

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

#### *Definitions and methodology*

This indicator presents information on educational performance by gender at age 10, or around. Data for the indicator come from two related international studies: the *Progress in International Reading Literacy Study* (PIRLS), which provides cross-nationally comparable data on the performance of 10-year-old students in reading literacy; and the *Trends in Mathematics and Science Study* (TIMSS), which provides cross-nationally comparable data on the performance of 10-year-old students in mathematics and science. PIRLS defines reading literacy as “*the ability to understand and use those written language forms required by society and/or valued by the individual*” (Mullis et al., 2009: 11). 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 dimension includes: life science, earth science and physical science. The cognitive aspect of both tests evaluates the following thinking processes: knowing, applying and reasoning (Mullis and Martin, 2013: 12, 30).

Both PIRLS and TIMSS evaluations are conducted when students are enrolled in the ‘fourth grade’, that is, 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 (the age range goes from 9.7 to 11.4 years old in both tests).

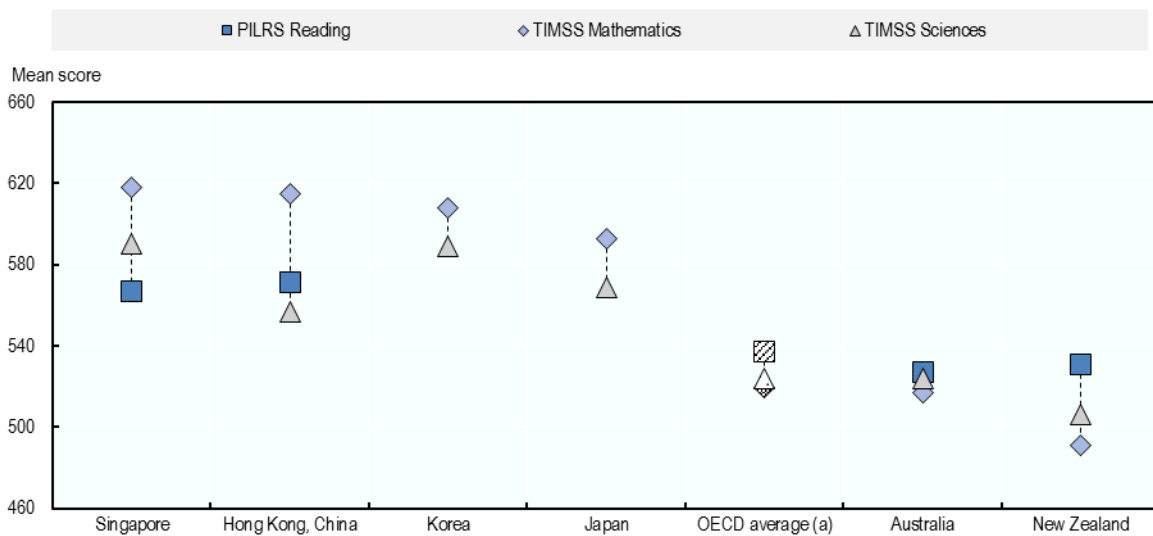
PIRLS assessments have taken place in 2001, 2006 and 2011, with an as-yet unpublished fourth round having taken place in 2016. TIMSS evaluations have been conducted every four years: 1995, 1999, 2003, 2007, 2011 and 2015. This indicator is based on the latest available rounds: PIRLS 2011 and TIMSS 2015. Six of the nine covered Asia/Pacific countries participated in TIMSS 2015 (Australia, Hong Kong (China), Japan, Korea, New Zealand, Singapore), and four in PIRLS 2011 (Australia, Hong Kong (China), New Zealand, Singapore).

#### *Key findings*

In comparative terms, students in most Asia/Pacific countries perform relatively well in both the PIRLS and the TIMSS student assessment studies (Chart CO3.3.A). Student performance is particularly good in mathematics – with the mean average scores for students in Hong Kong (China) (615 points), Japan (593 points), Korea (608 points) and Singapore (618 points) all well above the average for OECD countries, for example (520 points) – but average scores for students in these countries are also above the OECD average for science and, where available, reading too. Students in Australia and New Zealand perform slightly less well, particularly in mathematics. However, especially in Australia, mean average scores across subjects are still relatively similar to the OECD average.

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| <i>Other relevant indicators:</i> CO3.1 Educational attainment by gender; CO3.4 Literacy scores by gender at age 15; CO3.6 Proportion of immigrant students and their educational outcomes |
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Chart CO3.3.A. **Student performance in reading (PIRLS 2011), mathematics (TIMSS 2015) and science (TIMSS 2015)**  
Country mean average PIRLS and TIMSS scores, children age 10 or around



Note: Countries ranked in descending order according to the mean score in TIMSS Mathematics

a) The OECD average refers to the unweighted average across OECD member countries with available and comparable data. See OECD Family Database Indicator CO3.3 (<http://www.oecd.org/els/family/database.htm>) for more detail.

