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# How has student performance evolved over time?

- Improvement in PISA performance is not related to geography, national wealth or culture.
- In most cases, the countries that show significant improvement in PISA performance – Brazil, Germany, Greece, Italy, Mexico, Tunisia and Turkey – are those that manage to reduce the proportion of low-achieving students.
- Even over time, excellence and equity in education are not mutually exclusive goals, as the improvements in Germany, Italy, Mexico, Tunisia and Turkey demonstrate.

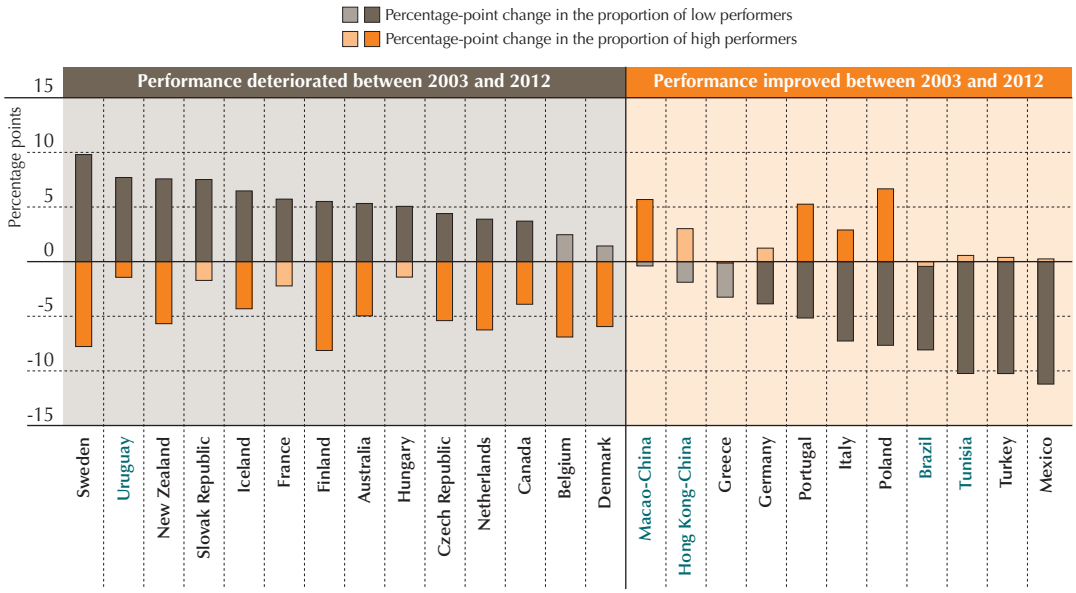
Every three years, when PISA results are published, the world's media focuses on countries' rankings in mathematics, reading and science performance. Often, what is lost in the subsequent national-level soul-searching about how to improve student performance is the fact that many countries have raised their game significantly since the first PISA test was conducted in 2000. In fact, half of the countries and economies that have participated in at least three PISA cycles have improved significantly in reading performance since 2000, a third have improved in mathematics performance since 2003, and almost a third have improved in science performance since 2006.

## All countries/economies can raise their game – and relatively quickly.

Improvements in PISA performance are not bound by region or national wealth or cultural heritage. For example, Singapore, a small, relatively wealthy Asian country (which ranked second in mathematics performance in PISA 2012) has improved its mean score by about 4 points per year – as has Brazil, a large, middle-income Latin American country, where two out of three students still do not attain the baseline proficiency Level 2 in mathematics. Countries as diverse as Chile, Germany, Israel, Malaysia, Qatar and Romania have also seen significant improvements in mathematics performance.

PISA results over the years show that change can happen relatively quickly – much faster than previously suspected. For example, over just one decade, Poland's performance in mathematics improved from 490 to 518 score points, from below the OECD average to well above it. Its score in reading increased from 479 to 518 points – a difference that is the equivalent of a full school year. Part of this improvement is linked to the structural reform Poland adopted in 1999. Brazil, Bulgaria, Israel, Italy, Mexico, Portugal, Qatar, Romania, Serbia, Tunisia and Turkey, all of which participated in at least three rounds of PISA, improved their performance in mathematics by at least two score points per year since 2003.

**Countries with significant changes in mathematics performance between 2003 and 2012**




**Note:** Statistically significant changes are marked in a darker tone.
**Source:** OECD, PISA 2012 Database, Table I.2.1b.
*StatLink* http://dx.doi.org/10.1787/888932935572

Better performance and greater equity can be achieved at the same time.

