

Education research

Primary Science Survey Report

December 2011

Background

In May 2009 Key Stage 2 science SATs (Standard Assessment Tests) were abolished in England. This followed a boycott of the tests by many head teachers. They were concerned about the effects that the tests were having on young people's education and worried that a repeat of the previous year's marking fiasco might occur, where the results were delayed and their quality questioned.

The loss of science SATs was met with a mixture of optimism and trepidation. The hope was that this change would allow for greater innovation in the classroom, with teachers freed from the need to drill students for narrow external assessments. However, others worried that, as SATs in English and mathematics remained, science would be relegated within schools and viewed as less important. Parents also expressed concerns that they would be less informed about the quality of science teaching in primary schools and their children's achievements in the subject.

The survey

The Wellcome Trust ran an online survey during July 2011. It asked primary school teachers for their views on the status of primary science, the opportunities available to their students and themselves as professionals, and how these things may have changed since the removal of SATs in 2009 in England. The survey was intended to explore anecdotal evidence from teachers suggesting that science was no longer seen as a priority in their schools and establish whether more systematic data collection would be advisable.

This survey was conducted using the 'Bristol Online Surveys' system (www.survey.bris.ac.uk) and was sent to all primary teachers on the National Science Learning Centre (NSLC) database. The NSLC provides high-quality continuing professional development (CPD) for science educators. The teachers on the database are therefore unlikely to be a representative sample from across UK schools and may be more engaged with the importance of primary science. In all, the survey was sent to 10 041 teachers in 6830 schools and 465 teachers responded – this may have included more than one response from a single school, which could potentially skew the results.

Findings

Considering teachers' views on the impact on science teaching and learning since the removal of SATs, 133 examples were given of negative changes and 48 examples of positive change. The large majority (73%) of examples provided by respondents were therefore negative. To quote two examples:

"Now that it is not externally tested, the status of the subject has slipped. In particular, it is given much less teaching time in upper KS2."

"Less time devoted to science and there is less appreciation of science as a core subject. Greater reluctance from teachers to report science achievement at end of key stage and less confidence in doing so."

The top examples of negative change cited by teachers were:

- less teaching time devoted to science
- change to the status of science
- science assessments not done
- reduced curriculum or coverage of the curriculum.

These examples are supported by the fact that 64% of all respondents disagreed or strongly disagreed with the statement: 'Compared with other core subjects (maths and English) science currently has an equal or greater importance placed on it in our school'.

58% of teachers who reported positive changes provided examples linked to a change to the aim of teaching science, from the need to pass tests to aiming to inspire their pupils instead:

"It has been a massive positive because we are not driven by a narrow test and have broadened the science curriculum making it far more practical. Our survey of the children two years ago rated science as the worst subject in the school, this year it was the most popular!"

When considering how their pupils currently experience science in their school, teachers were largely positive:

- 94% of respondents agreed or strongly agreed that 'Our students have the opportunity to take part in practical science work'
- 81% of respondents agreed or strongly agreed that 'Our students have the opportunity to take part in science learning outside of the classroom'
- 67% of teachers agreed or strongly agreed that 'Our students have the opportunity to take part in science-specific enrichment activities'.

Teachers were also asked about the support available to them, but because of the selectivity of the sample, it is hard to infer the wider availability of, for example, CPD. Nevertheless, it is interesting that many teachers commented on the lack of support for science-specific CPD:

"The money for training, CPD is all directed towards literacy and numeracy. Any ideas, such as the SLC [Science Learning Centre] practical science scheme, are rejected as the head teachers are under such pressure from the local authority to perform."

Support from colleagues was also valued, and its absence can be seen as a block to better practice:

"I would like more contact with, and support from, other science coordinators – have initiated some myself. My staff give me a lot of support in their enthusiasm to have a go."

The full set of results is included in the Appendix.

Conclusions






The data collected from this survey provide an interesting first insight into changes that have occurred since the removal of SATs. More robust research is required, with a representative sample from schools across England, to understand the extent of change and how it differs across schools. For example, the positive change of science lessons moving towards 'inspiring pupils' may be countered by the fact that less science is being done – in terms of both time and coverage of the curriculum. The effects also appear to vary across schools, with some noting fewer practical activities and others noting more. Further exploration of these specific changes may therefore find other mediating factors that result in these differing outcomes for individual schools.

In the meantime it is clear that the removal of science SATs has had an impact on the teaching of science in many primary schools. Furthermore it seems worryingly likely that negative changes (e.g. reduced lesson time) are far more frequent than positive ones (e.g. reduced 'teaching to the test').






