COUNTRY NOTE

PROGRAMME FOR INTERNATIONAL STUDENT ASSESSMENT (PISA)
RESULTS FROM PISA 2015

COLOMBIA

Key findings

- While Colombia performs below the OECD average in science, its mean performance increased 28 score points since 2006, the second largest improvement among the 52 education systems with comparable data.

- Students in Colombia score 425 points in reading, on average – below the OECD average and the mean score in Chile (459 points), comparable with that of Mexico, and above the mean score of Brazil (407 points) and Peru (398 points).

- Students in Colombia score 390 points in mathematics, on average – below the OECD average, and the mean score of Chile (423 points) and Mexico (408 points), comparable with that of Peru, and above the mean score of Brazil (377 points).

- As in many other countries, socio-economically disadvantaged students in Colombia are less likely to succeed at school than their more advantaged peers. In Colombia, equity in education outcomes is similar to the OECD average, as 14% of the variation in science performance is attributed to differences in students' socio-economic status.

- Boys outperform girls in science, but more girls (42%) than boys (37%) in Colombia expect to work in a science-related occupation.

- As in many countries, science departments in Colombia's advantaged schools are better resourced and staffed than those in disadvantaged schools – and by a wider margin than in most other PISA-participating countries and economies.

- The percentage of students in Colombia who had repeated a grade is the second largest, behind only Algeria, among all the countries and economies that participated in PISA 2015.

- There is nearly one computer for every student in Colombia – a higher ratio than observed across OECD countries, on average, higher than observed in Chile and Peru, and higher than would be expected given Colombia's level of spending on education.

- In Colombia, students enrolled in pre-vocational or vocational programmes score 27 points higher in science than students in general programmes, after accounting for socio-economic status.

Student performance in science

- Students in Colombia score 416 points in science, on average – below the OECD average and the mean score of Chile (447 points), comparable with that of Costa Rica, Georgia, Mexico, Montenegro, Qatar and Thailand, and above that of Brazil (410 points) and Peru (397 points) (Figure I.2.13).

- Colombia's mean performance has improved by 28 score points since 2006, the second largest improvement among the 52 education systems with comparable data (Table I.2.4a). The improvement is even more remarkable given that the percentage of 15-year-olds in Colombia who are eligible to sit the PISA assessment – that is, those who are enrolled in a school at grade 7 or above –has increased from 60% to 75% between 2006 and 2015.

- On average across OECD countries, just over 20% of students do not reach the baseline level of proficiency in science, Level 2. At this level, 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. In Colombia, 49% of students are low achievers in science (Figure I.2.15). This share shrank by 11 percentage points since 2006 (Table I.2.2a).

- Boys outperform girls in science by an average of 10 score points (Table I.2.8a), and this gender gap has remained stable since 2006 (Table I.2.8d).

Student performance in reading

- Students in Colombia score 425 points in reading, on average – below the OECD average and the mean score of Chile (459 points), comparable with that of Bulgaria, Costa Rica, Mexico, Montenegro, Romania, Trinidad and Tobago, and Turkey, and above that of Brazil (407 points) and Peru (398 points) (Figure I.4.1).

- Colombia's mean performance has improved 40 score points since 2006, the fourth largest improvement among the 51 education systems with comparable data (Table I.4.4a).

- About 20% of students in OECD countries, on average, do not attain the baseline level of proficiency in reading, considered the level of proficiency at which students begin to demonstrate the reading skills that will enable them to participate effectively and productively in life. In Colombia, 43% of students are low achievers in reading (Figure I.4.8), a decrease of 4 percentage points since 2009 (Table I.4.2a).

- Girls outperform boys in reading by an average of 16 score points (Table I.4.8a), and this gender gap widened by 6 score points since 2009 – not a significant change (Table I.4.8d).

Student performance in mathematics

- Students in Colombia's score 390 points in mathematics, on average – below the OECD average and the mean score of Chile (423 points) and Mexico (408 points), comparable with that of Indonesia, Lebanon and Peru, and above that of Brazil (377 points) (Figure I.5.1).

