

### CO3.3: Literacy scores by gender at age 10

#### *Definitions and methodology*

This indicator is based on two student assessment processes: the Progress in International Reading Literacy Study (PIRLS) and the Trends in Mathematics and Science Study (TIMSS). PIRLS defines reading literacy as “the ability to understand and use written language forms required by society and/or valued by the individual” (PIRLS 2011 Assessment Frameworks). The mathematics and science evaluations are examined around two dimensions: content and cognitive. The mathematics content dimension includes the following subjects: numbers, geometric shapes and measures, and data display. The science content domain includes: life science, earth science and physical science. The cognitive aspect of both tests evaluates the following thinking processes: knowing, applying and reasoning (TIMSS 2011 Assessment Frameworks).

Both PIRLS and TIMSS evaluations are conducted when students are enrolled in the fourth year of primary school. At the fourth year of formal schooling, most children have learned to read and are now starting to read in order to learn. In most countries, students begin formal schooling at age 6, thus children in PIRLS and TIMSS are around 10 years old (age range goes from 9.7 to 11.4 years old in both tests).

PIRLS assessments have taken place in 2001, 2006 and 2011; a fourth round of data collection is scheduled for 2016. TIMSS evaluations have been conducted every four years: 1995, 1999, 2003, 2007 and 2011. This indicator is based on PIRLS 2011 and TIMSS 2011.

#### *Key findings*

In 2011, PIRLS-scores presented small cross-country differences, with most OECD countries scoring above 500 points on a 700 point scale with a standard deviation of 15 (Chart CO3.3.A). The top performing countries included Finland, the United States, Denmark, Ireland and the United Kingdom (in each case with scores above 550 points). By contrast, Belgium (French speaking communities), Norway and Spain were the only OECD countries to participate in PIRLS and reported average reading scores below 520 points.

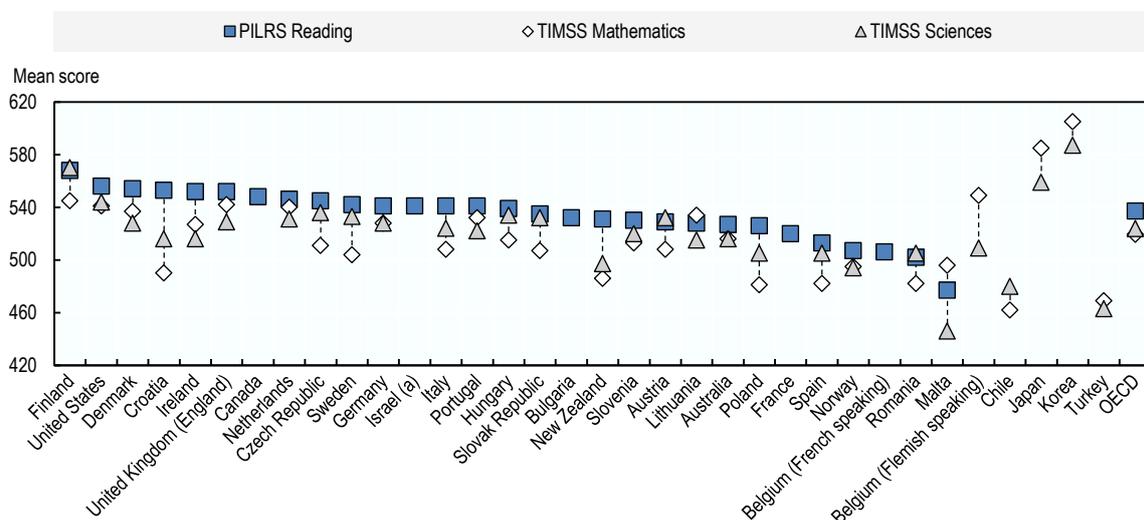
Chart CO3.3.A also shows that cross-country differences in mathematics and science scores are not all that large. Among the OECD countries participating in TIMSS 2011, students in Korea and Japan had the highest scores in mathematics (above 580 points), while students in the Chile, Turkey, Poland, Spain and New Zealand fared less well with scores below 500 points. As for science, cross-country differences were only small. Participating countries with the highest scores in 2011 included Korea, Finland, Japan and the United States (all with scores above 540 points).

Chart CO3.3.B shows gender differences in mean scores on the reading, mathematics and science literacy scales. Results show important gender differences among 10-year olds. On average, across OECD countries, girls perform better in reading literacy than their male peers, while boys perform better in mathematics. In science tests, boys do better than girls, but gender differences in scores are only relatively small (see also CO3.4).