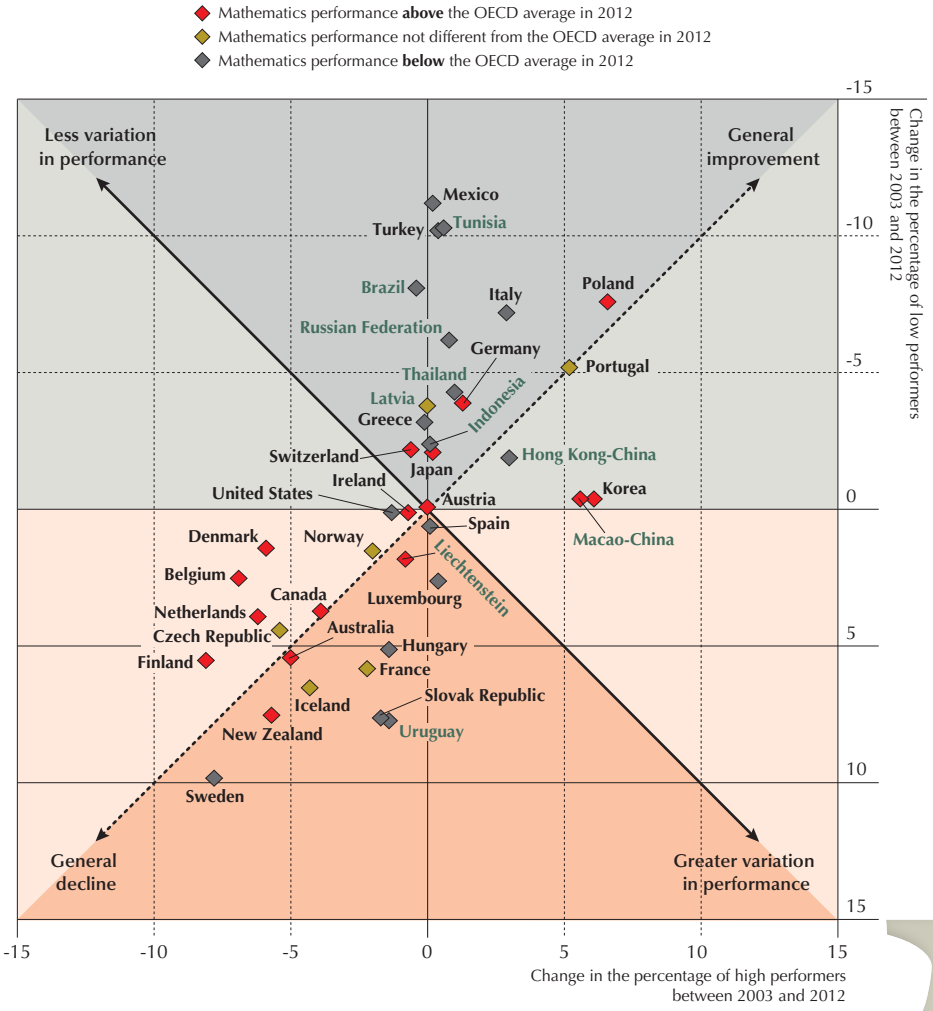
When countries show improvements in their performance, it is usually because they have managed to reduce the proportion of low-achieving students. For example, countries and economies that improved in reading between 2000 and 2009 did so as a result of declining numbers of low performers. The same was observed in mathematics between 2003 and 2012, although in Hong Kong-China, Italy, Macao-China, Poland and Portugal, improvement in mathematics performance during that period was also related to growing numbers of high-performing students.

As there are generally more low performers than high performers in any given student population, any changes at these two ends of the performance spectrum tend to be larger among low achievers than among high achievers. For example, across PISA-participating countries and economies, the proportion of high performers in mathematics changed by 2.7 percentage points, on average, between 2003 and 2012, while the proportion of

low performers changed by 4.4 percentage points during that period. In fact, only Korea and Macao-China, two high-performing education systems, have seen the proportion of high performers in mathematics increase significantly without a reduction in the percentage of low performers.

An analysis of trends in PISA performance shows that smooth, steady change is the norm. Results for Brazil, the top improver among the countries and economies that have participated in all PISA rounds since 2003, show no precipitous spikes or dips in scores on the way to high achievement in mathematics. This relatively smooth path towards excellence in mathematics is also observed in Germany, Hong Kong-China, Poland, Tunisia and Turkey.

**Change in the percentage of low and top performers in mathematics between 2003 and 2012**




**Note:** The chart shows countries/economies that participated in both PISA 2003 and PISA 2012 assessments.
**Source:** OECD, PISA 2012 Database, Table I.2.1b.
StatLink http://dx.doi.org/10.1787/888932935572

# PISA IN FOCUS

When comparing trends in mathematics, reading and science performance, only those countries with valid data to compare between assessments are included. Comparisons between the 2000 and 2012 assessments use data on reading performance and include only 38 countries and economies; comparisons between the 2003 and 2012 assessments use data on reading and mathematics performance and include 39 countries and economies.

Improvement in performance rarely comes at the expense of equity in education. Between 2003 and 2012, Poland and Portugal increased the proportion of high performers in mathematics as they simultaneously reduced the proportion of low performers. Improvements in mathematics performance in Mexico, Tunisia and Turkey, all of which scored well below average in their first PISA tests, are observed mainly among low-achieving students. This usually means greater equity of education opportunities in these countries too. Indeed, in a majority of the countries and economies whose mathematics performance has improved over the years, the relationship between students' socio-economic background and mathematics performance has grown weaker, not stronger.

**The bottom line:** PISA is a useful tool not only for measuring how students perform now, but how much countries have progressed over time in encouraging – and realising – excellence and equity in education. If nothing else, PISA shows that, with concerted effort and the right policies in place, it is possible to improve student performance – even among the lowest and highest performers in reading, mathematics and science.

**For more information**

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**See** OECD (2013), *PISA 2012 Results: What Students Know and Can do: Student Performance in Mathematics, Reading and Science (Volume I)*, PISA, OECD Publishing, Paris.
OECD (2013), *PISA 2012 Results: Excellence through Equity: Giving Every Student the Chance to Succeed (Volume II)*, PISA, OECD Publishing, Paris.

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