- Colombia's mean performance has improved 20 score points since 2006, the seventh largest improvement among the 52 education systems with comparable data (Table I.5.4a).

- Nearly 23% of students in OECD countries, on average, do not attain the baseline level of proficiency in mathematics, considered the level of proficiency at which students start solving the

kinds of problems that are routinely faced by adults in their daily lives. In Colombia, 66% of students are low achievers in mathematics (Figure I.5.8), and this share shrank by 4 percentage points since 2009 (Table I.5.2a).

- Boys outperform girls in mathematics by an average of 11 score points (Table I.5.8a). This gender gap in performance narrowed by 15 score points since 2012 (Table I.5.8e).

Students' engagement with science

Disposition towards the scientific method of enquiry

PISA 2015 asked students about their beliefs about the nature of science knowledge and the validity of scientific methods of enquiry (collectively known as 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.

In Colombia, students were less likely than students across OECD countries to agree with current views about the nature of science, particularly those about how scientific ideas evolve. For instance, about seven in ten students in Colombia agreed with the statement that ideas in science books sometimes change, compared with eight in ten students across OECD countries who agreed with that statement (Table I.2.12a).

Students' expectations of a career in science

PISA 2015 asked students what occupation they expect to be working in when they are 30 years old. Even though many 15-year-olds are undecided about their future, almost one in four students across OECD countries – and nearly one in two students (44%) in Colombia – reported that they expect to work in an occupation that requires further science training beyond compulsory education (Table I.3.10a). 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 more than triples to 41% among top performers in science (those who score at or above Level 5). In Colombia, 37% of low achievers and 47% of top-performing students expect to pursue a science-related career (Table I.3.10b).

Gender-related differences in students' engagement with science

Even when equal shares of boys and girls expect a science-related career, 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. 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). In Colombia, 42% of girls reported that they expect to pursue a career in science, compared with 37% of boys (Table I.3.10b). Whereas two out of three of these girls expect to work as a health professional, 44% of Colombian boys with science-related career expectations expect to pursue a career in engineering (Tables I.3.11).

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.

In 39 countries and economies, boys show significantly greater self-efficacy than girls. However, in Colombia, there are no gender differences in this respect. A similar percentage of girls and boys reported that they could easily "explain why earthquakes occur more frequently in some areas than in others", "interpret the scientific information provided on the labelling of food items" or "identify the better of two explanations for the formation of acid rain" (Table I.3.4c).

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**).

A majority of students who participated in PISA 2015 reported that they enjoy learning science, but boys tended to report so more than girls. In Colombia, boys and girls were equally likely to agree that they "generally have fun when [I] am learning science topics" or "like reading about science" (Table I.3.1c). Boys and girls in Colombia are also equally likely to report that what they "learn in school science will help them to get a job" (Table 1.3.3c).

Context for student achievement

In 2014, Colombia's per capita GDP was about one-third the OECD average per capita GDP, 10% higher than that of Peru, and almost half of Chile's per capita GDP. Colombia spends about one-quarter of the OECD average expenditure per student between the ages of 6 and 15, 20% more than Peru spends, and 60% of Chile's cumulative expenditure. If all PISA-participating countries and economies had the same per capita GDP, Colombia would have scored 461 points in science.

Some 23% of 35-44 year-olds are tertiary-educated, approximately the same proportion as in Chile, and lower than the OECD average share of 37 (Table I.2.11).

Some 75% of 15-year-olds in Colombia are covered by the PISA sample, on a par with Peru (74%) but below Chile (80%) (Table I.6.1). This is a large improvement since 2006 when 60% of 15-year-olds were covered by the PISA sample. PISA results need to be carefully interpreted when considering countries/economies with a low coverage, because PISA cannot fully represent the target population of 15-year-olds in these countries.

The impact of socio-economic status on performance

- Canada, Estonia, Finland and Japan achieve high levels of performance and equity in education outcomes as assessed in PISA 2015, with 10% or less of the variation in student performance attributed to differences in students' socio-economic status, compared with 13% of the variation across OECD countries.

