.3)	476	(8.4)	537	(10.8)	572	(10.6)
Partners																		
Colombia																		
Bogotá	469	(4.6)	83	(2.4)	329	(7.7)	363	(6.5)	414	(4.6)	470	(5.4)	527	(6.9)	576	(7.3)	602	(7.3)
Cali	432	(5.3)	84	(2.5)	296	(7.0)	323	(5.5)	372	(5.5)	432	(6.0)	492	(8.3)	544	(8.0)	573	(8.2)
Manizales	449	(4.7)	83	(2.3)	312	(7.3)	342	(5.2)	392	(6.0)	450	(4.9)	507	(5.8)	557	(8.7)	584	(8.6)
Medellín	451	(5.1)	88	(2.4)	308	(8.2)	338	(7.3)	388	(5.9)	451	(6.6)	515	(6.1)	566	(5.8)	593	(6.8)
United Arab Emirates																		
Abu Dhabi•	419	(5.0)	103	(2.1)	251	(5.6)	285	(6.3)	346	(6.1)	419	(5.9)	491	(6.1)	554	(6.4)	588	(6.2)
Ajman	401	(6.0)	96	(3.8)	243	(13.7)	274	(11.2)	334	(9.4)	404	(6.5)	469	(6.7)	527	(6.4)	553	(7.7)
Dubai•	475	(1.7)	106	(2.0)	288	(5.2)	330	(4.0)	405	(2.7)	484	(2.3)	553	(2.6)	606	(4.1)	636	(5.0)
Fujairah	398	(7.4)	99	(4.9)	242	(7.2)	272	(8.6)	330	(6.5)	394	(8.4)	463	(10.2)	525	(14.5)	566	(17.8)
Ras Al Khaimah	391	(10.5)	93	(4.8)	242	(14.9)	273	(9.5)	327	(9.9)	389	(11.2)	455	(13.0)	513	(15.5)	545	(17.5)
Sharjah	435	(10.2)	98	(4.4)	266	(14.8)	304	(13.5)	369	(12.2)	439	(10.7)	504	(12.4)	563	(12.6)	593	(11.5)
Umm Al Quwain	386	(5.6)	93	(3.7)	239	(11.8)	269	(11.6)	317	(7.0)	380	(8.1)	450	(8.2)	512	(11.9)	547	(13.7)

• PISA adjudicated region.
Notes: Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.4.3 for national data.
StatLink http://dx.doi.org/10.1787/888933433235

[Part 1/1]

Table B2.I.10 Mean score and variation in student performance in mathematics

		Mean score		Standard deviation		Percentiles													
						5th		10th		25th		Median (50th)		75th		90th		95th	
		Mean	S.E.	S.D.	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
OECD	**Belgium**																		
	Flemish community•	521	(2.5)	99	(1.8)	349	(6.1)	384	(5.0)	453	(4.0)	529	(3.4)	594	(2.9)	645	(2.9)	672	(3.5)
	French community	489	(4.4)	92	(2.0)	334	(6.3)	365	(5.3)	423	(5.5)	493	(5.5)	558	(5.1)	607	(4.3)	633	(4.6)
	German-speaking community	502	(5.1)	80	(3.4)	364	(14.6)	391	(10.2)	445	(6.2)	508	(6.3)	560	(7.6)	602	(10.0)	625	(10.3)
	Canada																		
	Alberta	511	(4.7)	86	(2.3)	365	(8.0)	398	(6.5)	453	(5.8)	514	(4.8)	571	(5.3)	621	(5.6)	650	(6.2)
	British Columbia	522	(5.0)	86	(2.3)	380	(8.5)	412	(6.0)	465	(6.2)	522	(5.6)	580	(5.7)	631	(6.5)	663	(7.8)
	Manitoba	489	(4.2)	82	(2.5)	354	(8.6)	382	(7.4)	433	(5.2)	490	(4.5)	545	(5.4)	597	(6.7)	624	(8.5)
	New Brunswick	493	(5.1)	85	(2.8)	351	(10.7)	380	(9.3)	432	(6.4)	495	(6.5)	553	(5.4)	602	(6.8)	628	(7.3)
	Newfoundland and Labrador	486	(3.2)	81	(2.2)	348	(7.6)	379	(6.9)	432	(4.5)	487	(3.6)	542	(4.6)	589	(6.2)	617	(6.9)
	Nova Scotia	497	(4.6)	82	(2.1)	360	(8.3)	390	(7.2)	440	(5.3)	500	(4.5)	554	(5.1)	602	(7.2)	632	(6.6)
	Ontario	509	(4.2)	86	(1.9)	365	(5.6)	395	(5.2)	450	(5.2)	512	(4.8)	570	(4.7)	619	(5.4)	649	(6.3)
	Prince Edward Island	499	(6.4)	76	(3.5)	375	(11.5)	401	(10.7)	446	(8.6)	498	(8.4)	550	(9.4)	599	(11.2)	624	(12.7)
	Quebec	544	(4.8)	88	(2.3)	392	(7.0)	426	(6.0)	486	(5.8)	549	(5.4)	606	(6.0)	652	(6.5)	681	(6.9)
	Saskatchewan	484	(2.9)	82	(2.1)	350	(7.9)	379	(6.8)	428	(4.4)	484	(3.7)	542	(4.5)	589	(5.2)	618	(5.4)
	Italy																		
	Bolzano	518	(6.7)	82	(1.9)	381	(6.5)	411	(6.4)	462	(7.5)	520	(7.7)	576	(7.8)	623	(8.6)	649	(9.3)
	Campania	456	(5.5)	87	(3.0)	319	(8.5)	347	(6.8)	394	(6.2)	451	(6.9)	514	(7.1)	571	(8.4)	606	606
	Lombardia	508	(6.4)	94	(3.5)	350	(10.9)	384	(8.9)	442	(8.2)	511	(7.6)	573	(7.0)	627	(8.1)	659	(9.6)
	Trento	516	(2.6)	84	(1.8)	372	(6.2)	405	(5.2)	461	(5.0)	519	(3.3)	576	(3.3)	623	(4.6)	649	(5.7)
	Portugal																		
	Região Autónoma dos Açores	462	(2.3)	93	(2.1)	318	(5.9)	346	(4.5)	393	(3.8)	458	(4.0)	526	(4.5)	586	(4.9)	623	(7.5)
	Spain																		
	Andalusia•	466	(4.1)	84	(2.2)	326	(7.1)	356	(5.5)	406	(5.3)	467	(5.2)	525	(5.0)	575	(5.9)	604	(7.0)
	Aragon•	500	(5.0)	83	(2.2)	357	(7.5)	388	(7.0)	445	(6.0)	504	(5.8)	560	(4.8)	604	(6.7)	629	(7.2)
	Asturias•	492	(5.3)	84	(1.9)	349	(7.0)	379	(6.5)	434	(5.7)	495	(6.5)	551	(6.0)	598	(6.8)	626	(7.7)
	Balearic Islands•	476	(6.3)	82	(2.3)	340	(8.4)	370	(7.4)	420	(7.0)	477	(6.2)	534	(7.1)	581	(7.7)	610	(8.8)
	Basque Country•	492	(3.7)	81	(1.4)	355	(4.5)	385	(4.3)	436	(5.2)	494	(4.2)	549	(4.0)	595	(4.9)	621	(5.1)
	Canary Islands•	452	(4.7)	84	(1.7)	314	(5.9)	342	(5.6)	394	(6.0)	451	(4.8)	513	(6.0)	563	(5.8)	589	(5.2)
	Cantabria•	495	(9.1)	82	(2.0)	356	(9.5)	386	(8.9)	439	(9.8)	498	(9.9)	553	(9.8)	599	(9.3)	624	(9.6)
	Castile and Leon•	506	(4.6)	80	(2.0)	370	(6.8)	400	(6.0)	453	(4.9)	508	(5.4)	563	(5.8)	608	(6.4)	633	(6.4)
	Castile-La Mancha•	486	(3.4)	82	(2.1)	347	(7.9)	379	(5.1)	430	(4.6)	488	(3.9)	545	(4.5)	590	(4.5)	617	(5.0)
	Catalonia•	500	(4.5)	85	(2.0)	354	(9.0)	388	(7.2)	443	(5.7)	503	(4.8)	559	(5.6)	608	(5.5)	635	(6.6)
	Comunidad Valenciana•	485	(3.5)	78	(1.8)	357	(5.8)	384	(5.5)	432	(4.8)	486	(4.2)	540	(4.7)	584	(4.8)	610	(5.2)
	Extremadura•	473	(4.6)	83	(2.1)	337	(7.1)	366	(6.8)	414	(5.4)	474	(5.8)	532	(5.9)	581	(5.9)	607	(5.4)
	Galicia•	494	(4.3)	82	(1.9)	354	(6.8)	385	(6.4)	440	(5.4)	497	(4.6)	551	(4.7)	596	(5.8)	622	(6.2)
	La Rioja•	505	(9.4)	86	(2.0)	354	(11.9)	389	(10.6)	450	(9.8)	508	(9.9)	565	(10.3)	613	(10.6)	640	(12.0)
	Madrid•	503	(4.2)	84	(2.2)	359	(7.8)	391	(6.9)	448	(5.1)	508	(5.1)	563	(4.6)	607	(6.2)	631	(5.6)
	Murcia•	470	(6.8)	82	(1.5)	334	(8.2)	361	(7.8)	413	(7.1)	472	(8.3)	529	(6.6)	577	(7.1)	604	(8.5)
	Navarre•	518	(7.7)	81	(1.9)	380	(9.2)	411	(7.6)	464	(7.2)	521	(8.4)	575	(8.3)	620	(9.0)	646	(10.2)
	United Kingdom																		
	England	493	(3.0)	95	(1.5)	334	(5.0)	369	(4.2)	429	(3.9)	497	(3.5)	559	(3.7)	613	(3.8)	644	(4.2)
	Northern Ireland	493	(4.6)	78	(2.0)	363	(6.1)	388	(6.0)	438	(4.9)	496	(5.0)	548	(4.9)	592	(6.0)	617	(6.8)
	Scotland	491	(2.6)	84	(1.4)	353	(4.4)	382	(3.8)	433	(3.2)	492	(3.2)	549	(3.3)	601	(4.2)	628	(4.9)
	Wales	478	(3.7)	78	(1.7)	350	(5.3)	377	(5.7)	425	(4.9)	478	(3.9)	533	(3.6)	578	(4.6)	604	(5.5)
	United States																		
	Massachusetts•	500	(5.5)	85	(2.3)	354	(8.4)	389	(7.5)	445	(6.9)	504	(6.1)	558	(6.6)	607	(6.1)	635	(7.6)
	North Carolina•	471	(4.4)	86	(2.0)	331	(6.2)	358	(5.8)	410	(5.6)	472	(5.6)	532	(5.1)	583	(5.7)	611	(5.9)
	Puerto Rico•	378	(5.6)	77	(3.5)	261	(7.7)	284	(6.5)	325	(5.6)	374	(6.2)	426	(7.6)	481	(10.4)	515	(11.8)
Partners	**Colombia**																		
	Bogotá	426	(4.6)	77	(2.9)	300	(6.2)	328	(6.2)	373	(4.5)	423	(4.8)	477	(7.9)	528	(8.3)	557	(9.3)
	Cali	394	(4.3)	73	(2.4)	280	(5.8)	303	(4.7)	343	(4.1)	390	(5.0)	442	(6.7)	491	(7.0)	519	(8.0)
	Manizales	407	(3.9)	74	(2.6)	291	(4.9)	314	(4.1)	356	(4.5)	406	(4.4)	456	(5.5)	503	(8.1)	533	(9.5)
	Medellín	408	(4.3)	77	(2.7)	288	(5.2)	312	(4.6)	354	(5.1)	405	(5.4)	459	(5.6)	510	(7.1)	541	(8.7)
	United Arab Emirates																		
	Abu Dhabi•	413	(4.7)	93	(2.1)	268	(6.4)	297	(4.6)	347	(5.0)	407	(5.1)	473	(6.1)	539	(6.8)	576	(7.7)
	Ajman	387	(6.6)	84	(4.0)	249	(14.0)	279	(11.8)	330	(9.4)	385	(7.0)	443	(6.0)	496	(7.5)	529	(10.1)
	Dubai•	467	(1.9)	99	(2.1)	302	(6.1)	338	(4.2)	399	(2.6)	470	(2.6)	537	(3.0)	594	(4.1)	626	(4.8)
	Fujairah	393	(5.5)	87	(3.7)	258	(10.1)	287	(7.5)	333	(7.0)	387	(6.9)	449	(8.1)	509	(10.3)	547	(10.1)
	Ras Al Khaimah	402	(9.4)	82	(4.9)	272	(9.3)	300	(9.1)	346	(8.3)	399	(9.4)	455	(11.4)	507	(14.4)	542	(19.0)
	Sharjah	429	(7.6)	91	(4.6)	283	(12.3)	315	(9.3)	367	(7.9)	427	(9.1)	489	(11.0)	547	(14.1)	584	(15.2)
	Umm Al Quwain	384	(5.0)	77	(3.3)	259	(10.1)	287	(10.1)	332	(7.5)	382	(7.6)	434	(5.9)	484	(8.3)	515	(11.8)

• PISA adjudicated region.
Notes: Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.5.3 for national data.
StatLink http://dx.doi.org/10.1787/888933433235

[Part 1/1]

Table B2.I.45 Top performers in science, reading and mathematics

	15-year-old students who are:																Percentage of top performers in science who are also top performers in reading and mathematics	
	Not top performers in any of the three domains		Top performers only in science		Top performers only in reading		Top performers only in mathematics		Top performers in science and reading but not in mathematics		Top performers in science and mathematics but not in reading		Top performers in reading and mathematics but not in science		Top performers in all three domains			
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD																		
Belgium																		
Flemish community•	74.8	(0.9)	1.1	(0.3)	2.6	(0.4)	8.3	(0.6)	0.9	(0.2)	3.7	(0.4)	2.3	(0.4)	6.3	(0.5)	52.7	(2.9)
French community	86.9	(1.1)	0.7	(0.2)	1.8	(0.3)	4.8	(0.6)	0.5	(0.1)	1.6	(0.3)	1.2	(0.3)	2.5	(0.4)	46.4	(4.6)
German-speaking community	87.5	(2.2)	1.5	(1.0)	1.4	(0.7)	3.8	(1.5)	0.6	(0.6)	1.7	(0.9)	1.2	(1.1)	2.3	(0.9)	38.8	(14.9)
Canada																		
Alberta	75.9	(1.6)	3.1	(0.6)	4.3	(0.8)	2.9	(0.8)	3.3	(0.8)	2.7	(0.7)	1.0	(0.3)	6.8	(0.7)	43.0	(3.5)
British Columbia	75.1	(2.1)	2.1	(0.5)	4.5	(1.0)	4.3	(0.9)	2.5	(0.6)	2.9	(0.7)	1.4	(0.4)	7.3	(1.2)	49.6	(5.4)
Manitoba	87.0	(1.5)	1.1	(0.4)	2.6	(0.5)	2.7	(0.7)	1.3	(0.4)	1.6	(0.5)	0.7	(0.3)	3.1	(0.7)	43.5	(7.0)
New Brunswick	85.6	(1.6)	1.3	(0.6)	2.4	(0.6)	2.9	(0.8)	1.6	(0.6)	1.6	(0.6)	1.0	(0.6)	3.6	(0.7)	44.4	(7.8)
Newfoundland and Labrador	87.6	(1.3)	1.6	(0.5)	2.8	(0.9)	1.4	(0.5)	1.7	(0.6)	1.5	(0.7)	0.5	(0.3)	3.1	(0.9)	39.3	(9.2)
Nova Scotia	84.1	(1.6)	1.6	(0.5)	3.2	(0.7)	2.2	(0.6)	2.0	(0.6)	1.6	(0.5)	0.7	(0.4)	4.6	(0.8)	47.1	(5.8)
Ontario	78.7	(1.6)	1.5	(0.3)	4.6	(0.6)	3.3	(0.6)	2.3	(0.5)	1.8	(0.4)	1.4	(0.4)	6.5	(0.8)	54.1	(4.2)
Prince Edward Island	85.8	(2.6)	1.7	(1.0)	3.0	(1.4)	1.8	(1.0)	1.5	(0.9)	1.8	(1.0)	0.7	(0.7)	3.8	(1.4)	43.0	(12.9)
Quebec	70.4	(2.3)	0.7	(0.2)	3.7	(0.7)	10.5	(1.5)	0.8	(0.4)	3.8	(0.7)	2.7	(0.5)	7.6	(1.1)	59.1	(4.1)
Saskatchewan	89.3	(1.0)	1.1	(0.3)	1.9	(0.5)	2.1	(0.7)	1.2	(0.4)	1.4	(0.4)	0.5	(0.2)	2.5	(0.5)	41.5	(7.1)
Italy																		
Bolzano	82.5	(1.9)	1.0	(0.5)	1.7	(0.9)	6.7	(1.4)	0.5	(0.4)	3.0	(0.8)	1.3	(0.8)	3.3	(0.8)	42.4	(9.8)
Campania	93.1	(1.1)	0.2	(0.2)	1.7	(0.5)	2.8	(0.8)	0.2	(0.2)	0.6	(0.3)	0.6	(0.3)	0.8	(0.3)	43.9	(12.0)
Lombardia	81.3	(2.0)	0.6	(0.2)	2.9	(0.7)	7.4	(1.4)	0.5	(0.3)	2.3	(0.6)	1.9	(0.6)	3.1	(0.6)	47.2	(6.8)
Trento	82.7	(1.2)	0.4	(0.2)	2.2	(0.6)	7.5	(0.8)	0.3	(0.3)	2.4	(0.6)	1.7	(0.6)	2.7	(0.6)	45.5	(8.4)
Portugal																		
Região Autónoma dos Açores	91.5	(0.9)	0.3	(0.3)	1.1	(0.5)	2.8	(0.7)	0.3	(0.2)	1.3	(0.4)	0.6	(0.4)	2.1	(0.6)	52.8	(11.9)
Spain																		
Andalusia•	92.1	(0.9)	0.6	(0.2)	2.1	(0.4)	1.9	(0.4)	0.5	(0.3)	0.8	(0.3)	0.7	(0.2)	1.2	(0.4)	39.2	(9.2)
Aragon•	86.1	(1.4)	1.1	(0.3)	2.6	(0.8)	3.5	(0.8)	0.9	(0.4)	1.9	(0.5)	1.2	(0.5)	2.8	(0.7)	42.2	(8.5)
Asturias•	87.9	(1.3)	1.1	(0.4)	2.2	(0.7)	3.2	(0.9)	0.7	(0.4)	1.6	(0.6)	0.9	(0.4)	2.5	(0.6)	42.9	(8.3)
Balearic Islands•	91.2	(1.4)	0.9	(0.4)	2.0	(1.0)	2.3	(0.7)	0.6	(0.3)	1.2	(0.5)	0.5	(0.3)	1.3	(0.3)	32.3	(7.2)
Basque Country•	89.5	(1.0)	0.4	(0.2)	2.3	(0.6)	3.8	(0.7)	0.4	(0.1)	0.9	(0.2)	1.2	(0.4)	1.6	(0.3)	48.3	(5.8)
Canary Islands•	92.4	(0.8)	0.9	(0.4)	2.9	(0.6)	1.1	(0.4)	0.9	(0.4)	0.5	(0.2)	0.4	(0.2)	1.0	(0.4)	29.7	(10.3)
Cantabria•	87.8	(1.7)	0.7	(0.4)	2.7	(0.6)	3.6	(1.3)	0.6	(0.3)	1.3	(0.4)	1.2	(0.4)	2.1	(0.5)	45.3	(7.7)
Castile and Leon•	83.6	(1.4)	1.4	(0.4)	3.4	(0.8)	3.3	(0.8)	1.4	(0.5)	1.8	(0.5)	1.2	(0.4)	3.9	(0.7)	46.1	(5.7)
Castile-La Mancha•	89.0	(1.1)	1.0	(0.3)	2.7	(0.5)	2.5	(0.5)	0.7	(0.3)	1.2	(0.4)	0.8	(0.3)	2.0	(0.4)	41.2	(7.1)
Catalonia•	86.2	(1.4)	1.2	(0.3)	1.8	(0.4)	4.3	(0.7)	0.6	(0.2)	2.1	(0.6)	1.0	(0.4)	2.8	(0.5)	41.6	(6.4)
Comunidad Valenciana•	90.4	(1.0)	0.7	(0.3)	2.6	(0.7)	2.2	(0.5)	0.8	(0.3)	0.9	(0.3)	0.7	(0.3)	1.6	(0.4)	40.0	(7.4)
Extremadura•	92.5	(0.8)	0.5	(0.3)	1.5	(0.5)	2.4	(0.7)	0.4	(0.2)	0.8	(0.4)	0.5	(0.2)	1.4	(0.3)	44.5	(9.9)
Galicia•	86.2	(1.1)	1.6	(0.4)	3.1	(0.8)	2.5	(0.7)	1.3	(0.5)	1.8	(0.6)	0.8	(0.3)	2.7	(0.5)	36.6	(6.0)
La Rioja•	85.5	(2.4)	0.9	(0.5)	1.4	(0.7)	5.9	(2.4)	0.5	(0.4)	2.3	(0.8)	1.2	(0.8)	2.3	(0.8)	38.7	(12.3)
Madrid•	83.2	(1.5)	1.3	(0.4)	4.2	(1.1)	3.8	(1.0)	1.3	(0.5)	1.8	(0.5)	1.2	(0.4)	3.2	(0.5)	41.6	(5.3)
Murcia•	91.7	(0.9)	0.9	(0.4)	2.1	(0.6)	1.8	(0.8)	0.7	(0.3)	1.0	(0.3)	0.4	(0.2)	1.4	(0.4)	36.2	(8.6)
Navarre•	82.5	(2.3)	0.7	(0.4)	2.7	(0.7)	6.4	(1.9)	0.6	(0.5)	2.1	(0.6)	1.6	(0.6)	3.5	(0.7)	51.4	(8.3)
United Kingdom																		
England	81.9	(1.0)	2.3	(0.4)	2.4	(0.4)	3.2	(0.4)	2.0	(0.3)	2.6	(0.4)	0.7	(0.2)	4.8	(0.4)	40.9	(2.7)
Northern Ireland	88.9	(1.2)	1.5	(0.4)	1.7	(0.5)	2.1	(0.7)	1.3	(0.4)	1.5	(0.4)	0.5	(0.4)	2.5	(0.4)	36.6	(5.4)
Scotland	86.9	(0.9)	1.6	(0.4)	1.8	(0.4)	3.2	(0.5)	1.1	(0.3)	1.9	(0.4)	0.6	(0.2)	2.9	(0.4)	38.3	(4.7)
Wales	92.2	(0.9)	1.3	(0.3)	1.3	(0.4)	1.6	(0.5)	0.7	(0.2)	1.2	(0.3)	0.2	(0.2)	1.6	(0.3)	33.6	(6.0)
United States																		
Massachusetts•	80.0	(2.1)	2.5	(0.7)	3.9	(0.7)	1.2	(0.3)	3.6	(0.7)	1.8	(0.6)	0.7	(0.3)	6.3	(1.1)	44.4	(5.2)
North Carolina•	86.3	(1.3)	2.1	(0.5)	3.4	(0.6)	0.8	(0.3)	2.7	(0.5)	1.1	(0.4)	0.3	(0.2)	3.2	(0.6)	35.3	(5.9)
Puerto Rico•	98.5	(0.5)	0.1	(0.1)	0.9	(0.4)	0.1	(0.2)	0.2	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	15.4	(21.6)
Partners																		
Colombia																		
Bogotá	96.9	(0.7)	0.2	(0.2)	1.6	(0.5)	0.2	(0.2)	0.3	(0.2)	0.1	(0.1)	0.1	(0.1)	0.4	(0.2)	38.7	(16.9)
Cali	99.0	(0.3)	0.0	(0.1)	0.6	(0.3)	0.1	(0.1)	0.1	(0.1)	0.0	(0.0)	0.0	(0.1)	0.1	(0.1)	41.1	(32.7)
Manizales	98.4	(0.6)	0.1	(0.1)	0.9	(0.4)	0.1	(0.1)	0.2	(0.2)	0.1	(0.1)	0.0	(0.1)	0.2	(0.2)	27.8	(24.4)
Medellín	97.8	(0.6)	0.1	(0.1)	1.3	(0.4)	0.1	(0.1)	0.2	(0.1)	0.1	(0.1)	0.1	(0.1)	0.3	(0.2)	47.2	(24.4)
United Arab Emirates																		
Abu Dhabi•	96.1	(0.6)	0.4	(0.2)	0.7	(0.3)	1.1	(0.4)	0.2	(0.1)	0.5	(0.2)	0.2	(0.1)	0.7	(0.2)	36.8	(9.7)
Ajman	99.1	(0.4)	0.0	(0.1)	0.4	(0.3)	0.3	(0.3)	0.1	(0.2)	0.0	c	0.0	(0.1)	0.0	(0.1)	m	m
Dubai•	87.9	(0.6)	1.2	(0.3)	2.2	(0.4)	3.0	(0.5)	1.1	(0.3)	1.5	(0.3)	0.7	(0.2)	2.5	(0.3)	40.5	(4.8)
Fujairah	97.8	(0.8)	0.2	(0.2)	0.6	(0.5)	0.5	(0.4)	0.2	(0.2)	0.2	(0.2)	0.1	(0.1)	0.4	(0.3)	44.2	(23.4)
Ras Al Khaimah	98.5	(0.9)	0.2	(0.2)	0.3	(0.3)	0.5	(0.4)	0.0	(0.1)	0.2	(0.2)	0.1	(0.1)	0.2	(0.3)	29.1	(30.2)
Sharjah	95.7	(1.4)	0.4	(0.3)	0.9	(0.5)	1.6	(0.7)	0.2	(0.2)	0.4	(0.3)	0.3	(0.2)	0.5	(0.4)	33.9	(19.8)
Umm Al Quwain	99.2	(0.5)	0.1	(0.2)	0.3	(0.4)	0.2	(0.3)	0.0	(0.1)	0.0	(0.1)	0.0	(0.1)	0.1	(0.2)	m	m

