

## TOP PERFORMING STUDENTS

The rapidly growing demand for highly skilled workers has led to a global competition for talent. High-level skills are critical for the creation of new knowledge, technologies and innovation. They are therefore an important determinant of economic growth and social development. Drawing on data from the OECD's Programme for International Student Assessment (PISA), this entry looks at top-performing students in science.

### Definition

Achievement scores are based on assessments administered as part of the OECD PISA programme, which were carried out in 2006 (with a special focus on students' abilities in science). "Students" refers here to 15-year-olds enrolled in secondary education. "Top performers" refers to students who attain Levels 5 and 6 on the PISA science scale,

Level 5 on the reading scale, and Levels 5 and 6 on the mathematics scale.

### Comparability

Leading experts in countries participating in PISA advise on the scope and nature of the assessments, with final decisions on this taken by OECD governments. Substantial efforts and resources are devoted to achieving cultural and linguistic breadth and balance in the assessment materials. Stringent quality assurance mechanisms are applied in translation, sampling and data collection.

Over 400 000 15-year-old students in 57 participating countries were assessed for PISA 2006. Because the results are based on probability samples, the standard errors are shown in the tables.

### Overview

The proportion of top performers in science varies widely across countries. Across countries, scientific excellence is only weakly related to average performance in the same field. While, across OECD countries, 9% of students reach PISA's Level 5 in science, and slightly more than 1% reach Level 6, these proportions vary substantially across countries. For example, seven OECD countries have at least 13% of the top performers in science, whereas this proportion is only 5% or less in six countries. On average, the proportions of top performers in reading and mathematics are respectively 9% and 13%. In reading, these proportions range from more than 13% in four OECD countries to less than 5% in six OECD countries. In mathematics, two OECD countries have less than 5% of top performers, while 13 OECD countries have more than 13% of top performers. Across OECD countries, 4% of students are top performers in all three subject areas (science, reading and mathematics), while 18% of students are top performers in at least one of these subject areas.

Girls are as likely to achieve top performance as boys. On average, 4.1% of girls and 3.9% of boys are top performers in all three subject areas and 17.3% of girls and 18.6% of boys are top performers in at least one subject area. While the gender gap among students who are top performers in science only is small, this gap is significantly higher among students who are top performers in reading only and in mathematics only. While there is no difference in the average performance in science of boys and girls, boys tend to show a marked advantage among the top performers. In eight of the 17 OECD countries with at least 3% of both boys and girls among the top performers in science, a significantly higher proportion of them are boys. On average, almost half of the top performers in science (44%) were also top performers in reading and mathematics, but this was the case for 50% of girls and for 37% of boys.

### Sources

- OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World: Volume 1 Analysis*, OECD, Paris.
- OECD (2009), *Top of the Class: High Performers in Science in PISA 2006*, OECD, Paris.

### Further information

#### Analytical publications

- OECD (2009), *Equally Prepared For Life?: How 15-Year-Old Boys and Girls Perform in School*, OECD, Paris.
- OECD (2009), *Green at Fifteen?: How 15-Year-Olds Perform in Environmental Science and Geoscience in PISA 2006*, OECD, Paris.

#### Methodological publications

- OECD (2006), *Assessing Scientific, Reading and Mathematical Literacy: A Framework for PISA 2006*, OECD, Paris.

#### Online databases

- OECD PISA Database.

#### Web sites

- PISA Web site, [www.pisa.oecd.org](http://www.pisa.oecd.org).



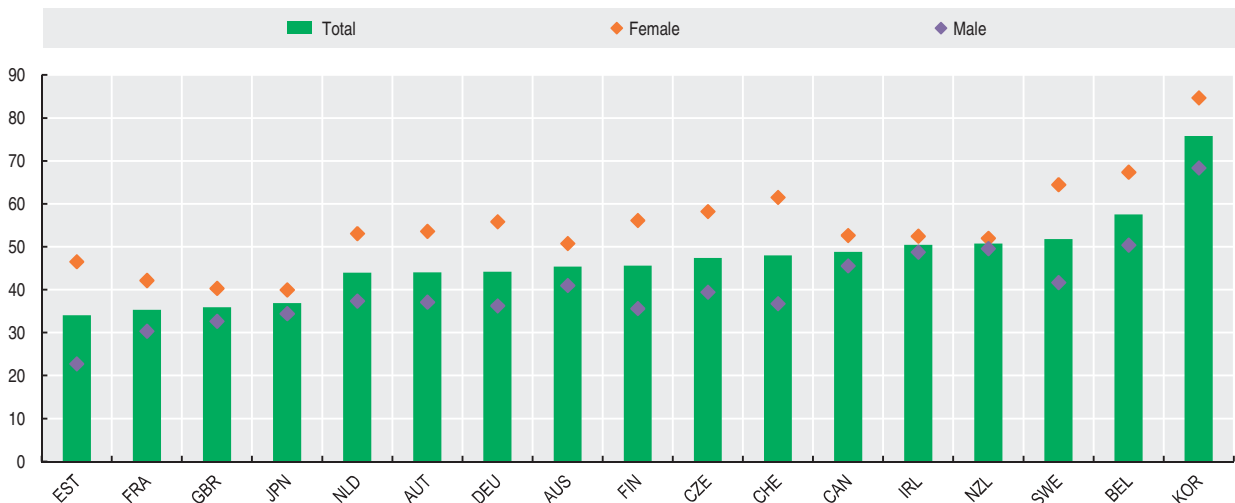
Percentage of top performers by domain in PISA 2006

