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KEY STAGE 2 ATTAINMENT OF PUPILS IN SCIENCE IN ENGLAND, 2009/10

Headlines

The results of science sampling tests taken by pupils in May 2010 show that the percentage of 11-year old pupils achieving the expected level is approximately **81 per cent**. The results do not suggest any significant difference in performance between boys and girls. This is the first year that science tests have been taken by a small number of 11-year old pupils. A representative sample of pupils was selected to provide a national figure accurate to approximately ± 1 percentage point.

The science sampling tests are not used to hold schools accountable (either in inspections or School Achievement and Attainment Tables). A difference between the national result of these tests and historic results does not necessarily mean that attainment has truly risen or fallen.

Introduction

All children in maintained primary schools are required to sit National Curriculum tests in English and maths before they move to secondary schools. In 2010, a 5 per cent sample of schools was also required to take part in these science sample tests. The tests are graded according to levels within the National Curriculum¹. Key Stage 2 tests are aimed at pupils working at levels 3, 4 and 5. Children are also assessed by their teachers in their work across the whole academic year; this is known as teacher assessment. Please see the 'Related Publications' at the end of this release to find details of statistics on assessments other than science sampling tests.

Typical age of child (years)	5	6	7	8	9	10	11	12	13	14
National Curriculum Year Group	R	1	2	3	4	5	6	7	8	9
Key Stage		1		2			3			
Expected National Curriculum level at end of Key Stage		2		4			5/6			

Figure 1: Typical age of child related to year group, key stage and expected level of attainment (R denotes reception year)

¹ The following website provides information on how pupils are expected to perform at each National Curriculum level in science for Key Stage 1 and 2:

<http://curriculum.qcda.gov.uk/key-stages-1-and-2/subjects/science/attainmenttargets/index.aspx>

National Curriculum tests are a measurement of achievement against the precise attainment targets of the National Curriculum rather than any generalised concept of ability in any of the subject areas. The National Curriculum standards have been designed so that most pupils will progress by approximately one level every two years. This means that by the end of KS2 pupils are expected to achieve **Level 4**.

This Statistical First Release (SFR) provides information on the achievements of a representative sample of eligible pupils in the 2010 Key Stage 2 (KS2) science sampling tests. As the sample was designed to be nationally representative they provide an estimate of attainment in science nationally at KS2, typically 11 year old pupils.

In previous years science tests for all 11 year olds formed a part of the 'school accountability framework' which meant that tests took place in all schools and the results (as well as being fed back to pupils, parents or their carers) were used as a part of school inspections and school results were published in the Achievement and Attainment Tables. The science sampling tests have been designed solely to give an estimate of attainment nationally and are not designed to be used as a tool to hold schools or local authorities accountable for pupil performance. The sample design is robust at national level only.

Key Points

Level 4 or above

The estimated percentages of children achieving Level 4 or above based on the 2010 Key Stage 2 science sample tests are as follows:

- Boys & girls 81% (95% confidence interval: 80%, 82%)
- Boys 80% (95% confidence interval: 79%, 81%)
- Girls 81% (95% confidence interval: 80%, 82%)

Based on the confidence intervals given it is not possible to conclude that girls perform significantly better than boys.

When the whole Key Stage 2 cohort took tests in 2009 the overall percentage of pupils achieving Level 4 or above was 88%.

Comparisons with previous years are difficult as previous tests were taken under a policy of tests which fed the school accountability framework. These tests do not play any part in school accountability.

Level 5

The estimated percentages of children achieving Level 5 based on the 2010 Key Stage 2 science sample tests are as follows:

- Boys & girls 28% (95% confidence interval: 27%, 30%)
- Boys 29% (95% confidence interval: 28%, 31%)
- Girls 28% (95% confidence interval: 27%, 30%)

Based on the confidence intervals given it is not possible to conclude that boys perform significantly better than girls at level 5.