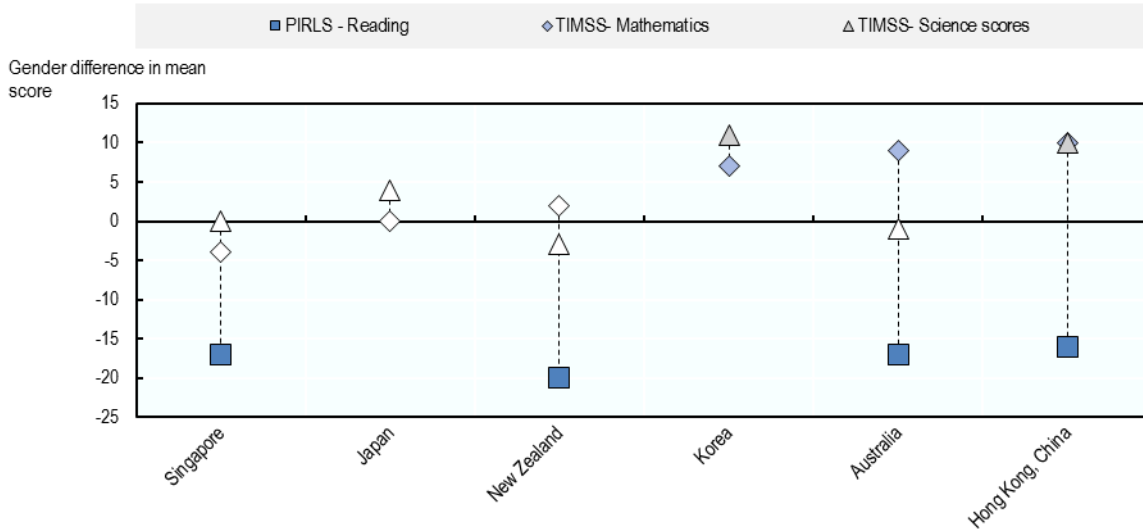
Sources: PIRLS 2011 and TIMSS 2015

Some Asia/Pacific countries see statistically significant gender differences in student performance on the PIRLS and the TIMSS test, even though the tests are taken as early as around age 10 (Chart CO3.3.B). All four of the covered Asia/Pacific countries that participated in PIRLS 2011 saw girls perform significantly better than boys at reading, with the largest gap in New Zealand (20 points). Gender differences in the TIMSS mathematics and science tests tend to be a little smaller, and in some countries (Japan, New Zealand, Singapore) any gender differences in these subjects are not statistically significant. Where they are statistically significant, however, gender differences in mathematics and science tend to run in the opposite direction to those for reading, with boys performing better than girls. In Australia, for example, boys score slightly but significantly better than girls at mathematics, while in Hong Kong (China) and Korea they perform better than girls at both mathematics and science.

#### *Comparability and data issues*

All the data used in this indicator come from the same sources – the PIRLS and the TIMSS international student assessments studies. Both studies put considerable effort into ensuring that the tests are fair, culturally-balanced and properly translated, so as not to disadvantage children from certain groups, countries, or regions. Both also employ consistent and rigorous school and classroom sampling techniques so as to receive nationally representative data from across the various test countries. As a result, issues around the comparability of data and results should be relatively few. For detailed information on the methods used in the two studies, see the [PIRLS 2011 Assessment Framework](#) and the [TIMSS and PIRLS 2011 Technical Documentation](#), and the [TIMSS 2015 Assessment Framework](#) and [TIMSS 2015 Methods and Procedures](#).

**Chart CO3.3.B: Gender differences (boys-girls) in student's reading (PIRLS 2011), mathematics (TIMSS 2015) and science (TIMSS 2015) performance**  
 Male-less-female country mean average scores, children age 10 or around



Note: Countries ranked in ascending order according to the gender difference in mean scores in TIMSS Mathematics. Shaded markers represent statistically significant gender differences and white markers non-statistically significant gender differences

Sources: PIRLS 2011 and TIMSS 2015

*Sources and further reading:* Mullis, I. V., Martin, M. O., Kennedy, A. M., Trong, K. L., & Sainsbury, M. (2009), *PIRLS 2011 Assessment Framework*. International Association for the Evaluation of Educational Achievement, Amsterdam, Netherlands; Mullis, I. V. and Martin, M. O. (eds.) (2013), *TIMSS 2015 Assessment Framework*. TIMSS & PIRLS International Study Center, Chestnut Hill, United States