APPENDIX: PRIMARY SCIENCE SURVEY REPORT (2011) – RESULTS

Section 1: The Status of Primary Science in Your School






1. Compared with **other core subjects (maths and English) science currently has an equal or greater importance placed on it in our school.**

		Number of responses	Percentage of all responses
Strongly Agree:		28	6.0%
Agree:		101	21.7%
Neutral:		37	8.0%
Disagree:		233	50.1%
Strongly Disagree:		66	14.2%

2. Compared with **all other subjects science has an equal or greater importance placed on it in our school.**

		Number of responses	Percentage of all responses
Strongly Agree:		91	19.6%
Agree:		257	55.3%
Neutral:		72	15.5%
Disagree:		41	8.8%
Strongly Disagree:		4	0.9%

3. The importance placed on science in our school has changed **since the removal of SATs.**






		Number of responses	Percentage of all responses
Strongly Agree:		65	13.9%
Agree:		173	37.0%
Neutral:		82	17.6%
Disagree:		104	22.4%
Strongly Disagree:		41	8.8%

3a was a free-response question and categories were therefore chosen to allow the responses to be quantified. Of the teachers who completed the survey 65 submitted responses to this question. These responses were then sorted into two broad categories: those detailing negative changes and those reporting positive changes. Some responses gave more than one example, sometimes including a balance of a negative change with a positive change to a different aspect of their science teaching and learning. Therefore in the 65 responses, 97 examples of change were listed – an average of 1.5 examples per response. Two scorers quantified the responses and disagreed on the categorisation of 16 of the examples given. The results reported below represent the categorisations agreed on by the two scorers.






3a. Please provide any examples of changes to practice in your school that support your response:		
Type of negative change	Number	Percentage of all negative changes
Less lesson time	27	30%
Change in profile/status	18	20%
Reduced curriculum/reduced coverage of the curriculum	13	15%
Science assessment not done/done with less rigour	12	13%
Science data not included in tracking	5	6%
Less subject-specific staff development time	4	4%
Science lessons and books not observed (internally and by Ofsted)	3	3%
Parents less interested in how students are doing	2	2%
Reduced support from management	2	2%
Fewer practical activities	1	1%
Less staff meeting time	1	1%
Teaching confidence in delivering science	1	1%
Total	89	
Type of positive changes	Number	Percentage of all positive changes
Appointment of science specialist	2	25%
Aim of science changed from passing test to inspiring pupils	1	13%
More opportunity for innovation	1	13%
Allowed for the development of better assessments	1	13%
Greater emphasis on science curriculum	1	13%
More time	1	13%
PSQM [Primary Science Quality Mark]	1	13%
Total	8	

Section 2: How Your Students Currently Experience Science






4. Our students have the opportunity to take part in practical science work.

		Number of responses	Percentage of all responses
Strongly Agree:		224	48.2%
Agree:		214	46.0%
Neutral:		19	4.1%
Disagree:		5	1.1%
Strongly Disagree:		3	0.6%

5. Our students have the opportunity to take part in science learning outside of the classroom.






		Number of responses	Percentage of all responses
Strongly Agree:		131	28.5%
Agree:		241	52.5%
Neutral:		66	14.4%
Disagree:		19	4.1%
Strongly Disagree:		2	0.4%

6. Our students have the opportunity to take part in science-specific enrichment activities.





		Number of responses	Percentage of all responses
Strongly Agree:		97	20.9%
Agree:		213	45.8%
Neutral:		75	16.1%
Disagree:		71	15.3%
Strongly Disagree:		9	1.9%

Section 3: Your Experience of Teaching Science in your School

7. As a teacher, I have the opportunity to undergo science-specific CPD.






		Number of responses	Percentage of all responses
Strongly Agree:		112	24.1%
Agree:		211	45.4%
Neutral:		83	17.8%
Disagree:		49	10.5%
Strongly Disagree:		10	2.2%

8. The removal of science SATs has impacted on the teaching and learning of science in my school.

		Number of responses	Percentage of all responses
Strongly Agree:		58	12.5%
Agree:		195	41.9%
Neutral:		100	21.5%
Disagree:		82	17.6%
Strongly Disagree:		30	6.5%

As 8a was a free-response question, categories were chosen that would allow the responses to be quantified. A total of 58 teachers who completed the survey submitted responses to this question. These responses were then sorted into two broad categories: those detailing negative changes and those reporting positive changes. Some responses gave more than one example, sometimes including a balance of a negative change with a positive change to a different aspect of their science teaching and learning. Therefore in the 58 responses, 84 examples of change were listed – an average of 1.4 examples per response. Two scorers quantified the responses and disagreed on the categorisation of four of the examples given. The results reported below represent the categorisations agreed on by the two scorers.

