

International Comparative Studies, 2015

TIMSS (Trends in International Mathematics and Science Study)

TIMSS assesses the performance and attitudes of 4th Grade pupils (aged 9-10; Year 5 in England, Year 6 in Northern Ireland) and 8th Grade pupils (aged 13-14; Year 9 in England) in mathematics and science. It also compares curricula and pedagogy across countries. The mathematics questions in TIMSS studies are curriculum-based and therefore fairly familiar to the selected sample. The study is conducted every four years and the data, judgements and conclusions are published the following year. There were 57 countries and 7 other jurisdictions in the 2015 study, the outcomes of which were published in November 2016.

The data are standardized to have mean 500 and standard deviation 100 internationally. For the younger cohort, the group of five high-scoring Pacific Rim countries stands 23 points clear of the second highest performing group into which, encouragingly, England falls. Impressively, Northern Ireland tops this second group, its score being the best among European countries. Both countries outperformed Finland, previously seen as a model they should follow. Germany scored below the EU average and France's score collapsed. For the first time, Scotland did not participate; Wales has never taken part.

England

Across England some 8800 pupils from 290 schools were involved in the study. The performance of both the Year 5 and Year 9 pupils was significantly above the international mean, and showed slight improvement since the previous study of 2011. This may be seen as part of a trend which goes right back to the first study of 1995. For the Year 5 pupils in schools in England over this time the TIMSS scores are 484 (1995), 531 (2003), 541 (2007), 542 (2011) and 546 (2015). And there was a notably better performance amongst the lowest performers between 2011 and 2015. The trend in the scores for Year 9 pupils since 1995 has been upwards though not uniformly: 498 (1995), 496 (1999), 498 (2003), 513 (2007), 507 (2011), 518 (2015).

There were also positive findings regarding pupils' attitudes towards their mathematics education. For the 2015 study, schools in England were found to be relatively well-resourced, though many have staffing issues, including unfilled vacancies, and teachers with less experience and poorer job satisfaction than their international counterparts. Social advantage is more telling in England than in other countries in terms of mathematics performance; affluence converts into higher scores, deprivation into lower scores and in an exaggerated way in England.

Matters for concern include performance on Geometry, Shapes and Measures by the younger cohort, and in Algebra by the older cohort. The general progress made by pupils in mathematics between Years 5 and 9 is also worrying.

An overview may be found in the NFER report *Twenty Years of TIMSS in England*, available online at www.nfer.ac.uk/publications/99958/99958.pdf. For fuller details, see *TIMSS 2015 National Report for England*, online at www.gov.uk/government/publications/timss-2015-national-report-for-england.

Northern Ireland

Northern Ireland participated only at the 4th Grade (Year 6) level, and as this was for just the second time, little can be said about trends. As already noted, the score attained was impressive (570), significantly above England and the Republic of Ireland (547). A quarter of Northern Ireland's pupils attained the Advanced International Benchmark; the top-end of the ability range is doing exceptionally well.

Specific points:

- There was an absence of the gender imbalance seen in many countries.
- Number aspects were handled very well but questions on Geometric Shapes and Measures were tackled with less success.
- There is scope for improvement in reasoning.

- There is work to be done on relating mathematics teaching to the real world.
- Pupils were impressed by their teachers, many of whom they categorized as 'very engaging', and this is thought to have been a factor in the overall success.

Further details may be found in the NFER reports:

TIMSS 2015 in Northern Ireland by Burge, Classick and Stacey, available online at www.nfer.ac.uk/publications/TMSS01/TMSS01.pdf.

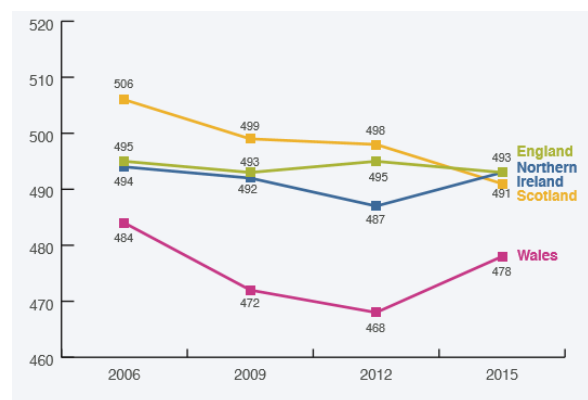
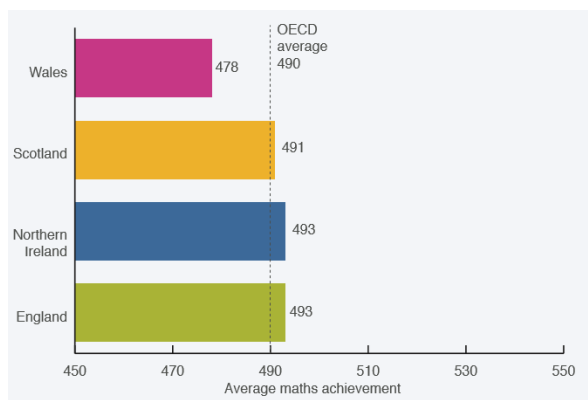
Key Insight from TIMSS 2015 (Northern Ireland), www.nfer.ac.uk/publications/99957/99957.pdf.

PISA (Programme for International Student Assessment)

PISA is an international study, held under the auspices of the OECD every three years. It compares the performance of 15-year olds in mathematics, science, reading and problem-solving. The most recent study was held in 2015, with the results being released in December 2016. Its main focus was on science, but mathematical performance was also studied and especially the application of the mathematics learnt in school to the solution of real-life problems. Taking part in the computer-based tests were over half a million youngsters from 74 countries/jurisdictions. An overview document, *PISA 2015: Results in Focus*, is available online at www.oecd.org/pisa/pisa-2015-results-in-focus.pdf.

Once again, the highest performing jurisdictions were to be found on the Pacific Rim (Singapore, 564; Hong Kong, 548; Macao, 544; Taipei, 542; Japan, 532; Beijing-Shanghai-Jiangsu-Guangdong, 531; South Korea, 524). In the West, the leading countries were Switzerland (521) and Estonia (520), but some countries previously heralded for the quality of their mathematics education, such as Finland, the Netherlands and Belgium, saw their scores fall away.

The NFER has produced *Key Insights from PISA 2015 for the UK Nations* and this is available online at www.nfer.ac.uk/publications/99960/99960.pdf. It includes the charts below which indicate that there is little difference in overall performance in mathematics in Scotland, Northern Ireland and England, whilst Wales performed relatively poorly. With the figures hovering around the OECD average, these results paint a picture of ordinariness and stability (or stagnation) over time.



Specific points:

- Of some concern in England will be the large spread in the performance data, with a reasonable proportion achieving high performance but a significant proportion attaining only a lowly level. By contrast, there is greater consistency in the data for Scotland, which may raise questions about the education of the most-able there.
- The data for England and Wales showed a gender gap in favour of boys; the gender gap in Scotland and Northern Ireland is not significant.

For fuller details, see *PISA 2015 Results (Volume 1: Excellence and Equity in Education)*

www.keepeek.com/Digital-Asset-Management/oecd/education/pisa-2015-results-volume-i_9789264266490-en#.WGUB7IXXKM8.

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29 December 2016