• PISA adjudicated region.
Notes: Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.2.9a for national data.

StatLink http://dx.doi.org/10.1787/888933433235

[Part 1/1]

Table B2.I.46 Low achievers in science, reading and mathematics

		15-year-old students who are:																Percentage of low achievers in science who are also low achievers in reading and mathematics	
		Not low achievers in any of the three domains		Low achievers only in science		Low achievers only in reading		Low achievers only in mathematics		Low achievers in science and reading but not in mathematics		Low achievers in science and mathematics but not in reading		Low achievers in reading and mathematics but not in science		Low achievers in all three domains			
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	**Belgium**																		
	Flemish community•	76.4	(1.0)	1.8	(0.3)	2.6	(0.3)	2.7	(0.4)	2.4	(0.4)	2.1	(0.3)	1.2	(0.3)	10.9	(0.8)	63.5	(2.7)
	French community	67.9	(1.9)	2.1	(0.4)	3.1	(0.5)	4.0	(0.6)	2.8	(0.5)	3.3	(0.5)	1.8	(0.3)	14.9	(1.4)	64.5	(3.4)
	German-speaking community	77.8	(2.4)	1.5	(1.0)	1.9	(1.0)	4.1	(1.7)	1.6	(1.0)	2.3	(1.4)	1.9	(1.2)	8.8	(1.7)	62.6	(11.5)
	Canada																		
	Alberta	81.6	(1.6)	0.8	(0.3)	1.8	(0.4)	6.5	(1.1)	0.8	(0.3)	2.0	(0.5)	1.5	(0.4)	5.0	(0.7)	58.7	(5.3)
	British Columbia	83.9	(1.5)	1.2	(0.4)	2.1	(0.7)	4.5	(0.8)	1.1	(0.5)	2.3	(0.7)	0.8	(0.4)	4.0	(0.8)	46.5	(7.9)
	Manitoba	72.6	(2.0)	1.7	(0.6)	2.9	(0.7)	5.4	(0.9)	2.3	(0.7)	3.6	(0.8)	1.7	(0.6)	9.9	(1.2)	56.7	(3.8)
	New Brunswick	73.9	(2.2)	1.2	(0.5)	2.3	(0.6)	6.6	(1.1)	1.6	(0.4)	3.5	(0.8)	1.7	(0.5)	9.2	(1.7)	59.4	(6.2)
	Newfoundland and Labrador	75.2	(1.7)	0.9	(0.5)	1.7	(0.6)	6.2	(0.9)	1.1	(0.4)	3.6	(0.9)	1.5	(0.6)	9.8	(1.2)	63.6	(4.9)
	Nova Scotia	78.0	(2.0)	1.3	(0.5)	1.7	(0.5)	6.1	(1.1)	1.2	(0.6)	3.3	(0.8)	1.4	(0.5)	7.1	(1.2)	55.5	(7.0)
	Ontario	79.5	(1.5)	1.3	(0.3)	2.1	(0.4)	5.1	(0.8)	1.4	(0.3)	3.0	(0.5)	1.0	(0.3)	6.5	(0.8)	53.3	(3.5)
	Prince Edward Island	80.5	(2.8)	1.2	(0.9)	1.6	(0.7)	5.2	(1.7)	1.3	(0.8)	2.7	(1.3)	1.5	(0.9)	6.0	(1.5)	53.7	(9.4)
	Quebec	85.5	(1.4)	1.0	(0.3)	3.0	(0.6)	2.3	(0.5)	1.6	(0.4)	1.5	(0.4)	0.8	(0.3)	4.3	(0.7)	51.4	(5.4)
	Saskatchewan	72.1	(1.7)	1.8	(0.5)	2.6	(0.7)	6.6	(0.8)	1.5	(0.5)	3.9	(0.7)	2.0	(0.6)	9.5	(1.1)	56.8	(4.5)
	Italy																		
	Bolzano	79.8	(1.4)	1.6	(0.5)	3.9	(1.2)	3.2	(1.0)	2.4	(0.8)	1.8	(0.6)	1.3	(0.5)	5.9	(0.8)	50.4	(5.6)
	Campania	50.5	(2.5)	4.5	(1.0)	4.2	(0.8)	6.6	(1.3)	4.8	(0.8)	7.2	(1.2)	2.3	(0.6)	20.0	(2.1)	54.9	(4.3)
	Lombardia	74.2	(2.2)	2.1	(0.6)	3.0	(0.7)	5.0	(0.9)	2.1	(0.5)	3.7	(0.9)	1.5	(0.5)	8.5	(1.4)	52.1	(5.5)
	Trento	81.1	(1.2)	1.9	(0.5)	2.2	(0.5)	3.4	(0.7)	1.8	(0.4)	2.3	(0.5)	0.8	(0.3)	6.5	(0.7)	51.9	(4.7)
	Portugal																		
	Região Autónoma dos Açores	58.5	(1.3)	1.7	(0.5)	2.8	(0.6)	7.8	(1.0)	1.7	(0.4)	5.6	(0.9)	3.2	(0.7)	18.7	(1.2)	67.7	(2.6)
	Spain																		
	Andalusia•	62.6	(2.2)	2.4	(0.5)	2.5	(0.5)	7.1	(1.1)	2.3	(0.7)	5.6	(0.9)	2.5	(0.6)	15.1	(1.3)	59.5	(2.9)
	Aragon•	77.3	(1.9)	1.4	(0.5)	2.3	(0.6)	4.5	(0.9)	1.9	(0.6)	2.6	(0.7)	1.7	(0.6)	8.3	(1.1)	58.6	(5.6)
	Asturias•	73.6	(1.7)	1.4	(0.4)	2.7	(0.6)	5.6	(1.1)	1.7	(0.5)	3.2	(0.7)	1.8	(0.6)	10.1	(1.2)	61.5	(5.5)
	Balearic Islands•	67.9	(2.1)	2.0	(0.6)	3.0	(1.2)	6.7	(1.6)	2.2	(0.7)	4.3	(1.2)	2.0	(0.6)	12.0	(1.1)	58.8	(3.9)
	Basque Country•	71.5	(1.6)	3.0	(0.5)	2.9	(0.5)	4.2	(0.8)	3.0	(0.6)	3.8	(0.7)	1.3	(0.5)	10.3	(1.0)	51.0	(3.9)
	Canary Islands•	59.9	(1.9)	1.3	(0.3)	1.9	(0.5)	11.3	(1.4)	1.0	(0.5)	6.4	(1.1)	3.1	(0.6)	15.1	(1.2)	63.4	(3.4)
	Cantabria•	74.1	(2.3)	2.1	(0.8)	2.3	(0.6)	5.0	(1.6)	2.1	(0.7)	3.9	(0.9)	1.2	(0.5)	9.3	(1.3)	53.9	(5.6)
	Castile and Leon•	81.6	(1.4)	1.1	(0.4)	1.7	(0.5)	5.3	(1.0)	0.9	(0.3)	2.9	(0.6)	1.1	(0.4)	5.3	(0.8)	51.6	(6.4)
	Castile-La Mancha•	73.0	(1.6)	1.7	(0.5)	2.5	(0.6)	6.3	(1.1)	1.4	(0.5)	4.1	(0.8)	2.0	(0.5)	8.9	(0.9)	55.1	(4.0)
	Catalonia•	75.5	(1.9)	1.7	(0.4)	3.1	(0.6)	4.3	(0.6)	2.0	(0.5)	3.2	(0.6)	1.4	(0.4)	8.8	(1.4)	56.2	(5.5)
	Comunidad Valenciana•	73.6	(1.7)	1.8	(0.5)	2.4	(0.6)	6.4	(0.9)	1.8	(0.5)	3.8	(0.7)	1.8	(0.5)	8.3	(1.0)	52.7	(4.5)
	Extremadura•	64.3	(1.9)	2.4	(0.6)	3.4	(0.8)	5.9	(0.9)	2.8	(0.7)	4.4	(0.8)	2.1	(0.5)	14.7	(1.4)	60.6	(4.1)
	Galicia•	77.0	(1.6)	1.1	(0.4)	2.2	(0.6)	5.8	(1.0)	1.1	(0.3)	2.8	(0.7)	1.6	(0.5)	8.4	(1.0)	63.1	(5.2)
	La Rioja•	74.9	(2.1)	1.9	(0.9)	3.8	(1.4)	3.1	(1.2)	3.0	(1.0)	2.0	(0.8)	1.2	(0.6)	10.0	(1.4)	59.3	(8.7)
	Madrid•	79.3	(1.6)	1.3	(0.4)	1.7	(0.5)	5.5	(1.0)	1.2	(0.4)	3.1	(0.8)	1.3	(0.5)	6.6	(1.0)	54.3	(5.6)
	Murcia•	66.5	(2.1)	1.7	(0.5)	2.3	(0.7)	7.9	(1.9)	1.6	(0.6)	4.5	(0.8)	2.2	(0.6)	13.3	(1.1)	63.2	(4.2)
	Navarre•	81.2	(1.6)	2.0	(0.5)	2.6	(0.9)	3.4	(1.0)	2.1	(0.7)	2.3	(0.7)	0.9	(0.4)	5.6	(0.8)	46.9	(5.4)
	United Kingdom																		
	England	71.0	(1.2)	1.5	(0.3)	3.5	(0.5)	6.0	(0.5)	1.9	(0.4)	3.7	(0.5)	2.5	(0.4)	9.8	(0.8)	58.1	(3.7)
	Northern Ireland	75.1	(1.4)	2.1	(0.5)	2.1	(0.6)	3.8	(0.7)	2.0	(0.5)	3.7	(0.9)	1.2	(0.5)	9.9	(1.0)	55.9	(4.3)
	Scotland	71.3	(1.2)	2.3	(0.4)	3.1	(0.4)	4.7	(0.6)	2.8	(0.4)	3.7	(0.4)	1.4	(0.3)	10.7	(0.8)	54.6	(3.1)
	Wales	68.4	(1.4)	2.2	(0.4)	3.4	(0.8)	4.9	(0.7)	2.7	(0.7)	3.6	(0.6)	1.7	(0.3)	13.0	(1.0)	60.3	(3.7)
	United States																		
	Massachusetts•	79.7	(2.2)	0.8	(0.3)	1.5	(0.5)	5.4	(0.9)	0.8	(0.3)	2.9	(0.7)	1.5	(0.4)	7.5	(1.0)	62.4	(4.5)
	North Carolina•	67.6	(2.2)	0.7	(0.2)	1.8	(0.4)	9.9	(1.2)	1.1	(0.4)	3.9	(0.8)	2.7	(0.6)	12.4	(1.3)	68.8	(4.2)
	Puerto Rico•	24.9	(2.8)	0.7	(0.3)	1.2	(0.4)	14.1	(1.6)	0.6	(0.4)	9.9	(1.0)	4.5	(0.8)	44.1	(3.2)	79.7	(2.2)
Partners	**Colombia**																		
	Bogotá	49.3	(2.4)	0.7	(0.3)	1.0	(0.4)	18.7	(1.8)	0.3	(0.2)	8.8	(1.2)	2.9	(0.6)	18.3	(1.5)	65.2	(3.6)
	Cali	32.6	(2.6)	0.6	(0.3)	0.9	(0.4)	16.5	(1.6)	0.4	(0.2)	10.8	(1.2)	3.0	(0.8)	35.3	(2.4)	75.2	(2.6)
	Manizales	40.6	(2.4)	0.7	(0.3)	0.7	(0.3)	17.2	(1.3)	0.5	(0.4)	10.2	(1.5)	2.5	(0.9)	27.5	(2.1)	70.7	(3.5)
	Medellín	40.3	(2.5)	0.8	(0.4)	0.6	(0.3)	16.1	(1.5)	0.5	(0.2)	10.5	(1.1)	2.4	(0.6)	28.8	(2.2)	70.9	(2.7)
	United Arab Emirates																		
	Abu Dhabi•	37.0	(2.0)	1.7	(0.4)	3.0	(0.4)	9.2	(1.0)	2.9	(0.6)	6.2	(0.8)	3.6	(0.6)	36.3	(1.9)	77.1	(2.1)
	Ajman	27.2	(1.8)	1.7	(0.8)	3.0	(0.9)	10.9	(1.8)	2.4	(0.8)	8.7	(1.4)	3.8	(0.8)	42.3	(2.5)	76.7	(3.3)
	Dubai•	61.7	(0.8)	1.5	(0.3)	2.9	(0.4)	7.1	(0.6)	2.2	(0.4)	3.9	(0.4)	2.5	(0.4)	18.2	(0.6)	70.8	(1.6)
	Fujairah	27.7	(2.6)	1.7	(0.8)	3.3	(1.0)	9.1	(2.0)	2.9	(0.9)	6.6	(1.5)	4.1	(1.3)	44.6	(2.6)	79.9	(3.1)
	Ras Al Khaimah	27.7	(3.9)	2.1	(0.9)	4.5	(1.4)	7.1	(1.8)	5.4	(1.8)	5.6	(1.5)	3.4	(1.0)	44.1	(4.2)	77.1	(4.0)
	Sharjah	44.0	(4.1)	3.0	(1.0)	2.8	(0.9)	9.1	(1.6)	3.3	(1.1)	6.4	(1.1)	2.8	(0.7)	28.7	(3.5)	69.3	(4.4)
	Umm Al Quwain	22.7	(2.3)	1.8	(1.2)	3.0	(1.3)	7.4	(1.6)	3.9	(1.6)	7.2	(2.5)	3.0	(1.2)	50.9	(3.0)	79.9	(5.0)

• PISA adjudicated region.
Notes: Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.2.10a for national data.

StatLink http://dx.doi.org/10.1787/888933433235

[Part 1/1]

Table B2.I.63 Students' career expectations

Results based on students' self-reports

		PISA 2015											
		Students who expect to work in science-related occupations[1] at age 30								Students who expect to work in other occupations at age 30		Students with vague career expectations or whose answer is missing or invalid (undecided, does not know...)[2]	
		Science and engineering professionals		Health professionals		Information and communication technology professionals		Science-related technicians and associate professionals					
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	**Belgium**												
	Flemish community•	m	m	m	m	m	m	m	m	m	m	m	m
	French community	8.6	(0.6)	12.5	(0.8)	3.0	(0.3)	0.5	(0.1)	60.0	(1.4)	15.5	(0.7)
	German-speaking community	8.6	(1.4)	8.1	(1.3)	2.2	(0.8)	0.2	(0.2)	60.9	(2.2)	19.9	(1.9)
	Canada												
	Alberta	14.4	(0.9)	16.2	(0.8)	1.4	(0.3)	0.9	(0.2)	43.7	(1.5)	23.4	(1.1)
	British Columbia	12.3	(0.9)	19.1	(1.1)	2.0	(0.4)	0.4	(0.1)	43.9	(1.4)	22.3	(1.4)
	Manitoba	9.7	(0.7)	19.6	(0.9)	1.4	(0.3)	0.4	(0.2)	45.0	(1.2)	23.9	(1.0)
	New Brunswick	11.0	(1.1)	19.5	(0.9)	1.1	(0.3)	1.1	(0.3)	48.5	(1.5)	18.8	(1.3)
	Newfoundland and Labrador	13.0	(0.9)	22.4	(1.3)	0.9	(0.3)	0.8	(0.3)	43.1	(1.5)	19.8	(1.4)
	Nova Scotia	8.4	(0.8)	21.3	(1.0)	1.4	(0.3)	1.0	(0.3)	41.6	(1.3)	26.3	(1.3)
	Ontario	12.1	(0.7)	19.5	(0.9)	2.6	(0.3)	0.6	(0.1)	47.3	(1.0)	18.0	(0.9)
	Prince Edward Island	8.7	(1.6)	23.2	(2.4)	2.1	(0.9)	1.1	(0.6)	44.8	(3.3)	20.0	(2.7)
	Quebec	12.0	(0.8)	19.5	(1.0)	1.7	(0.3)	0.3	(0.1)	43.7	(1.8)	22.8	(1.9)
	Saskatchewan	9.8	(0.8)	19.4	(0.9)	1.7	(0.3)	0.7	(0.2)	46.0	(1.5)	22.4	(1.2)
	Italy												
	Bolzano	4.7	(0.4)	8.6	(0.6)	1.4	(0.2)	2.3	(0.3)	59.7	(1.2)	23.2	(1.1)
	Campania	8.5	(1.1)	12.1	(1.3)	1.2	(0.4)	1.2	(0.4)	58.5	(2.4)	18.4	(2.1)
	Lombardia	10.3	(1.5)	9.3	(1.0)	1.6	(0.3)	2.5	(0.7)	59.6	(2.2)	16.7	(1.3)
	Trento	6.3	(0.6)	8.6	(0.7)	1.6	(0.4)	3.0	(0.5)	63.2	(1.2)	17.4	(0.9)
	Portugal												
	Região Autónoma dos Açores	6.7	(0.8)	15.7	(1.1)	1.0	(0.2)	0.4	(0.2)	61.6	(1.2)	14.6	(1.0)
	Spain												
	Andalusia•	8.2	(0.7)	11.7	(0.8)	3.7	(0.4)	0.5	(0.2)	66.9	(1.0)	8.9	(0.6)
	Aragon•	11.7	(1.0)	13.3	(0.7)	3.5	(0.5)	0.6	(0.2)	59.8	(1.4)	11.2	(0.8)
	Asturias•	11.8	(1.0)	12.6	(0.8)	4.7	(0.4)	0.8	(0.2)	57.1	(1.8)	12.9	(0.9)
	Balearic Islands•	9.5	(0.8)	10.8	(0.8)	4.8	(0.5)	0.3	(0.2)	61.4	(1.4)	13.2	(1.0)
	Basque Country•	14.4	(0.7)	12.4	(0.6)	2.8	(0.3)	0.4	(0.1)	51.5	(0.9)	18.5	(0.9)
	Canary Islands•	8.3	(0.7)	14.3	(1.0)	2.5	(0.4)	0.4	(0.2)	63.3	(1.2)	11.1	(0.7)
	Cantabria•	10.3	(0.8)	11.3	(0.8)	3.6	(0.4)	0.7	(0.1)	62.6	(1.2)	11.6	(0.7)
	Castile and Leon•	11.8	(0.8)	13.5	(0.8)	3.1	(0.4)	0.3	(0.1)	57.5	(1.1)	13.8	(1.0)
	Castile-La Mancha•	10.3	(0.9)	14.8	(1.0)	3.8	(0.4)	0.5	(0.2)	61.1	(1.4)	9.5	(0.9)
	Catalonia•	12.9	(0.9)	10.5	(0.8)	4.5	(0.5)	0.8	(0.2)	60.0	(1.3)	11.3	(0.9)
	Comunidad Valenciana•	10.9	(0.8)	12.7	(0.8)	4.0	(0.4)	0.4	(0.2)	61.6	(1.4)	10.5	(0.7)
	Extremadura•	9.0	(0.8)	14.4	(0.7)	3.2	(0.5)	0.4	(0.2)	62.2	(1.3)	10.8	(0.9)
	Galicia•	11.6	(0.8)	11.9	(0.7)	4.4	(0.5)	0.6	(0.1)	59.2	(1.2)	12.3	(0.9)
	La Rioja•	9.8	(0.7)	10.6	(0.9)	4.3	(0.6)	0.0	(0.0)	60.9	(1.3)	14.3	(1.1)
	Madrid•	16.0	(0.9)	13.9	(0.6)	4.2	(0.4)	0.2	(0.1)	56.1	(1.0)	9.6	(0.9)
	Murcia•	9.9	(0.6)	13.0	(0.9)	2.9	(0.4)	0.5	(0.2)	62.3	(1.4)	11.4	(0.8)
	Navarre•	12.2	(0.9)	11.2	(0.8)	2.7	(0.5)	0.7	(0.2)	59.9	(1.4)	13.4	(0.8)
	United Kingdom												
	England	13.0	(0.6)	13.8	(0.5)	2.6	(0.3)	0.3	(0.1)	53.2	(1.0)	17.1	(1.0)
	Northern Ireland	11.5	(0.6)	16.7	(0.8)	4.4	(0.5)	0.3	(0.1)	52.3	(1.0)	14.8	(0.7)
	Scotland	10.7	(0.6)	9.4	(0.5)	2.5	(0.3)	0.2	(0.1)	55.0	(1.0)	22.1	(0.7)
	Wales	12.5	(0.6)	12.7	(0.7)	2.5	(0.3)	0.2	(0.1)	54.3	(1.1)	17.7	(1.1)
	United States												
	Massachusetts•	12.6	(0.9)	17.1	(1.2)	2.7	(0.5)	0.8	(0.2)	49.1	(1.7)	17.7	(1.1)
	North Carolina•	11.8	(0.9)	24.1	(1.0)	1.9	(0.4)	0.9	(0.2)	49.2	(1.2)	12.0	(0.9)
	Puerto Rico•	9.6	(0.8)	29.1	(1.6)	0.5	(0.2)	1.4	(0.4)	49.7	(2.0)	9.7	(0.8)
Partners	**Colombia**												
	Bogotá	12.3	(1.1)	15.0	(0.9)	3.4	(0.4)	0.7	(0.2)	57.5	(1.7)	11.1	(2.2)
	Cali	8.2	(0.7)	22.0	(1.5)	3.8	(0.6)	1.2	(0.4)	52.5	(2.4)	12.3	(3.5)
	Manizales	16.3	(1.0)	25.5	(1.1)	4.2	(0.7)	1.1	(0.3)	43.5	(1.3)	9.4	(0.7)
	Medellín	11.3	(0.7)	23.7	(1.1)	4.4	(0.5)	0.7	(0.2)	51.5	(1.3)	8.3	(0.8)
	United Arab Emirates												
	Abu Dhabi•	23.0	(1.0)	19.2	(1.0)	1.1	(0.2)	1.6	(0.2)	43.3	(0.9)	11.9	(0.8)
	Ajman	20.7	(2.2)	18.9	(1.7)	0.7	(0.3)	0.1	(0.1)	46.4	(2.1)	13.2	(1.5)
	Dubai•	18.7	(0.7)	16.3	(0.6)	2.5	(0.3)	0.2	(0.1)	52.3	(0.8)	10.0	(0.4)
	Fujairah	24.8	(1.4)	15.3	(1.3)	0.9	(0.2)	0.2	(0.2)	47.7	(2.4)	11.0	(1.5)
	Ras Al Khaimah	25.6	(1.8)	15.7	(1.5)	0.3	(0.2)	0.1	(0.1)	49.0	(2.1)	9.3	(1.1)
	Sharjah	20.0	(1.5)	18.1	(1.6)	1.2	(0.3)	0.0	c	52.3	(1.5)	8.4	(1.4)
	Umm Al Quwain	20.9	(2.1)	13.8	(1.8)	0.3	(0.3)	0.0	c	54.1	(2.5)	10.8	(1.6)