	Science scale		Reading scale		Mathematics scale		Top performers in all three domains	
	Percentage	S.E.	Percentage	S.E.	Percentage	S.E.	Percentage	S.E.
Australia	14.6	0.7	10.6	0.6	16.4	0.8	6.6	0.4
Austria	10.0	0.8	9.0	0.7	15.8	1.0	4.4	0.4
Belgium	10.1	0.5	11.3	0.6	22.3	0.8	5.8	0.4
Canada	14.4	0.5	14.5	0.7	17.9	0.7	7.0	0.4
Czech Republic	11.6	0.9	9.2	0.8	18.3	1.2	5.5	0.6
Denmark	6.8	0.7	5.9	0.6	13.7	0.8	3.0	0.5
Finland	20.9	0.8	16.7	0.8	24.4	1.0	9.5	0.5
France	8.0	0.7	7.3	0.7	12.5	0.9	2.8	0.4
Germany	11.8	0.7	9.9	0.7	15.4	1.0	5.2	0.5
Greece	3.4	0.4	3.5	0.4	5.0	0.5	0.9	0.2
Hungary	6.9	0.6	4.7	0.6	10.3	0.9	2.4	0.4
Iceland	6.3	0.5	6.0	0.5	12.7	0.7	2.8	0.3
Ireland	9.4	0.7	11.7	0.8	10.2	0.8	4.8	0.5
Italy	4.6	0.3	5.2	0.4	6.2	0.5	1.3	0.2
Japan	15.1	0.8	9.4	0.7	18.3	1.0	5.5	0.5
Korea	10.3	1.1	21.7	1.4	27.1	1.5	7.8	0.8
Luxembourg	5.9	0.4	5.6	0.4	10.6	0.5	2.5	0.3
Mexico	0.3	0.1	0.6	0.1	0.8	0.2	0.0	0.0
Netherlands	13.1	0.9	9.1	0.6	21.1	1.1	5.8	0.5
New Zealand	17.6	0.8	15.9	0.8	18.9	0.9	8.9	0.6
Norway	6.1	0.5	7.7	0.6	10.4	0.7	2.7	0.3
Poland	6.8	0.5	11.6	0.8	10.6	0.8	3.7	0.4
Portugal	3.1	0.4	4.6	0.5	5.7	0.5	1.5	0.2
Slovak Republic	5.8	0.5	5.4	0.5	11.0	0.9	2.3	0.3
Spain	4.9	0.4	1.8	0.2	7.2	0.5	0.8	0.2
Sweden	7.9	0.5	10.6	0.8	12.6	0.7	4.1	0.3
Switzerland	10.5	0.8	7.7	0.7	22.6	1.2	5.0	0.5
Turkey	0.9	0.3	2.1	0.6	4.2	1.2	0.4	0.2
United Kingdom	13.7	0.6	9.0	0.6	11.1	0.6	4.9	0.3
United States	9.1	0.7	..	..	7.6	0.8	..	..
OECD average	9.0	0.1	8.6	0.1	13.4	0.2	4.1	0.1
Brazil	0.6	0.2	1.1	0.3	1.0	0.3	0.2	0.1
Chile	1.9	0.3	3.5	0.6	1.5	0.4	0.4	0.1
Estonia	11.5	0.8	6.0	0.6	12.5	0.8	3.9	0.5
Indonesia	..	..	0.1	0.0	0.4	0.2	..	..
Israel	5.2	0.6	5.0	0.5	6.1	0.6	1.7	0.2
Russian Federation	4.2	0.5	1.7	0.3	7.4	0.8	0.6	0.1
Slovenia	12.9	0.6	5.3	0.5	13.7	0.6	3.3	0.4

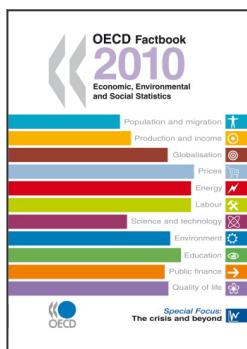
StatLink <http://dx.doi.org/10.1787/826068484665>

Top performing students in the three domains in PISA 2006

As a percentage of top performers in science



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