COUNTRY NOTE

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

Italy

Key findings

- Italy performs below the OECD average in science (481 score points) and reading (485 score points) and around the OECD average in mathematics (490 score points) (Figures I.2.13, I.4.1 and I.5.1).

- The average performance of 15-year-old students in science did not change significantly since 2006; similarly, reading performance remained stable since 2009 (when reading was the main domain). In contrast, mathematics performance improved, on average, by 7 score points every three years between 2003 and 2015.

- As in many other countries, socio-economically disadvantaged students in Italy are less likely to succeed at school than their more advantaged peers; but the relationship between socio-economic status and performance is weaker in Italy than on average across OECD countries (Table I.6.4a and Figure I.6.7).

- Gender differences in favour of boys in science and mathematics are particularly marked in Italy. In reading, where boys score below girls, the gap narrowed significantly between 2009 and 2015, because boys' performance improved, while girls' performance deteriorated.

- Students from an immigrant background (first or second generation) in Italy do not perform as well in science as non-immigrant students. But while the share of immigrant students doubled between 2006 and 2015 (from 4% to 8%), the performance gap of immigrant students, after accounting for differences in socio-economic status and language spoken at home between immigrant and non-immigrant students, narrowed significantly (Figure I.7.4).

Student performance in science

- Students in Italy score 481 points in science, on average (Table I.2.3a). Mean performance in Italy lies below the OECD average and is comparable with that of students in Croatia, Hungary and the Russian Federation. Italy's 15-year-old students score more than 50 points below students in Estonia, Japan and Singapore, and between 10 and 40 points below students in Austria, France, Germany Portugal, Slovenia, Switzerland, the United Kingdom and the United States, but clearly above students in Greece, Israel and Turkey (Figures I.2.13 and I.2.14).

- Italy's mean science performance has remained unchanged since 2006, when its mean score was 475 points (Table I.2.4a). Between 2006 and 2015, Portugal (whose score in science was similar to Italy's in 2006) overtook Italy in science performance (Figure I.2.24).

- On average across OECD countries, 21% 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. The share of low-performing students in Italy is 23% -- the same as the OECD average – and has decreased by 2 percentage points between 2006 and 2015, not a significant change (Table I.2.2a).

- Some 8% of students across OECD countries are top performers in science, meaning that they are proficient at Level 5 or 6. At these levels, students can creatively and autonomously apply their scientific knowledge and skills to a wide variety of situations, including unfamiliar ones. Some 4% of students in Italy are top performers (below the OECD average) and this share has remained stable since 2006 (Table I.2.2a).

- Four regions/provinces over-sampled students for participation in PISA, allowing for a comparison of their results to the national results. Students in Bolzano (515 points), Trento (511 points) and Lombardia (503 points) score above the national average for Italy, while students in Campania (445 points) score more than 30 points, or the equivalent of about one year of schooling, below.

Gender differences in science performance

- Boys outperform girls in science by an average of 17 points, one of the largest gender gaps among PISA-participating countries and economies. This gender gap widened significantly (by 14 score points) between 2006 and 2015 (Tables I.2.8a and I.2.8d).

- As in most countries, the gender gap in science in Italy is small among low-achieving students, and is largest among the highest-achieving students. The share of top performers in science is about twice as large among boys (5.3%) as among girls (2.8%) (Tables I.2.6a, I.2.6b and I.2.6d).

Student performance in reading

- Students in Italy score 485 points in reading, on average (Table I.4.3a), below the OECD average. Mean performance in Italy is comparable with that in Austria, Israel and Switzerland, but clearly below that in Canada, Estonia, Finland, France, Germany, Japan, Ireland, Poland, Portugal, the Russian Federation, Singapore, Slovenia, Spain, Sweden, the United Kingdom and the United States (Figure I.4.1).

- Italy's mean reading performance is close to that observed in 2000 (487 points) and in 2009 (486 points), when reading was last assessed as a major domain, indicating a non-significant trend (Table I.4.4a). Between 2009 and 2015, Portugal, Slovenia and Spain (whose scores were similar to Italy's in 2009) overtook Italy in reading performance, as did the Russian Federation, whose score was lower than Italy's in 2009 (Figure I.5.4).