• PISA adjudicated region.
1. See Annex A1 for the list of science-related occupations.
2. Students who did not reach this question in their questionnaire are not included here.
Notes: Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.3.10a for national data.
StatLink http://dx.doi.org/10.1787/888933433235

[Part 1/2]

Table B2.I.64 Students expecting to work in science-related occupations,[1] by gender and performance in science

Results based on students' self-reports

	Students who expect to work in science-related occupations at age 30															
	All students		Boys		Girls		Increased likelihood of boys expecting that they will work in science-related occupations		Low achievers in science (students performing below Level 2)		Moderate performers in science (students performing at Level 2 or 3)		Strong performers in science (students performing at Level 4)		Top performers in science (students performing at Level 5 or above)	
	%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD																
Belgium																
Flemish community•	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
French community	24.5	(1.0)	25.4	(1.6)	23.7	(1.2)	1.1	(0.1)	9.7	(1.3)	23.7	(1.2)	37.1	(2.2)	45.7	(4.5)
German-speaking community	19.2	(2.0)	17.7	(2.5)	20.7	(3.0)	0.9	(0.2)	2.6	(2.9)	13.0	(2.5)	33.3	(6.4)	c	c
Canada																
Alberta	32.9	(1.3)	31.4	(1.8)	34.4	(1.4)	0.9	(0.1)	19.2	(3.8)	28.3	(2.1)	37.4	(2.9)	46.1	(3.5)
British Columbia	33.9	(1.2)	31.4	(1.6)	36.3	(1.6)	**0.9**	(0.1)	19.4	(4.2)	29.1	(1.9)	38.5	(2.7)	49.4	(3.5)
Manitoba	31.1	(1.1)	26.5	(1.6)	36.0	(1.5)	**0.7**	(0.1)	15.8	(2.9)	32.4	(1.8)	36.6	(3.8)	43.2	(7.0)
New Brunswick	32.7	(1.4)	28.6	(2.3)	37.1	(1.6)	**0.8**	(0.1)	13.8	(2.9)	32.0	(2.0)	40.3	(4.0)	54.2	(7.3)
Newfoundland and Labrador	37.1	(1.2)	34.5	(1.7)	39.7	(2.1)	0.9	(0.1)	16.7	(3.2)	35.4	(1.9)	49.2	(4.0)	56.8	(6.7)
Nova Scotia	32.1	(1.2)	24.4	(1.6)	39.7	(1.6)	**0.6**	(0.0)	15.8	(3.4)	31.4	(1.8)	38.1	(3.0)	43.0	(4.5)
Ontario	34.8	(1.1)	31.0	(1.4)	38.6	(1.4)	**0.8**	(0.0)	16.9	(2.1)	30.8	(1.4)	44.1	(1.9)	50.4	(3.0)
Prince Edward Island	35.2	(2.6)	24.0	(3.5)	46.7	(4.0)	**0.5**	(0.1)	12.6	(5.1)	31.0	(4.0)	50.3	(8.7)	55.0	(11.7)
Quebec	33.5	(1.4)	34.5	(2.0)	32.6	(1.7)	1.1	(0.1)	19.1	(3.1)	27.4	(1.5)	39.8	(2.5)	51.6	(3.4)
Saskatchewan	31.6	(1.1)	25.4	(1.8)	38.5	(1.9)	**0.7**	(0.1)	23.4	(3.7)	30.2	(1.7)	39.3	(3.7)	45.4	(6.6)
Italy																
Bolzano	17.0	(0.7)	19.0	(1.1)	15.3	(1.0)	**1.2**	(0.1)	8.5	(2.2)	13.8	(1.1)	24.4	(2.4)	30.3	(5.6)
Campania	23.0	(1.8)	25.4	(2.1)	20.5	(2.0)	**1.2**	(0.1)	11.0	(2.1)	27.0	(2.3)	43.2	(4.6)	57.0	(10.1)
Lombardia	23.7	(2.1)	26.4	(2.8)	21.0	(2.2)	1.3	(0.2)	8.3	(2.0)	21.4	(2.5)	35.5	(3.5)	41.9	(5.5)
Trento	19.5	(1.0)	21.7	(1.5)	17.4	(1.2)	**1.2**	(0.1)	7.9	(2.3)	15.5	(1.4)	28.8	(2.9)	44.0	(7.0)
Portugal																
Região Autónoma dos Açores	23.7	(1.2)	19.8	(1.5)	27.4	(1.7)	**0.7**	(0.1)	11.6	(2.0)	23.3	(2.0)	42.6	(5.5)	53.9	(7.7)
Spain																
Andalusia•	24.1	(1.1)	24.7	(1.5)	23.6	(1.5)	1.0	(0.1)	13.4	(1.8)	22.4	(1.4)	41.0	(3.4)	63.6	(6.8)
Aragon•	29.0	(1.3)	29.6	(1.8)	28.3	(1.5)	1.0	(0.1)	17.0	(2.8)	24.9	(1.8)	40.2	(2.8)	52.4	(5.3)
Asturias•	30.0	(1.4)	31.5	(2.0)	28.4	(1.8)	1.1	(0.1)	9.4	(2.1)	28.0	(1.9)	43.6	(3.8)	56.5	(5.9)
Balearic Islands•	25.4	(1.4)	27.0	(1.8)	23.7	(1.4)	**1.1**	(0.1)	14.7	(2.8)	23.2	(1.6)	39.7	(3.4)	51.5	(6.3)
Basque Country•	30.0	(0.8)	32.6	(1.4)	27.5	(0.9)	**1.2**	(0.1)	14.3	(1.7)	28.3	(1.0)	50.4	(2.4)	57.1	(5.7)
Canary Islands•	25.6	(1.3)	24.4	(1.5)	26.8	(1.7)	0.9	(0.1)	14.2	(2.1)	25.3	(1.6)	40.3	(3.7)	43.3	(7.8)
Cantabria•	25.8	(1.1)	25.9	(1.6)	25.7	(1.6)	1.0	(0.1)	11.5	(2.1)	21.6	(1.6)	44.0	(3.3)	54.4	(7.0)
Castile and Leon•	28.7	(1.1)	29.0	(1.4)	28.4	(1.6)	1.0	(0.1)	14.1	(3.5)	24.3	(1.6)	39.6	(2.8)	45.2	(5.3)
Castile-La Mancha•	29.4	(1.4)	30.0	(1.9)	28.9	(1.4)	1.0	(0.1)	14.0	(2.6)	26.6	(1.5)	43.9	(3.1)	55.5	(5.7)
Catalonia•	28.7	(1.1)	32.2	(1.5)	25.0	(1.5)	**1.3**	(0.1)	18.0	(3.2)	24.2	(1.5)	40.3	(2.7)	53.0	(6.0)
Comunidad Valenciana•	27.9	(1.4)	30.7	(2.0)	25.0	(1.8)	**1.2**	(0.1)	9.9	(2.2)	25.4	(1.7)	45.1	(3.4)	59.1	(8.0)
Extremadura•	27.0	(1.2)	25.8	(1.6)	28.4	(1.6)	0.9	(0.1)	11.4	(1.9)	27.2	(1.6)	44.9	(3.5)	60.5	(7.7)
Galicia•	28.5	(1.2)	31.7	(2.0)	25.4	(1.3)	**1.2**	(0.1)	11.7	(2.5)	23.2	(1.4)	42.7	(2.8)	53.5	(5.5)
La Rioja•	24.8	(1.2)	26.8	(1.8)	22.6	(1.8)	1.2	(0.1)	12.7	(2.6)	21.0	(1.8)	38.7	(3.6)	47.8	(7.7)
Madrid•	34.3	(1.1)	37.9	(1.7)	30.7	(1.5)	**1.2**	(0.1)	18.8	(3.3)	27.9	(1.9)	47.3	(2.8)	60.5	(4.4)
Murcia•	26.3	(1.3)	26.3	(1.6)	26.3	(1.5)	1.0	(0.1)	10.9	(1.7)	23.2	(1.7)	47.6	(4.0)	61.5	(7.4)
Navarre•	26.7	(1.1)	28.8	(1.4)	24.6	(1.4)	**1.2**	(0.1)	12.7	(2.7)	22.6	(1.4)	37.6	(2.8)	49.0	(5.3)
United Kingdom																
England	29.7	(0.9)	29.1	(1.3)	30.3	(1.3)	1.0	(0.1)	19.5	(1.6)	27.6	(1.3)	34.9	(1.7)	43.4	(2.4)
Northern Ireland	32.9	(1.0)	32.2	(1.4)	33.7	(1.3)	1.0	(0.1)	15.7	(2.2)	29.9	(1.3)	47.2	(2.7)	59.4	(4.4)
Scotland	22.8	(0.8)	24.7	(1.2)	20.9	(1.0)	**1.2**	(0.1)	10.4	(1.4)	19.7	(1.1)	36.4	(2.6)	42.0	(4.7)
Wales	27.9	(0.9)	27.4	(1.0)	28.5	(1.2)	1.0	(0.0)	16.8	(1.6)	26.8	(1.2)	39.1	(3.0)	50.7	(4.8)
United States																
Massachusetts•	33.2	(1.3)	30.2	(1.5)	36.2	(1.8)	**0.8**	(0.0)	19.7	(3.2)	30.3	(1.8)	38.1	(2.7)	44.9	(3.9)
North Carolina•	38.8	(1.4)	31.2	(1.7)	46.3	(1.8)	**0.7**	(0.0)	26.7	(3.1)	38.7	(2.0)	43.9	(3.4)	49.6	(5.2)
Puerto Rico•	40.6	(2.1)	33.9	(2.4)	47.3	(2.6)	**0.7**	(0.1)	34.3	(2.3)	47.5	(2.8)	55.7	(7.8)	c	c
Partners																
Colombia																
Bogotá	31.4	(1.3)	30.0	(2.3)	32.6	(1.5)	0.9	(0.1)	28.1	(2.4)	32.7	(1.9)	31.0	(4.5)	c	c
Cali	35.2	(1.9)	31.2	(1.9)	38.9	(2.8)	**0.8**	(0.1)	33.6	(2.5)	36.2	(2.4)	41.0	(6.5)	c	c
Manizales	47.1	(1.4)	45.4	(1.7)	48.8	(2.3)	0.9	(0.1)	43.0	(2.3)	49.5	(2.2)	49.6	(7.9)	c	c
Medellín	40.1	(1.3)	35.8	(1.6)	44.3	(1.9)	**0.8**	(0.0)	38.4	(2.0)	41.3	(1.8)	41.7	(5.0)	c	c
United Arab Emirates																
Abu Dhabi•	44.8	(1.0)	43.5	(1.6)	46.1	(1.3)	0.9	(0.0)	33.3	(1.3)	53.0	(1.7)	63.6	(4.4)	71.0	(7.0)
Ajman	40.4	(2.1)	41.6	(2.4)	39.3	(2.9)	1.1	(0.1)	31.1	(2.8)	49.9	(3.9)	c	c	c	c
Dubai•	37.7	(0.8)	38.1	(1.0)	37.4	(1.1)	1.0	(0.0)	24.6	(1.3)	39.8	(1.2)	46.0	(2.5)	52.3	(4.5)
Fujairah	41.3	(1.8)	35.9	(3.0)	46.2	(2.5)	**0.8**	(0.1)	29.8	(2.1)	53.5	(3.1)	80.2	(7.5)	c	c
Ras Al Khaimah	41.7	(2.1)	36.1	(3.0)	47.0	(3.4)	**0.8**	(0.1)	32.7	(2.5)	51.6	(2.9)	75.5	(9.9)	c	c
Sharjah	39.3	(1.1)	36.5	(2.2)	41.8	(2.2)	0.9	(0.1)	30.8	(2.7)	43.6	(2.5)	53.5	(8.5)	c	c
Umm Al Quwain	35.0	(2.5)	32.4	(3.5)	37.6	(3.2)	0.9	(0.1)	28.3	(3.1)	45.4	(5.5)	c	c	c	c

• PISA adjudicated region.
1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.3.10b for national data.

StatLink http://dx.doi.org/10.1787/888933433235

[Part 2/2]

Table B2.I.64 Students expecting to work in science-related occupations,[1] by gender and performance in science

Results based on students' self-reports

		Students who expect to work in science-related occupations at age 30									
		Increased likelihood of top performers in science expecting that they will work in science-related occupations		Students whose parents have not completed secondary education		Students whose parents attained secondary education as their highest level of education		Students whose father or mother completed tertiary education		Increased likelihood of students with at least one tertiary-educated parent expecting that they will work in science-related occupations	
		Relative risk	S.E.	%	S.E.	%	S.E.	%	S.E.	Relative risk	S.E.
OECD	**Belgium**										
	Flemish community•	m	m	m	m	m	m	m	m	m	m
	French community	**2.0**	(0.2)	23.5	(2.7)	19.6	(1.6)	27.1	(1.2)	**1.3**	(0.1)
	German-speaking community	c	c	5.3	(3.7)	15.4	(3.6)	23.0	(2.8)	**1.8**	(0.5)
	Canada										
	Alberta	**1.5**	(0.1)	12.5	(4.6)	24.4	(2.0)	36.9	(1.6)	**1.6**	(0.1)
	British Columbia	**1.6**	(0.1)	21.2	(5.8)	29.4	(2.8)	36.5	(1.2)	**1.3**	(0.1)
	Manitoba	**1.4**	(0.2)	6.9	(2.9)	24.7	(1.9)	35.8	(1.4)	**1.6**	(0.1)
	New Brunswick	**1.8**	(0.3)	17.5	(5.6)	23.7	(2.9)	36.2	(1.7)	**1.6**	(0.2)
	Newfoundland and Labrador	**1.6**	(0.2)	c	c	30.8	(3.0)	41.5	(1.5)	**1.4**	(0.1)
	Nova Scotia	**1.4**	(0.2)	20.8	(4.9)	21.9	(2.5)	37.7	(1.6)	**1.7**	(0.2)
	Ontario	**1.5**	(0.1)	28.4	(5.8)	27.0	(2.2)	37.1	(1.2)	**1.4**	(0.1)
	Prince Edward Island	**1.7**	(0.4)	c	c	35.3	(6.7)	35.1	(2.8)	1.0	(0.2)
	Quebec	**1.7**	(0.1)	19.5	(5.0)	23.9	(2.6)	37.8	(1.4)	**1.6**	(0.2)
	Saskatchewan	**1.5**	(0.2)	28.8	(8.1)	27.3	(2.1)	35.0	(1.4)	**1.3**	(0.1)
	Italy										
	Bolzano	**1.9**	(0.4)	10.7	(2.4)	15.1	(1.0)	22.0	(1.6)	**1.5**	(0.2)
	Campania	**2.5**	(0.5)	17.6	(3.3)	24.7	(2.2)	28.7	(2.0)	**1.3**	(0.1)
	Lombardia	**1.9**	(0.3)	14.0	(3.0)	25.6	(2.9)	26.5	(2.1)	1.2	(0.1)
	Trento	**2.5**	(0.5)	14.7	(3.0)	20.8	(1.6)	20.5	(1.6)	1.0	(0.1)
	Portugal										
	Região Autónoma dos Açores	**2.4**	(0.4)	19.4	(1.6)	29.1	(3.0)	30.2	(3.0)	**1.4**	(0.2)
	Spain										
	Andalusia•	**2.8**	(0.4)	19.2	(1.7)	24.1	(2.0)	29.2	(1.8)	**1.4**	(0.1)
	Aragon•	**1.9**	(0.2)	20.9	(2.4)	28.4	(1.9)	32.1	(1.7)	**1.3**	(0.1)
	Asturias•	**2.0**	(0.2)	18.0	(2.7)	33.3	(2.6)	33.5	(1.6)	**1.3**	(0.1)
	Balearic Islands•	**2.1**	(0.3)	20.7	(2.2)	25.4	(2.7)	28.0	(1.8)	**1.2**	(0.1)
	Basque Country•	**2.0**	(0.2)	22.2	(1.9)	26.8	(1.9)	33.0	(0.9)	**1.3**	(0.1)
	Canary Islands•	**1.7**	(0.3)	21.2	(2.3)	25.7	(2.2)	29.8	(1.7)	**1.3**	(0.1)
	Cantabria•	**2.2**	(0.3)	21.2	(2.8)	19.3	(1.5)	29.9	(1.6)	**1.5**	(0.1)
	Castile and Leon•	**1.7**	(0.2)	23.3	(2.3)	29.5	(2.8)	31.1	(1.7)	1.2	(0.1)
	Castile-La Mancha•	**2.0**	(0.2)	24.3	(1.9)	31.2	(2.0)	33.2	(2.0)	**1.2**	(0.1)
	Catalonia•	**2.0**	(0.3)	26.2	(2.8)	29.1	(2.5)	29.8	(1.3)	1.1	(0.1)
	Comunidad Valenciana•	**2.2**	(0.3)	20.8	(2.3)	26.1	(2.0)	31.9	(1.9)	**1.4**	(0.1)
	Extremadura•	**2.3**	(0.3)	19.6	(1.9)	24.4	(2.0)	34.5	(1.6)	**1.6**	(0.1)
	Galicia•	**2.0**	(0.2)	20.1	(1.8)	28.4	(2.3)	32.7	(1.5)	**1.4**	(0.1)
	La Rioja•	**2.1**	(0.4)	16.5	(2.3)	23.4	(2.5)	29.0	(1.7)	**1.5**	(0.1)
	Madrid•	**1.9**	(0.2)	22.8	(2.7)	34.4	(2.7)	36.8	(1.6)	**1.3**	(0.1)
	Murcia•	**2.5**	(0.3)	19.5	(1.3)	27.1	(2.5)	31.6	(2.1)	**1.4**	(0.1)
	Navarre•	**2.0**	(0.2)	24.5	(3.0)	23.0	(2.6)	28.6	(1.3)	**1.2**	(0.1)
	United Kingdom										
	England	**1.6**	(0.1)	37.0	(4.2)	26.9	(1.1)	32.5	(1.2)	**1.2**	(0.1)
	Northern Ireland	**1.9**	(0.2)	26.9	(6.5)	30.5	(1.5)	37.3	(1.3)	**1.2**	(0.1)
	Scotland	**2.0**	(0.2)	17.1	(3.1)	21.3	(1.7)	25.1	(1.1)	**1.2**	(0.1)
	Wales	**1.9**	(0.2)	18.9	(4.7)	26.3	(1.5)	31.1	(1.0)	**1.2**	(0.1)
	United States										
	Massachusetts•	**1.4**	(0.2)	29.8	(5.2)	28.6	(2.0)	35.5	(1.6)	**1.2**	(0.1)
	North Carolina•	**1.3**	(0.2)	29.4	(4.7)	36.1	(2.9)	41.1	(1.3)	**1.2**	(0.1)
	Puerto Rico•	c	c	29.8	(7.8)	33.7	(2.2)	45.4	(2.4)	**1.4**	(0.1)
Partners	**Colombia**										
	Bogotá	c	c	29.5	(4.5)	32.6	(2.4)	32.9	(1.7)	1.0	(0.1)
	Cali	c	c	37.5	(4.8)	39.6	(2.4)	36.5	(1.7)	0.9	(0.1)
	Manizales	c	c	42.0	(4.5)	47.1	(2.7)	48.5	(1.7)	1.1	(0.1)
	Medellín	c	c	38.5	(4.1)	41.5	(1.5)	40.5	(1.8)	1.0	(0.1)
	United Arab Emirates										
	Abu Dhabi•	**1.6**	(0.2)	34.3	(3.6)	39.8	(2.0)	48.8	(1.1)	**1.3**	(0.1)
	Ajman	c	c	36.8	(6.9)	32.3	(3.9)	45.9	(2.5)	**1.4**	(0.2)
	Dubai•	**1.4**	(0.1)	27.1	(3.2)	34.5	(2.2)	39.4	(0.8)	**1.2**	(0.1)
	Fujairah	c	c	32.0	(5.9)	37.9	(3.2)	46.7	(2.8)	**1.3**	(0.1)
	Ras Al Khaimah	c	c	33.4	(5.9)	37.2	(3.4)	45.1	(2.5)	**1.2**	(0.1)
	Sharjah	c	c	31.5	(6.1)	38.0	(1.9)	41.3	(1.6)	1.1	(0.1)
	Umm Al Quwain	c	c	37.1	(7.0)	32.8	(4.3)	36.6	(3.0)	1.1	(0.1)

