What can students do in mathematics?

– *On average across OECD countries, 22% of 15-year-olds perform below the baseline proficiency Level 2 in mathematics while 13% are top performers in mathematics, attaining Level 5 or 6.*

– *In six countries and economies, more than 90% of students reach at least Level 2, but in 17 countries only a minority do so.*

– *In Korea and the partner countries and economies Chinese Taipei; Hong Kong, China; Shanghai, China and Singapore, between 25% and 51% of students are top performers in mathematics, attaining Level 5 or 6.*

What it means

Students whose proficiency in mathematics is limited to Level 1a or below can, at best, perform simple mathematical tasks in very familiar contexts. They will find it difficult to think mathematically, limiting their ability to make sense of a complex world. A priority for all countries is to ensure that as many students as possible attain at least the baseline proficiency Level 2. At the other end of the performance range, having a corps of students capable of the complex mathematical thinking required at Levels 5 and 6 will help countries to establish a competitive advantage in the global marketplace.

Findings

On average across OECD countries, nearly four in five students (78%) are proficient in mathematics to at least the baseline Level 2. At that level, students can use basic mathematical algorithms, formulae, procedures, or conventions, and can reason mathematically. In the OECD countries Finland and Korea, and in the partner countries and economies Hong Kong, China; Liechtenstein; Shanghai, China and Singapore, over 90% of students reach Level 2 or above. But only a minority of students reaches Level 2 in Chile, Mexico and 15 partner countries.

At the other end of the scale, one in eight students (13%), on average in OECD countries, is proficient at Level 5 or6. These top performers are capable of complex mathematical tasks requiring broad, well-developed thinking and reasoning skills. In Korea, the highest-performing OECD country in mathematics, one in four students (26%) reaches this level. More students do so in the partner country and economies, Chinese Taipei (29%), Hong Kong, China (31%) and Singapore (36%), and as many as half of the students in Shanghai, China are top performers in mathematics. But in 12 countries, less than 1% of students reach Level 5 or 6.

Among these high performers, fewer than a quarter, on average (3% in OECD countries), attain Level 6, the highest proficiency level. However, in Shanghai, China, more than one-quarter of students (27%) do so and in the partner country Singapore, one student in six (16%) does. The OECD countries with the largest percentage of students attaining Level 6 are Korea and Switzerland, where 8% of students in these countries reach this level.

Definitions

In the PISA survey, mathematics 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

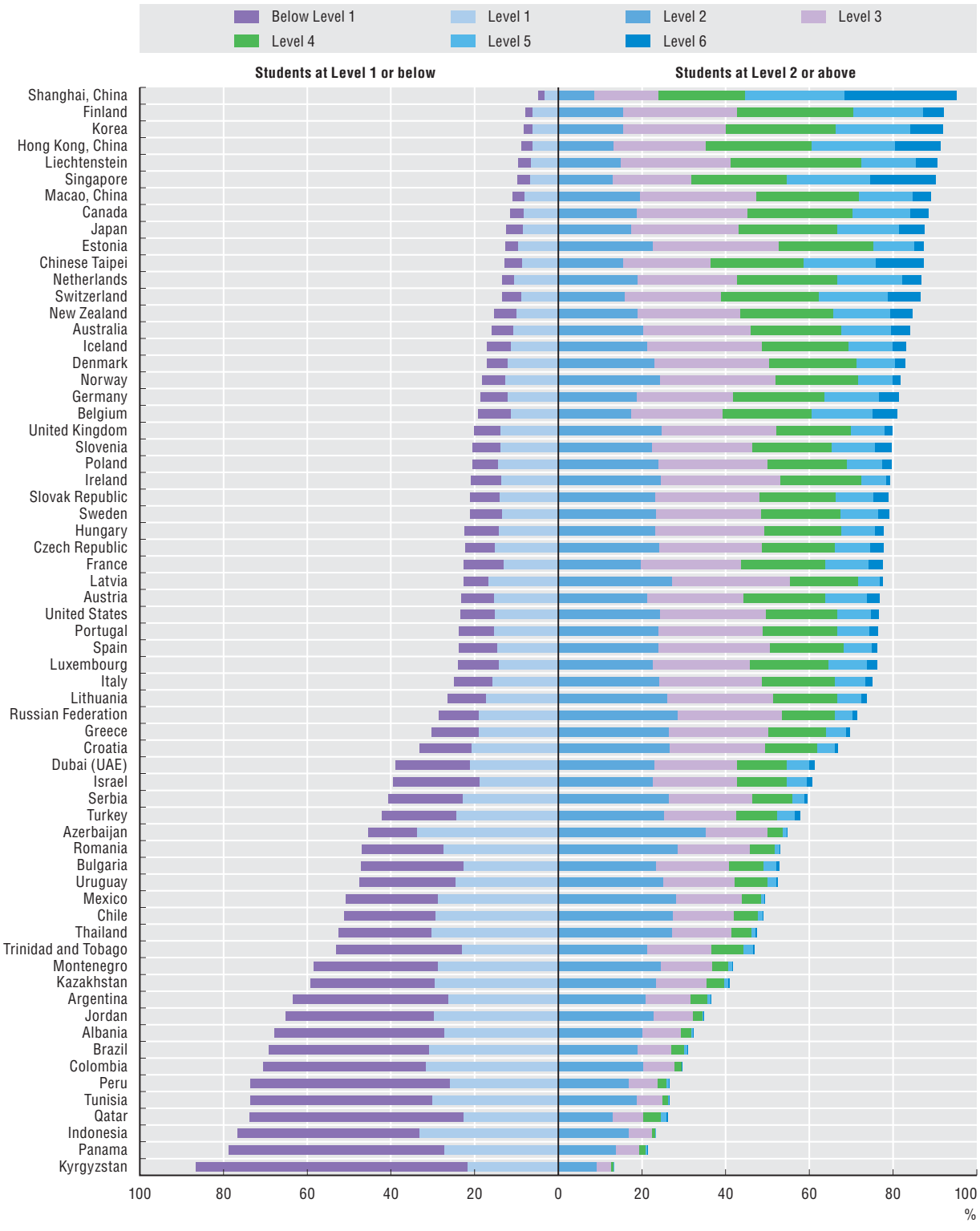
Descriptions of what students can do at each proficiency level and examples of tasks are presented in Chapter 3 of *PISA 2009 Results Volum I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*. Full data are shown in Table I.3.1 at the back of that volume.

Further reading from the OECD

Mathematics performance was assessed in depth in 2003, and will be again in 2012. See: The PISA 2003 Assessment Framework (2003) and Learning for Tomorrow's World, First Results From PISA 2003 (2004).

Figure 1.4. **How proficient are students in mathematics?**

Percentage of students at the different levels of mathematics 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.3.9, available at *http://dx.doi.org/10.1787/888932343152*.