- About 20% of students in OECD countries, on average, do not attain the baseline level of proficiency in reading (Level 2), 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 Italy, 21% of students perform below Level 2 in reading, a similar percentage as the OECD average. This percentage has been stable since 2009 (Table I.4.2a).

- Across OECD countries, 8.3% of students are top performers in reading, meaning that they are proficient at Level 5 or 6. At these levels students can find information in texts that are unfamiliar in form or content, demonstrate detailed understanding, and infer which information is relevant to the task. They are also able to critically evaluate such texts and build hypotheses about them, drawing on specialised knowledge and accommodating concepts that may be contrary to expectations. Some 5.7% students in Italy are top performers, below OECD average. The share of top performers in Italy is unchanged since 2009, when reading was the main domain assessed (Table I.4.2a).

Gender differences in reading performance

- Girls outperform boys in reading by an average of 16 points, a smaller gap than the average gap observed across OECD countries (27 points). This gender gap shrank by 30 points since 2009 (an average decrease of 12 points was observed, over the same period, across OECD countries) (Tables 14.8a and I.4.8d).

- Boys are more likely than girls to score below Level 2 in reading: 24% of boys, but only 18% of girls, do not attain the baseline level in reading. But equal shares of boys and girls score at the highest levels in reading (at or above Level 5) (Table I.4.6a).

- Between 2009 and 2015, the share of low-achieving boys (those scoring below Level 2) decreased by 5 percentage points, while the share of low-achieving girls increased by a similar amount.

Student performance in mathematics

- Students in Italy score 490 points in mathematics, on average (Table I.5.3) – close to the OECD average and comparable with students in Austria, France, Portugal, the Russian Federation, Spain, Sweden and the United Kingdom (Figure I.5.1). Italy's mean performance is below that of the top-performing Asian countries and economies (Beijing-Shanghai-Jiangsu-Guangdong [China], Hong Kong [China], Japan, Korea, Macao [China], Singapore and Chinese Taipei). It is also between 10 and 30 points lower than that of Austria, Germany, Poland, Slovenia and Switzerland, but higher than that of Greece and the United States.

- Italy's mean performance has improved since 2003, when its mean score was 466 points, by an average of 7 points every three years (Table I.5.4a). Mean performance in 2012, the last time mathematics was assessed as a main domain, was 485 points (lower, but not significantly so, than in 2015). Between 2012 and 2015, Italy overtook the United States (whose performance was similar to Italy's in 2012) and caught up with Austria, France and the United Kingdom in mathematics performance (Figure I.5.4).

- On average across OECD countries, almost one in four students (23.4%) does not reach the baseline Level 2 of proficiency. In mathematics, students who do not reach this level can sometimes carry out a routine procedure, such as an arithmetic operation, in situations where all the instructions are given to them, but have difficulty recognising how a (simple) real-world situation can be represented mathematically (e.g. comparing the total distance across two alternative routes, or converting prices into a different currency). In Italy, 23.3% students are low achievers, a similar percentage as the OECD average. Italy reduced its share of low achievers by 9 percentage points between 2003 and 2015 (Tables I.5.2a).

- Around one in ten students in OECD countries (10.7%) is a top performer in mathematics, on average; but in Singapore, more than one in three students are top performers in the subject. In Italy, 10.5% of students are top performers, similar to the OECD average. Italy has increased its share of top performers by 3.5 percentage points since 2003, when mathematics was the main domain assessed (Tables I.5.2a).

Gender differences in mathematics performance

- Boys outperform girls in mathematics by an average of 20 points, one of the largest gaps in favour of boys among PISA-participating countries and economies. This gender gap has remained stable since 2006 (Tables I.5.8a, I.5.8b and I.5.8d). Some 13% of boys, but only 8% of girls, score above Level 5 in mathematics. Meanwhile, 25% of girls, but 20% of boys, do not reach the baseline level of performance (Level 2) in mathematics (Table I.5.6a).