• PISA adjudicated region.
1. See Annex A1 for the list of science-related occupations.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.3.10b for national data.
StatLink http://dx.doi.org/10.1787/888933433235

[Part 1/1]

Table B2.I.66 Socio-economic status and science performance

Results based on students' self-reports

	Unadjusted science score		Science score adjusted by ESCS[1]		Percentage of variance in student performance in science explained by ESCS (strength of the socio-economic gradient)		Score-point difference in science associated with a one-unit increase in ESCS (slope of the socio-economic gradient)		Performance in science, by socio-economic status: Bottom quarter of ESCS		Second quarter of ESCS		Third quarter of ESCS		Top quarter of ESCS		Difference in science performance between students in the top quarter and students in the bottom quarter of ESCS	
	Mean score	S.E.	Mean score	S.E.	%	S.E.	Score dif.	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.
OECD																		
Belgium																		
Flemish community•	515	(2.6)	505	(2.2)	17.6	(1.5)	**48**	(2.4)	463	(3.8)	493	(4.1)	539	(3.4)	571	(3.6)	**108**	(5.2)
French community	485	(4.5)	484	(3.2)	20.4	(2.0)	**46**	(2.3)	433	(5.6)	471	(6.6)	500	(6.4)	545	(5.2)	**112**	(6.8)
German-speaking community	505	(4.8)	500	(5.0)	5.7	(2.4)	**25**	(5.4)	481	(9.0)	498	(9.4)	509	(10.8)	535	(9.7)	**54**	(12.5)
Canada																		
Alberta	541	(4.0)	523	(4.2)	7.4	(1.4)	**31**	(3.0)	513	(6.3)	528	(5.5)	550	(5.9)	576	(5.5)	**63**	(7.2)
British Columbia	539	(4.3)	521	(4.3)	8.0	(1.7)	**32**	(3.6)	511	(5.7)	521	(7.4)	552	(8.0)	577	(6.8)	**67**	(8.1)
Manitoba	499	(4.7)	490	(4.9)	8.0	(1.8)	**29**	(3.1)	468	(7.2)	493	(8.3)	507	(6.1)	533	(5.4)	**65**	(8.0)
New Brunswick	506	(4.5)	497	(4.7)	7.3	(2.1)	**29**	(4.5)	475	(9.0)	499	(7.9)	509	(5.9)	544	(5.9)	**70**	(11.0)
Newfoundland and Labrador	506	(3.2)	498	(3.4)	7.0	(1.9)	**27**	(3.7)	473	(7.1)	501	(6.9)	521	(6.6)	532	(6.2)	**58**	(9.1)
Nova Scotia	517	(4.5)	508	(4.1)	6.5	(1.6)	**27**	(3.0)	491	(5.1)	508	(8.6)	532	(6.5)	548	(7.0)	**57**	(7.7)
Ontario	524	(3.9)	506	(3.2)	8.3	(1.3)	**34**	(2.9)	487	(5.0)	517	(4.4)	540	(4.8)	558	(6.0)	**70**	(6.3)
Prince Edward Island	515	(5.4)	506	(5.7)	2.8	(2.1)	**18**	(6.8)	493	(8.8)	515	(12.3)	525	(10.6)	527	(12.9)	**34**	(16.1)
Quebec	537	(4.7)	520	(3.8)	11.2	(1.9)	**36**	(3.3)	495	(6.0)	529	(5.3)	553	(7.7)	573	(6.3)	**78**	(7.5)
Saskatchewan	496	(3.1)	488	(3.5)	5.8	(1.4)	**25**	(2.9)	470	(6.6)	493	(5.7)	497	(5.3)	524	(5.5)	**54**	(7.9)
Italy																		
Bolzano	515	(2.5)	516	(2.5)	6.0	(1.2)	**26**	(2.6)	489	(4.4)	512	(4.9)	519	(4.6)	544	(4.3)	**55**	(5.7)
Campania	445	(5.0)	454	(5.1)	12.2	(2.3)	**30**	(3.2)	409	(6.3)	441	(7.3)	447	(6.7)	491	(8.2)	**82**	(9.4)
Lombardia	503	(5.0)	503	(4.5)	10.2	(2.0)	**30**	(3.0)	466	(5.7)	497	(7.5)	506	(6.6)	542	(7.6)	**76**	(9.6)
Trento	511	(2.5)	512	(2.4)	7.2	(1.4)	**26**	(2.8)	483	(3.9)	503	(5.4)	521	(4.2)	539	(4.5)	**56**	(6.3)
Portugal																		
Região Autónoma dos Açores	470	(2.3)	498	(3.1)	17.2	(2.0)	**34**	(2.3)	431	(4.6)	449	(5.4)	476	(6.0)	524	(5.4)	**93**	(7.2)
Spain																		
Andalusia•	473	(4.1)	497	(3.9)	13.1	(2.0)	**27**	(2.2)	438	(5.8)	458	(6.9)	477	(5.8)	521	(6.2)	**83**	(7.3)
Aragon•	508	(4.6)	519	(4.1)	12.4	(1.7)	**28**	(2.0)	474	(5.6)	492	(6.6)	521	(6.8)	546	(5.8)	**73**	(6.4)
Asturias•	501	(3.9)	515	(3.3)	15.6	(2.4)	**31**	(2.4)	460	(5.2)	489	(5.7)	512	(4.6)	547	(8.1)	**88**	(9.3)
Balearic Islands•	485	(4.5)	501	(4.1)	9.0	(1.9)	**24**	(2.5)	454	(6.6)	477	(5.8)	485	(5.9)	523	(7.5)	**69**	(8.5)
Basque Country•	483	(3.0)	489	(2.8)	7.6	(1.2)	**22**	(1.7)	453	(3.9)	475	(4.9)	495	(4.4)	513	(4.0)	**60**	(4.9)
Canary Islands•	475	(3.6)	498	(4.2)	12.7	(2.3)	**27**	(2.5)	441	(5.0)	461	(5.1)	479	(5.5)	523	(7.1)	**82**	(8.3)
Cantabria•	496	(5.6)	506	(4.9)	8.9	(1.9)	**24**	(2.5)	465	(8.1)	487	(6.8)	496	(7.1)	535	(6.3)	**69**	(8.0)
Castile and Leon•	519	(3.5)	528	(3.3)	7.0	(1.3)	**20**	(2.0)	492	(5.6)	509	(4.7)	527	(5.5)	549	(5.2)	**57**	(6.4)
Castile-La Mancha•	497	(4.0)	514	(4.4)	11.2	(2.1)	**24**	(2.2)	466	(4.9)	486	(5.8)	501	(5.8)	538	(7.2)	**72**	(7.4)
Catalonia•	504	(4.7)	515	(3.8)	13.6	(2.0)	**29**	(2.3)	465	(6.2)	487	(7.3)	516	(6.6)	550	(5.7)	**85**	(7.9)
Comunidad Valenciana•	494	(3.3)	507	(2.8)	10.8	(1.5)	**24**	(1.8)	461	(5.4)	483	(4.2)	503	(6.9)	531	(4.6)	**69**	(6.1)
Extremadura•	474	(3.8)	494	(3.7)	10.8	(2.0)	**24**	(2.3)	438	(5.3)	466	(6.2)	481	(5.3)	513	(5.5)	**75**	(7.4)
Galicia•	512	(3.1)	522	(2.9)	5.9	(1.3)	**19**	(2.3)	489	(5.9)	502	(5.3)	515	(5.8)	544	(5.3)	**55**	(7.3)
La Rioja•	498	(5.5)	512	(5.7)	12.8	(1.9)	**28**	(2.2)	456	(6.8)	490	(6.5)	511	(7.9)	539	(7.6)	**83**	(7.4)
Madrid•	516	(3.5)	519	(2.4)	14.4	(2.3)	**28**	(2.1)	475	(6.6)	501	(5.1)	533	(5.6)	555	(4.9)	**81**	(8.1)
Murcia•	484	(3.8)	508	(3.7)	17.0	(1.8)	**29**	(1.5)	440	(4.7)	469	(5.6)	494	(6.2)	532	(5.0)	**92**	(5.9)
Navarre•	512	(4.1)	521	(4.0)	12.3	(1.7)	**27**	(2.0)	478	(4.5)	496	(5.8)	523	(6.3)	552	(5.8)	**74**	(5.3)
United Kingdom																		
England	512	(3.0)	507	(2.4)	10.8	(1.2)	**38**	(2.2)	475	(3.7)	492	(4.8)	529	(5.0)	561	(4.5)	**86**	(5.2)
Northern Ireland	500	(2.8)	496	(2.5)	11.5	(1.7)	**36**	(2.9)	464	(4.3)	486	(5.4)	517	(4.8)	544	(5.5)	**81**	(7.3)
Scotland	497	(2.4)	490	(2.1)	10.7	(1.4)	**37**	(2.7)	462	(3.6)	481	(3.7)	507	(4.0)	543	(4.9)	**80**	(6.0)
Wales	485	(2.8)	483	(2.5)	5.6	(0.9)	**25**	(2.2)	463	(4.1)	474	(3.6)	496	(4.7)	515	(3.8)	**52**	(5.3)
United States																		
Massachusetts•	529	(6.6)	523	(4.5)	14.1	(2.5)	**37**	(3.5)	481	(7.5)	514	(9.9)	551	(8.2)	578	(9.1)	**97**	(10.7)
North Carolina•	502	(4.9)	502	(4.2)	9.2	(2.1)	**29**	(3.5)	470	(6.9)	486	(6.9)	508	(7.1)	548	(7.3)	**78**	(9.3)
Puerto Rico•	403	(6.1)	415	(4.6)	17.8	(2.9)	**41**	(3.4)	366	(7.8)	378	(8.2)	410	(7.8)	458	(9.7)	**92**	(10.4)
Partners																		
Colombia																		
Bogotá	458	(4.8)	475	(4.0)	20.1	(4.7)	**36**	(4.3)	421	(4.8)	436	(5.8)	461	(7.1)	512	(14.0)	**91**	(14.6)
Cali	421	(4.6)	440	(5.2)	12.0	(3.1)	**29**	(4.0)	393	(4.6)	407	(5.5)	424	(8.1)	462	(10.2)	**69**	(11.3)
Manizales	434	(4.2)	452	(4.7)	14.0	(2.9)	**30**	(3.4)	400	(4.8)	419	(6.1)	441	(6.2)	478	(9.2)	**78**	(10.3)
Medellín	433	(4.1)	457	(4.0)	17.8	(2.6)	**34**	(2.7)	393	(4.6)	422	(6.0)	437	(6.5)	484	(7.8)	**90**	(9.0)
United Arab Emirates																		
Abu Dhabi•	423	(4.5)	413	(3.8)	3.4	(1.0)	**23**	(3.6)	394	(4.8)	415	(5.8)	443	(5.3)	443	(7.8)	**48**	(8.4)
Ajman	402	(3.4)	397	(3.7)	3.2	(1.2)	**21**	(4.1)	383	(5.4)	398	(7.1)	411	(7.7)	420	(8.1)	**37**	(10.1)
Dubai•	480	(1.3)	454	(2.1)	6.3	(0.7)	**40**	(2.4)	438	(3.1)	483	(3.6)	496	(3.2)	507	(2.8)	**69**	(4.4)
Fujairah	401	(5.3)	397	(4.6)	0.9	(0.7)	**11**	(5.1)	386	(6.2)	397	(7.5)	407	(10.4)	417	(9.0)	**31**	(10.7)
Ras Al Khaimah	400	(8.5)	394	(8.7)	2.0	(1.1)	**15**	(4.4)	382	(10.3)	388	(10.2)	417	(11.4)	415	(9.0)	**33**	(10.9)
Sharjah	432	(9.5)	425	(7.7)	3.0	(1.9)	**21**	(6.8)	402	(9.3)	442	(14.3)	452	(12.4)	437	(14.8)	**35**	(14.2)
Umm Al Quwain	387	(4.1)	385	(4.3)	0.6	(1.0)	8	(5.8)	375	(8.0)	375	(9.7)	412	(9.5)	388	(10.5)	14	(14.3)

• PISA adjudicated region.
1. ESCS refers to the PISA index of economic, social and cultural status.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.6.3a for national data.
StatLink http://dx.doi.org/10.1787/888933433235

[Part 1/2]

Table B2.I.68 Low and top performance in science, by students' socio-economic status

Results based on students' self-reports

	All students				Students in the bottom quarter of ESCS[1]				Students in the second quarter of ESCS			
	Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)		Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)		Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)	
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD												
Belgium												
Flemish community•	17.1	(1.0)	12.0	(0.7)	30.1	(2.0)	3.4	(0.6)	21.0	(1.7)	6.9	(1.0)
French community	23.1	(1.7)	5.3	(0.6)	41.5	(3.1)	1.0	(0.5)	24.6	(3.0)	2.3	(0.7)
German-speaking community	14.2	(2.3)	6.1	(1.6)	19.2	(5.8)	2.2	(1.8)	16.6	(4.5)	4.2	(2.6)
Canada												
Alberta	8.6	(1.0)	15.9	(1.4)	12.4	(1.9)	8.7	(1.8)	10.7	(2.0)	11.5	(2.1)
British Columbia	8.7	(1.2)	14.7	(1.5)	13.3	(2.3)	7.5	(1.9)	11.5	(2.7)	11.2	(2.2)
Manitoba	17.4	(1.7)	7.1	(1.1)	26.7	(3.8)	1.7	(1.0)	18.4	(3.2)	6.7	(2.4)
New Brunswick	15.6	(1.9)	8.1	(1.1)	23.2	(4.7)	2.7	(1.5)	15.8	(3.1)	5.4	(1.8)
Newfoundland and Labrador	15.4	(1.3)	7.8	(1.0)	23.5	(3.7)	4.2	(2.0)	18.2	(2.9)	6.9	(2.6)
Nova Scotia	12.8	(1.5)	9.8	(1.2)	17.9	(2.2)	4.5	(1.5)	14.6	(2.9)	7.6	(2.3)
Ontario	12.3	(1.0)	12.1	(1.1)	20.2	(2.0)	4.8	(1.1)	11.7	(1.6)	9.5	(1.4)
Prince Edward Island	11.3	(2.1)	8.7	(2.0)	15.8	(5.0)	4.3	(2.9)	8.7	(4.0)	7.2	(4.5)
Quebec	8.5	(1.1)	12.8	(1.5)	17.9	(2.5)	4.5	(1.3)	8.3	(1.8)	9.8	(1.7)
Saskatchewan	16.7	(1.4)	6.2	(0.7)	23.3	(3.8)	2.8	(1.2)	18.2	(2.8)	5.5	(1.5)
Italy												
Bolzano	11.7	(0.9)	7.8	(1.0)	18.3	(2.3)	4.1	(1.2)	11.5	(2.2)	7.0	(1.6)
Campania	36.4	(2.5)	1.8	(0.4)	53.2	(4.4)	0.3	(0.3)	36.9	(3.7)	1.8	(0.7)
Lombardia	16.3	(1.9)	6.5	(0.9)	28.2	(3.7)	2.1	(0.8)	14.9	(3.0)	5.0	(1.6)
Trento	12.4	(0.9)	5.9	(0.7)	19.6	(1.9)	3.1	(1.2)	14.6	(2.3)	5.1	(1.7)
Portugal												
Região Autónoma dos Açores	27.7	(1.6)	4.1	(0.7)	41.9	(3.6)	0.7	(0.7)	34.0	(3.5)	1.5	(1.0)
Spain												
Andalusia•	25.4	(1.8)	3.2	(0.6)	38.0	(3.4)	0.8	(0.7)	30.3	(3.8)	1.6	(0.9)
Aragon•	14.2	(1.5)	6.6	(0.8)	24.3	(3.0)	3.0	(1.1)	16.3	(2.8)	4.0	(1.2)
Asturias•	16.3	(1.4)	5.9	(0.8)	29.3	(2.7)	2.1	(0.8)	18.5	(2.6)	4.1	(1.3)
Balearic Islands•	20.4	(1.7)	4.0	(0.8)	31.3	(3.4)	1.3	(0.5)	21.9	(2.5)	3.5	(1.1)
Basque Country•	20.2	(1.2)	3.3	(0.4)	30.2	(2.4)	0.8	(0.4)	22.5	(2.4)	2.3	(0.7)
Canary Islands•	23.8	(1.6)	3.2	(0.6)	37.2	(2.8)	1.4	(0.8)	27.3	(2.8)	1.6	(0.9)
Cantabria•	17.3	(1.9)	4.8	(1.0)	27.8	(3.9)	2.4	(1.6)	17.7	(2.8)	2.5	(1.2)
Castile and Leon•	10.2	(1.0)	8.5	(0.9)	16.5	(2.6)	3.9	(1.1)	11.3	(1.9)	6.7	(1.2)
Castile-La Mancha•	16.2	(1.5)	5.0	(0.8)	25.0	(2.7)	1.9	(0.8)	17.5	(2.7)	2.9	(1.1)
Catalonia•	15.7	(1.6)	6.7	(1.0)	26.8	(3.0)	2.0	(1.0)	20.5	(3.2)	4.3	(1.3)
Comunidad Valenciana•	15.8	(1.4)	4.1	(0.6)	26.6	(3.4)	1.3	(0.6)	16.6	(2.9)	1.6	(0.8)
Extremadura•	24.2	(1.6)	3.1	(0.5)	38.2	(3.2)	1.0	(0.5)	26.8	(3.2)	1.8	(0.8)
Galicia•	13.4	(1.3)	7.4	(0.8)	20.1	(2.6)	3.3	(1.1)	16.0	(2.3)	5.4	(1.4)
La Rioja•	17.0	(1.5)	5.9	(1.2)	31.5	(3.5)	1.9	(1.1)	16.8	(2.4)	4.2	(1.2)
Madrid•	12.2	(1.2)	7.6	(0.7)	23.9	(3.1)	3.1	(1.4)	14.3	(2.3)	4.1	(1.2)
Murcia•	21.1	(1.4)	3.9	(0.6)	38.1	(2.8)	1.4	(0.7)	24.9	(2.6)	2.2	(1.0)
Navarre•	11.9	(1.2)	6.8	(1.2)	21.6	(2.8)	2.7	(1.0)	14.2	(2.5)	3.5	(1.2)
United Kingdom												
England	17.0	(0.9)	11.7	(0.8)	25.1	(1.5)	4.7	(0.8)	21.4	(1.7)	7.0	(1.1)
Northern Ireland	17.8	(1.2)	6.8	(0.8)	29.3	(2.8)	2.7	(0.8)	21.0	(2.7)	4.5	(1.2)
Scotland	19.5	(1.0)	7.5	(0.7)	28.7	(2.2)	2.9	(0.8)	22.7	(1.8)	4.6	(0.9)
Wales	21.5	(1.1)	4.7	(0.5)	27.7	(2.2)	2.4	(0.7)	24.8	(1.9)	3.3	(1.0)
United States												
Massachusetts•	12.0	(1.6)	14.2	(1.9)	24.1	(3.4)	5.1	(1.5)	12.3	(3.1)	8.9	(2.4)
North Carolina•	18.0	(1.6)	9.2	(1.0)	26.9	(3.1)	3.9	(1.3)	20.4	(2.6)	4.8	(1.3)
Puerto Rico•	55.3	(3.1)	0.4	(0.2)	72.4	(4.0)	0.0	c	66.7	(4.4)	0.1	(0.2)
Partners												
Colombia												
Bogotá	28.1	(2.0)	1.1	(0.4)	43.0	(3.6)	0.0	(0.2)	35.9	(3.6)	0.3	(0.3)
Cali	47.0	(2.4)	0.3	(0.2)	62.0	(3.3)	0.0	(0.1)	56.0	(4.0)	0.2	(0.3)
Manizales	38.9	(2.1)	0.6	(0.3)	55.9	(3.6)	0.0	(0.4)	45.6	(4.0)	0.4	(0.6)
Medellín	40.5	(2.3)	0.6	(0.3)	61.4	(3.2)	0.1	(0.2)	45.4	(3.7)	0.2	(0.2)
United Arab Emirates												
Abu Dhabi•	47.1	(2.0)	1.8	(0.3)	58.7	(2.6)	0.2	(0.2)	51.0	(2.9)	1.3	(0.5)
Ajman	55.1	(2.0)	0.2	(0.2)	64.3	(3.3)	0.0	c	58.1	(4.4)	0.1	(0.4)
Dubai•	25.7	(0.6)	6.3	(0.5)	39.7	(1.6)	2.3	(0.7)	23.8	(1.5)	5.6	(1.2)
Fujairah	55.8	(2.7)	1.0	(0.4)	64.0	(3.7)	0.6	(0.7)	57.6	(4.2)	1.0	(0.7)
Ras Al Khaimah	57.2	(4.1)	0.6	(0.5)	66.1	(6.3)	0.0	c	63.0	(4.8)	0.1	(0.3)
Sharjah	41.4	(4.2)	1.6	(0.7)	53.4	(5.0)	0.5	(0.8)	38.0	(6.6)	1.5	(1.2)
Umm Al Quwain	63.8	(2.3)	0.2	(0.3)	70.0	(5.6)	0.3	(0.7)	69.6	(5.2)	0.0	c

• PISA adjudicated region.
1. ESCS refers to the PISA index of economic, social and cultural status.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.6.6a for national data.
StatLink http://dx.doi.org/10.1787/888933433235

[Part 2/2]

Table B2.I.68 Low and top performance in science, by students' socio-economic status