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| Other relevant indicators: CO3.1: Educational attainment by gender and average years spent in formal education; CO3.2: Gender choices in fields of study; CO3.4: Literacy scores at age 15; and, PF1.2: Public spending on education |
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**Chart CO3.3.A: Student performance in reading (PIRLS 2011), mathematics (TIMSS2011) and science (TIMSS 2011)**

Country mean average PIRLS and TIMSS scores, children age 10 or around



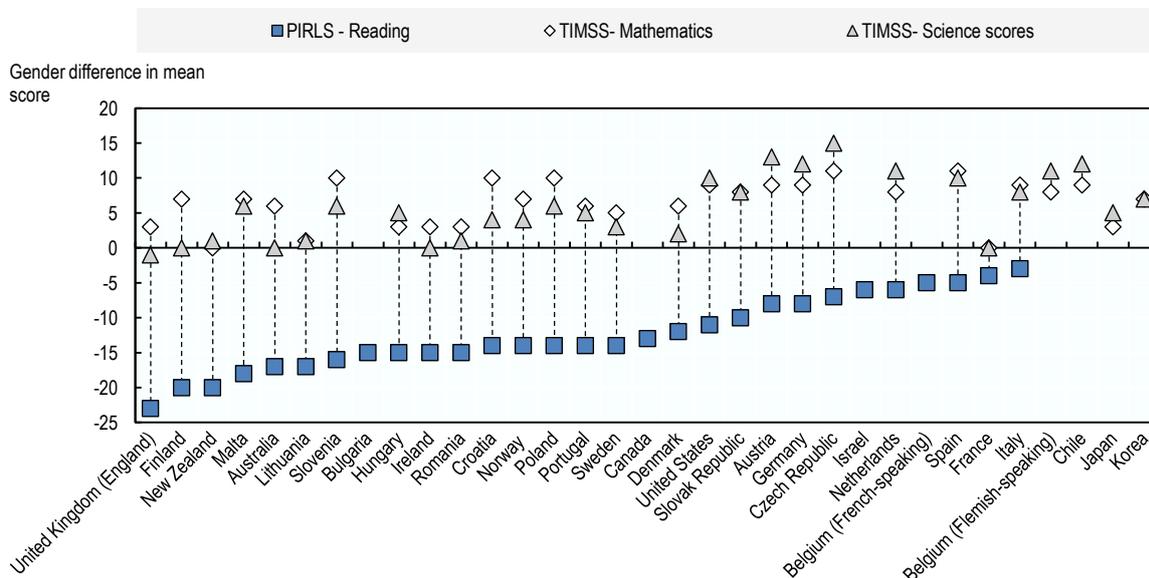
Notes: Data is shown in descending order of reading achievement scores. Data for the United Kingdom are for England only. Data for Belgium were collected and are reported separately for the Flemish- and French-speaking communities.

a) The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Sources: PIRLS 2011 and TIMSS 2011. <http://timssandpirls.bc.edu/>

**Chart CO3.3.B: Gender differences (boys-girls) in reading, mathematics and science scores**

Male-less-female country mean average scores, children age 10 or around



Notes: Data is shown in ascending order of gender differences in reading achievement scores. Data for the United Kingdom are for England only. Data for Belgium were collected and are reported separately for the Flemish- and French-speaking communities.

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*PIRLS scores vary according to background:*

PIRLS and TIMSS collect information about educational resources at home to examine possible differences between children from different backgrounds. PIRLS, for example, has an index on Home Resources for Learning (HRL) based on parent's education, number of books, number of children's books, and the presence of four educational aids: a computer, a study desk, children's books and access to a daily newspaper. Chart CO3.3.C presents the percentage of students classified as having high levels of the HRL index (Panel A) as well as the average reading scores at each level of the HRL index (Panel B).

The first panel of Chart CO3.3.C shows substantial variation in the proportion of households with high educational resources. In the Nordic countries, Australia, Canada and New Zealand, a high percentage of students were classified as living in a household with high levels of resources for learning. Furthermore, in these countries the numbers of students assigned to the low level of the index were too small to be reported. By contrast, in Italy, Slovak Republic and Poland less than 15 % of students in fourth grade lived in homes with high levels of Home Resources for Learning.

