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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

- [dark blue] 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
- [grey] Countries/economies with a mean performance/share of top performers/share of low achievers not significantly different from the OECD average
- [light blue] 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.
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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.
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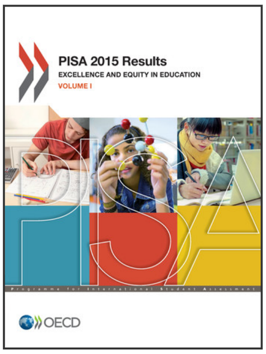
Countries and economies are ranked in descending order of the mean science score in PISA 2015.
Source: OECD, PISA 2015 Database, Tables I.2.3, I.6.1, I.6.3a, I.6.7, I.6.17, I.7.1 and I.7.15a.
StatLink http://dx.doi.org/10.1787/888933431984



PISA 2015 Results (Volume I)

Excellence and Equity in Education

Please cite this chapter as:

OECD (2016), “Overview: Excellence and Equity in Education”, in *PISA 2015 Results (Volume I): Excellence and Equity in Education*, OECD Publishing, Paris.

DOI: https://doi.org/10.1787/9789264266490-5-en