- In Colombia, equity in education outcomes is similar to the OECD average, as 14% of the variation in science performance is attributed to differences in students' socio-economic status (Table I.6.3a).

- Across OECD countries, 29% of disadvantaged students are "**resilient**", meaning that they beat the socio-economic odds against them and perform among the top 25% of students worldwide. In Hong Kong (China), Macao (China) and Viet Nam, more than one in two disadvantaged students are resilient. Some 11% of disadvantaged students in Colombia are resilient, a share considerably larger than that observed in Peru (3%), but smaller than the share in Chile (15%) (Table I.6.7).

Education policies and practices

Opportunity to learn science at school

Inequalities in opportunities to learn are mainly reflected in the time education systems, schools and teachers allocate to learning. If time is a necessary condition for learning, students who do not attend science lessons are probably those who enjoy the fewest opportunities to acquire competencies in science.

On average across OECD countries, 94% of students reported that they attend at least one science course per week. But that means that at least one million 15-year-old students are not required to attend any science lesson. In Colombia, 6% of students reported that they are not required to attend any science lesson (Table II.2.3).

Moreover, students who reported that they do not attend school science classes are more likely to be in schools that are socio-economically disadvantaged. In Colombia, students in disadvantaged schools are three percentage points more likely than students in advantaged schools not to be required to attend science lessons (Table II.2.4). Being deprived of science courses in school will not help disadvantaged students close the performance gap with their advantaged peers.

Extracurricular science activities

On average across OECD countries, students in schools that offer science competitions score 36 points higher in science and are 55% more likely to expect to work in a science-related occupation than students in schools that do not offer such activities. Students in schools offering a science club score 21 score points higher and are 30% more likely to expect to pursue a career in science.

Science-related extracurricular activities, such as science clubs and competitions, help students understand scientific concepts, raise interest in science and even nurture future scientists. Across OECD countries, 39% of students are enrolled in schools that offer a science club and 66% attend schools that offer science competitions. Science clubs are most commonly offered in East Asian countries and economies, while science competitions are most frequently offered in several Eastern European countries. In Colombia, one in three students is enrolled in schools where a science club is offered as a school activity, and more than two in three students (68%) are in schools that offer science competitions (Table II.2.11).

In Colombia, advantaged schools offer a science club and science competitions more often than disadvantaged schools do (Table II.2.12). For example, while 18% of students enrolled in disadvantaged schools are offered a science club, 54% of students in advantaged schools are offered this activity.

Teaching strategies

How teachers teach science is more strongly associated with science performance and students' expectations of working in a science-related career than the material and human resources of science departments, including the qualifications of teachers or the kinds of extracurricular science activities offered to students.

Almost everywhere, students who reported that their teachers explain scientific ideas demonstrate an idea or discuss students' questions more frequently score higher in science. In Colombia, students who reported that their science teachers discuss students' questions in many lessons or every lesson score 32 points higher after accounting for their socio-economic status (Table II.2.18).

In almost every school system, students who reported that their science teachers adapt the lesson to students' needs and knowledge more frequently score higher in science. In Colombia, students score

19 points higher when they reported that, in many lessons or every lesson, their science teachers adapt the lesson to students' needs and knowledge (Table II.2.24).

School resources

Compared to principals in other school systems, more principals in Colombia are concerned about the quality and the lack of material resources at their schools. For instance, 26% of students attend schools whose principal considers that the capacity to provide instruction is hindered a lot by the lack of educational material. The OECD average is 6%, while in Chile, only 1% of students attend such schools (Table II.6.1).

Equitable resource allocation means that the schools attended by socio-economically disadvantaged students are at least as well-equipped as the schools attended by advantaged students, to compensate for inequalities in the home environment. Based on school principals' reports, in 26 countries and economies, advantaged schools are better equipped than disadvantaged schools.

With the exception of Ciudad Autónoma de Buenos Aires (Argentina) and Macao (China), all school systems where principals of disadvantaged schools are considerably more concerned about the material resources at their school than principals of advantaged schools score below 450 points in science. Colombia is one such education system (Table II.6.3).