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 Italy, 84% of students reported that they agree or strongly agree that good answers are based on evidence from many different experiments, and 77% reported that sometimes scientists change their minds about what is true in science. These values are broadly similar to those observed, on average, across OECD countries (Figure I.2.32). As in all countries, in Italy, stronger agreement with these and similar statements are associated with higher performance on the PISA science test (Figure I.2.34).

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 (24%) across OECD countries reported that they expect to work in an occupation that requires further science training beyond compulsory education, compared with 23% in Italy. In almost all countries/economies, the expectation of pursuing a career in science is strongly related to proficiency in science. In Italy, only 11% of students who score below PISA proficiency Level 2 in science hold such expectations, but that percentage more than triples, to 39%, among top performers in science (those who score at or above Level 5) (Figures I.3.2 and I.3.3).

- Between 2006 and 2015, the share of students who expect to be working in a science-related occupation at age 30 decreased by 2.7 percentage points – largely because of a decrease in the share of students (particularly boys) who expect to be working as science and engineering professionals from 12% in 2006 to about 9% in 2015. The shares of students who expect to be working as health professionals (about 10%), ICT professionals (less than 2%) or science-related technicians (less than 2%) remained stable (Table I.3.10a and I.3.10e).

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 Italy, gender differences are similar to those observed on average across OECD countries. Some 25% of boys reported that they expect to pursue a career in science, compared to 21%

of girls. Girls are more than twice as likely as boys to expect a career as health professionals (14% of girls, 6% of boys), while boys are about twice as likely to expect a career as science or engineering professionals (12% of boys, 6% of girls). Very few girls (0.2%) expect a career as ICT professionals, compared to about 3% of boys (Tables I.3.11a-c).

When a student is confident of 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, including Italy, boys show significantly greater self-efficacy than girls. Boys in Italy are at least as likely as girls to report that they could easily do any of the eight tasks, requiring science competencies, listed in the PISA student questionnaire – from explaining why earthquakes occur more frequently in some areas than in others, to identifying the better of two explanations for the formation of acid rain. Students' self-efficacy in science increased significantly between 2006 and 2015 in Italy. For instance, in 2006, only 8% of students reported that they could easily explain the role of antibiotics in the treatment of disease; by 2015, that share had increased to 19% (Figure I.3.20 and Tables I.3.4a, c, e, f).

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).

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 and are interested in learning science, but boys tended to report so more than girls. In Italy, 72% of boys, and 66% of girls, agreed with the statement "I am interested in learning about science" (Table 1.3.1c). Moreover, in Italy, boys are 10 percentage points more likely than girls (74%, compared to 64%) to report that "making an effort in science subjects at school is worth it because this will help [them] in the work [they] want to do later on" (Table 1.3.3c). More than 90% of students who expect to be working as medical doctors, and 89% of students who expect to be working as engineers at age 30, so reported; but only about two in three students who expect to be working as software and applications developers and analysts, and about half of those who expect to be working as legal professionals or as journalists, reported so (Table I.3.11f). Perhaps, when prompted to think about what they learn in science at school, students mainly refer to content knowledge – the facts and theories learned in biology, chemistry, physics or earth science classes – rather than to procedural or epistemic knowledge that can be applied outside of science-related careers too (e.g. "What constitutes a valid argument based on data?", "How can experiments be used to identify cause and effect?").

Student truancy

On average across OECD countries, 20% of students reported that they had skipped a day of school or more in the two weeks prior to the PISA test. In Italy, 55% of students so reported, and 41% reported that they had skipped some classes (Table II.3.1). Not only are both shares higher than the OECD average, they are also significantly higher (by 7 and 6 percentage points, respectively) than the shares observed in 2012 in response to the same question (Table II.3.3).

Students who play truant miss learning opportunities. They also disrupt class, creating a disciplinary climate that is not conducive to learning for their fellow students. In PISA-participating countries and economies, skipping a whole day of school is more common in disadvantaged schools than in advantages schools. This is observed in 44 countries and economies, including in Italy (Table II.3.4 and Figure II.3.3).