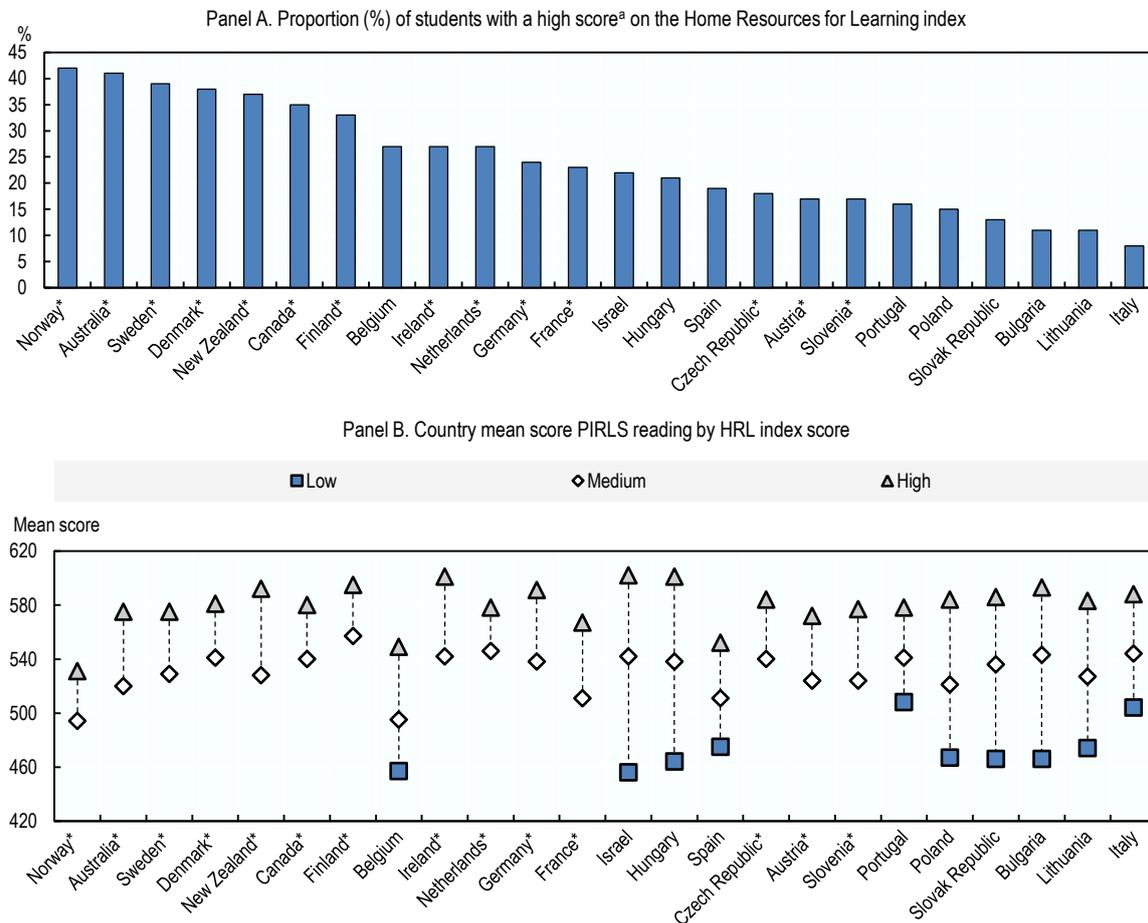
The second panel of Chart CO3.3.C shows that in countries with a larger percentage of students that score high on the HRL index (for example, the Nordic countries), differences in reading achievement by level of educational resources are relatively small. Conversely, in countries with a lower percentage of students with a high score on the HRL index (for example, Hungary, Poland and Israel), the gap in reading scores varies significantly by level of educational resources.

*Comparability and data issues*

PIRLS and TIMSS evaluations are generally conducted when students are enrolled in the fourth year of primary school. However, in some countries this is not the case. In New Zealand and the United Kingdom, where children start school at a very early age, students are tested at the fifth year of schooling.

These comparative studies take place in around 40 different countries, including Belgium with data for two communities (Flemish and French-speaking communities), and England and Scotland for the United Kingdom.

**Chart CO3.3.C: Scores on reading achievement relative to Home Resources for Learning, PIRLS 2011**  
Children age 10 or around



Notes: Data is shown in descending order according to the proportion of children with high HRL index scores. Data for Belgium refer to the French-speaking communities.

a) Students were scored according to their own and their parents' responses concerning the availability of five resources on the Home Resources for Learning scale. Students with Many Resources had a score of at least 11.9, which is the point on the scale corresponding to students reporting they had more than 100 books in the home and two home study supports, and parents reporting that they had more than 25 children's books in the home, that at least one parent had finished university, and that at least one parent had a professional occupation, on average. Students with Few Resources had a score no higher than 7.3, which is the scale point corresponding to students reporting that they had 25 or fewer books in the home and neither of the two home study supports, and parents reporting that they had 10 or fewer children's books in the home, that neither parent had gone beyond upper-secondary education, and that neither parent was a small business owner or had a clerical or professional occupation, on average. All other students were assigned to the Some Resources category. The rest of students were assigned to the medium level (i.e. some resources).

\* In these countries sample sizes were too small to provide robust estimates for students in the low index level.

Sources: PIRLS 2011 <http://timssandpirls.bc.edu/>

Sources and further reading: PIRLS and TIMSS website <http://timss.bc.edu/index.html> has all information relating to the programme including an interactive database, copies of the questionnaires and all associated publications and reports, including the PIRLS 2011 Assessment Frameworks and TIMSS 2011 Assessment Frameworks.