

Programme for International Student Assessment (PISA)

Quick Guide

November 2013

What is PISA?

The Programme for International Student Assessment (PISA) is a survey of the educational achievements of 15 year olds in countries around the world. The programme was launched by the Organisation for Economic Co-operation and Development (OECD) in 1997 and the first survey was undertaken in 2000. It takes place every three years and Wales participated for the first time in 2006.

Participation in PISA is based on pupil age, rather than year group, due to the varying grade levels amongst participating countries and in order to achieve consistency.

The PISA 2012 tests were sat by a sample of 15 year olds in Wales in November 2012. [For an indication of the scale, over 3,200 pupils took part in 2009] Results are broken down for each country and public attention tends to focus on one outcome in particular – the mean value of each country's pupils' achievements and the ranking of these. (Further information contained under 'PISA 2009 results' below).

What does PISA measure?

PISA tests 15 year old pupils, as they near the end of their compulsory education, on their ability to apply their knowledge and skills to address real life challenges, as set out in the tests. This sets PISA apart from other forms of pupils' assessment, 'such as GCSEs, which measure their mastery of the school curriculum'.¹

PISA consists of three domains: Reading, Mathematics and Science. For each PISA cycle, there is a particular focus on one of these; in 2006 it was Science, in 2009 it was Reading, in 2012 this was Mathematics and in 2015 it will again be Science.

The relationship between PISA results, including the importance attached to them, and more traditional forms of pupil assessment such as GCSE has been a matter of debate. The Chief Executive of Wales' largest examination board, WJEC, Gareth Pierce, has offered one possible distinction which is that PISA is primarily for states to evaluate and compare how effective their education systems are, whilst GCSEs enable students to demonstrate their suitability for further and higher education as well as for the employment market.²

PISA questions tend to present a real-life scenario, placing a reading, mathematic, or scientific question within a narrative context of application and problem solving, which is an area of difference to GCSE style questions.

Estyn's Strategic Director, Meilyr Rowlands, told the Policy Forum for Wales conference on Literacy and Numeracy on 23 October 2013 that, in relation to numeracy, pupils in Wales lacked confidence in PISA style questions, which heavily contextualised problems and are expressed in words.

¹ Bradshaw, J., Ager, R., Burge, B. and Wheeler, R. (2010). *PISA 2009: Achievements of 15 year olds in Wales*. Slough: NFER, p1 [accessed 6 November 2013]

² Gareth Pierce, "PISA versus GCSE: where does attainment most matter?", Presentation to the *Institute of Welsh Affairs conference "The second wave in Welsh school improvement"*, 8 March 2013 [accessed 6 November 2013]

Testing and sampling arrangements

The PISA tests are administered in Wales, England, and Northern Ireland by the National Foundation for Educational Research (NFER), whilst Scotland participated in the study separately. The design of the tests, their implementation and the subsequent data analysis is delegated by the OECD to an international consortium led by the Australian Council for Educational Research. By using standardised tests and procedures, and applying strict quality assurance to ensure equivalence in translation and adaptation, the results of the tests enable the programme to compare countries' education systems and the level of achievement of their pupils.

The tests are taken by a sample of 15 year olds in Wales, most, but not all, of whom will be in Year 11. Variables such as school type, region, gender and local authority are used to ensure a fair and representative sample.³ Under the sampling process, the Welsh Government provides a list of all eligible schools and populations (pupils aged 15 at the time of the tests) to the PISA consortium which selects an original main sample. For PISA 2009, this was 152 schools. Schools have the option of declining, in which case schools from replacement samples may be used.

132 schools in Wales took part in PISA 2009, representing 60 per cent of all secondary schools in Wales and 87 per cent of the original main sample, which met the OECD's sampling requirements. A number of pupils are randomly selected from each school in the sample and, in total, 3,270 pupils sat PISA tests in 2009. The Welsh Government has said that the equivalent sampling figures for 2012 will be published along with the results in December 2013, although it has confirmed the sampling process was the same as for 2009.

A list of schools in Wales that participated in the 2012 tests will not be disclosed, which is the same practice as in PISA 2009. This is because all schools taking part were assured by the OECD and NFER that their identities would not be revealed.

In 2009, all pupils took the tests in the main domain which was Reading, whilst random sub-samples of approximately 70 per cent took the Mathematics and Science tests, the results of which were used as an estimate of the full sample for these two domains. The same was applied to the 2012 tests, where all pupils took the Mathematics test and a selection of pupils were assessed in the other two domains. The size of these smaller sub-samples as a proportion of the full sample will be published at the same time as the results in December, along with further information on how the tests were administered.

Reporting arrangements

As with 2009, the 2012 PISA results will be published on the OECD website with the official report including the UK as a whole in the list. However, analysis of the results specifically in Wales will be produced by the NFER, in a similar format to its previous publication, **PISA 2009: Achievements of 15 year olds in Wales**. Tables A1, B1 and C1 in the Appendices to that report provided for international comparisons, listing other countries' scores and their statistically significant differences, if any, to Wales. Overall scores were given for each of the three domains, with additional information on gender differences and distribution of scores by percentile. Further in depth information was included for the main domain (2009: Reading, 2012: Mathematics) including scores for the different elements and skills assessed in the tests.