In Italy, students who had skipped a whole day of school at least once in the two weeks prior to the PISA assessment score 31 points lower in the science assessment than students who had not skipped a day of school (21 points lower after accounting for the socio-economic profile of students and schools) – the equivalent of about one full year of schooling) (Table II.3.4).

Moreover, across OECD countries, students score lower on the PISA science test when more of their peers had skipped a whole day of school at least once in the two weeks prior to the PISA test, even after taking into account whether the student himself/herself had skipped school and the socio-economic status of students and schools. In Italy, students score 1.2 points lower in science for every percentage-point increase in the number of their peers who had skipped a day of school (Figure II.3.5 and Table II.3.8).

Context for student achievement

Italy spends about USD 87 000 (adjusted for purchasing power parities) per student from the age of 6 to 15, close to the OECD average of USD 90 000 (Table I.2.11). Between 2005 and 2013, public expenditure per student, in public primary and secondary schools, decreased by about 11% (in real terms) in Italy. Over the same period, expenditure increased by about 19%, on average, in OECD countries with available data (source: OECD [2016], *Education at a Glance 2016: OECD Indicators*, Indicator B1, Table B1.5a).

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% across OECD countries (Figure I.6.6 and Table I.6.3a).

- In Italy, equity in education outcomes is above the OECD average, as 10% of the variation in student performance in mathematics is attributed to differences in students' socio-economic status.

- Across OECD countries, a more socio-economically advantaged student scores 38 points higher in science – the equivalent of more than one year of schooling – than a less-advantaged student. In Italy, an advantaged student scores 30 points higher in science – a difference that is below the OECD average.

- Across OECD countries, 29% of disadvantaged students (those in the lowest 25% of socio-economic status) are "**resilient**", meaning that they beat the odds against them and score among the top 25% of students internationally, among students of similar socio-economic status. In Hong Kong (China), Macao (China) and Viet Nam, more than one in two disadvantaged students are resilient. In Italy, 27% of disadvantaged students are resilient – a similar share as on average across OECD countries (Figure I.6.10).

Students with an immigrant background

- The share of immigrant students in OECD countries increased from 9% in 2006 to 12% in 2015 while the difference in science performance between immigrant and non-immigrant students shrank by 6 score points during the same period (after accounting for differences in socio-economic status and in language spoken at home) (Figure I.7.13).

- In Italy, the proportion of students with an immigrant background increased from nearly 4% in 2006 to 8% in 2015. The difference in science scores between immigrant and non-immigrant students narrowed by 32 score points during the same period. In 2006, non-immigrant students of similar socio-economic status as immigrant students scored 43 points higher than immigrant students; in 2015, the score-point difference was only 11 points in 2015, after accounting for socio-economic status and language spoken at home.

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 (Table II.2.3). In Italy, only 3% of students are not required to attend any science lessons. Moreover, school principals in Italy reported that the science department is well-equipped and -staffed, compared with most school principals in OECD countries (Table II.2.5). For instance, 81% of principals in Italy reported that the material for hands-on activities in science is in good shape – a similar percentage as on average across OECD countries; and 73% reported that their school has extra laboratory staff who help support science teaching, compared to only 34% of principals who so reported across OECD countries, on average.

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. Those in schools offering a science club score 21 score points higher and are 30% more likely to expect to pursue a career in science.

Extracurricular activities such as science clubs and competitions help students understand scientific concepts, raise interest in science and even nurture future scientists. In Italy, 66% of students attend schools that offer science competitions, on a par with the OECD average (Figure II.2.9).

In Italy, advantaged schools offer science competitions more often than disadvantaged schools do (Table II.2.13). While 43% of students enrolled in disadvantaged schools are offered science competitions, 92% of students in advantaged schools are offered this activity (Figure II.2.10), a larger difference than the OECD average. Moreover, in Italy, students in schools that offer science competitions score 49 points higher in science (19 points higher after accounting for students' and schools' socio-economic profile) and are more than twice as likely to expect to pursue a career in science, even after accounting for students' and schools' socio-economic profile (Tables II.2.12 and Figure II.2.11).

