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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 wellfounded 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 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.

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