Results based on students' self-reports

	Students in the third quarter of ESCS				Students in the top quarter of ESCS				Increased likelihood of students in the bottom quarter of ESCS scoring below Level 2 in science, relative to non-disadvantaged students (3 other quarters of ESCS		Increased likelihood of students in the bottom quarter of ESCS scoring below Level 2 in science, relative to advantaged students (top quarter of ESCS)	
	Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)		Percentage of low performers in science (below Level 2)		Percentage of top performers in science (Level 5 or above)					
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	Odds ratio	S.E.	Odds ratio	S.E.
OECD												
Belgium												
Flemish community•	10.0	(1.2)	14.5	(1.3)	5.3	(0.8)	23.9	(1.7)	**3.13**	(0.3)	**4.85**	(0.7)
French community	17.0	(2.2)	5.3	(1.3)	6.7	(1.4)	13.0	(1.5)	**3.69**	(0.5)	**6.07**	(1.3)
German-speaking community	10.9	(4.0)	6.1	(3.5)	9.5	(3.5)	12.1	(4.9)	1.71	(0.7)	2.12	(1.1)
Canada												
Alberta	6.9	(1.6)	17.9	(2.8)	4.1	(1.4)	26.7	(2.8)	**1.83**	(0.4)	**2.91**	(0.9)
British Columbia	5.1	(1.6)	16.5	(3.0)	2.7	(1.0)	24.8	(3.3)	**2.24**	(0.5)	**2.73**	(1.3)
Manitoba	14.2	(2.3)	6.4	(1.9)	9.4	(1.6)	14.1	(2.3)	**2.24**	(0.4)	**2.93**	(0.7)
New Brunswick	14.9	(2.7)	8.1	(2.0)	8.4	(1.7)	16.2	(3.0)	**2.01**	(0.5)	**3.21**	(1.2)
Newfoundland and Labrador	10.0	(2.5)	9.0	(2.7)	9.4	(2.1)	11.9	(3.0)	**2.17**	(0.5)	**2.70**	(0.9)
Nova Scotia	7.2	(2.3)	11.2	(2.5)	7.0	(2.2)	17.4	(3.1)	**2.06**	(0.4)	**1.63**	(0.4)
Ontario	8.8	(1.4)	14.6	(1.9)	6.6	(1.1)	20.2	(2.4)	**2.55**	(0.4)	**2.65**	(0.5)
Prince Edward Island	8.2	(4.3)	9.5	(4.8)	11.9	(4.6)	14.1	(5.0)	1.82	(0.8)	1.38	(0.8)
Quebec	4.8	(1.3)	15.1	(2.9)	3.6	(1.2)	23.6	(3.0)	**3.68**	(0.8)	**5.62**	(1.6)
Saskatchewan	14.1	(2.1)	6.2	(1.5)	11.3	(2.2)	10.5	(1.9)	**1.80**	(0.4)	**2.28**	(0.6)
Italy												
Bolzano	10.6	(1.8)	8.1	(2.2)	5.9	(1.6)	12.5	(2.0)	**2.20**	(0.4)	**3.18**	(0.9)
Campania	34.7	(4.3)	1.6	(0.8)	16.4	(3.5)	3.8	(1.4)	**2.76**	(0.5)	**3.71**	(1.2)
Lombardia	14.7	(2.6)	6.1	(1.5)	7.5	(1.8)	13.0	(2.6)	**2.79**	(0.6)	**4.64**	(1.2)
Trento	8.5	(1.5)	6.4	(1.6)	7.2	(1.4)	9.6	(2.0)	**2.18**	(0.3)	**3.01**	(0.7)
Portugal												
Região Autónoma dos Açores	24.4	(2.9)	4.5	(1.8)	9.6	(2.6)	9.8	(2.3)	**2.47**	(0.4)	**5.64**	(1.7)
Spain												
Andalusia•	22.3	(2.5)	2.5	(1.0)	10.7	(2.1)	7.9	(1.6)	**2.29**	(0.3)	**4.90**	(1.0)
Aragon•	10.2	(2.3)	7.3	(1.7)	5.1	(1.5)	12.4	(2.0)	**2.75**	(0.5)	**4.81**	(1.3)
Asturias•	11.7	(2.1)	6.5	(1.4)	4.1	(1.8)	11.2	(2.3)	**3.23**	(0.6)	**6.16**	(2.2)
Balearic Islands•	18.1	(2.8)	2.6	(1.2)	9.4	(2.3)	8.4	(1.9)	**2.31**	(0.3)	**3.98**	(1.1)
Basque Country•	15.5	(1.6)	4.6	(1.1)	10.9	(1.7)	5.5	(0.9)	**2.21**	(0.3)	**2.91**	(0.5)
Canary Islands•	20.4	(2.4)	1.8	(0.8)	9.6	(2.4)	8.2	(2.1)	**2.51**	(0.4)	**4.79**	(1.2)
Cantabria•	17.5	(3.2)	4.0	(1.5)	6.3	(1.3)	10.2	(2.2)	**2.42**	(0.4)	**5.45**	(1.3)
Castile and Leon•	7.3	(1.6)	8.7	(1.9)	5.1	(1.3)	15.0	(2.6)	**2.30**	(0.5)	**3.15**	(0.9)
Castile-La Mancha•	15.8	(2.2)	5.3	(1.5)	6.1	(1.6)	10.1	(2.3)	**2.21**	(0.3)	**4.75**	(1.4)
Catalonia•	10.3	(2.4)	6.6	(1.5)	4.4	(1.3)	14.2	(2.4)	**2.76**	(0.5)	**6.63**	(2.4)
Comunidad Valenciana•	12.9	(2.7)	3.9	(1.2)	5.9	(1.6)	9.8	(1.8)	**2.72**	(0.6)	**4.78**	(1.7)
Extremadura•	20.0	(2.6)	3.4	(1.0)	11.5	(2.0)	6.3	(1.4)	**2.59**	(0.5)	**4.50**	(1.0)
Galicia•	11.4	(2.4)	8.1	(1.7)	5.7	(1.6)	12.9	(2.2)	**2.03**	(0.4)	**3.74**	(1.2)
La Rioja•	10.7	(2.1)	6.2	(1.9)	7.6	(1.8)	11.5	(2.7)	**3.45**	(0.6)	**4.39**	(1.0)
Madrid•	6.7	(1.8)	9.8	(2.1)	3.3	(1.2)	13.6	(2.0)	**3.59**	(0.7)	**7.92**	(3.2)
Murcia•	13.7	(2.6)	3.6	(1.2)	7.2	(1.8)	8.6	(1.7)	**3.44**	(0.5)	**7.19**	(2.0)
Navarre•	7.4	(1.8)	7.4	(2.1)	4.0	(1.1)	13.9	(2.9)	**2.96**	(0.5)	**5.89**	(1.9)
United Kingdom												
England	11.9	(1.7)	13.4	(1.6)	6.8	(1.0)	23.6	(1.8)	**2.18**	(0.2)	**2.81**	(0.4)
Northern Ireland	11.9	(2.1)	7.6	(1.7)	6.5	(1.4)	13.5	(2.2)	**2.75**	(0.4)	**3.66**	(0.8)
Scotland	15.1	(1.8)	7.4	(1.4)	9.3	(1.3)	16.0	(2.1)	**2.17**	(0.3)	**2.75**	(0.5)
Wales	16.7	(1.8)	4.8	(1.0)	12.5	(1.6)	9.0	(1.3)	**1.75**	(0.2)	**1.79**	(0.3)
United States												
Massachusetts•	4.6	(1.6)	16.1	(3.1)	4.8	(1.7)	27.3	(4.1)	**4.10**	(1.0)	**4.12**	(1.3)
North Carolina•	14.8	(2.7)	8.4	(1.8)	9.3	(1.8)	19.8	(2.5)	**2.13**	(0.3)	**3.31**	(0.9)
Puerto Rico•	51.2	(4.8)	0.2	(0.4)	29.9	(4.9)	1.4	(0.8)	**2.73**	(0.5)	**5.73**	(1.2)
Partners												
Colombia												
Bogotá	25.5	(3.7)	0.7	(0.7)	9.3	(3.2)	3.6	(1.6)	**2.44**	(0.4)	**6.43**	(1.8)
Cali	43.5	(4.2)	0.3	(0.3)	25.1	(5.0)	0.9	(0.6)	**2.31**	(0.5)	**3.67**	(1.1)
Manizales	36.5	(3.5)	0.6	(0.5)	17.4	(3.6)	1.3	(1.0)	**2.57**	(0.5)	**5.67**	(1.7)
Medellín	36.5	(3.8)	0.5	(0.5)	17.5	(3.3)	1.8	(1.0)	**3.23**	(0.5)	**6.48**	(1.4)
United Arab Emirates												
Abu Dhabi•	39.3	(2.8)	2.9	(0.8)	38.7	(3.5)	2.9	(0.8)	**1.89**	(0.2)	**2.11**	(0.3)
Ajman	50.4	(3.8)	0.5	(1.0)	45.0	(4.3)	0.2	(1.0)	**1.74**	(0.3)	**1.96**	(0.5)
Dubai•	19.9	(1.2)	8.1	(1.2)	17.5	(1.0)	9.6	(1.1)	**2.57**	(0.2)	**2.67**	(0.3)
Fujairah	52.1	(5.4)	0.3	(0.5)	48.7	(4.7)	2.2	(1.3)	**1.59**	(0.3)	**1.79**	(0.4)
Ras Al Khaimah	48.7	(6.0)	1.4	(1.3)	50.3	(4.3)	1.1	(1.1)	**1.66**	(0.4)	**1.90**	(0.5)
Sharjah	31.6	(5.2)	1.9	(1.7)	40.8	(6.9)	2.5	(1.2)	**1.95**	(0.5)	1.55	(0.6)
Umm Al Quwain	53.4	(5.7)	0.7	(1.0)	61.2	(6.0)	0.0	c	1.48	(0.5)	1.43	(0.6)

• PISA adjudicated region.
1. ESCS refers to the PISA index of economic, social and cultural status.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.6.6a for national data.
StatLink http://dx.doi.org/10.1787/888933433235

[Part 1/2]

Table B2.I.72 Differences in science performance between immigrant and non-immigrant students, and socio-economic status

Results based on students' self-reports

	Percentage of immigrant students in PISA 2015		Science performance: Non-immigrant students		Science performance: Immigrant students		Science performance: Second-generation immigrants		Science performance: First-generation immigrants	
	%	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.
OECD										
Belgium										
Flemish community•	14.0	(1.0)	529	(2.4)	447	(5.7)	448	(8.6)	446	(7.6)
French community	22.2	(1.7)	499	(4.1)	453	(7.6)	459	(8.5)	446	(8.3)
German-speaking community	21.8	(2.1)	511	(5.5)	489	(10.4)	c	c	492	(11.5)
Canada										
Alberta	28.0	(1.8)	543	(4.1)	541	(5.4)	548	(6.6)	535	(6.3)
British Columbia	39.4	(2.7)	540	(4.6)	544	(6.3)	541	(6.9)	548	(7.7)
Manitoba	23.9	(1.2)	506	(5.7)	494	(5.1)	502	(8.2)	490	(6.5)
New Brunswick	5.6	(0.8)	507	(4.7)	530	(12.7)	c	c	535	(13.1)
Newfoundland and Labrador	2.5	(1.2)	508	(3.3)	c	c	c	c	c	c
Nova Scotia	8.3	(1.2)	520	(4.4)	521	(11.4)	c	c	522	(15.4)
Ontario	37.1	(2.4)	526	(4.2)	530	(5.1)	529	(5.3)	531	(6.5)
Prince Edward Island	5.2	(1.2)	513	(5.2)	c	c	c	c	c	c
Quebec	23.3	(3.9)	541	(4.3)	531	(9.5)	535	(10.0)	527	(11.2)
Saskatchewan	13.8	(1.0)	500	(3.4)	477	(7.6)	526	(13.3)	468	(8.1)
Italy										
Bolzano	8.0	(0.7)	522	(2.5)	450	(8.5)	456	(11.9)	446	(10.7)
Campania	1.7	(0.4)	449	(5.4)	c	c	c	c	c	c
Lombardia	11.3	(1.1)	510	(4.8)	452	(8.2)	465	(11.3)	442	(9.6)
Trento	10.6	(0.8)	518	(2.5)	459	(8.0)	478	(11.2)	441	(10.6)
Portugal										
Região Autónoma dos Açores	2.2	(0.5)	471	(2.4)	469	(21.8)	c	c	c	c
Spain										
Andalusia•	4.1	(0.6)	475	(4.0)	445	(17.2)	c	c	436	(20.2)
Aragon•	13.9	(1.2)	519	(4.7)	449	(6.9)	c	c	448	(7.4)
Asturias•	6.5	(0.7)	506	(4.0)	457	(7.9)	c	c	454	(8.1)
Balearic Islands•	17.2	(1.4)	493	(4.7)	455	(6.4)	481	(12.3)	449	(6.2)
Basque Country•	8.8	(0.7)	489	(3.0)	433	(5.0)	444	(16.8)	432	(5.5)
Canary Islands•	12.9	(1.8)	479	(3.9)	463	(5.9)	468	(11.1)	461	(6.9)
Cantabria•	9.5	(1.1)	501	(5.5)	453	(11.2)	c	c	453	(11.8)
Castile and Leon•	7.4	(0.9)	523	(3.7)	472	(7.0)	c	c	465	(7.6)
Castile-La Mancha•	9.0	(1.0)	502	(4.3)	459	(10.5)	c	c	457	(12.1)
Catalonia•	18.8	(2.1)	518	(4.0)	456	(7.0)	460	(11.5)	455	(7.4)
Comunidad Valenciana•	14.6	(1.8)	499	(3.5)	476	(6.5)	497	(12.7)	472	(6.9)
Extremadura•	2.1	(0.5)	476	(4.0)	439	(17.3)	c	c	c	c
Galicia•	6.1	(0.8)	516	(3.1)	473	(10.5)	c	c	468	(11.0)
La Rioja•	17.1	(0.9)	513	(5.6)	441	(8.2)	c	c	441	(8.4)
Madrid•	19.5	(1.7)	528	(3.2)	474	(6.5)	483	(13.5)	470	(7.8)
Murcia•	15.3	(1.2)	494	(4.0)	437	(8.2)	425	(15.7)	440	(7.7)
Navarre•	14.2	(1.5)	520	(4.2)	470	(5.2)	c	c	466	(5.6)
United Kingdom										
England	18.4	(1.1)	520	(2.9)	494	(6.4)	503	(6.4)	486	(8.7)
Northern Ireland	15.9	(1.1)	509	(3.0)	469	(6.4)	c	c	463	(6.4)
Scotland	5.7	(0.5)	498	(2.4)	497	(8.7)	512	(15.6)	492	(9.1)
Wales	7.7	(0.9)	488	(2.7)	475	(10.0)	482	(10.3)	471	(12.0)
United States										
Massachusetts•	20.1	(1.9)	539	(6.2)	501	(11.3)	520	(10.8)	462	(13.0)
North Carolina•	11.4	(1.3)	504	(5.1)	506	(8.3)	510	(9.9)	497	(13.9)
Puerto Rico•	4.4	(0.9)	407	(6.1)	397	(12.2)	393	(13.5)	c	c
Partners										
Colombia										
Bogotá	0.7	(0.2)	458	(4.9)	c	c	c	c	c	c
Cali	0.7	(0.2)	423	(4.9)	c	c	c	c	c	c
Manizales	0.1	(0.1)	435	(4.2)	c	c	c	c	m	m
Medellín	0.8	(0.2)	435	(4.2)	c	c	c	c	c	c
United Arab Emirates										
Abu Dhabi•	54.2	(1.6)	390	(4.4)	457	(5.2)	443	(4.6)	472	(6.8)
Ajman	46.5	(2.3)	387	(4.3)	426	(5.1)	412	(7.4)	436	(6.5)
Dubai•	74.3	(0.3)	410	(2.5)	509	(1.6)	498	(2.5)	514	(2.1)
Fujairah	27.6	(3.1)	383	(3.9)	456	(13.9)	455	(16.5)	457	(16.0)
Ras Al Khaimah	27.1	(3.5)	395	(4.1)	424	(23.3)	418	(24.7)	430	(24.2)
Sharjah	60.7	(3.2)	395	(9.7)	462	(12.1)	472	(13.8)	456	(12.5)
Umm Al Quwain	32.9	(2.2)	378	(5.4)	416	(7.5)	412	(12.7)	420	(9.9)

• PISA adjudicated region.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
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See Table I.7.4a for national data.
StatLink http://dx.doi.org/10.1787/888933433235

[Part 2/2]

Table B2.I.72 Differences in science performance between immigrant and non-immigrant students, and socio-economic status

Results based on students' self-reports

		Differences in science performance											
		Before accounting for students' socio-economic status						After accounting for students' socio-economic status					
		Between non-immigrants and immigrants		Between non-immigrants and second-generation immigrants		Between non-immigrants and first-generation immigrants		Between non-immigrants and immigrants		Between non-immigrants and second-generation immigrants		Between non-immigrants and first-generation immigrants	
		Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
OECD	**Belgium**												
	Flemish community•	**82**	(5.7)	**81**	(8.4)	**82**	(7.9)	**57**	(5.1)	**50**	(7.0)	**63**	(7.6)
	French community	**46**	(7.1)	**40**	(7.8)	**53**	(8.1)	**26**	(6.2)	**24**	(6.6)	**28**	(7.7)
	German-speaking community	22	(11.8)	m	m	19	(12.6)	**28**	(12.1)	m	m	**26**	(12.7)
	Canada												
	Alberta	3	(4.9)	-4	(6.7)	8	(5.5)	2	(4.8)	-8	(6.5)	**11**	(5.4)
	British Columbia	-4	(6.9)	-1	(8.0)	-7	(7.6)	-7	(6.1)	-9	(7.1)	-3	(7.3)
	Manitoba	12	(7.2)	4	(9.3)	15	(8.4)	8	(7.1)	-2	(9.0)	13	(8.4)
	New Brunswick	-23	(14.2)	m	m	-28	(14.8)	-12	(13.1)	m	m	-15	(13.5)
	Newfoundland and Labrador	m	m	m	m	m	m	m	m	m	m	m	m
	Nova Scotia	0	(11.8)	m	m	-2	(16.2)	6	(10.3)	m	m	7	(14.8)
	Ontario	-4	(5.1)	-3	(5.5)	-5	(6.4)	-4	(4.5)	-6	(4.7)	0	(6.0)
	Prince Edward Island	m	m	m	m	m	m	m	m	m	m	m	m
	Quebec	10	(8.1)	6	(8.8)	15	(9.9)	6	(6.7)	-2	(7.6)	15	(8.4)
	Saskatchewan	**23**	(8.2)	-26	(13.9)	**31**	(8.6)	**21**	(8.5)	**-27**	(13.6)	**30**	(9.0)
	Italy												
	Bolzano	**72**	(8.7)	**66**	(12.1)	**75**	(10.8)	**64**	(8.8)	**62**	(11.7)	**66**	(11.3)
	Campania	m	m	m	m	m	m	m	m	m	m	m	m
	Lombardia	**58**	(7.9)	**45**	(10.7)	**68**	(9.5)	**43**	(7.8)	**33**	(10.8)	**50**	(9.9)
	Trento	**59**	(8.0)	**40**	(11.2)	**77**	(10.8)	**43**	(8.3)	**24**	(11.0)	**63**	(10.9)
	Portugal												
	Região Autónoma dos Açores	1	(22.3)	m	m	m	m	24	(18.5)	m	m	m	m
	Spain												
	Andalusia•	30	(16.3)	m	m	**39**	(19.1)	**32**	(15.6)	m	m	**38**	(18.8)
	Aragon•	**70**	(6.4)	m	m	**70**	(6.8)	**48**	(6.4)	m	m	**48**	(6.4)
	Asturias•	**49**	(8.7)	m	m	**52**	(9.0)	**30**	(8.9)	m	m	**31**	(9.5)
	Balearic Islands•	**38**	(7.0)	12	(11.7)	**44**	(7.2)	**31**	(6.4)	11	(11.3)	**35**	(6.9)
	Basque Country•	**56**	(5.4)	**45**	(16.9)	**58**	(5.8)	**38**	(5.6)	27	(16.4)	**40**	(6.1)
	Canary Islands•	**16**	(7.1)	11	(11.2)	**18**	(8.3)	10	(6.6)	4	(11.2)	12	(7.3)
	Cantabria•	**48**	(10.5)	m	m	**48**	(11.3)	**37**	(9.2)	m	m	**36**	(9.9)
	Castile and Leon•	**52**	(7.6)	m	m	**58**	(8.4)	**35**	(7.7)	m	m	**42**	(8.5)
	Castile-La Mancha•	**43**	(11.4)	m	m	**45**	(12.8)	**28**	(10.8)	m	m	**29**	(12.6)
	Catalonia•	**62**	(6.1)	**58**	(10.9)	**63**	(6.6)	**42**	(6.4)	**33**	(9.4)	**44**	(7.2)
	Comunidad Valenciana•	**23**	(7.1)	2	(13.4)	**27**	(7.3)	**15**	(7.0)	0	(14.4)	**17**	(6.8)
	Extremadura•	**37**	(18.7)	m	m	m	m	24	(20.8)	m	m	m	m
	Galicia•	**43**	(10.7)	m	m	**48**	(11.0)	**36**	(10.1)	m	m	**41**	(10.5)
	La Rioja•	**71**	(7.5)	m	m	**72**	(7.8)	**46**	(8.3)	m	m	**46**	(8.5)
	Madrid•	**54**	(6.3)	**45**	(13.4)	**57**	(7.6)	**32**	(5.2)	23	(12.9)	**35**	(6.2)
	Murcia•	**57**	(9.3)	**69**	(16.3)	**55**	(8.9)	**31**	(8.2)	**44**	(14.8)	**29**	(7.7)
	Navarre•	**50**	(6.0)	m	m	**54**	(6.6)	**26**	(6.2)	m	m	**28**	(6.8)
	United Kingdom												
	England	**26**	(6.2)	**18**	(6.1)	**34**	(8.6)	**20**	(5.0)	**10**	(4.9)	**30**	(7.0)
	Northern Ireland	**40**	(6.6)	m	m	**46**	(6.5)	**34**	(6.2)	m	m	**39**	(6.1)
	Scotland	1	(8.5)	-13	(14.8)	6	(9.2)	4	(7.9)	-15	(12.1)	11	(8.9)
	Wales	13	(9.6)	6	(10.1)	16	(11.6)	14	(8.8)	6	(10.2)	18	(10.8)
	United States												
	Massachusetts•	**39**	(9.8)	**19**	(9.3)	**77**	(12.8)	14	(7.5)	-1	(7.4)	**44**	(11.2)
	North Carolina•	-2	(8.6)	-5	(9.6)	7	(15.0)	**-29**	(8.6)	**-33**	(9.2)	-22	(14.3)
	Puerto Rico•	10	(12.9)	14	(15.0)	m	m	12	(10.2)	12	(13.1)	m	m
Partners	**Colombia**												
	Bogotá	m	m	m	m	m	m	m	m	m	m	m	m
	Cali	m	m	m	m	m	m	m	m	m	m	m	m
	Manizales	m	m	m	m	m	m	m	m	m	m	m	m
	Medellín	m	m	m	m	m	m	m	m	m	m	m	m
	United Arab Emirates												
	Abu Dhabi•	**-67**	(5.5)	**-52**	(5.3)	**-81**	(6.9)	**-68**	(5.2)	**-54**	(5.2)	**-80**	(6.4)
	Ajman	**-39**	(6.6)	**-26**	(8.5)	**-50**	(7.9)	**-42**	(6.6)	**-29**	(8.1)	**-51**	(8.0)
	Dubai•	**-99**	(3.1)	**-88**	(3.7)	**-104**	(3.4)	**-96**	(3.2)	**-89**	(3.7)	**-100**	(3.4)
	Fujairah	**-73**	(14.6)	**-72**	(17.0)	**-74**	(16.7)	**-74**	(14.0)	**-72**	(16.7)	**-76**	(15.9)
	Ras Al Khaimah	-30	(22.0)	-23	(23.9)	-35	(22.7)	-32	(21.9)	-25	(23.8)	-38	(22.4)
	Sharjah	**-66**	(13.3)	**-77**	(14.9)	**-61**	(13.8)	**-66**	(12.7)	**-76**	(14.6)	**-61**	(13.1)
	Umm Al Quwain	**-38**	(9.3)	**-34**	(14.8)	**-42**	(10.4)	**-39**	(9.3)	**-36**	(15.1)	**-41**	(10.4)

• PISA adjudicated region.
Notes: Values that are statistically significant are indicated in bold (see Annex A3).
Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.
For Massachusetts and North Carolina, the desired target population covers 15-year-old students in grade 7 or above in public schools only (see Annex A2).
Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.
See Table I.7.4a for national data.
StatLink http://dx.doi.org/10.1787/888933433235

ANNEX B3

LIST OF TABLES AND FIGURES AVAILABLE ON LINE

The following tables and figures are available in electronic form only, they may be found at: www.oecd.org/pisa.

