COUNTRY NOTE

PROGRAMME FOR INTERNATIONAL STUDENT ASSESSMENT (PISA)
RESULTS FROM PISA 2012

AUSTRIA

Key findings

- Austria's mean performance in mathematics, reading and science in 2012 returned to the levels found in 2003 and 2006.
- Austria performs above the OECD average in mathematics (ranks between 17 and 22), below average in reading (ranks between 25 and 34), and around average in science (ranks between 22 and 26) among the 65 countries and economies that participated in PISA 2012.
- The 15-point increase in the gender gap in mathematics performance between 2003 and 2012 is the largest increase observed among all countries with data for both years.
- Austrian students are among those who enjoy mathematics the least, and girls tend to have particularly low levels of enjoyment of mathematics and motivation to learn mathematics. This may be linked to the practice of grouping students into different schools based on ability.
- In Austria, some 82% of students are satisfied with their school and more than three in four students (77%) find the conditions in their schools ideal, compared to the OECD average of 61%.

Student performance in mathematics, reading and science

Mean mathematics performance

- Students in Austria score 506 points in mathematics, on average – above the OECD average and comparable with Australia, the Czech Republic, Denmark, Ireland, New Zealand, Slovenia and Viet Nam. Austria performs below Liechtenstein, Switzerland and Germany in mathematics, but above Italy, the Slovak Republic and Hungary.
- Students on average scored 506 points in 2003 and 505 points in 2006 – a level that is not statistically different from Austria's mean performance in 2012. Students' mean performance in 2009, estimated at 496 points in mathematics, was significantly lower. The comparability of the 2009 data with data from other PISA assessments can however not be ensured: a negative atmosphere in regard to educational assessment affected the conditions under which the

assessment was administered in 2009 and could have adversely affected student motivation to respond to the PISA tasks.

Share of top- and low-performing students in mathematics

Changes in a country's average performance can result from changes among low performers (those who perform below the baseline Level 2) and/or among top performers (those who perform at Level 5 or 6). In Austria, the proportions of low performers and top performers have remained stable over time.

- Some 18.7% of students are low performers in mathematics, meaning that, at best, they can extract relevant information from a single source and can use basic algorithms, formulae, procedures or conventions to solve problems involving whole numbers. This proportion is below the OECD average.
- Some 14.3% of students are top performers in mathematics, meaning that they can develop and work with models for complex situations, and work strategically using broad, well-developed thinking and reasoning skills. This proportion not statistically different from the OECD average.

Gender differences in mathematics performance

- In 2003, Austrian boys scored 8 points higher in mathematics than girls, on average; in 2012, boys scored 22 points higher than girls – the largest increase in the gender gap observed among all countries with data for both 2003 and 2012.

Mean reading performance

- Students in Austria score 490 points in reading, on average – below the OECD average and comparable with Croatia, the Czech Republic, Denmark, Hungary, Israel, Italy, Latvia, Luxembourg, Portugal, Spain, Sweden and the United States. Austria performs below Liechtenstein, Switzerland and Germany in reading, but above Slovenia and the Slovak Republic.

Share of top- and low-performing students in reading

- Some 19.5% of students perform below the baseline level of reading performance (Level 2), meaning that, at best, they can recognise the main theme or author's purpose in a text about a familiar topic and make a simple connection between information in the text and everyday knowledge. This proportion is similar to the OECD average.
- Some 5.5% of students are top performers, performing at Level 5 or above, meaning that they can handle texts that are unfamiliar in either form or content and can conduct fine-grained analyses of texts. This proportion is below the OECD average.

Gender differences in reading performance

- Girls outperform boys in reading by an average of 37 score points, a gender gap similar to that observed across OECD countries, on average. The gender gap in reading has remained stable since 2000.

Mean science performance

- Students in Austria score 506 points in science, on average – close to the OECD average and comparable with Belgium, the Czech Republic, Denmark, France, Latvia, the United Kingdom and the United States. Austria performs below Germany, Liechtenstein, Slovenia and Switzerland, but above Hungary, Italy, Croatia and the Slovak Republic.

