

1. WHAT STUDENTS KNOW AND CAN DO

What can students do in science?

- On average across OECD countries, 18% of 15-year-olds do not attain the baseline proficiency Level 2 in science, while more than 8% of students are top performers at Level 5 or 6.
- In 7 countries and economies, more than 90% of students reach at least Level 2, but in 13 countries only a minority does so.
- In Finland, New Zealand, the partner economy Shanghai, China and the partner country Singapore, at least 17% of students are top performers at Level 5 or 6 – twice the OECD average.

What it means

Students whose proficiency in science is limited to Level 1 will find it difficult to participate fully in society at a time when science and technology play a large role in daily life. Those students capable of the advanced scientific thinking required at Levels 5 and 6 could become part of a corps of future innovators who will boost their countries' technological and innovative capacities in science-related industries.

Findings

On average in OECD countries, over four in five students (82%) are proficient in science to at least the baseline Level 2. At that level, students have adequate scientific knowledge to provide possible explanations in familiar contexts or draw conclusions based on simple investigations. In Canada, Estonia, Finland, Korea and the partner economies Hong Kong, China; Macao, China and Shanghai, China; over 90% of students reach Level 2 or above; but in 13 partner countries, only a minority of students reaches Level 2.

At the other end of the scale, one in twelve students (8.5%), on average in OECD countries, is proficient at Level 5 or 6. These top performers are capable of applying scientific knowledge and skills to a variety of complex scientific questions drawn from the real world. In Finland, New Zealand, the partner economy Shanghai, China and the partner country Singapore, between 17% and 25% of students reach at least Level 5, which means that the pool of future workers with high proficiency in science is over twice that of the average OECD country. Among these high

performers, only a small minority of 15-year-olds (1% in OECD countries) can perform the most difficult science tasks, at Level 6. These tasks require advanced scientific thinking and reasoning. However, in the partner country Singapore, 5% of students perform at Level 6 and in New Zealand and the partner economy Shanghai, China, 4% of students reach this level.

On the other hand, some countries have almost no students at these levels: in Mexico and in 15 partner countries, less than 1% of students reach Level 5.

Definitions

In PISA, science tasks are ranked by difficulty and are associated with each of the six proficiency levels from 1 (easiest) to 6 (hardest). A student reaches a given proficiency level if the test results show that he or she has at least a 50% chance of performing a task at that level. Students are classified at the highest level at which they are proficient.

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

Going further

Descriptions of what students can do at each proficiency level and examples of tasks are presented in Chapter 3 of *PISA 2009 Results Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*. Full data are shown in Table I.3.4 at the back of that volume.

Further reading from the OECD

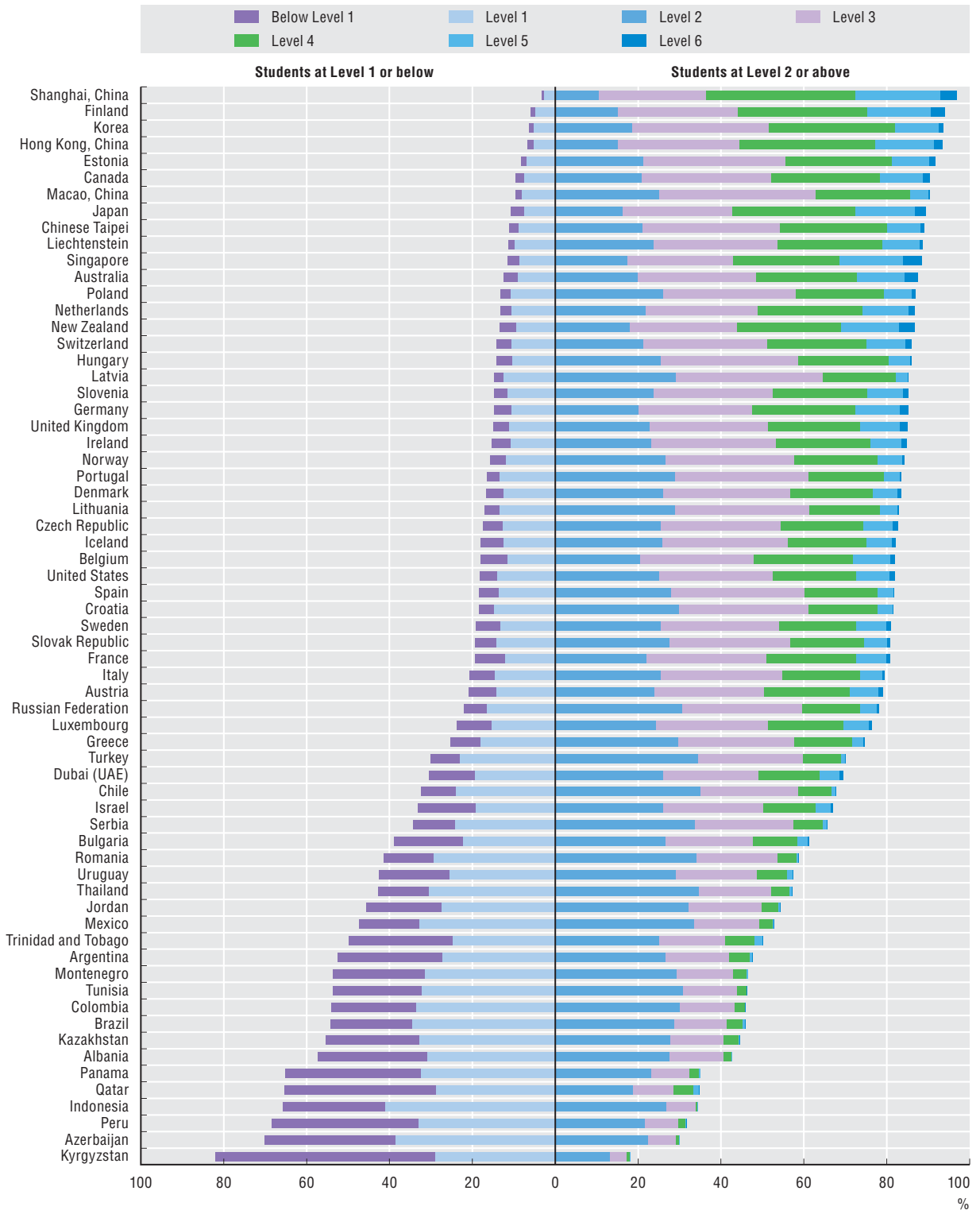
Student performance in science was assessed in depth in 2006, and will be again in 2015. See: *Assessing Scientific, Reading and Mathematical Literacy: A Framework for PISA 2006* (2006) and *PISA 2006, Science Competencies for Tomorrow's World, Volume 1: Analysis* (2007).

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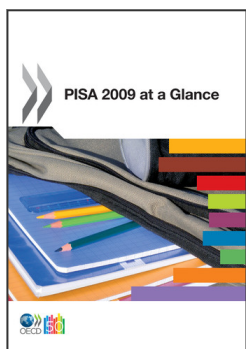
Figure 1.7. **How proficient are students in science?**

Percentage of students at the different levels of science proficiency



Note: Countries are ranked in descending order of the percentage of students at Levels 2, 3, 4, 5 and 6.

Source: OECD (2010), PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science, Figure I.3.20, available at <http://dx.doi.org/10.1787/888932343152>.



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