Chapter 2 Science performance among 15-year-olds

...

...

Chapter 5 Mathematics performance among 15-year-olds

Chapter 6 Socio-economic status, student performance and students'attitudes towards science

Chapter 7 Immigrant background, student performance and students'attitudes towards science

Chapter 8 What PISA results imply for policy

...

Annex B2 Results for regions within countries

http://dx.doi.org/10.1787/888933433235

...

Annex C

PISA 2015 TEST ITEMS

Annex C1: Released items from the PISA 2015 computer-based science assessment

This annex presents example units (groups of questions related to the same stimulus information) from the PISA 2015 computer-based science assessment. One unit from the field trial (*RUNNING IN HOT WEATHER*) is presented in order to illustrate the use of computer-based simulations in the PISA 2015 assessment. Four units from the main study are also included.

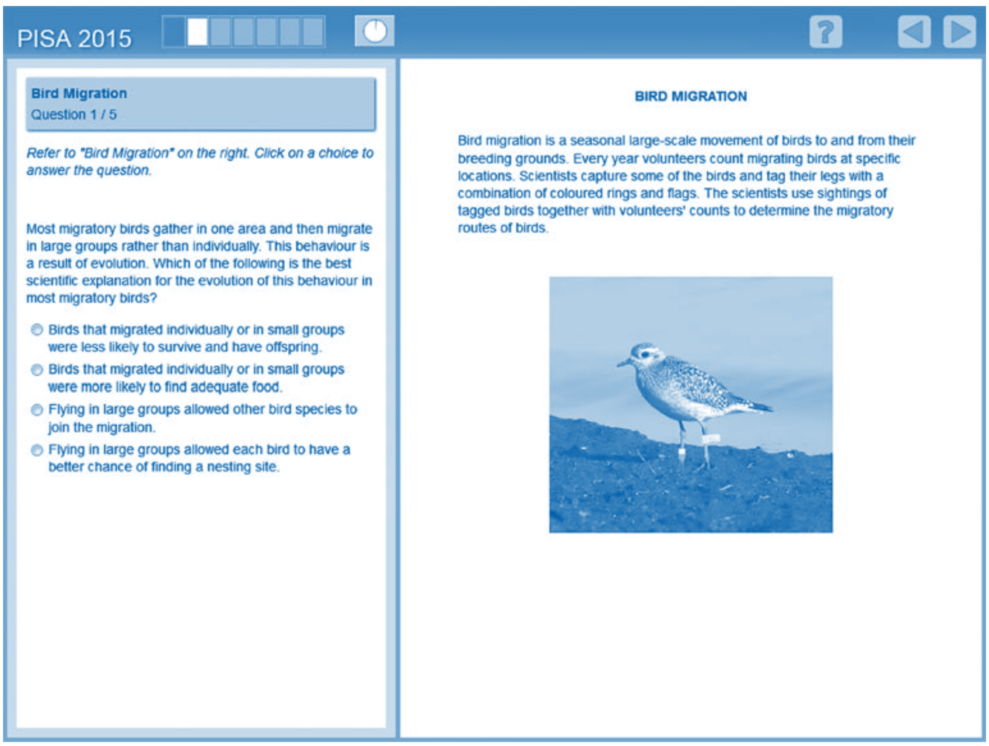
Annex C2: Classification and scaling information of PISA 2015 Main Survey Items
http://dx.doi.org/10.1787/888933433242

Tables C2.1, C2.2, C2.3 and C2.4 (available on line and listed in the Annex C2) present the item classification and the scaling information for the item pool for science (trend and new items), reading and mathematics.

ANNEX C1
RELEASED ITEMS FROM THE PISA 2015 COMPUTER-BASED SCIENCE ASSESSMENT

Main survey items

BIRD MIGRATION – QUESTION 1



Question Type	Simple multiple choice
Competency	Explain Phenomena Scientifically
Knowledge – System	Content – Living
Context	Global – Environmental Quality
Difficulty	501 – Level 3
Question ID	S656Q01

Scoring

Full Credit

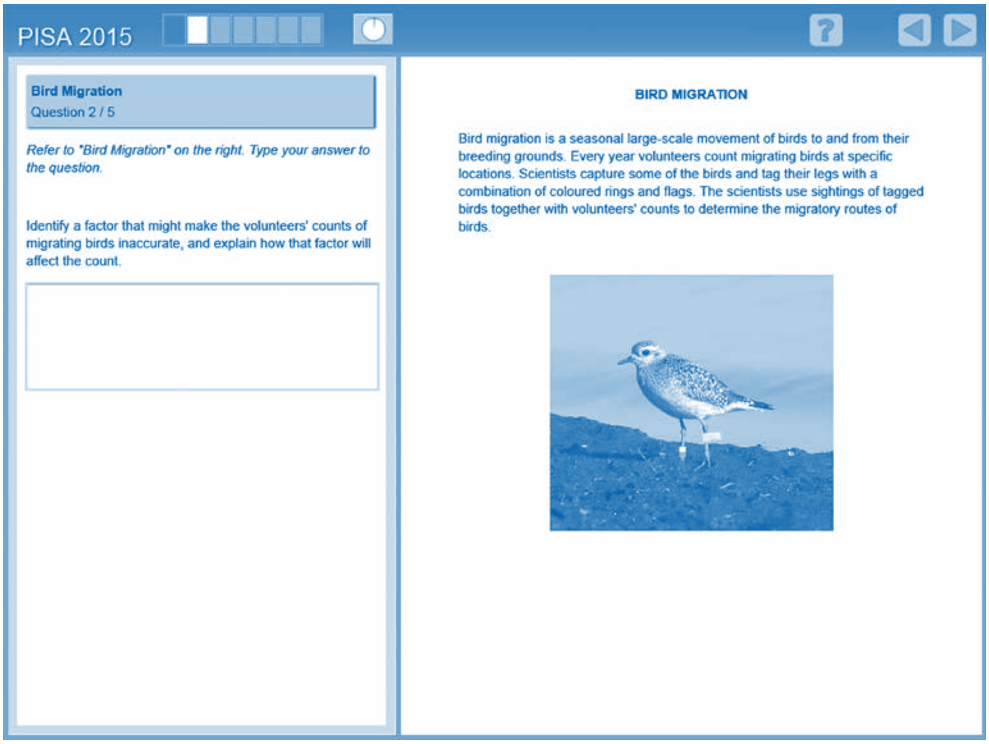
The student selects:

Birds that migrated individually or in small groups were less likely to survive and have offspring.

Comment

In question 1, students are asked to select an explanation for the specified phenomenon that birds migrate in large groups. This question, which is at the very low end of Level 3, requires that students identify an appropriate conclusion about the evolutionary benefit of this behaviour.

BIRD MIGRATION – QUESTION 2



Question Type	Human Coded
Competency	Evaluate and design scientific enquiry
Knowledge – System	Procedural – Living
Context	Global – Environmental Quality
Difficulty	630 – Level 5
Question ID	S656Q02

Scoring

Full Credit

The student identifies at least one specific factor that can affect the accuracy of counts by observers.

The observers may miss counting some birds because they fly high.

If the same birds are counted more than once, that can make the numbers too high.

For birds in a large group, volunteers can only estimate how many birds there are.

The observers might be wrong about what kind of bird they are, so the numbers of that kind of bird will be wrong.

The birds migrate at night.

Volunteers will not be everywhere the birds migrate.

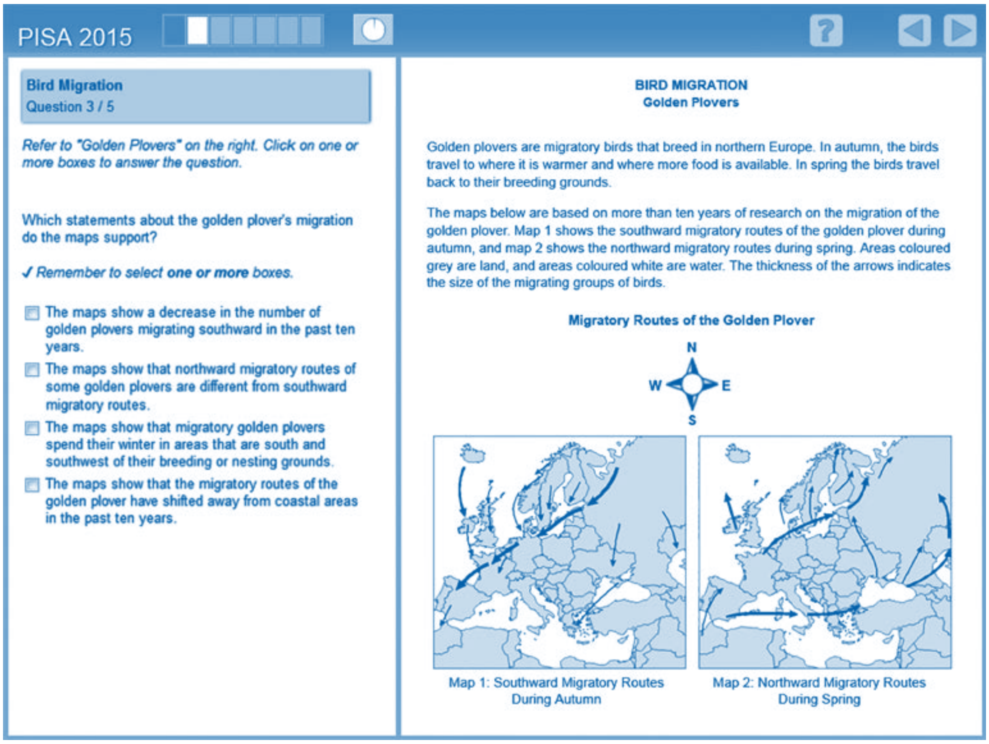
The observers can make a mistake in counting.

Clouds or rain hide some of the birds.

Comment

To correctly answer this question, students must use procedural knowledge to identify a factor that might lead to inaccurate counts of migrating birds and explain how that could affect the data collected. Being able to identify and explain potential limitations in data sets is an important aspect of scientific literacy and locates this question at the top Level.

BIRD MIGRATION – QUESTION 3



Question Type	Complex Multiple Choice
Competency	Interpret data and evidence scientifically
Knowledge – System	Procedural – Living
Context	Global – Environmental Quality
Difficulty	574 – Level 4
Question ID	S656Q04

Scoring

Full Credit

The student selects BOTH of the following 2 responses:

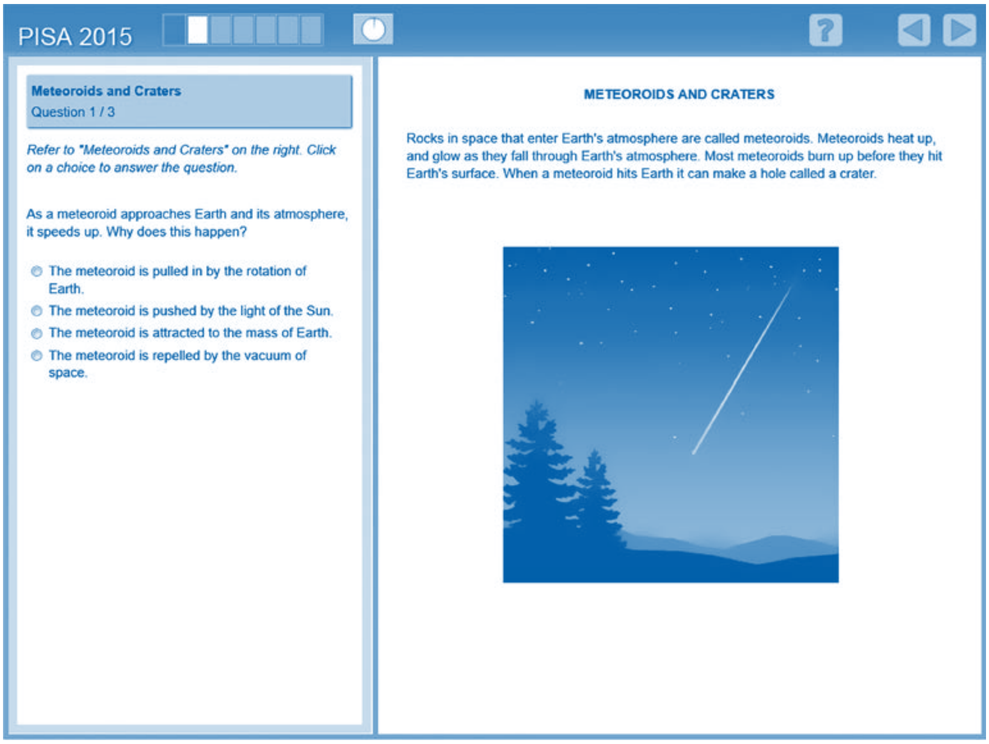
The maps show that northward migratory routes of some golden plovers are different from southward migratory routes.

The maps show that migratory golden plovers spend their winter in areas that are south and southwest of their breeding or nesting grounds.

Comment

Question 3 requires students to understand how data is represented in two maps and use that information to compare and contrast migration routes for the golden plover in the autumn and spring. This Level 4 interpretation task requires students to analyse the data and identify which of several provided conclusions are correct.

METEOROIDS AND CRATERS – QUESTION 1



Question Type	Simple Multiple Choice
Competency	Explain phenomena scientifically
Knowledge – System	Content – Physical
Context	Global – Frontiers
Difficulty	483 – Level 2
Question ID	S641Q01

Scoring

Full Credit

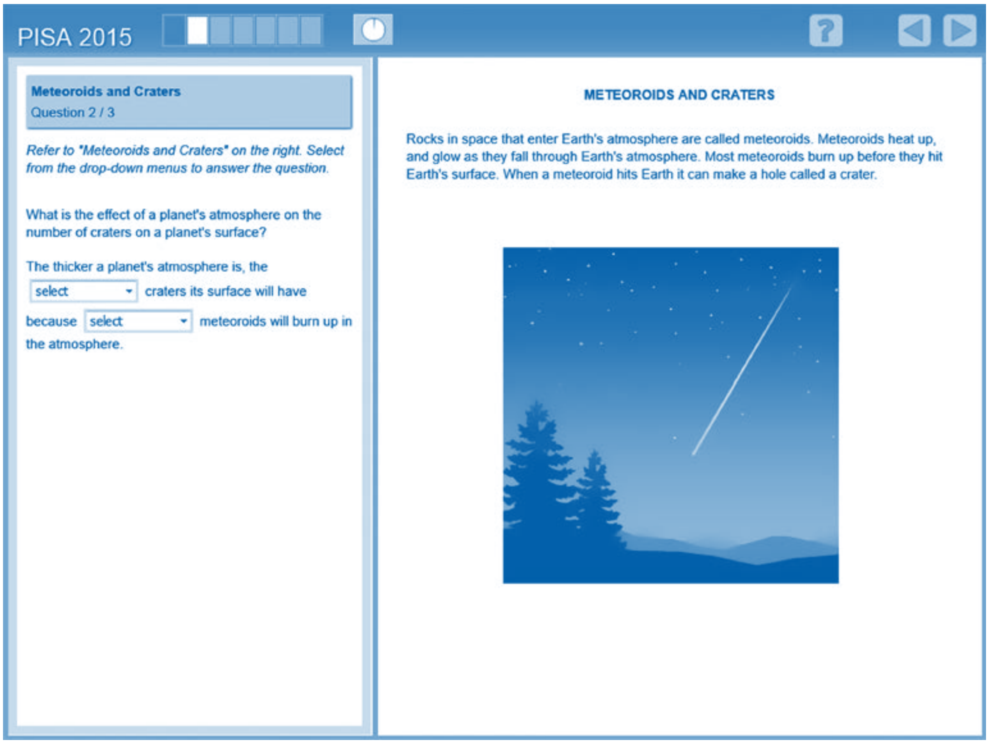
The student selects:

The meteoroid is attracted to the mass of Earth.

Comment

Question 1 requires students to apply simple scientific knowledge to select the correct explanation for why objects speed up as they approach Earth. This content question, which requires students to explain a phenomenon scientifically, is at the top of Level 2.

METEOROIDS AND CRATERS – QUESTION 2



Question Type	Complex Multiple Choice
Competency	Explain phenomena scientifically
Knowledge – System	Content – Earth & Space
Context	Global – Frontiers
Difficulty	450 – Level 2
Question ID	S641Q02

Scoring

Full Credit

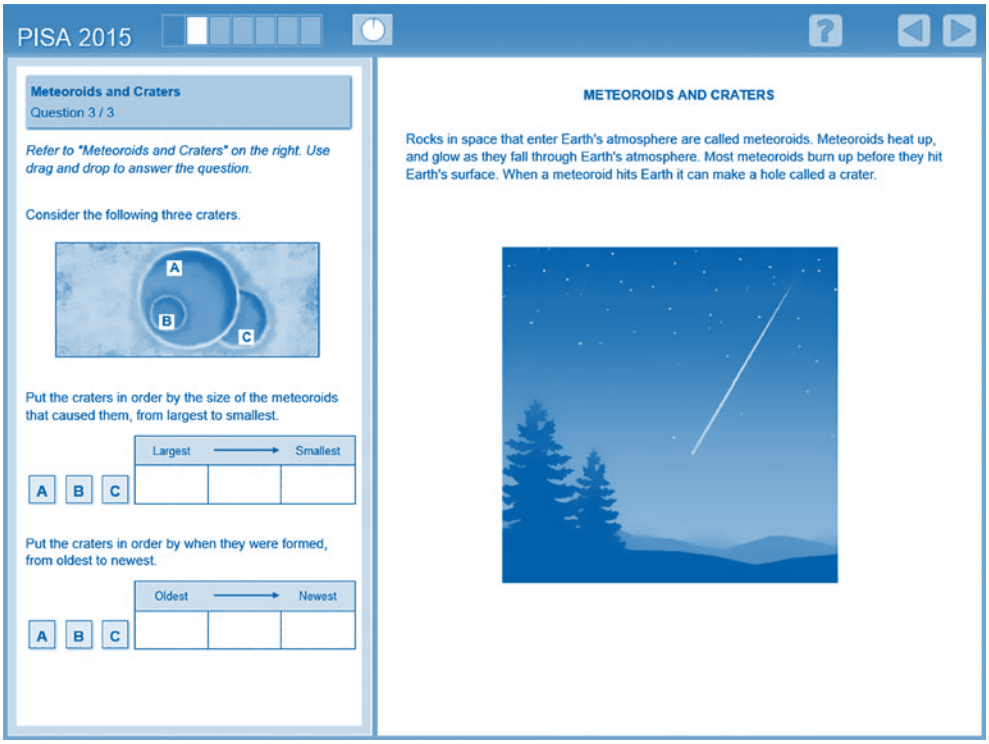
The student selects:

The thicker a planet's atmosphere is, the more/fewer craters its surface will have because more/fewer meteoroids will burn up in the atmosphere.

Comment

This Level 2 question requires students to select two responses that explain the relationship between the thickness of a planet's atmosphere, the likelihood that meteoroids will burn up in the atmosphere and, therefore, the number of craters that will be on the planet surface.

METEOROIDS AND CRATERS – QUESTIONS 3A AND 3B[1]



Question Type	Complex Multiple Choice (drag and drop)
Competency	Interpret data and evidence scientifically
Knowledge – System	Content – Earth & Space
Context	Global – Frontiers
Difficulty	3A: 299 – Level 1b
	3B: 438 – Level 2
Question ID	3A: S641Q03
	3B: S641Q04

Scoring

3A • Full Credit

The student orders the craters: A, C, B.

3B • Full Credit

The student orders the craters: C, A, B.