Share of top- and low-performing students in science

- Some 15.8% of students are low performers in science, meaning that, at best, they can present scientific explanations that are obvious and follow explicitly from given evidence. This proportion is not significantly different from the OECD average and has remained stable over time.
- Some 7.9% of students are top performers, meaning that they can identify, explain and apply scientific knowledge and knowledge about science in a variety of complex life situations. This proportion is not significantly different from the OECD average and has remained stable over time.

Gender differences in science performance

- Girls and boys in Austria perform at similar levels in science.

Giving every student the chance to succeed

Equity and performance

Australia, Canada, Estonia, Finland, Hong Kong-China, Japan, Korea, Liechtenstein and Macao-China achieve high levels of performance and equity in education outcomes as assessed in PISA 2012. Across OECD countries, 15% of the variation in student performance in mathematics is attributed to differences in students' socio-economic status.

- In Austria, equity in education outcomes is close to the OECD average, as 15.8% 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 39 points higher in mathematics – the equivalent of nearly one year of schooling – than a less-advantaged student; in Austria, the gap between the two is larger: 43 points in mathematics.

Changes between 2003 and 2012 in equity and performance

Of the 39 countries and economies that participated in both PISA 2003 and 2012, Germany, Mexico and Turkey improved both their mathematics performance and their levels of equity in education during the period.

- In Austria, performance and equity remained stable during this period.

Resilient students

Across OECD countries, 26% of disadvantaged students – the equivalent of 6.5% of the entire student population – are "resilient", meaning that they beat the socio-economic odds against them and exceed expectations in performance. In Hong Kong-China, Korea, Macao-China, Singapore and

Viet Nam, more than half of all disadvantaged students, or 12.5% of the overall student population, are considered resilient.

- Some 5.6% of students in Austria are resilient. This proportion is close to the OECD average and has been stable since 2003.

Immigrant students

The share of immigrant students in OECD countries increased from 9% in 2003 to 12% in 2012 while the difference in mathematics performance between immigrant and non-immigrant students shrank by 11 score points during the same period.

- In Austria, the proportion of students with an immigrant background increased from 13.1% in 2003 to 16.4% in 2012. The difference in mathematics performance between immigrant and other students – 33 score points, after accounting for socio-economic status – remained unchanged during this period.

Access to resources

OECD countries allocate at least an equal, if not a larger, number of teachers to socio-economically disadvantaged schools as to advantaged schools.

- In Austria, however, the student-teacher ratio in advantaged schools is 10.0, while in disadvantaged schools it is 12.7 – meaning that there are fewer teachers in disadvantaged than in advantaged schools.

Students' engagement, drive and self-beliefs

Students' engagement with school, the belief that they can achieve at high levels, and their ability and willingness to do what it takes to reach their goals not only play a central role shaping students' ability to master academic subjects, they are also valuable attributes that will enable students to lead full lives, meeting challenges and making the most of available opportunities along the way. In other words, much more is required of students – and adults – than just cognitive proficiency.

Engagement with and at school

Students who arrive late or play truant miss learning opportunities. They also disrupt class, creating a disciplinary climate that is not conducive to learning for their fellow students. On average across OECD countries, 35.3% of students reported that they arrived late for school in the two weeks before the PISA test, 17.8% of students reported that they had skipped at least one class, and 14.5% of students reported that they had skipped an entire day of school or more over the same period.

- Only 20.7% of students in Austria reported that they had arrived late for school in the two weeks before the PISA test; 12.8% of students reported that they had skipped at least one class, and 8% reported that they had skipped a day of school or more over the same period. These proportions are comparatively low among OECD countries.

Across most countries and economies that participated in PISA 2012, students who attend schools with better teacher-student relations are less likely to have reported that they had arrived late for school in the two weeks before the PISA test. In Austria too, negative teacher-student relations are strongly associated with students' lack of punctuality.

For the first time, PISA 2012 asked students to evaluate their happiness at, and satisfaction with, school and to reflect on whether their school environment approaches their idea of an ideal situation. As schools are a, if not *the*, primary social environment for 15-year-olds, these subjective evaluations

provide a good indication of whether education systems are able to foster or hinder overall student well-being.

