

### 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., 2017). The mathematics and science evaluations are examined around two dimensions: content and cognitive aspects. 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 et al., 2017, and Mullis et al., 2020).

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 evaluations are around 10 years old (the age ranges from 9.7 to 11.4 years of age in both tests).

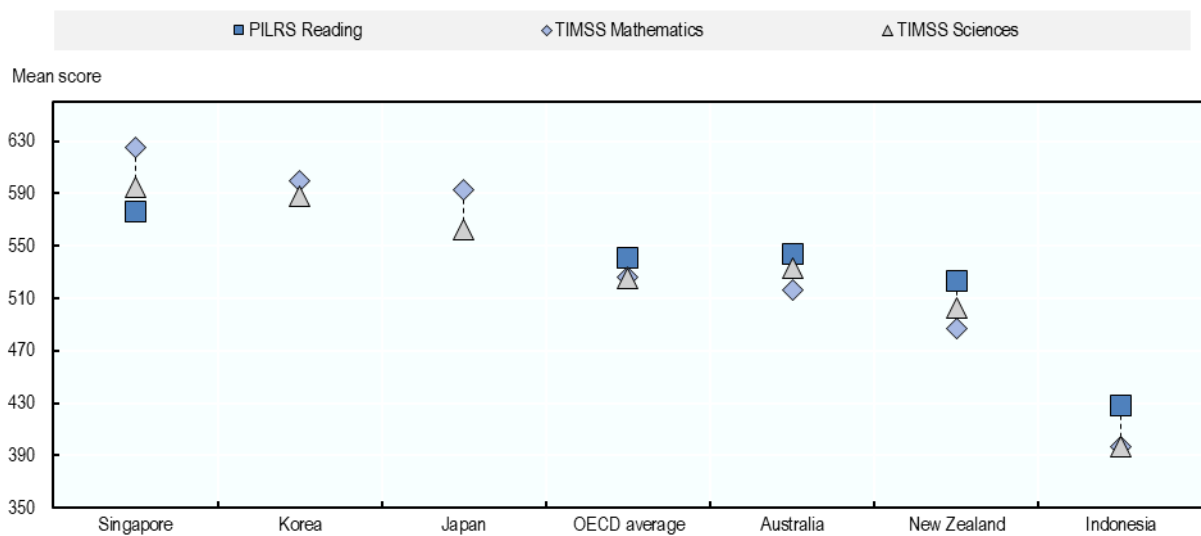
PIRLS assessments have taken place in 2001, 2006, 2011 and 2016, with an as-yet unpublished fourth round having taken place in 2021. TIMSS evaluations have been conducted every four years: 1995, 1999, 2003, 2007, 2011, 2015 and 2019. This indicator is based on the latest available rounds: PIRLS 2016 and TIMSS 2019. Six of the nine covered Asia/Pacific countries participated in TIMSS 2015 (Australia, Indonesia, Japan, Korea, New Zealand, Singapore), and four in PIRLS 2011 (Australia, Indonesia, 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 Japan (593 points), Korea (600 points) and Singapore (625 points) all well above the average for OECD countries (526 points). Average scores for students in these countries are also above the OECD average for science and, where available, reading skills tests too. Students in New Zealand perform slightly less well, particularly in mathematics. Indonesia has the lowest average scores across all three subjects.

<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 2016), mathematics (TIMSS 2019) and science (TIMSS 2019)**  
 Country mean average PIRLS and TIMSS scores, children age 10 or around



Note: OECD average of PIRLS Reading refers 26 OECD member countries with available and comparable data and TIMSS refers 27 OECD member countries with available and comparable data.

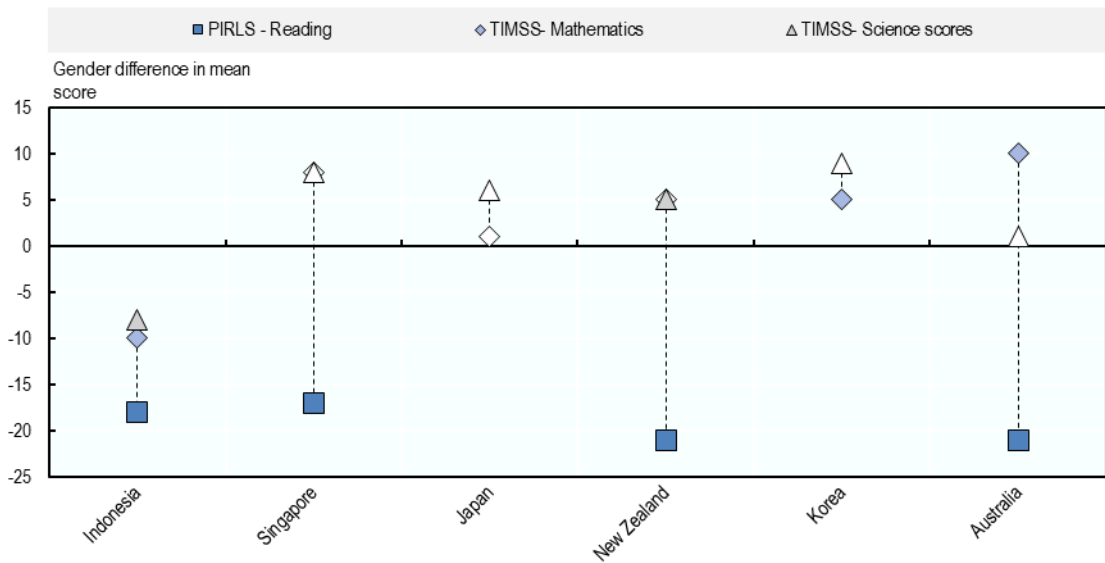
Sources: [PIRLS 2016 and TIMSS 2019](#).

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 Australia and New Zealand (21 points). Gender differences in the TIMSS mathematics and science tests tend to be a little smaller, and in some countries (Japan, New Zealand and Singapore) 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. The exception is Indonesia, where girls perform significantly better than boys in 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 in order to obtain nationally representative data from across the various test countries. For detailed information on the methods used in the two studies, see the [PIRLS 2016 Assessment Framework](#) and the [TIMSS and PIRLS 2019 Technical Documentation](#), and the [TIMSS 2019 Assessment Framework](#) and [TIMSS 2019 Methods and Procedures](#).

Chart CO3.3.B: **Gender differences (boys-girls) in student’s reading (PIRLS 2016), mathematics (TIMSS 2019) and science (TIMSS 2019) 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. Data for Indonesia refers to PIRLS 2011 and TIMSS 2015.

Sources: [PIRLS and TIMSS](#).

*Sources and further reading:* Mullis, I. V. S., Martin, M. O., Foy, P., & Hooper, M. (2017). PIRLS 2016 International Results in Reading. Retrieved from Boston College, TIMSS & PIRLS International Study Center website: <http://timssandpirls.bc.edu/pirls2016/international-results/>; Mullis, I. V. S., Martin, M. O., Foy, P., Kelly, D. L., & Fishbein, B. (2020). TIMSS 2019 International Results in Mathematics and Science. Retrieved from Boston College, TIMSS & PIRLS International Study Center website: <https://timssandpirls.bc.edu/timss2019/international-results/>