There is nearly one computer (0.95) for every student in Colombia – a higher ratio than the OECD average (0.77), than in Chile (0.65) and in Peru (0.41), and particularly so given Colombia's level of spending on education (Table II.6.4).

Science-specific resources

PISA asked school principals to provide information about the resources available to their school's science department. Compared with most students in OECD countries who attend schools whose principal reported that the science department is well-equipped and -staffed, one in two students in Colombia or fewer attends schools whose principal reported that "compared to other departments, our school's science department is well-equipped", "compared to similar schools, we have a well-equipped laboratory" or "enough laboratory material that all courses can regularly use it" (Table II.2.5).

As in many countries, in Colombia, the science department is better resourced and staffed in advantaged and urban schools than in disadvantaged and rural schools (Table II.2.6). The difference between advantaged and disadvantaged schools in Colombia is the 12th largest among PISA-participating countries and economies, but the difference between urban and rural schools is similar to the OECD average.

About 82% of Colombia's science teachers have a university degree and a major in science, above the OECD average (Table II.2.8).

The learning environment

Principals in Colombia reported slightly more than principals across OECD countries that student or teacher behaviour hinders learning. For instance, 11% of students in Colombia attend schools whose principal reported that student truancy hinders learning a lot, compared to 5% of students across OECD countries who attend such schools (Table II.3.12). About 5% of students in Colombia are in schools whose principal reported that teacher absenteeism hinders learning a lot, compared to 1% of students across OECD countries who attend such schools (Table II.3.17).

Selecting and sorting students

On average across OECD countries, school systems begin selecting students for different programmes at the age of 14. Some OECD countries, including Austria and Germany, start selecting students as early as age 10. In Colombia, schools start selecting students at age 15, later than the OECD average (Table II.5.27). The later students are selected into different academic programmes/schools, the greater the equity in science performance, even after accounting for the school's mean score in science and the variation in student performance.

In Colombia, 21% of students are enrolled in pre-vocational or vocational programmes (Table II.5.14). In countries and economies with large enrolments in pre-vocational or vocational programmes, these enrolments vary markedly according to schools' socio-economic profiles. On average across OECD countries, the proportion of 15-year-old students enrolled in a vocational track is 21 percentage points smaller among students in advantaged schools than among students in disadvantaged schools. But in Colombia there is no difference in this proportion between advantaged and disadvantaged schools (Table II.5.17). In fact, enrolment in these programmes is largest among students of average socio-economic status.

When considering the performance of students enrolled in general and vocational programmes, students in general programmes score 22 points higher in science, on average across OECD countries, after accounting for students' and schools' socio-economic profile. However, among countries and economies where enrolment rates in vocational programmes are higher than 10%, these performance differences can amount to as much as 91 score points, as in the Netherlands, around 60 score points, as in Greece, or between 40 and 50 score points, as in Belgium, France, Portugal and Turkey. There are also several education systems, including those in Brazil, Colombia, Costa Rica, the Dominican Republic, Japan, Luxembourg, Mexico and Switzerland, where students in pre-vocational or vocational programmes score higher in science than students in general or academic programmes. In Colombia, for instance, students enrolled in these programmes score 27 points higher in science than students in general programmes, after accounting for socio-economic status (Table II.5.17).

Grade repetition

Grade repetition is more prevalent in school systems where students score lower on the PISA science assessment and where students' socio-economic status is most strongly associated with science performance. Students might have been kept back to repeat course content that they had not fully mastered; or they might have been invited to skip a grade when their teachers felt they were capable of taking on more challenging schoolwork. In 13 countries and economies, at least 30% of students had repeated a grade at least once in primary or secondary education. The percentage of students in Colombia who had repeated a grade (43% of students) is the second largest among all countries and economies participating in PISA 2015; only Algeria has a larger proportion of these students (Table II.5.9).

Students in disadvantaged schools are more likely to have repeated a grade almost everywhere, including in Colombia, where 48% of students enrolled in disadvantaged schools had repeated a grade, compared to 32% of students in advantaged schools (Table II.5.12).