- Some 80% of students in Austria reported that they feel happy at school – a proportion similar to the OECD average. But a larger proportion of students than in most OECD countries is satisfied with their school (82%) and more than three in four students (77%) find the conditions in their schools ideal, compared to the OECD average of 61%.

In 2012, as in 2003, PISA asked students to report whether they "strongly agree", "agree", "disagree" or "strongly disagree" that they feel like an outsider or left out of things, that they make friends easily, that they feel like they belong, that they feel awkward and out of place, that other students seem to like them, or that they feel lonely. Across OECD countries, 81% of students feel that they belong, 87% of students agree or strongly agree that they can make friends easily, and 89% of students disagree that they feel like an outsider or feel left out of things.

- In 2003, Austria was already one of the countries where students expressed the strongest sense of belonging at school. Between 2003 and 2012, the situation improved: the proportion of students who reported that they feel lonely at school shrank from an already low level, and the proportion of students who reported that other students seem to like them increased from 78% to 94%.

Drive

Intrinsic motivation refers to the drive to perform an activity because of the pleasure and interest in the activity itself. Across OECD countries, large proportions of students reported low levels of enjoyment of mathematics.

- Austrian students are among those who enjoy mathematics the least. For example, 53% of students in OECD countries agreed or strongly agreed that they are interested in the things they learn in mathematics. In Austria, only 41% of students agreed or strongly agreed with this statement.
- Girls tend to have particularly low levels of enjoyment of mathematics and intrinsic motivation to learn mathematics. While in Austria 50% of boys reported that they are interested in the things they learn in mathematics, only 32% of girls agreed with that statement.

Self-beliefs

Across OECD countries 31% of students reported that they get very nervous when doing mathematics problems; only 24% of students in Austria reported so, and this proportion remained unchanged between 2003 and 2012.

Students' beliefs in their ability to learn mathematics are associated not only with how well they perform in mathematics, but also with how much better these students perform compared to other students in their school.

- In Austria, the strength of these social comparisons in shaping students' self-beliefs in their ability to learn mathematics is particularly strong: students who perform around average in mathematics do not believe as much in their own mathematics ability if they are surrounded by high-performing students than if they were surrounded by low-performing students.

Gender gaps in dispositions to learn mathematics

PISA results show that even when girls perform as well as boys in mathematics, on average, they report less drive and motivation and more negative self-beliefs about mathematics; this is also true in Austria, where girls who perform as well as boys in mathematics reported less openness to

problem solving. Girls who perform as well as boys in mathematics also tended to report lower levels of mathematics self-efficacy and higher mathematics anxiety.

Gender gaps in drive, motivation and self-beliefs are particularly worrying because these factors are essential if students are to achieve at the highest levels; and the relationship between drive, motivation and mathematics-related self-beliefs on the one hand, and mathematics performance on the other, is particularly strong at the top of the performance distribution. Unless girls believe that they can achieve at the highest levels, they will not be able to do so.

In the short term, changing mindsets may require making mathematics more interesting to girls, identifying and eliminating gender stereotypes in textbooks, promoting female role models, and using learning materials that appeal to girls. Over the longer term, shrinking the gender gap in mathematics performance will require the concerted effort of parents, teachers and society as a whole to change the stereotyped notions of what boys and girls excel at, what they enjoy doing, and what they believe they can achieve.

Resources, policies and practices

Disciplinary climate and teacher shortages

In Austria, as in most countries, schools where the disciplinary climate is more conducive to learning perform better in mathematics, even after accounting for socio-economic status and other school differences.

- Between 2003 and 2012, the disciplinary climate in Austrian schools improved significantly. In 2003, 30% of students reported that, in most or all lessons, students don't start working for a long time after the lesson begins; by 2012 that proportion had been trimmed to 26%. The disciplinary climate is worse, however, in schools where the average student comes from a more disadvantaged background.

In 2010, Austria invested USD 116 603 per student from the age of 6 to 15 for their education – up from USD 89 518 spent per student in 2001.