The PISA 2012 results are scheduled to be published on 3 December 2013 and a Wales specific report from the NFER will be available at the same time.

³ For further information on the sampling arrangements for Wales in PISA 2009, see pages 9-11 of **PISA 2009: Achievements of 15 year olds in Wales**.

PISA 2009 results

The PISA 2009 results were published on 7 December 2010 and are available on the **OECD website**. As already stated, the Welsh results were reported on by the NFER and the then Minister for Children, Education and Lifelong Learning, Leighton Andrews, also issued a **Cabinet Statement** on the same day as the publication of the results.

Wales' performance gave rise to considerable concern both relative to the previous cycle in 2006, from which its scores fell in all three domains, and in terms of comparisons with other parts of the UK and the OECD as a whole.

Wales had lower mean scores in each of the three domains than all of its UK counterparts. When making comparisons of mean scores between countries, PISA uses a test of statistical significance based on whether differences are beyond explanation by merely sampling or measuring error alone. The differences between Wales' scores and those of the other UK nations were significantly different in each of Reading, Mathematics and Science. However, there were no statistically significant differences between the scores in any of the three domains for England, Scotland and Northern Ireland.

Table 2: PISA 2009 mean scores for the UK nations

	<i>mean score</i>		
	Reading	Mathematics	Science
UK	494	492	514
England	495	492	515
Scotland	500	499	514
Northern Ireland	499	493	511
Wales	476	472	496

Source: Extracted from Table 8.1, p46; Table 8.11, p51; Table 8.15, p53; Table A1, p59; Table B1, p74; Table C1, p79, Bradshaw, J., Ager, R., Burge, B. and Wheeler, R. (2010). ***PISA 2009: Achievement of 15 year olds in Wales***. Slough: NFER [accessed 6 November 2013]

Wales' results were lower than the OECD average in each of the three domains of Reading, Mathematics and Science, although for Science the difference was not statistically significantly different. However, for Reading and Mathematics, Wales' mean scores were statistically significantly lower than the OECD average.

- In Reading, Wales' mean score was 476 whilst the OECD average was 493. 29 countries had scores at a statistically significantly higher level than Wales, with 10 countries' scores having no significant difference, and 25 countries significantly lower.
- Wales' mean score in Mathematics was 472, compared to the OECD average of 496. There were 35 countries that had significantly higher scores, three with no significant difference and 26 countries that were significantly lower.
- In Science, Wales' mean score of 496 was significantly lower than 20 countries. However, there was no statistical difference to the OECD average of 501 and 15 other countries, and 29 countries had significantly lower scores.

Tables A1, B1 and C1 in the Appendices to **'PISA 2009: Achievement of 15 year olds in Wales'** provide this information in full, listing other countries' scores and their statistically significant differences, if any, to Wales.

Influence on policy

In his **Cabinet Statement** on 7 December 2010 responding to the publication of the PISA 2009 results, the then Minister Leighton Andrews said “the 2009 figures paint an even more disappointing picture of our performance and progress [than 2006]”. The Minister also asserted that the results could not be underplayed or accounted for by Wales’ demographics and socio-economic profile.

‘PISA is a highly respected and robust measure of the relative performance of educational systems. These results cannot be argued away or excused. We need to face up to the harsh truth: schools in Wales are not delivering the outcomes that our young people need and deserve. These results cannot be excused on the basis of low socio-economic status or the bilingual nature of our nation and education system. They cannot be excused by relative funding levels ...’

Subsequently, in a high profile **speech on 2 February 2011**, Wales’ PISA 2009 results were described as a ‘wake up call to a complacent system’ by the Minister.

Policy responses to PISA formed a significant part of the **‘20 point action plan’** outlined by the Welsh Government in Cabinet Statements on 2 February 2011 and expanded upon on **7 February 2012**. At the forefront of this improvement agenda have been national programmes for both literacy and numeracy, and a national framework to deliver these within the curriculum along with annual national tests for Years 2-9. Other measures have included: up-skilling the teaching profession through a new Masters in Education Practice and revised Continuous Professional Development arrangements; greater accountability through a new School Standards Unit and secondary school banding; and strengthened legislative provisions to tackle school underperformance.

Expectations for 2012 results

The Welsh Government has stressed on a number of occasions that many of its reforms will take several years to have an impact and that the more realistic aim is to achieve progress identified in the 2015 round of PISA results, rather than 2012. The Welsh Government’s ambition is that Wales will be in the top 20 ranked countries when the PISA 2015 results are published in December 2016.

Expectations for the 2012 results have been the subject of several Assembly Questions with the First Minister commenting in **Plenary** on 8 October 2013 that he did ‘expect to see an improvement in [Wales’] PISA results in December [2013]’, and the Minister for Education and Skills answering **WAQ65066** on 10 July 2013:

‘All along, we have been clear that we do not expect to see **large** improvements in the PISA 2012 results. Our target is focused on the results of PISA 2015.’ [my emphasis]

Further information

For further information on **PISA**, please contact **Michael Dauncey** (Michael.Dauncey@wales.gov.uk), Research Service.

See also:

- **Literacy and Numeracy in Wales** (Research Service Research Paper, June 2013)
- **PISA 2009: Achievements of 15 year olds in Wales** (National Foundation for Educational Research, 2010)

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