



Educational Research Centre

St Patrick's College Campus, Drumcondra, Dublin 9

Results of PISA 2015 Released!

The results of the sixth cycle of the Programme for International Assessment (PISA), sponsored by the Paris-based Organisation for Economic Cooperation and Development (OECD) (of which Ireland is member) were released today. The PISA 2015 assessment was administered to over 500,000 students in 72 countries/economies.¹ PISA 2015 is the first cycle in which PISA has been administered entirely on computer in most participating countries, including Ireland.

PISA is implemented in Ireland by the Educational Research Centre (ERC) on behalf of the Department of Education and Skills. In March 2015, the PISA tests of science (the major assessment domain in this cycle), reading literacy and mathematics (the minor domains) were completed by 5,741 students in 167 schools. The students also completed questionnaires, as did their parents and school principals. The tests were administered by members of the inspectorate of the Department of Education and Skills and test administrators working on behalf of the ERC. Students completed the tests on computer.

In addition to the move to computer-based assessment, PISA 2015 incorporated a number of additional changes including the transition to a new (hybrid one- and two-parameter) scaling model, a new approach to defining the calibration sample (the sample of students on which links to earlier cycles depend), and the way in which not reached items at the end of a test section and country by item interactions are treated. The design of the PISA tests also changed, with equivalent numbers of units and items in major and minor domains completed by most test takers (thereby strengthening the content coverage in the minor domains).

Students in Ireland achieved a mean score on PISA 2015 science (503 points)² that is significantly higher than the average for OECD countries (493). Ireland ranked 13th of 35 OECD countries, and 19th of 70 participating countries³. On reading literacy, students in Ireland achieved a mean score (521) that is also significantly higher than the corresponding OECD average (493), with a ranking of 3rd among 35 OECD countries, and a ranking of 5th of 70 participating countries.⁴ Students in Ireland achieved a mean score of 504 on mathematics, which is significantly higher than the average for OECD countries (490.0).

¹ Only 70 entities had internationally-comparable data.

² PISA scores are scaled to an OECD average of 500 and a standard deviation of 100 in the first cycle in which they are a major domain (2000 for reading literacy, 2003 for mathematics, and 2006 for science).

³ With a 95% confidence interval applied, Ireland's true rank in science lies between 11th and 18th among OECD countries, and between 17th and 24th among all participating countries and economies

⁴ Applying a 95% confidence interval, which takes account of measurement and sampling error, Ireland's true rank in reading among the OECD countries is between 2nd and 6th and between 4th and 8th among all participating countries/economies

Ireland ranks 13th of 35 among OECD countries, and 18th among 70 participating countries.⁵ Singapore ranks first in all three domains, while Japan, Estonia, Chinese Taipei, Finland, Hong-Kong China and Macao China finished in the top six in two domains.

In each domain, there were fewer lower-achieving students in Ireland (those achieving below Proficiency Level 2) than on average across OECD countries. On the other hand, the proportions of high-performing students (those achieving Proficiency Levels 5-6) were slightly below the corresponding OECD proportions in science and mathematics. More students in Ireland than on average across OECD countries performed at the highest levels on reading literacy.

In Ireland, female students achieved a significantly higher mean score than males on reading literacy (by 12 score points) while male students significantly outperformed females by 11 points on science, and 16 on mathematics. The gender gap in reading literacy was smaller than on average across OECD countries, while it was greater for science and mathematics.

The science activities in which students in Ireland participated most frequently include watching TV programmes about science, visiting websites about science topics, and following news of science, environmental or ecology organisations via blogs or microblogs. However, engagement in such activities is lower than on average across OECD countries. Students in Ireland have higher mean scores than on average across OECD countries on enjoyment of science, instrumental motivation to learn science, and interest in science topics. They also have higher mean scores on environmental awareness and environmental optimism. However, male students outperform females on all of these except instrumental motivation where there is no difference between genders.

Students in Ireland also had significantly higher mean scores on measures of interest in ICTs (Information and Communication Technologies), higher levels of perceived ICT competence, and higher perceived autonomy with regard to ICT than on average across OECD countries. However, they engaged significantly less often with ICT at school in general, and with ICT use outside of school for schoolwork. Again, male students in Ireland had higher mean scores than females on a number of ICT measures including interest in ICTs and perceived ICT competence, interest in science topics, science self-efficacy, environmental awareness and environmental optimism.

PISA facilitates comparison between major domain and major domain (for example, science in 2006 and 2015), between major and minor domain (reading in 2009 and 2015, mathematics in 2012 and 2015), and between minor and major domain (science in 2012 and 2015), with the OECD indicating that major to major domain yields the most stable comparisons.

There was a small and non-significant drop in science performance in Ireland between 2006 and 2015 (by 6 score points), which was marginally bigger than the OECD average drop of 5 points. Between 2012 and 2015, the mean score of students in Ireland dropped by 19 score points. Twelve of the top 30 countries in PISA 2012 science also had significantly lower scores in 2015, with mean performance in Hong Kong (-32 points), Poland (-24) and Korea (-22) also falling. On average across OECD countries, performance fell by 8 score points. Among the reasons for these declines are the transition to computer-based

⁵ Applying a 95% confidence interval, which takes account of measurement and sampling error, Ireland's true rank in mathematics among the OECD countries is between 10th and 14th and between 15th and 19th among all participating countries/economies

testing, and, in particular, the inclusions of new items, including items linked to interactive virtual experiments, in the 2015 item pool. An analysis of percent correct scores showed that students in Ireland struggled on the new science items, and especially on items described as interactive. It is unclear to what extent lack of engagement with computers at school or at home for schoolwork impacted on the performance of students in Ireland. In general, those countries with the highest drops in performance in 2015 tended to have had high mean science scores in 2012. This was true of Ireland which had a mean score of 522 in PISA 2012 science.

Finally, mean performance on reading literacy and mathematics in Ireland was at about the same level in 2012 and 2015. This may arise because unlike science, all items in these domains were taken directly from earlier paper-based assessments and transferred to computer with minimal change.

The scores of female students in Ireland fell back to a greater extent than male students in science between 2012 and 2015. In mathematics, the mean scores of both male and female students increased by similar amounts, while in reading between 2012 and 2015, male students improved by 2 points, while female students fell back by 5 points.

The Educational Research Centre plans to publish a number of additional reports over the next few years on such themes as home environment and science performance (drawing on the PISA parent questionnaire) and ICTs and science performance. It is also planned to publish a guide on similarities and differences between PISA and TIMSS (the Trends in International Mathematics Study in which students in Fourth class and Second year in Ireland participated in 2015).

Further information:

The national report on PISA 2015 in Ireland can be accessed at www.erc.ie

International reports on PISA 2015 can be accessed at www.oecd.org/pisa

Sample science items can be viewed in the national report for Ireland. They can be taken interactively at www.oecd.org/pisa

For further information, contact: pisa2015@erc.ie or 01 837 3789

December 6, 2016