- Yet, between 2003 and 2012, the proportion of students in schools whose principals reported teacher shortages – a lack of qualified teachers, particularly in mathematics and German language – increased by about 10 percentage points.

To ensure that the learning environment is conducive to learning for all, it is important to be able to attract and retain qualified teachers.

Grouping students by ability

In Austria, the first age of selection for ability grouping is as low as 10, and students are offered as many as four different tracks. By age 15, more than one in two students are enrolled in vocational tracks. Students who are in more selective schools are likely be transferred to other schools if they perform poorly, have behavioural problems or have special learning needs, according to principals' reports.

- Austria handles diversity in interests and academic ability among students mainly by sorting students into different schools, where they are exposed to different curricula and pedagogy. Students in these kinds of systems tend to have less instrumental motivation for learning mathematics, meaning that they do not see any tangible benefit in learning the subject. Indeed, students in Austria are among the least likely to report that they agree with statements like "Learning mathematics is worthwhile for me because it will improve my career prospects".

PISA reveals that when education systems stream students into different schools based on ability, student motivation to learn and student performance suffer, on average. Only when education systems cultivate, foster and communicate the belief that all students can achieve at higher levels do students feel the drive and motivation that enables them to learn.

Snapshot of performance in mathematics, reading and science

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 low-achievers/share of top-performers not statistically 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
Countries/economies in which the annualised change in performance is statistically significant are marked in **bold**.