When the whole Key Stage 2 cohort took tests in 2009 the overall percentage of pupils achieving Level 5 was 43%.

Comparison with national figures based on teacher assessment

The recent publication “National Curriculum Tests and Teacher Assessments at Key Stage 2 & 3 in England, 2010 (Provisional)” provided information on attainment of pupils at the end of Key Stage 2 in science. This showed a decrease in attainment in science at level 4 or above of one percentage point from 86% to 85%. This showed a two percentage point gender gap with girls’ attainment at 86% and boys at 84%. The results of the *science sampling tests* consistently show a lower estimate of attainment (at this level of the National Curriculum) than teacher assessment by at least three percentage points.

At level 5 the difference is even more marked with teacher assessment showing a decrease of 1 percentage point in science between 2009 and 2010 from 38% to 37%. At this level the gender gap is reversed with boys one percentage point ahead of girls at 37%. The results of the *science sampling tests* show a lower estimate of attainment (at this level of the National Curriculum) than teacher assessment by at least seven percentage points.

NOTES TO EDITORS

National testing for all pupils at the end of Key Stage 2 in science was ended following the 2009 tests. They were replaced with teacher assessment and sample testing from 2010. This release provides the outcome from the first of those sample tests.

The figures in this SFR are based on administration of a test similar to past National Curriculum science tests to a representative sample of 27,210 pupils in 747 schools. Two schools who were required to take part did not administer the tests, if they had this would have yielded 749 schools. The tests took place in selected schools on Friday 14th May 2010. Tests and teacher assessments (TA) provide complementary information about pupils' attainment.

Information concerning the selection of the schools that were obliged to administer the test was published by the Qualifications and Curriculum Development Agency in February 2010 and can be found here: <http://www.qcda.gov.uk/sciencesampling> .

These sampling arrangements were not designed to provide robust results at regional or local authority (council) level.

How the assessments are made

Pupils' attainment is assessed in relation to the National Curriculum programmes of study, and pupils are awarded levels on the National Curriculum scale to reflect their attainment.

The Qualifications and Curriculum Development Agency (QCDA) have responsibility for ensuring that standards in the tests remain consistent from year to year. The standard setting process used for the KS2 science sample test in 2010 is consistent with the processes used in previous years for whole cohort science testing at KS2. Two forms of evidence are used in the process: statistical evidence is drawn from the pre-test; and judgemental evidence is provided by the most senior markers on how pupils performed in the test compared to pupil performance on previous tests. National data is available at the level setting meeting to demonstrate the impact of the decisions made but is not used as the basis for decision making. The standard setting process is observed by representatives from the teacher associations and unions and has not been subject to any political interference.

When the tests are marked, there are no quotas set for each of the National Curriculum levels, or underlying assumptions about the proportion of pupils who should be at any particular level. Proportions are decided entirely by how pupils' attainments measure up to the standards of the National Curriculum. The Key Stage 2 tests are marked by experienced markers external to the schools in a process administered centrally by the QCDA.

At present, all pupils who are moving on to the next Key Stage programme of study in the next school year are regarded as being in the final year of their current Key Stage. All pupils in their final year of a Key Stage are eligible to be assessed. Most of the pupils will be in the year group with similarly aged pupils, for example, most 11 year olds will be in year group 6 and at the end of Key Stage 2. Some pupils, however, may be older or younger because they are not being taught with their chronological year group.

Changes to the National Curriculum Test Administrative Arrangements

Pupil performance – the number and proportion of pupils achieving at least the expected level - can be affected by a number of factors which mean that small year on year changes should not necessarily be considered to be significant shifts in attainment. Since National Curriculum tests were introduced over a decade ago, there have been a number of changes to the process by which the tests are run and marked.

These sample tests differ further from whole cohort testing undertaken prior to 2010, in that they have only been administered to approximately 5% of the cohort. These tests were administered in maintained schools only and were marked using an on screen marking system already successfully used to mark Single Level Tests for a number of years. Pupil level results are not available and as such no review processes are provided for these sample tests. Further detail on the differences in administrative arrangements can be found on the QCDA website here:

<http://www.qcda.gov.uk/sciencesampling> .