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 more frequently score higher in science, even after accounting for socio-economic status. In Italy, 59% of students reported that their teachers explain scientific ideas in many or all lessons (the OECD average is 55%), and these students score 62 points higher in science than students who reported that their teachers explain scientific ideas only in some lessons or never (45 points higher after accounting for students' and schools' socio-economic profile) (Table II.2.16 and II.2.18).

In almost all school systems, students who reported that their teachers adapt the lesson to the needs and knowledge of students more frequently score higher in science, even after accounting for socio-economic status. In Italy, 43% of students reported that their teachers adapt most or every lesson to the class's needs and knowledge (the OECD average is 45%), and these students score 19 points higher in science than students who reported that their teachers never or only sometimes adapt lessons to the class's needs and knowledge (16 points higher after accounting for students' and schools' socio-economic profile) (Tables II.2.22 and II.2.24).

Grade repetition

In Italy, virtually no student repeated a grade in primary education, and only 6% repeated a grade in lower secondary education. But almost one in ten 15-year-old students (9.5%) who are in upper secondary education had already repeated a grade – a high percentage, considering that at age 15, students in Italy are typically attending the second year of upper secondary education (Table II.5.10). Between 2009 and 2015, the percentage of 15-year-old students who had repeated a grade in upper secondary education decreased by 2 percentage points (Table II.5.11).

Many people would agree that performance, behaviour and motivation are legitimate reasons for deciding which students repeat a grade; and the data clearly show these associations. What is more troubling is that, even after accounting for students' academic performance, behaviour and motivation, in Italy, boys and students with an immigrant background are more than twice as likely as girls and non-immigrant students to have repeated a grade (Table II.5.13 [on line]).

Learning time

Students in Italy reported spending about 29 hours per week in school and 21 hours per week doing homework, attending private lessons, or studying. This total learning time of almost 50 hours per week is higher than the OECD average (44 hours). (Tables II.6.32 and II.6.37). Many countries, including Finland (36 hours), Germany (36 hours), Switzerland (38 hours) and Japan (41 hours) achieve better results than Italy with less total learning time (Figure II.6.23).

Snapshot of performance in science, reading and mathematics

(dark shading)	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 shading)	Countries/economies with a mean performance/share of top performers/ share of low achievers not significantly different from the OECD average
(light shading)	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

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

	Mean science score	Beliefs about the nature and origin of scientific knowledge		Share of students with science-related career expectations				Motivation for learning science		
		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	Korea
Austria	Latvia
Belgium	Luxembourg
Canada	Mexico
Chile	The Netherlands
Czech Republic	New Zealand
Denmark	Norway
Estonia	Poland
Finland	Portugal
France	Slovak Republic
Germany	Slovenia
Greece	Spain
Hungary	Sweden
Iceland	Switzerland
Ireland	Turkey
Israel	United Kingdom
Italy	United States
Japan	

Partner countries and economies in PISA 2015

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

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.

Note regarding data from Israel

The statistical data for Israel are supplied by and are 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.

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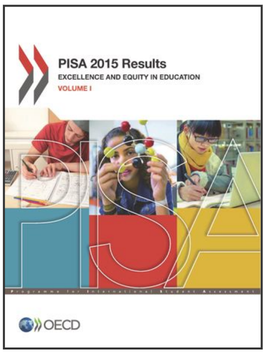
For more information on the Programme for International Student Assessment and to access the full set of PISA 2015 results, visit:

www.oecd.org.edu/pisa

BETTER POLICIES FOR BETTER LIVES



From:
PISA 2015 Results (Volume I)
Excellence and Equity in Education

Access the complete publication at:
https://doi.org/10.1787/9789264266490-en

Please cite this chapter as:

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

DOI: https://doi.org/10.1787/9789264266490-22-en

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