	Mathematics				Reading		Science	
	Mean score in PISA 2012	Share of low-achievers (Below Level 2)	Share of top-performers in mathematics (Level 5 or 6)	Annualised change	Mean score in PISA 2012	Annualised change	Mean score in PISA 2012	Annualised change
OECD average	494	23.1	12.6	**-0.3**	496	**0.3**	501	**0.5**
Shanghai-China	613	3.8	55.4	**4.2**	570	**4.6**	580	1.8
Singapore	573	8.3	40.0	**3.8**	542	**5.4**	551	**3.3**
Hong Kong-China	561	8.5	33.7	**1.3**	545	**2.3**	555	**2.1**
Chinese Taipei	560	12.8	37.2	1.7	523	**4.5**	523	-1.5
Korea	554	9.1	30.9	1.1	536	**0.9**	538	**2.6**
Macao-China	538	10.8	24.3	**1.0**	509	**0.8**	521	**1.6**
Japan	536	11.1	23.7	0.4	538	**1.5**	547	**2.6**
Liechtenstein	535	14.1	24.8	0.3	516	**1.3**	525	0.4
Switzerland	531	12.4	21.4	0.6	509	**1.0**	515	0.6
Netherlands	523	14.8	19.3	**-1.6**	511	-0.1	522	-0.5
Estonia	521	10.5	14.6	0.9	516	**2.4**	541	1.5
Finland	519	12.3	15.3	**-2.8**	524	**-1.7**	545	**-3.0**
Canada	518	13.8	16.4	**-1.4**	523	**-0.9**	525	**-1.5**
Poland	518	14.4	16.7	**2.6**	518	**2.8**	526	**4.6**
Belgium	515	18.9	19.4	**-1.6**	509	0.1	505	-0.8
Germany	514	17.7	17.5	**1.4**	508	**1.8**	524	1.4
Viet Nam	511	14.2	13.3	m	508	m	528	m
Austria	506	18.7	14.3	0.0	490	-0.2	506	-0.8
Australia	504	19.7	14.8	**-2.2**	512	**-1.4**	521	-0.9
Ireland	501	16.9	10.7	-0.6	523	**-0.9**	522	**2.3**
Slovenia	501	20.1	13.7	**-0.6**	481	**-2.2**	514	-0.8
Denmark	500	16.8	10.0	**-1.8**	496	0.1	498	0.4
New Zealand	500	22.6	15.0	**-2.5**	512	**-1.1**	516	**-2.5**
Czech Republic	499	21.0	12.9	**-2.5**	493	-0.5	508	-1.0
France	495	22.4	12.9	**-1.5**	505	0.0	499	0.6
United Kingdom	494	21.8	11.8	-0.3	499	0.7	514	-0.1
Iceland	493	21.5	11.2	**-2.2**	483	**-1.3**	478	**-2.0**
Latvia	491	19.9	8.0	0.5	489	**1.9**	502	**2.0**
Luxembourg	490	24.3	11.2	**-0.3**	488	**0.7**	491	0.9
Norway	489	22.3	9.4	-0.3	504	0.1	495	1.3
Portugal	487	24.9	10.6	**2.8**	488	**1.6**	489	**2.5**
Italy	485	24.7	9.9	**2.7**	490	0.5	494	**3.0**
Spain	484	23.6	8.0	0.1	488	-0.3	496	1.3
Russian Federation	482	24.0	7.8	1.1	475	**1.1**	486	1.0
Slovak Republic	482	27.5	11.0	**-1.4**	463	-0.1	471	**-2.7**
United States	481	25.8	8.8	0.3	498	-0.3	497	1.4
Lithuania	479	26.0	8.1	-1.4	477	1.1	496	1.3
Sweden	478	27.1	8.0	**-3.3**	483	**-2.8**	485	**-3.1**
Hungary	477	28.1	9.3	**-1.3**	488	**1.0**	494	-1.6
Croatia	471	29.9	7.0	0.6	485	1.2	491	-0.3
Israel	466	33.5	9.4	**4.2**	486	**3.7**	470	**2.8**
Greece	453	35.7	3.9	**1.1**	477	0.5	467	-1.1
Serbia	449	38.9	4.6	**2.2**	446	**7.6**	445	1.5
Turkey	448	42.0	5.9	**3.2**	475	**4.1**	463	**6.4**
Romania	445	40.8	3.2	**4.9**	438	1.1	439	**3.4**
Cyprus	440	42.0	3.7	m	449	m	438	m
Bulgaria	439	43.8	4.1	**4.2**	436	0.4	446	2.0
United Arab Emirates	434	46.3	3.5	m	442	m	448	m
Kazakhstan	432	45.2	0.9	**9.0**	393	0.8	425	**8.1**
Thailand	427	49.7	2.6	**1.0**	441	**1.1**	444	**3.9**
Chile	423	51.5	1.6	**1.9**	441	**3.1**	445	1.1
Malaysia	421	51.8	1.3	**8.1**	398	**-7.8**	420	-1.4
Mexico	413	54.7	0.6	**3.1**	424	**1.1**	415	0.9
Montenegro	410	56.6	1.0	**1.7**	422	**5.0**	410	-0.3
Uruguay	409	55.8	1.4	**-1.4**	411	**-1.8**	416	**-2.1**
Costa Rica	407	59.9	0.6	-1.2	441	-1.0	429	-0.6
Albania	394	60.7	0.8	**5.6**	394	**4.1**	397	2.2
Brazil	391	67.1	0.8	**4.1**	410	**1.2**	405	**2.3**
Argentina	388	66.5	0.3	1.2	396	-1.6	406	2.4
Tunisia	388	67.7	0.8	**3.1**	404	**3.8**	398	**2.2**
Jordan	386	68.6	0.6	0.2	399	-0.3	409	**-2.1**
Colombia	376	73.8	0.3	1.1	403	**3.0**	399	1.8
Qatar	376	69.6	2.0	**9.2**	388	**12.0**	384	**5.4**
Indonesia	375	75.7	0.3	0.7	396	**2.3**	382	-1.9
Peru	368	74.6	0.6	1.0	384	**5.2**	373	1.3

Countries and economies are ranked in descending order of the mathematics mean score in PISA 2012.
Source: OECD PISA 2012 database, Tables I.2.1a, I.2.1b, I.2.3a, I.2.3b, I.4.3a, I.4.3b, I.5.3a and I.5.3b.

1. Footnote 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".

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

What 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 2012

The content

- The PISA 2012 survey focused on mathematics, with reading, science and problem-solving minor areas of assessment. For the first time, PISA 2012 also included an assessment of the financial literacy of young people, which was optional for countries.