Comment

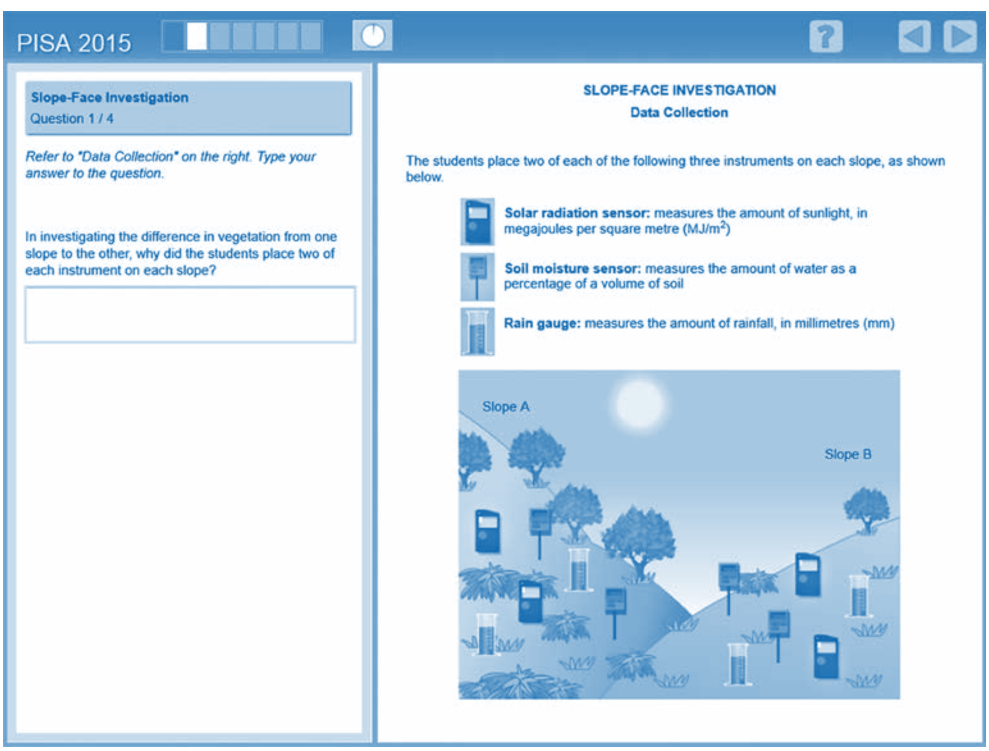
Question 3A, a basic data interpretation question, was the easiest question in the 2015 science assessment. It requires simple, everyday knowledge that a larger object would cause a larger crater and a smaller one would cause a smaller crater.

Question 3B is somewhat more difficult because students must compare the three craters shown in the image to determine when the craters were formed, from oldest to newest, based on the way they overlap in the image – e.g. crater C must have formed first because crater A overlaps C a bit and crater B must be the most recent crater because it is within A.

1. Note that these two questions are identified as Q03 and Q04 in the item codes.

SLOPE-FACE INVESTIGATION – INTRODUCTION

SLOPE-FACE INVESTIGATION – QUESTION 1



Question Type	Open Response – Human Coded
Competency	Evaluate and design scientific enquiry
Knowledge – System	Epistemic – Earth & Space
Context	Local/ National - Natural Resources
Difficulty	517 – Level 3
Question ID	S637Q01

Scoring

Full Credit

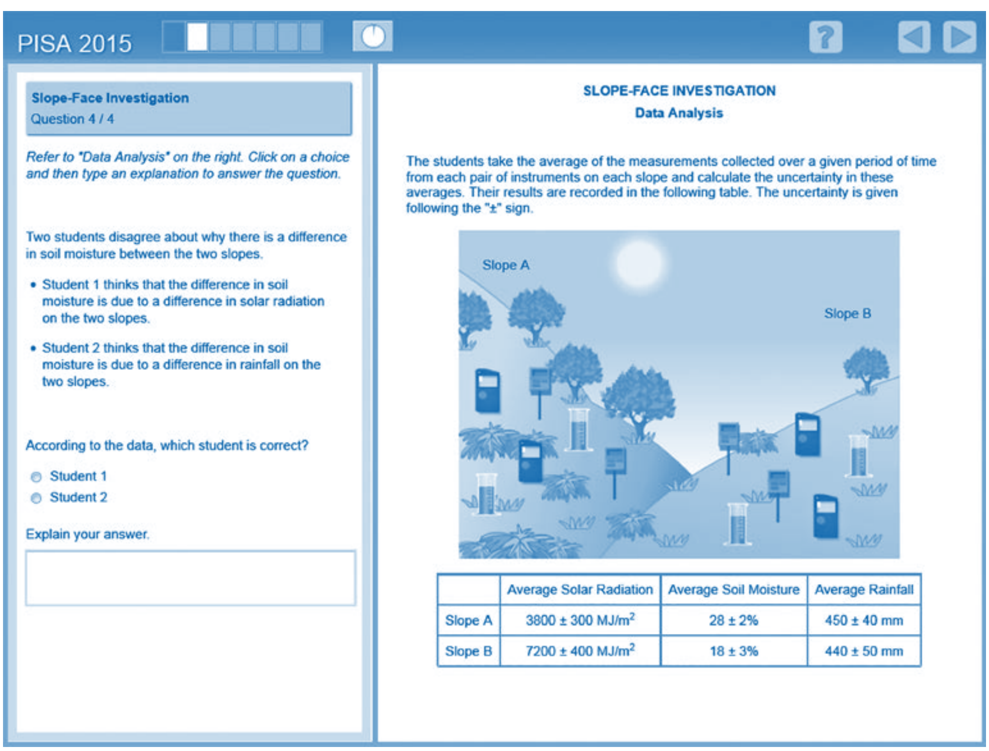
The student gives an explanation that identifies a scientific advantage of using more than one measurement instrument on each slope, e.g. correcting for variation of conditions within a slope, increasing the precision of measurement for each slope.

- So they could determine whether a difference between slopes is significant.
- Because there is likely to be variation within a slope.
- To increase the precision of the measurement for each slope.
- The data will be more accurate.
- In case one of the two malfunctions
- To compare different amounts of sun on a slope [A comparison implies that there may be variation.]

Comment

Question 1 requires students to apply epistemic knowledge to explain the design of the investigation presented in this unit. This Level 3 question allows students to demonstrate their understanding of the underlying rationale for the procedure of taking two independent measures of the phenomena being investigated. Knowledge of this rationale is the aspect of this question that assesses epistemic knowledge.

SLOPE-FACE INVESTIGATION – QUESTION 2



Question Type	Open Response – Human Coded
Competency	Interpret data and evidence scientifically
Knowledge – System	Epistemic – Earth & Space
Context	Local/ National - Natural Resources
Difficulty	589 – Level 4
Question ID	S637Q05

Scoring

Full Credit

The student selects **Student 1**

AND

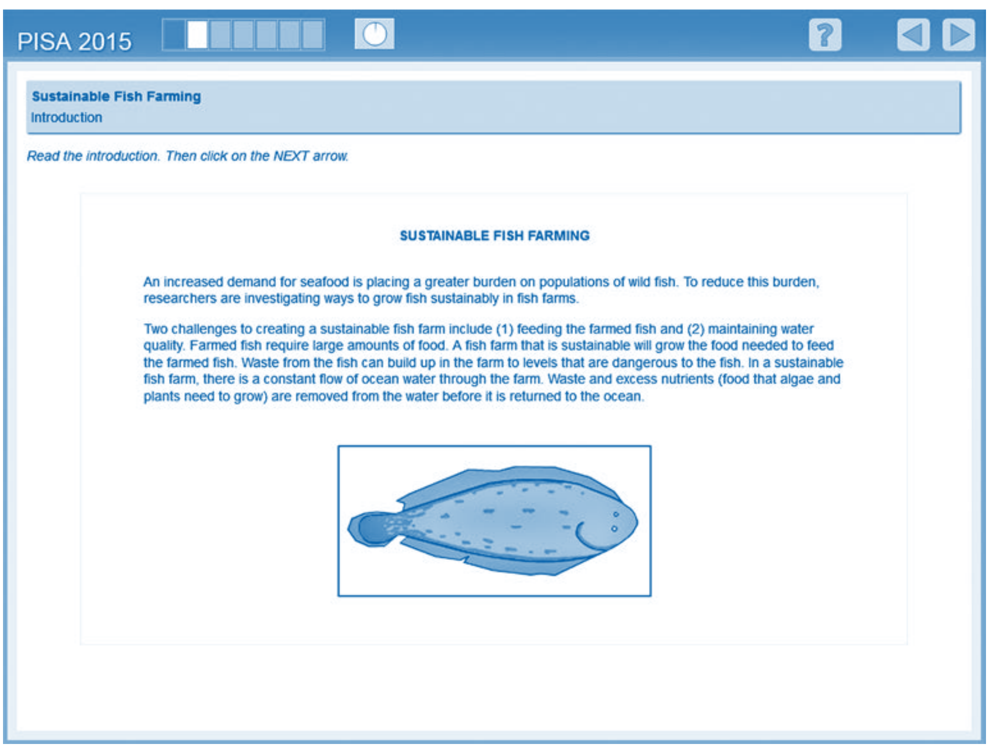
Gives an explanation that indicates that there is a difference in solar radiation between the two slopes **and/or** that rainfall does not show a difference.

- Slope B gets much more solar radiation than slope A, but the same amount of rain.
- There is no difference in the amount of rainfall the two slopes get.
- There is a big difference in how much sunlight slope A gets compared to slope B.

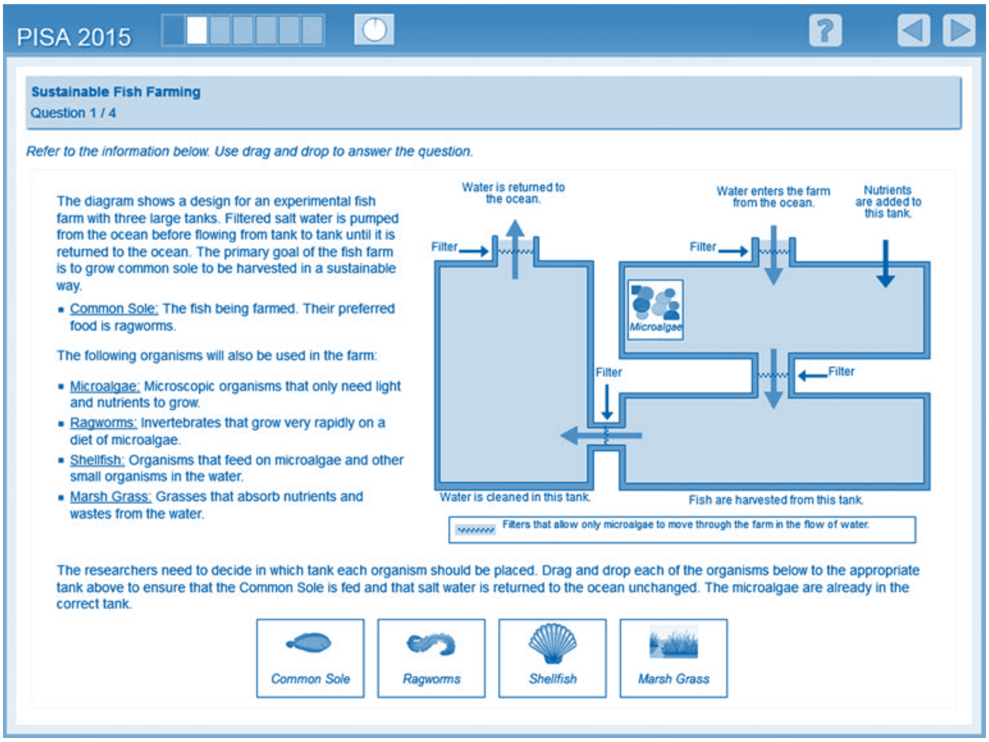
Comment

In this question, students must evaluate two claims by interpreting the provided data, which include confidence intervals around the average of measurements of solar radiation, soil moisture and rainfall. Students are asked to demonstrate an understanding of how measurement error affects the degree of confidence associated with specific scientific measurements, one major aspect of epistemic knowledge.

SUSTAINABLE FISH FARMING – INTRODUCTION



SUSTAINABLE FISH FARMING – QUESTION 1



Question Type	Complex Multiple Choice
Competency	Explain phenomena scientifically
Knowledge – System	Content – Living
Context	Local/ National – Natural Resources
Difficulty	740 – Level 6
Question ID	CS601Q01S

Scoring

Full Credit

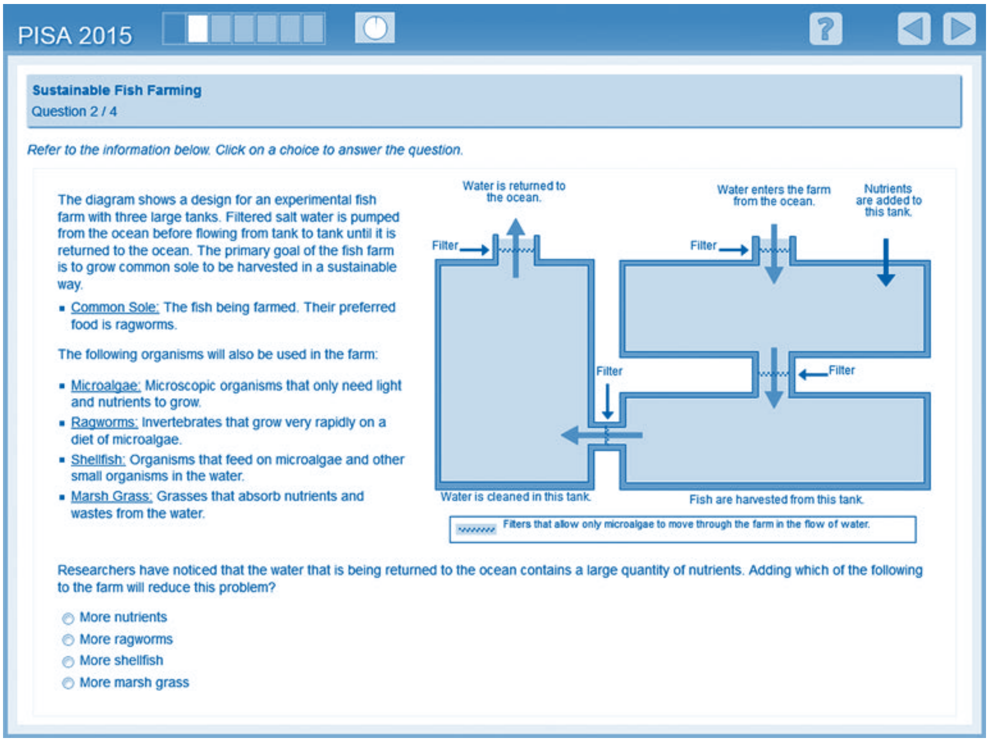
The student drags Ragworms and Common Sole into Tank 2 (bottom right) and drags.

Marsh Grass and Shellfish into Tank 3 (left).

Comment

This question requires students to understand a system and the role of several organisms within that system. In order to answer correctly, students must understand the goal of the fish farm, the function of each of the three tanks therein, and which organisms will best fulfil each function. Students must use information provided in the stimulus and the diagram, including a footnote under the diagram. An additional component that adds difficulty is the open-ended nature of the task. Any of the four organisms can be placed in any of the three tanks and there is no restriction on the number of organisms in each tank. As a result, there are multiple ways of getting this incorrect.

SUSTAINABLE FISH FARMING – QUESTION 2



Question Type	Simple Multiple Choice
Competency	Interpret data and evidence scientifically
Knowledge – System	Content – Living
Context	Local/ National – Environmental Quality
Difficulty	456 – Level 2
Question ID	CS601Q02S

Scoring

Full Credit

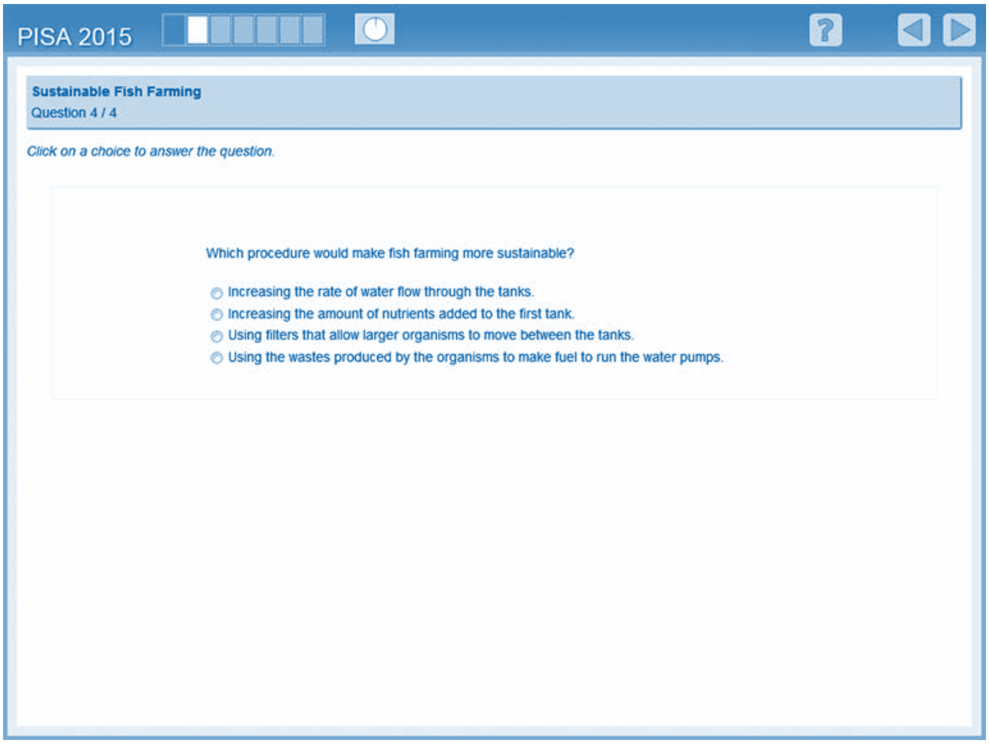
The student selects:

More marsh grass.

Comment

For question 2, which is at Level 2, students only need to identify which of the listed organisms will reduce the large number of nutrients being released to the ocean from the fish farm, based on descriptions of each organism. As the question does not require the construction of an explanation, it focuses on the ability to interpret data and evidence scientifically.

SUSTAINABLE FISH FARMING – QUESTION 3[2]



Question Type	Simple Multiple Choice
Competency	Explain phenomena scientifically
Knowledge – System	Content – Physical
Context	Local/ National – Environmental Quality
Difficulty	585 – Level 4
Question ID	CS601Q04S

Scoring

Full Credit

The student selects:

Using the wastes produced by the organisms to make fuel to run the water pumps.

Comment

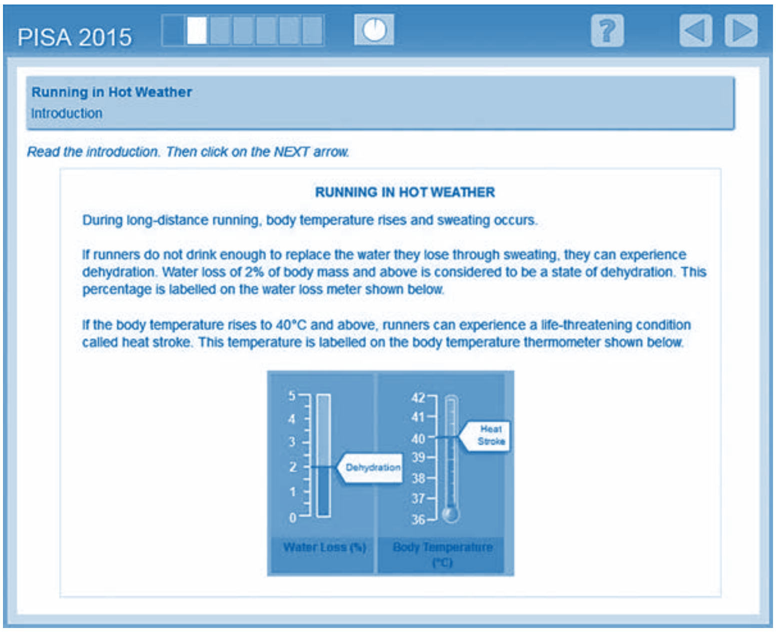
Question 3 asks students to use their understanding of the system provided in this unit and the explanation of what it means to be “sustainable” in this context in order to identify how the system could be modified to be more sustainable.

2. In the PISA 2015 main survey, this is the third question in this unit. In the field trial, another question appeared before this question, which explains why the question id identifies this as “Q04”.

Field trial items

RUNNING IN HOT WEATHER – INTRODUCTION

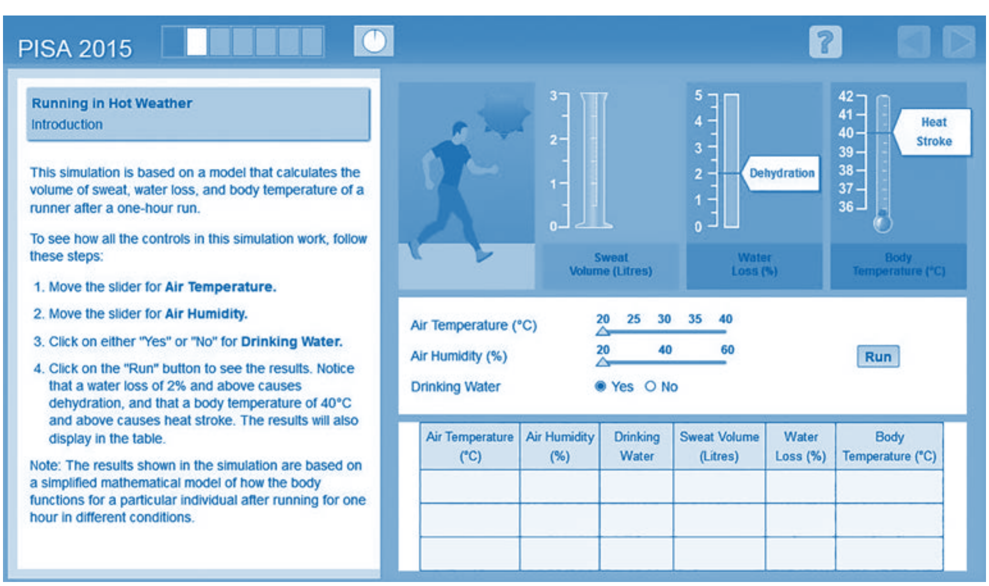
This unit presents a scientific enquiry about thermoregulation in the context of long-distance runners training in a location where weather conditions are sometimes hot and/or humid. The simulation allows students to manipulate the air temperature and air humidity levels, as well as whether or not the simulated runner drinks water.