8a. Please list examples of impacts and whether they are positive or negative:		
Type of negative change	Number	Percentage of all negative changes
Less lesson time	17	39%
Change in profile/status	14	32%
Reduced curriculum/reduced coverage of the curriculum	4	9%
Fewer practical activities	4	9%
Science assessment not done/done with less rigour	2	5%
Less subject-specific staff development time	2	5%
Teaching confidence in delivering science	1	2%
Total	44	
Type of positive change	Number	Percentage of all positive changes
Aim of science changed from passing test to inspiring pupils	27	68%
More opportunity for innovation	6	15%
Allowed for the development of better assessments	4	10%
Appointment of science specialist	1	3%
PSQM [Primary Science Quality Mark]	1	3%
More support for staff	1	3%
Total	40	

9. I feel supported in the development and delivery of science teaching and learning.			
		Number of responses	Percentage of all responses
Strongly Agree:		64	13.8%
Agree:		226	48.6%
Neutral:		126	27.1%
Disagree:		43	9.2%
Strongly Disagree:		6	1.3%

As 9a was a free-response question, categories were chosen that would allow the responses to be quantified. Two scorers quantified the responses and disagreed on the categorisation of 36 of the examples given. The results reported below represent the categorisations agreed on by the two scorers.

9a. Please list the different types of support available to you and any other types of support you would like:		
Type of additional support teachers would like	Number	Percentage of all examples of additional support listed
Access to more CPD opportunities	18	26%
More support from other staff members	14	21%
Specialist science advisers	14	21%
Additional funding	10	15%
Practical resources	4	6%
More non-contact time	2	3%
Examples of good practice	2	3%
Clearer messages about policy changes	2	3%
Access to school-specific CPD	1	1%
Being allowed to attend conferences	1	1%
Total	68	
Type of support available to teachers	Number	Percentage of all examples of available support listed
Subject-specific CPD	38	23%
Support from colleagues	33	20%
Generic CPD (e.g. on assessment)	17	10%
LA support	16	10%
Cluster group/network meetings	14	8%
Links with other schools	7	4%
Staff meeting time	7	4%
PSQM [Primary Science Quality Mark]	7	4%
Conferences	6	4%
ASE [Association for Science Education]	6	4%
Non-contact time	5	3%
Internet resources	4	2%
TA [Teaching Assistant] support	2	1%
AST [Advanced Skills Teacher]	2	1%
Kew	2	1%
Educational research	1	1%
Total	167	

Note

Interestingly, not all those who submitted a response to question 3a (about whole-school change) went on to submit a response to question 8a (about their experience of teaching), and vice versa. There were 66 responses to 3a and 59 responses to 8a, but only 26 respondents answered both questions. Looking in more detail at the free-response questions, only seven of those who responded to both 3a and 8a repeated their answers, with most citing different examples and therefore providing additional information.

Because of commonality in the categories of responses between 3a and 8a, as well as the fact that only some respondents provided examples in both (and most of those who did provided different examples in response to each question), the results for 3a and 8a can be combined. This provides a more comprehensive understanding of what changes have occurred since the removal of SATs.

Examples of types of change in schools since the removal of SATs, combined results from questions 3a and 8a		
Type of negative change	Number	Percentage of all negative changes
Less lesson time	44	33%
Change in profile/status	32	24%
Reduced curriculum/reduced coverage of the curriculum	17	13%
Science assessment not done/done with less rigour	14	11%
Less subject-specific staff development time	6	5%
Fewer practical activities	5	4%
Science data not included in tracking	5	4%
Science lessons and books not observed (internally and by Ofsted)	3	2%
Parents less interested in how students are doing	2	2%
Reduced support from management	2	2%
Teaching confidence in delivering science	2	2%
Less staff meeting time	1	1%
Total	133	
Type of positive change	Number	Percentage of all positive changes
Aim of science changed from passing test to inspiring pupils	28	58%
More opportunity for innovation	7	15%
Allowed for the development of better assessments	5	10%
Appointment of science specialist	3	6%
PSQM [Primary Science Quality Mark]	2	4%
Greater emphasis on science curriculum	1	2%
More time	1	2%
More support for staff	1	2%
Total	48	

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