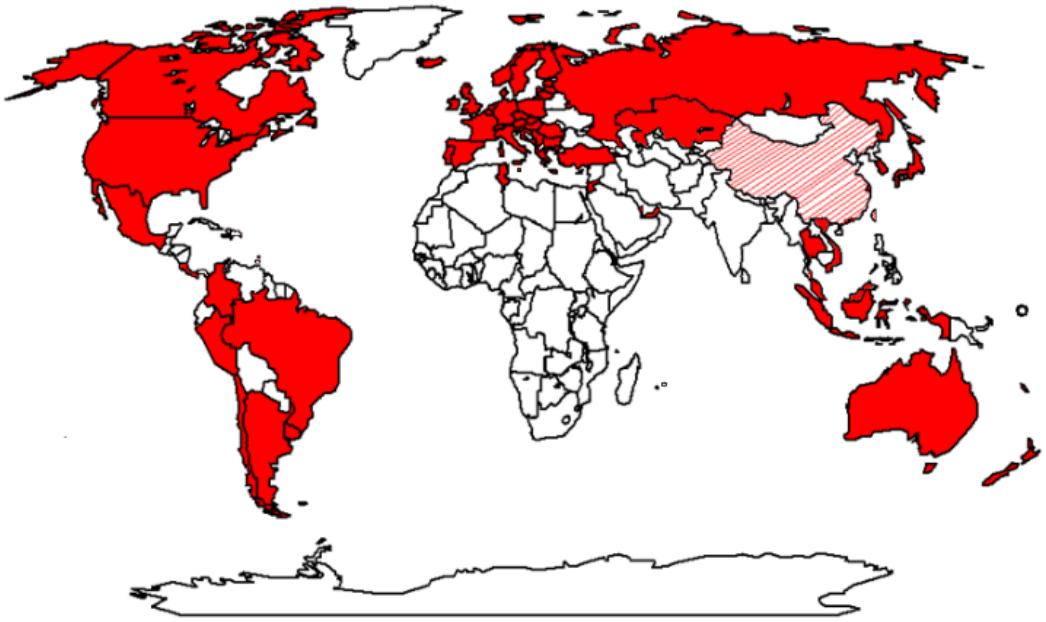
The students

- Around 510 000 students completed the assessment in 2012, representing about 28 million 15-year-olds in the schools of the 65 participating countries and economies.
- In Austria, 4 756 students in 191 schools completed the assessment in 2012. The participation rate after replacement is 92%.

The assessment

- Paper-based tests were used, with assessments lasting a total of two hours for each student. In a range of countries and economies, an additional 40 minutes were devoted to the computer-based assessment of mathematics, reading and problem solving.
- Test items were a mixture of multiple-choice items 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. A total of about 390 minutes of test items were covered, with different students taking different combinations of test items.
- Students answered a background questionnaire, which took 30 minutes to complete, that sought information about themselves, their homes and their school and learning experiences. School principals were given a questionnaire, to complete in 30 minutes, that covered the school system and the learning environment. In some countries and 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 mathematics. Countries could choose two other optional questionnaires for students: one asked students about their familiarity with and use of information and communication technologies, and the second sought information about their education to date, including any interruptions in their schooling and whether and how they are preparing for a future career.

Map of PISA 2012 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
Luxembourg
Mexico
Netherlands
New Zealand
Norway
Poland
Portugal
Slovak Republic
Slovenia
Spain
Sweden
Switzerland
Turkey
United Kingdom
United States

Partner countries and economies in PISA 2012

Albania
Argentina
Brazil
Bulgaria
Colombia
Costa Rica
Croatia
Cyprus[1,2]
Hong Kong-China
Indonesia
Jordan
Kazakhstan
Latvia
Liechtenstein
Lithuania
Macao-China
Malaysia
Montenegro
Peru
Qatar
Romania
Russian Federation
Serbia
Shanghai-China
Singapore
Chinese Taipei
Thailand
Tunisia
United Arab Emirates
Uruguay
Vietnam

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For more information on
the Programme for International Student Assessment
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