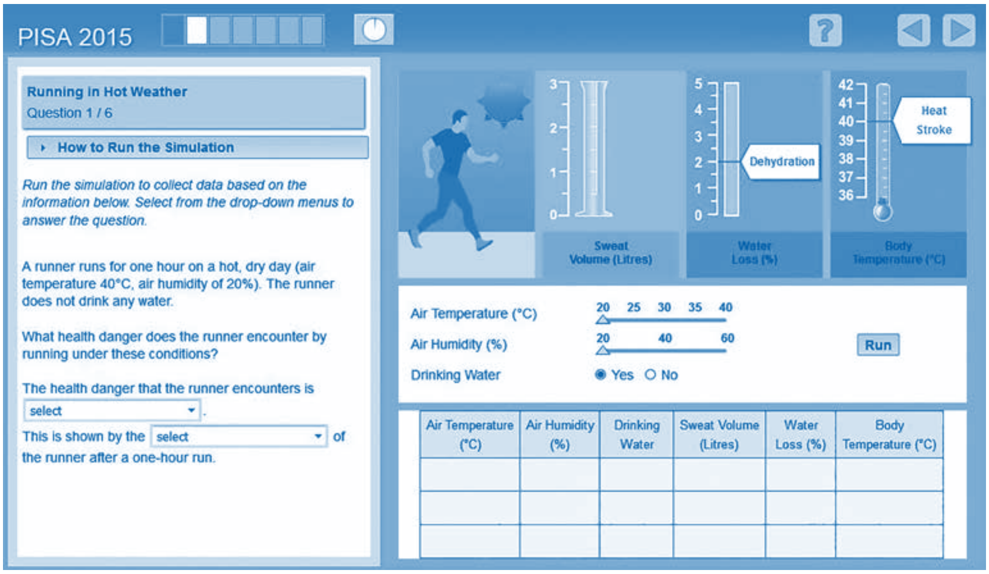
For each trial, data associated with the selected variables are displayed, including: air temperature, air humidity, drinking water (yes/no), sweat volume, water loss and body temperature. The runner's sweat volume, water loss and body temperature are also displayed on the top panel in the simulation panel. When the conditions trigger dehydration or heat stroke those health dangers are highlighted with red flags.

RUNNING IN HOT WEATHER – PRACTICE

Before beginning the unit, students are introduced to the simulation controls and asked to practice setting each control. Help messages are displayed if students do not perform the requested actions within 1 minute. If students time-out by not acting within 2 minutes, they are shown what the simulation would look like if the controls were set as specified in the provided instructions. As explained in the orientation that students take before beginning the Science section, reminders about how to use the controls, as well as how to select or delete a row of data are available on each question screen by clicking on the "How to Run the Simulation" tab in the left pane.



RUNNING IN HOT WEATHER – QUESTION 1



Students are asked to use the simulation and the data they generate to identify whether the person running under the specified conditions is in danger of either dehydration or heat stroke. They are also asked to specify whether this is shown by the runner's sweat volume, water loss or body temperature.

Question Type	Complex Multiple Choice
Competency	Interpret Data and Evidence Scientifically
Knowledge – System	Procedural - Living
Context	Personal – Health and Disease
Difficulty	497 – Level 3

Scoring

Full Credit

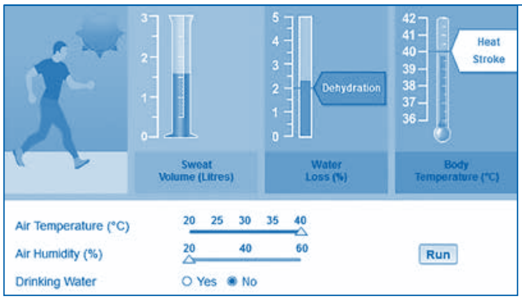
The student selects:

The health danger that the runner encounters is (dehydration/heat stroke).[3]

This is shown by the (sweat volume/water loss/body temperature) of the runner after a one-hour run.

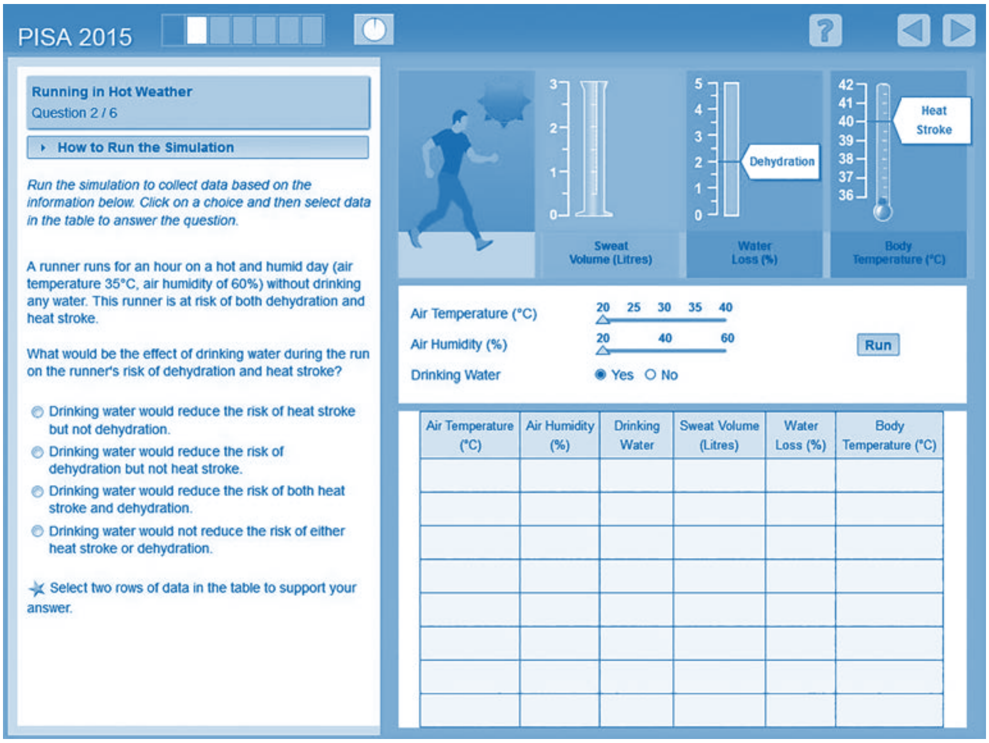
Comment

In this question, students are provided with the specific values for each of the variables in the simulation. They must set the controls as specified and run the simulation once. A red flag is displayed indicating that, under these conditions, the runner would suffer from water loss leading to dehydration. This is the easiest question in the unit, requiring students to carry out a straightforward procedure, identify the flagged condition in the display as shown below, and interpret the display to correctly identify water loss as the cause of the runner's dehydration.



3. Note that underlining indicates the correct response.

RUNNING IN HOT WEATHER – QUESTION 2



Question Type	Simple Multiple Choice/Open Response
Competency	Interpret Data and Evidence Scientifically
Knowledge – System	Content – Living
Context	Personal – Health and Disease
Difficulty	580 – Level 4

Scoring

Full Credit

The student selects:

Drinking water would reduce the risk of dehydration but not heat stroke AND selects the following two rows in the data table:

- Air temperature set to 35° C, 60% air humidity and "No" for drinking water AND
- Air temperature set to 35° C, 60% air humidity and "Yes" for drinking water

Partial Credit

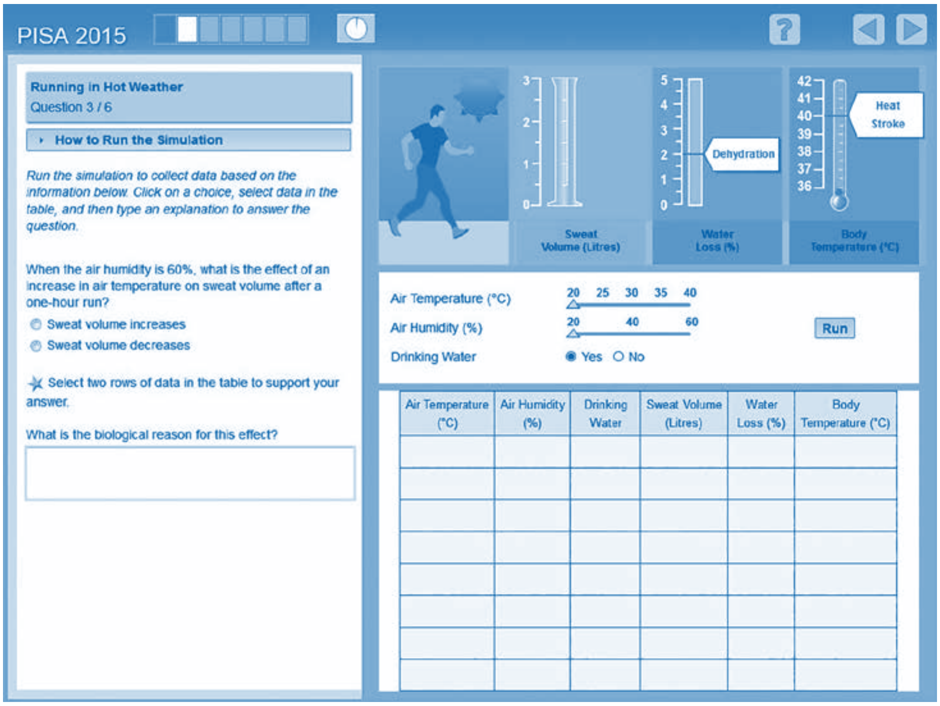
The student selects:

Drinking water would reduce the risk of dehydration but not heat stroke AND selects incorrect or incomplete data.

Comment

In question 2, students are asked to run the simulation holding the air temperature and humidity constant using specified values, and they must manipulate the variable of whether or not the runner drinks water. The simulation shows that running under the specified conditions without drinking water leads to both dehydration and heat stroke. In contrast, drinking water reduces the risk of dehydration but not the risk of heat stroke. Students must run the simulation twice in order to collect the data that supports their answer. Because students must manipulate one variable and compare the outcomes of two trials, this question is more difficult than the first question in the unit.

RUNNING IN HOT WEATHER – QUESTIONS 3A AND 3B



3A

Question Type	Multiple Choice and Open Response (select data) – Computer Scored
Competency	Evaluate and Design Scientific Enquiry
Knowledge – System	Procedural – Living
Context	Personal – Health and Disease
Difficulty	531 – Level 3

3B

Question Type	Open Response – Human Coded
Competency	Explain Phenomena Scientifically
Knowledge – System	Content – Living
Context	Personal – Health and Disease
Difficulty	641 – Level 5

Scoring

3A • Full Credit

The student selects:

Sweat volume increases

AND

The two selected rows must have air humidity of 60% and two different air temperatures selected (one lower and one higher – such as 20°C in one row and 25°C in the second or 35°C in one row and 40°C in the second, etc.) In addition, drinking water must have the same setting (either “Yes” or “No”) in both of the selected rows.

3B • Full Credit

The student’s response indicates or implies the function of sweat in cooling the body and/or regulating body temperature.

Sweat evaporates to cool the body when temperatures are high.

Increasing sweat levels in high temperatures keeps the body from getting too hot.

Sweat helps maintain body temperature at a safe level.

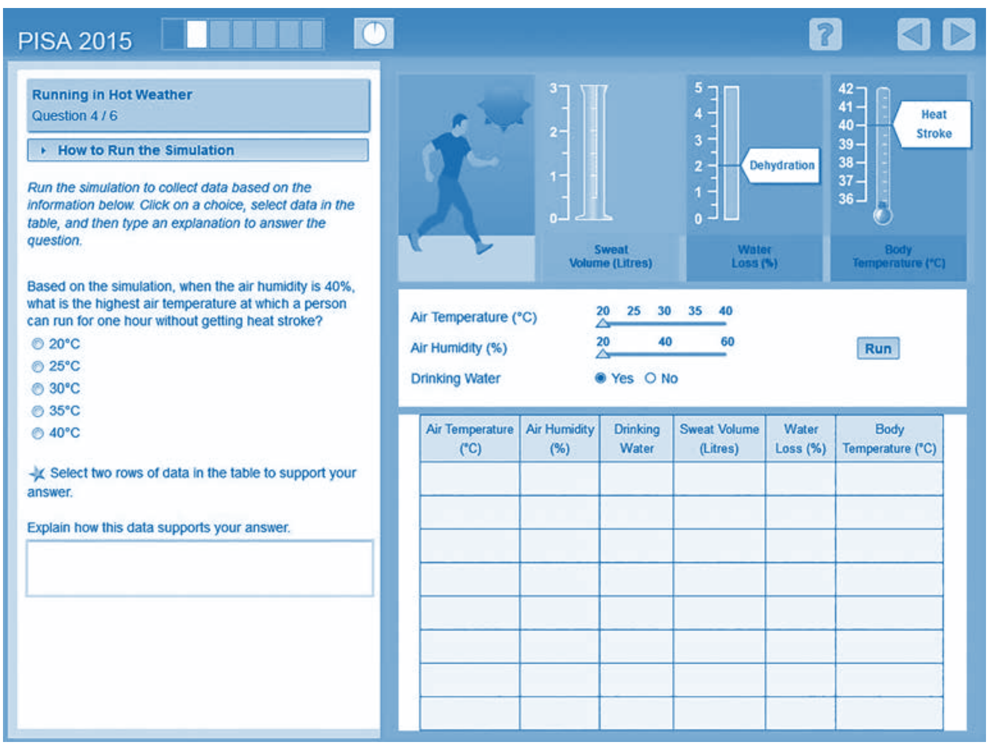
Comment

This set includes two separately coded questions: 3A is a multiple-choice question and also requires the selection of data to support that answer; 3B asks students to explain the reason that sweat volume increases under the specified conditions.

In 3A, one variable is defined – the humidity level – and students must run the simulation using at least two different temperatures to show the impact of an increase in temperature on sweat volume. Students must identify at least two rows of data in the data table that supports their answer. This question falls at Level 3.

Question 3B is the most difficult question in the unit at Level 5. It requires students to draw on their knowledge of biology (content knowledge) to explain that sweating cools the body at higher temperatures.

RUNNING IN HOT WEATHER – QUESTION 4



Question Type	Open Response – Human Coded
Competency	Evaluate and Design Scientific Enquiry
Knowledge – System	Procedural – Living
Context	Personal – Health and Disease
Difficulty	592 – Level 4

Scoring

Full Credit

The student selects *35°C*

AND

The two rows selected have 40% humidity at 35°C air temperature and 40% humidity at 40°C air temperature

AND

The student gives an explanation that indicates or implies that with humidity at 40%, 35°C is the highest air temperature that is safe from heat stroke, since moving the air temperature up from 35°C to 40°C puts the runner into heat stroke.

As the outdoor temperature goes up from 35° to 40°C, the body temperature goes above 40°, putting the runner in heat stroke.

At 40% humidity, running in 40°C air temperature leads to heat stroke, but at 35°C the runner's body temperature remains just below the level of heat stroke.

When the air temperature is increased, 40°C is the first time the runner gets heat stroke.

When humidity is 40%, the runner only gets heat stroke at 40°C. The other highest temperature is 35°C.

40°C heat stroke, not 35°C. [Minimum response]

Partial Credit

The student selects ***35°C***

AND

The two rows selected have 40% humidity at 35°C air temperature and 40% humidity at 40°C air temperature

AND

The student's explanation is missing, unclear or incorrect.

OR

The student selects ***35°C***

AND

Correct rows are not selected

AND

The student gives a correct explanation.

OR

The student selects ***40°C***

AND

The two rows selected have 40% humidity at 35°C air temperature and 40% humidity at 40°C air temperature

AND

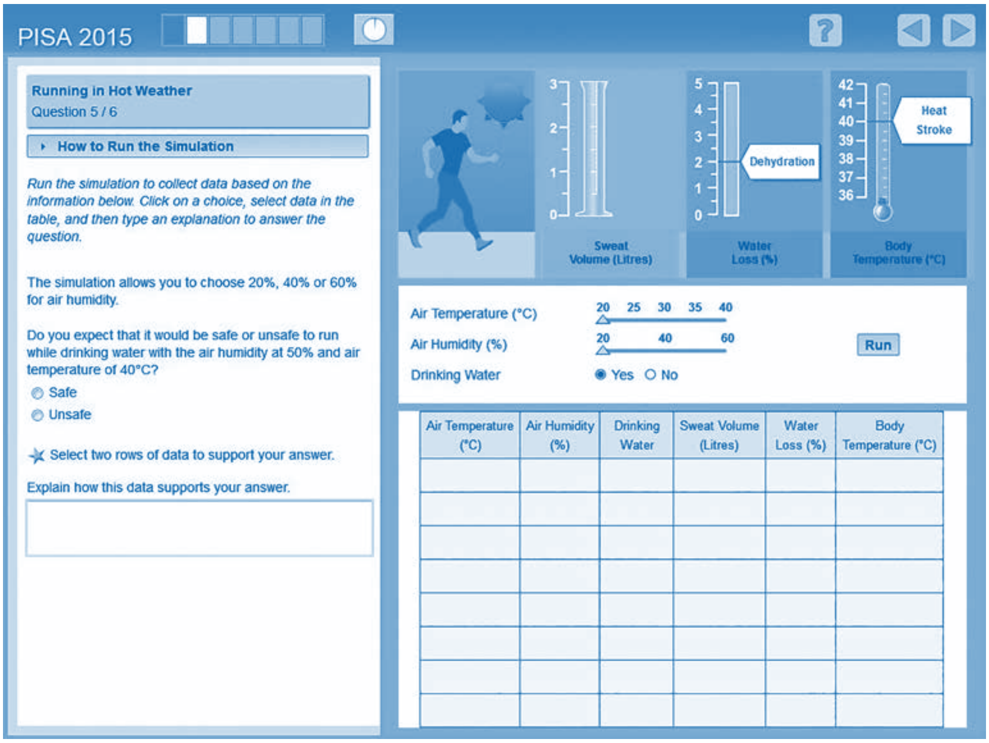
The student gives an explanation that indicates or implies that with humidity at 40%, 35°C is the highest air temperature that is safe from heat stroke.

Note: This last combination is given credit because students might simply interpret the question as: "What is the lowest temperature that is *unsafe*?"

Comment

In this question, one variable is defined. With a set air humidity of 40%, students must run at least two trials in order to determine the highest temperature at which a person can run without getting heat stroke. They must draw on procedural knowledge to explain how the data they have collected supports their answer by indicating that at 40% humidity, an air temperature higher than 35°C results in heat stroke.

RUNNING IN HOT WEATHER – QUESTION 5



Question Type	Open Response – Human Coded
Competency	Evaluate and Design Scientific Enquiry
Knowledge – System	Procedural
Context	Personal – Health and Disease
Difficulty	598 – Level 4

Scoring

Full Credit

The student selects *Unsafe*

AND

The two rows selected have:

- 40% humidity at 40°C with Drinking Water = Yes, and
- 60% humidity at 40°C with Drinking Water = Yes

AND

The student gives an explanation that indicates that with the runner suffering from heat stroke at both 40% and 60% humidity, there is a risk of heat stroke at 50% humidity in the same conditions.

With a temperature of 40°C and the drinking water, the runner will experience heat stroke at both 40% and 60% humidity, so the runner will probably experience heat stroke between those two levels of humidity, at 50%.

50% is halfway between 40% and 60%, and both those levels involve heat stroke, so 50% probably does as well.

40% is unsafe, so higher than that will be worse. [Minimum response. With a correct selection of data, this response can be read as explaining how the data supports a selection of unsafe for 50%.]

Partial Credit

The student selects ***Unsafe***

AND

The two rows selected have

40% humidity at 40°C with Drinking Water=Yes and

60% humidity at 40°C with Drinking Water=Yes

AND

The student's explanation is missing, unclear or incorrect.

OR

The student selects ***Unsafe***

AND

Correct rows are **not** selected

AND

The student gives a correct explanation referring to results from the simulation.

Comment

This question requires students to extrapolate beyond the data that can be directly collected through the simulation. They must develop a hypothesis about the safety of running at 40°C at 50% air humidity, where only 40% and 60% humidity levels are available in the simulation tools. The correct response is that it would be unsafe, and students must select one row with a humidity level at 40% and one at 60% with temperature and drinking water set as specified in the question in both rows. The explanation must indicate that, given that the runner would suffer from heat stroke at both 40% and 60% humidity at 40°C while drinking water, it is likely that heat stroke would also occur at 50% humidity.

ANNEX C2

CLASSIFICATION AND SCALING INFORMATION OF PISA 2015 MAIN SURVEY ITEMS

All tables in Annex C2 are available on line: http://dx.doi.org/10.1787/888933433242

Annex D

THE DEVELOPMENT AND IMPLEMENTATION OF PISA: A COLLABORATIVE EFFORT

Notes regarding Cyprus

Note by Turkey: The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the “Cyprus issue”.

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

PISA is a collaborative effort, bringing together experts from the participating countries, steered jointly by their governments on the basis of shared, policy-driven interests.

A PISA Governing Board, representing each country, determines the policy priorities for PISA, in the context of OECD objectives, and oversees adherence to these priorities during the implementation of the programme. This includes setting priorities for the development of indicators, for establishing the assessment instruments and for reporting the results.

Experts from participating countries also serve on working groups that are charged with linking policy objectives with the best internationally available technical expertise. By participating in these expert groups, countries ensure that: the instruments are internationally valid and take into account the cultural and educational contexts in OECD countries and in partner countries and economies; the assessment materials have strong measurement properties; and the instruments emphasise authenticity and educational validity.

Participating countries and economies implement PISA at the national level through National Project Managers, subject to the agreed administration procedures. National Project Managers play a vital role in ensuring that the implementation of the survey is of high quality, and verify and evaluate the survey results, analyses, reports and publications.

External contractors are responsible for designing and implementing the surveys, within the framework established by the PISA Governing Board. Pearson developed the science and collaborative problem-solving frameworks, and adapted the frameworks for reading and mathematics, while the Deutsches Institut für Pädagogische Forschung (DIPF) designed and developed the questionnaires. Management and oversight of this survey, the development of the instruments, scaling and analyses are the responsibility of the Educational Testing Service (ETS) as is development of the electronic platform. Other partners or subcontractors involved with ETS include: cApStAn Linguistic Quality Control and the Department of Experimental and Theoretical Pedagogy at the University of Liège (SPe) in Belgium; the Center for Educational Technology (CET) in Israel; the Public Research Centre (CRP) Henri Tudor and the Educational Measurement and Research Center (EMACS) of the University of Luxembourg in Luxembourg; and GESIS – Leibniz-Institute for the Social Sciences in Germany. Westat assumed responsibility for survey operations and sampling with the subcontractor, the Australian Council for Educational Research (ACER).

The OECD Secretariat has overall managerial responsibility for the programme, monitors its implementation daily, acts as the secretariat for the PISA Governing Board, builds consensus among countries, and serves as the interlocutor between the PISA Governing Board and the international Consortium charged with implementing the activities. The OECD Secretariat also produces the indicators and analyses and prepares the international reports and publications in co-operation with the PISA Consortium and in close consultation with OECD countries and partner countries and economies at both the policy level (PISA Governing Board) and the level of implementation (National Project Managers).

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OECD PUBLISHING, 2, rue André-Pascal, 75775 PARIS CEDEX 16
(98 2016 06 1P) ISBN 978-92-64-26732-9 – 2016

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ISBN 978-92-64-26732-9
98 2016 06 1P