TECHNICAL INFORMATION

Source of data

The statistics published in this SFR are produced from data provided to the Department by the QCDA on 13th July 2010. The list of schools that were obliged to participate in this sample test was published on the QCDA website in February 2010 and is available here: <http://www.qcda.gov.uk/sciencesampling>

Coverage information

Figures are representative of all **maintained** schools in England with pupils eligible for assessment at Key Stage 2 in 2010; independent schools were not obliged to participate. As such care should be taken in comparison with past years where headline figures included independent schools that chose to participate in the tests. Schools administering Single Level Tests were not obliged to participate.

The science sampling tests were taken in all but 2 schools that were selected in the sample. The tests were completed in a number of schools that did not administer National Curriculum Tests in English and mathematics.

For the calculations showing the percentage of pupils achieving a particular level, the denominator for national results is the number of pupils who are eligible for KS2 tests or teacher assessments. This denominator includes pupils who were working below the level of the test (B), unable to access the test (T), took the test but failed to register a level (N), or were absent (A). Pupils with missing results, or results coded as maladministration, are not included.

Confidence intervals

Figures in this release are based upon a sample of pupils and as a result contain some degree of uncertainty; this uncertainty is captured within the confidence intervals quoted. These confidence intervals are calculated taking into account the complex design of the sample which was stratified by school level eligibility for Free School Meals. Attainment in Key Stage tests is quoted to the nearest percentage point; therefore confidence intervals have also been quoted to the nearest percentage point as point estimates in those intervals would. A 95% confidence interval gives that a 95% chance that attainment of the population falls inside the quoted interval.

Rounding

Any percentages given in this SFR are given to zero decimal places. The rounding convention is as follows: any fractions of 0.5 and above will be rounded up, anything less than 0.5 will be rounded down, e.g. 85.4586 will be rounded to 85; 85.5 and 85.5283 will be rounded to 86.

A National Statistics publication

National Statistics are produced to high professional standards set out in the Code of Practice for Official Statistics. They undergo regular quality assurance reviews to ensure that they meet customer needs. They are produced free from any political interference.

Compliance with statistical policies

The Department has a set of statistical policies in line with the Code of Practice for Official Statistics, these are published here: <http://www.dcsf.gov.uk/rsgateway/nat-stats.shtml> . There are no further revisions or updates planned for this release.

Related publications

SFR23/2010 - National Curriculum Tests and Teacher Assessments at Key Stage 2 & 3 in England, 2010 (Provisional)

<http://www.dcsf.gov.uk/rsgateway/DB/SFR/s000949/index.shtml>

This publication was released at 9.30am on Tuesday 3 August 2010.

SFR26/2010: National Curriculum Assessments at Key Stage 1 in England, 2010

<http://www.dcsf.gov.uk/rsgateway/DB/SFR/s000947/index.shtml>

This publication is scheduled to be released at 9.30 am on Thursday 26 August 2010

SFR32/2009: National Curriculum Assessments at Key Stage 2 in England 2008/09 (Revised)

<http://www.dcsf.gov.uk/rsgateway/DB/SFR/s000893/index.shtml>

This publication was released at 9.30 am on Tuesday 1 December 2009

SFR27/2009: National Curriculum Assessments: Teacher Assessments at Key Stage 2 and 3 in England, 2009

<http://www.dcsf.gov.uk/rsgateway/DB/SFR/s000883/index.shtml>

This publication was released at 9.30 am on Tuesday 27 October 2009

SFR21/2009: National Curriculum Assessments at Key Stage 1 in England, 2009

<http://www.dcsf.gov.uk/rsgateway/DB/SFR/s000867/index.shtml>

This publication was released at 9.30 am on Tuesday 25 August 2009

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