One promising finding is that, across OECD countries, the percentage of students who reported that they had repeated a grade at least once decreased by almost three percentage points between 2009 and 2015. But in Colombia, the percentage of students who reported that they had repeated a grade at least once increased by five percentage points between 2009 and 2015, the largest increase among all PISA-participating countries and economies (Table II.5.11).

School governance

About 24% of students in Colombia are enrolled in a private school, above the OECD average but smaller than the proportion in Chile (63%) and Peru (31%) (Table II.4.6). As in most other PISA-participating school systems, including those in Chile and Peru, socio-economically advantaged students in Colombia are more likely than disadvantaged students to attend private schools (Table II.4.10). Colombian students in public and private schools perform similarly in science, after accounting for socio-economic status.

In education systems where school principals hold greater responsibility for school governance, students score higher in science; and this relationship is stronger among school systems where the percentage of students whose achievement data are tracked over time and posted publicly is higher than the OECD average.

In Colombia, schools have less autonomy than the average school in OECD countries (Table II.4.1). For instance, in Colombia principals and teachers hold 24% of the responsibility for resources, compared to 42% of that responsibility across OECD countries; 61% of the responsibility for the curriculum, compared to 66% across OECD countries; and 31% of the responsibility for student assessments, compared to 68% across OECD countries (Table II.4.2).

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.
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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

What is PISA?

The Programme for International Student Assessment (PISA) is an ongoing triennial survey that assesses the extent to which 15-year-olds students near the end of compulsory education have acquired key knowledge and skills that are essential for full participation in modern societies. 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 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 offers insights for education policy and practice, and helps monitor trends in students' acquisition of knowledge and skills across countries and in different demographic subgroups within each country. 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.

Key features of PISA 2015

- The PISA 2015 survey focused on science, with reading, mathematics and collaborative problem-solving as minor areas of assessment. 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.

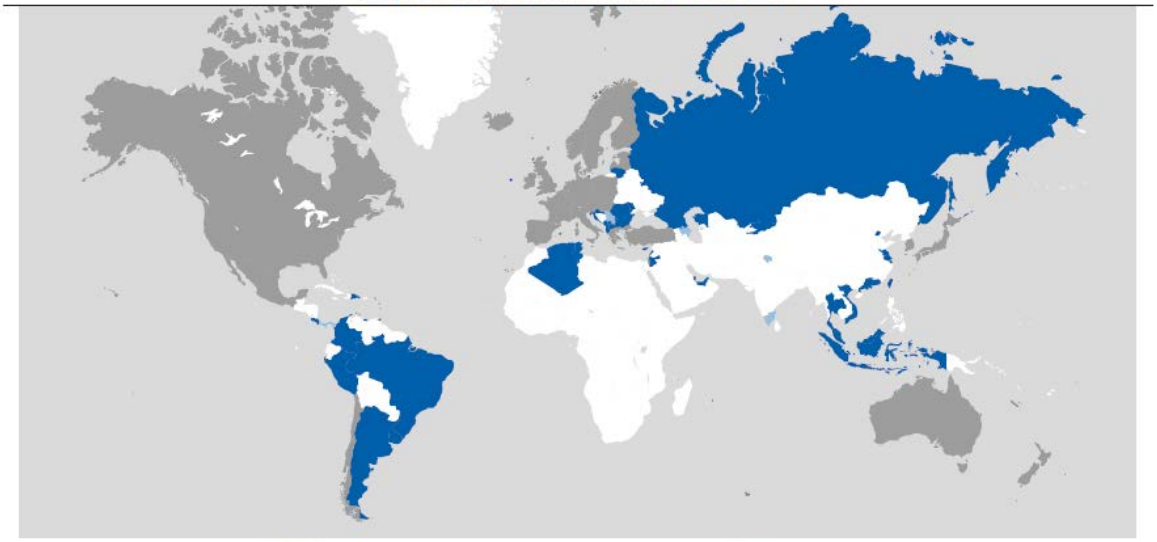
The students

- Around 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 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.

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.

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For more information on the Programme for International Student Assessment and to access the full set of PISA 2015 results, visit:

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