



## Executive Summary

Nearly all adults, not just those with technical or scientific careers, now need to have adequate proficiency in mathematics – as well as reading and science – for personal fulfilment, employment and full participation in society. With mathematics as its primary focus, the PISA 2012 assessment measured 15-year-olds' capacity to reason mathematically and use mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena, and to make the well-founded judgements and decisions needed by constructive, engaged and reflective citizens. Literacy in mathematics defined this way is not an attribute that an individual has or does not have; rather, it is a skill that can be acquired and used, to a greater or lesser extent, throughout a lifetime.

***Shanghai-China has the highest scores in mathematics, with a mean score of 613 points – 119 points above the OECD average, or the equivalent of nearly 3 years of schooling.***

Singapore, Hong Kong-China, Chinese Taipei, Korea, Macao-China, Japan, Liechtenstein, Switzerland and the Netherlands, in descending order of their scores, round out the top 10 performers in mathematics.

***Of all countries and economies with trend data between 2003 and 2012, 25 improved in mathematics performance, 25 show no change, and 14 deteriorated.***

Among countries that participated in every assessment since 2003, Brazil, Italy, Mexico, Poland, Portugal, Tunisia and Turkey show an average improvement in mathematics performance of more than 2.5 points per year since 2003. Although countries and economies that improved the most are more likely to be those that had lower performance in 2003, some with average or high performance in 2003 – such as Germany, Hong Kong-China and Macao-China – also improved during this period. Shanghai-China and Singapore, which began their participation in PISA after the 2003 assessment, also improved their already-high performance.

***On average across OECD countries, 12.6% of students are top performers in mathematics, meaning that they are proficient at Level 5 or 6.***

The partner economy Shanghai-China has the largest proportion of students performing at Level 5 or 6 (55.4%), followed by Singapore (40.0%), Chinese Taipei (37.2%) and Hong Kong-China (33.7 %). In Korea, 30.9% of students are top performers in mathematics; and between 15% and 25% of students in Belgium, Canada, Finland, Germany, Japan, Liechtenstein, Macao-China, the Netherlands, New Zealand, Poland and Switzerland are top performers in mathematics.

***Between 2003 and 2012 Italy, Poland and Portugal increased the share of top performers and simultaneously reduced the share of low performers in mathematics.***

Israel, Qatar and Romania saw similar improvements between 2006 and 2012 as did Ireland, Malaysia and the Russian Federation between 2009 and 2012.

***Boys perform better than girls in mathematics in only 37 out of the 65 countries and economies that participated in PISA 2012, and girls outperform boys in 5 countries.***

In only six countries is the gender gap in mathematics scores larger than the equivalent of half a year of formal schooling.



***Shanghai-China, Hong Kong-China, Singapore, Japan and Korea are the five highest-performing countries and economies in reading.***

Shanghai-China had a mean score of 570 points in reading – the equivalent of more than a year-and-a-half of schooling above the OECD average of 496 score points, and 25 score points above the second best-performing participant, Hong Kong-China.

***Of the 64 countries and economies with comparable data in reading performance throughout their participation in PISA, 32 improved their reading performance, 22 show no change, and 10 deteriorated in reading performance.***

Among OECD countries, Chile, Estonia, Germany, Hungary, Israel, Japan, Korea, Luxembourg, Mexico, Poland, Portugal, Switzerland and Turkey improved their reading performance across successive PISA assessments.

***Across OECD countries, 8.4% of students are top performers in reading, meaning that they are proficient at Level 5 or 6. Shanghai-China has the largest proportion of top performers – 25.1% – among all participating countries and economies.***

More than 15% of students in Hong Kong-China, Japan and Singapore are top performers in reading, as are more than 10% of students in Australia, Belgium Canada, Finland, France, Ireland, Korea, Liechtenstein, New Zealand, Norway, Poland and Chinese Taipei.

***Between the 2000 and 2012 PISA assessments, Albania, Israel and Poland increased the share of top performers and simultaneously reduced the share of low performers in reading.***

The same trend was observed in Hong Kong-China, Japan and the Russian Federation since PISA 2003; in Bulgaria, Qatar, Serbia, Spain and Chinese Taipei since PISA 2006; and in Ireland, Luxembourg, Macao-China and Singapore since PISA 2009.

***Between 2000 and 2012 the gender gap in reading performance – favouring girls – widened in 11 countries and economies.***

In Bulgaria, France and Romania, the gender gap in reading performance widened by more than 15 score points during that period. Only in Albania did the gap narrow as a result of a greater improvement in reading performance among boys than among girls.

***Shanghai-China, Hong Kong-China, Singapore, Japan and Finland are the top five performers in science in PISA 2012.***

Shanghai-China's mean score in science (580 points) is more than three-quarters of a proficiency level above the OECD average of 501 score points. Estonia, Korea, Viet Nam, Poland, Canada, Liechtenstein, Germany, Chinese Taipei, the Netherlands, Ireland, Australia, Macao-China, New Zealand, Switzerland, Slovenia, the United Kingdom, the Czech Republic and Belgium also score above the OECD average in science, while Austria, Latvia, France, Denmark and the United States scored around the OECD average.

***Across OECD countries, 8.4% of students are top performers in science and score at proficiency Level 5 or 6.***

More than 15% of students in Shanghai-China (27.2%), Singapore (22.7%), Japan (18.2%), Finland (17.1%) and Hong Kong-China (16.7%) are top performers.

***Between 2006 and 2012, Italy, Poland and Qatar, and between 2009 and 2012, Estonia, Israel and Singapore increased the share of top performers and simultaneously reduced the share of low performers in science.***

Brazil, Hong Kong-China, Ireland, Japan, Korea, Latvia, Lithuania, Portugal, Romania, Spain, Switzerland, Thailand, Tunisia, Turkey and the United States saw a significant reduction in the share of students performing below proficiency Level 2 between 2006 and 2012.

***Boys and girls perform similarly in science and, on average, that remained true in 2012.***

However, in Finland, Montenegro, the Russian Federation and Sweden, while there was no gender gap in science performance in 2006, a gender gap in favour of girls was observed in 2012.



■ Table I.A ■

## 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


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

Note: Countries/economies in which the annualised change in performance is statistically significant are marked in bold.

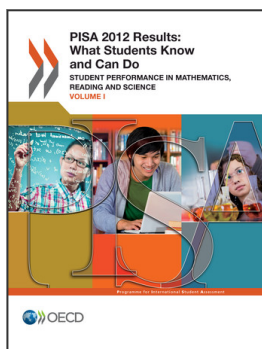
\* See notes in the Reader's Guide.

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.

StatLink  <http://dx.doi.org/10.1787/888932937035>





**From:**  
**PISA 2012 Results: What Students Know and Can Do (Volume I)**  
Student Performance in Mathematics, Reading and Science

**Access the complete publication at:**  
<https://doi.org/10.1787/9789264201118-en>

**Please cite this chapter as:**

OECD (2013), "Executive Summary", in *PISA 2012 Results: What Students Know and Can Do (Volume I): Student Performance in Mathematics, Reading and Science*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264201118-2-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to [rights@oecd.org](mailto:rights@oecd.org). Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at [info@copyright.com](mailto:info@copyright.com) or the Centre français d'exploitation du droit de copie (CFC) at [contact@cfcopies.com](mailto:contact@cfcopies.com).