

# 1. WHAT STUDENTS KNOW AND CAN DO

## How do countries/economies perform in science overall?

- The partner economy Shanghai, China shows the highest average score in science among countries participating in PISA 2009 – well above the next four highest-ranking countries and economy: Finland; Hong Kong, China; Singapore and Japan.
- In most OECD countries, students perform on average at Level 3 in science, but in partner countries and economies, the average varies widely, from Level 1 to Level 4.
- Eight out of the ten highest performers in science are East Asian and English-speaking countries and economies.

### What it means

The mean PISA science score for each country/economy summarises the performance of students overall. The results show that overall science performance varies widely across countries and economies. In a world where science plays an important part in daily life, countries strive to ensure that their populations attain at least a baseline level of proficiency in science. To be able to compete in the global marketplace, countries must also develop a corps of people capable of complex and innovative scientific thinking.

### Findings

The partner economy Shanghai, China ranks first in science proficiency; Finland and the partner economy Hong Kong, China share second place. Differences among the remaining seven highest-performing countries – Australia, Canada, Estonia, Japan, Korea, New Zealand and the partner country Singapore – are, in many cases, too close to be statistically significant. Students in nine of the ten top-performing countries and economies score more than one-third of a proficiency level above the OECD average, with Shanghai, China scoring one proficiency level above the average.

Belgium, Germany, Ireland, the Netherlands, Poland, Slovenia, Switzerland, the United Kingdom and the partner countries and economy Chinese Taipei; Liechtenstein and Macao, China also perform significantly above the OECD average.

Overall, the range in country performance is particularly wide among partner countries, but much less so among OECD countries. In 28 out of the 34 OECD countries, students are proficient to Level 3, on average, in science. Average performance among partner countries and economies ranges from Level 4 in Shanghai, China to Level 1 – and, in the case of

Kyrgyzstan, below Level 1 – in 12 countries. At Level 1, students have limited knowledge about science that they can only apply in familiar situations. At Level 4, students can select and integrate explanations from different disciplines of science or technology and link them directly to real-life situations.

### Definitions

In the 2006 PISA survey, the first where student performance in science was assessed in detail, the mean science score was set at 500 points for those OECD countries taking part. In 2009, the average score was 501 points among the participating OECD countries. The original PISA scale was set such that approximately two-thirds of students across OECD countries score between 400 and 600 points. A gap of 75 points in science scores is equivalent to one proficiency level.

The averages shown here are estimates based on the PISA sample. In many cases, differences between countries/economies are too close to be statistically significant. In such cases, it cannot be said which of a pair of countries/economies has students with higher average performance.

Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

### Going further

A full set of comparisons across countries and economies, showing in which cases differences between mean performance are statistically significant, can be found in Chapter 3 of *PISA 2009 Results Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*.

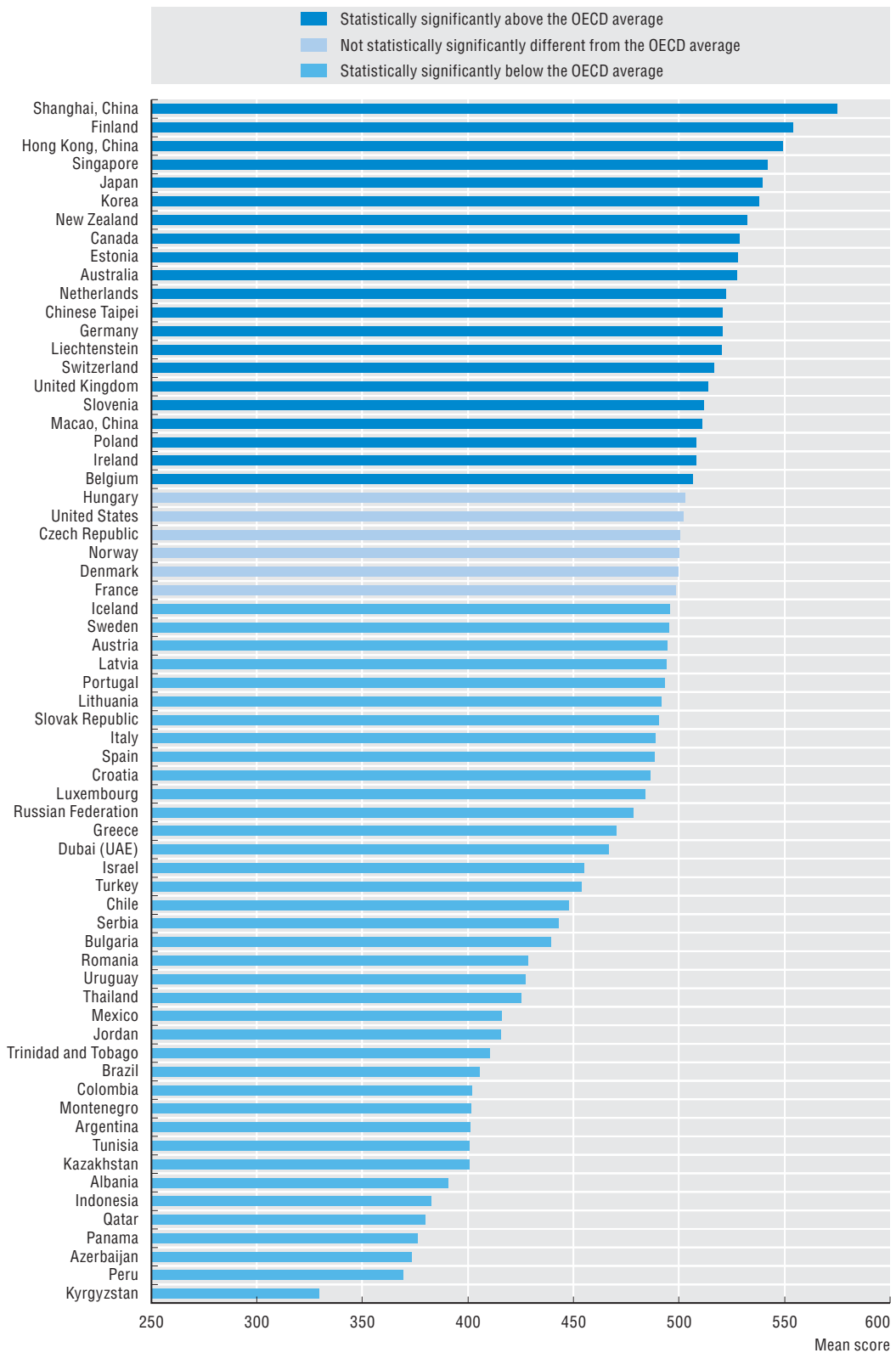
### Further reading from the OECD

Student performance in science was assessed in depth in 2006, and will be again in 2015. See: *Assessing Scientific, Reading and Mathematical Literacy: A Framework for PISA 2006* (2006) and *PISA 2006, Science Competencies for Tomorrow's World, Volume 1: Analysis* (2007).

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Figure 1.8. Comparing performance in science



Source: OECD (2010), PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science, Figure I.3.21, available at <http://dx.doi.org/10.1787/888932343152>.



**From:**  
**PISA 2009 at a Glance**

**Access the complete publication at:**  
<https://doi.org/10.1787/9789264095298-en>

**Please cite this chapter as:**

OECD (2011), "How do countries/economies perform in science overall?", in *PISA 2009 at a Glance*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264095250-10-en>

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