



A review of Ofsted inspection reports: science

This document describes Wellcome's review of the nature and frequency of science reporting in Ofsted inspection reports in the school year (2016/17).

Key points

- In 2016/17, 47.8% of primary school Ofsted inspection reports mentioned science and 15% of reports refer to practical science. This is far behind the 99% of reports that mention mathematics.
- In 2016/17, 81.4% of secondary school Ofsted inspection reports mentioned science and 4.5% mentioned practical science.

Recommendations

- **Every Ofsted full school inspection report should comment on science and inspectors should consider whether there is sufficient:**
 - weekly curriculum time for science – at least 2 hours per week in primary schools to meet the international average¹
 - science-specific continuing professional development in both primary and secondary schools
 - regular monitoring of pupils' progress in science.
- **Ofsted reports should comment on a school's provision of practical science with respect to both its quality and quantity** - it is an invaluable part of science education.

These recommendations are similar to those in the 2013 Ofsted report, [Maintaining Curiosity](#).

Background

Science is a core subject alongside English and mathematics for primary and secondary schools in England and is studied until the age of 16. Despite this, the Ofsted School Inspection Handbook (updated August 2016) makes just three references to science (compared to 46 for mathematics).

Science enables young people to develop their understanding of scientific concepts and make sense of the world around them. It develops transferable skills including problem-solving, reasoning and enquiry and opens the door for young people to a range of careers that are vital to the UK's prosperity. Improving educational outcomes in science and ensuring sufficient numbers of students pursue STEM careers will be essential if the government is to deliver its industrial strategy.²

Primary schools

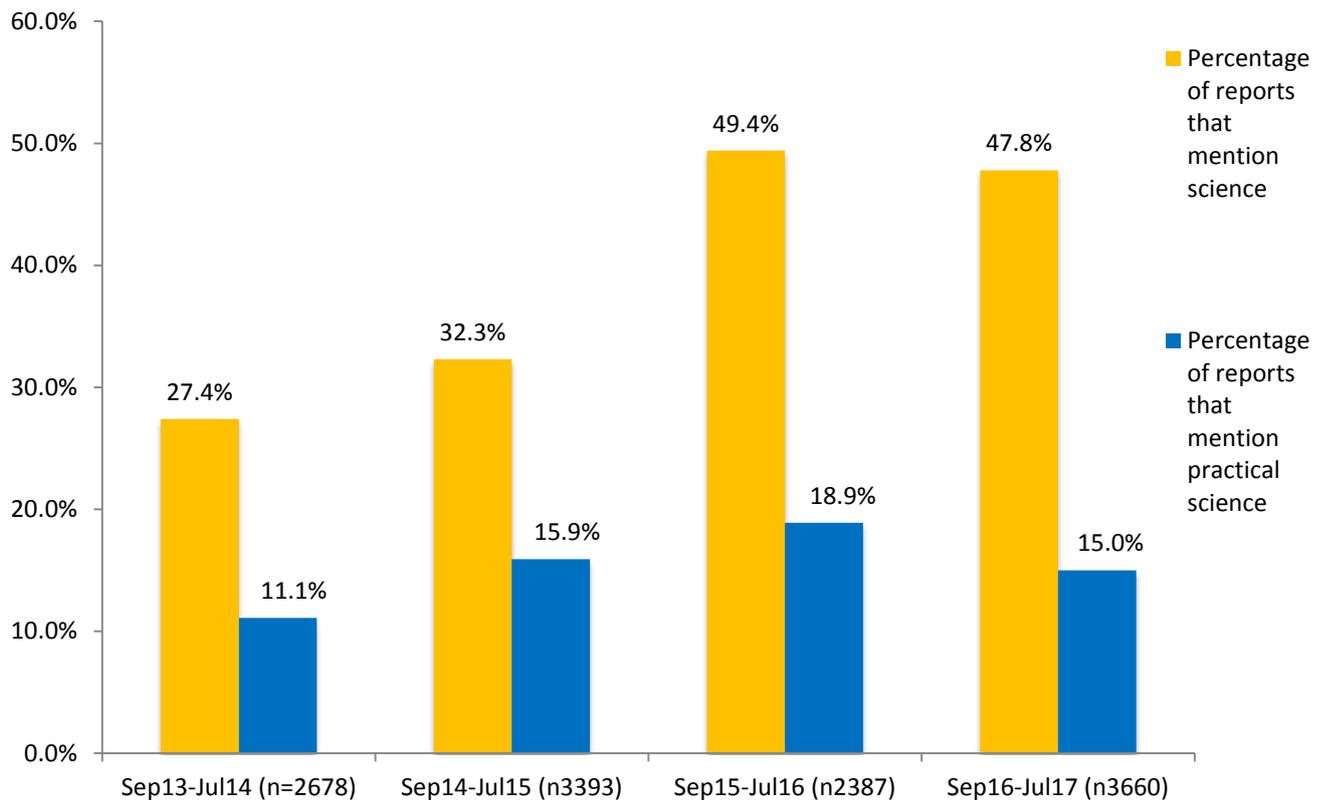
We reviewed all Ofsted inspection reports of primary schools from September 2013 to August 2017. As illustrated in Figure 1, in 2016/17 47.8% of primary school Ofsted reports commented on science and 15% of reports commented on practical science. This is far behind the 99% of reports that mention mathematics. Furthermore, many reports mention science only in relation to how it is being used to reinforce writing skills, failing to make important points about curriculum time and the quantity and quality of practical work.³

¹ [TIMSS 2015 International results in science](#)

² HM Government, [Building our industrial strategy](#), January 2017

³ We manually checked the context of comments on science in 100 reports selected at random from the years 2015/16

Figure 1: Percentage of Ofsted inspection reports of primary schools in England that mention science and practical science from 2013-17



There had been an encouraging rise in the percentage of reports mentioning science and practical science since 2013/14 (see Wellcome’s 2016 [review of Ofsted reports](#)).⁴ This is likely to be in part because between January and February 2016 Ofsted collected specific evidence on science in primary schools during 234 inspections.⁵ They found that two thirds of the schools spent one to two hours on science teaching and a fifth of schools spent, on average, less than an hour a week.⁶ Unfortunately the growth in attention to science has not been sustained.

It is also disappointing to see that there is a decrease in the percentage of reports commenting on practical science. Practical science enthuses and inspires pupils. It is a vital element of learning science, helping pupils to develop enquiry skills and gain scientific knowledge.

The fact that half of inspection reports do not even mention science is a problem: science is a core subject at primary school and science attainment is low – just 23% of pupils reached the expected standard at Key Stage 2 in 2016.⁷ The international average of curriculum time spent on science at primary schools is two hours per week, and yet the average amount of time spent on science in England is 1 hour 24 minutes.^{8,9} **Ofsted inspections should contribute to raising the quality of science in all schools. This should include diagnostic feedback for both teachers and parents on the quality of science – including practical work - in every inspection report.**

⁴ Wellcome, [A review of Ofsted inspection reports](#), 2016

⁵ Ofsted, [Foreign languages and science provision in primary schools](#), May 2016

⁶ This is consistent with research Wellcome commissioned in March 2016: one fifth (19%) of primary school teachers reported that they spent 30 minutes to one hour per week teaching science, while 48% taught between one and two hours. Wellcome Trust – NFER, [Teacher Voice Omnibus Survey Data](#), 2016

⁷ [For context](#), 66% achieved the expected standards in Reading, 73% achieved the expected standards in Grammar, Punctuation and Spelling, 70% achieved the expected standards in Maths, and 74% achieved the expected standards in Writing.

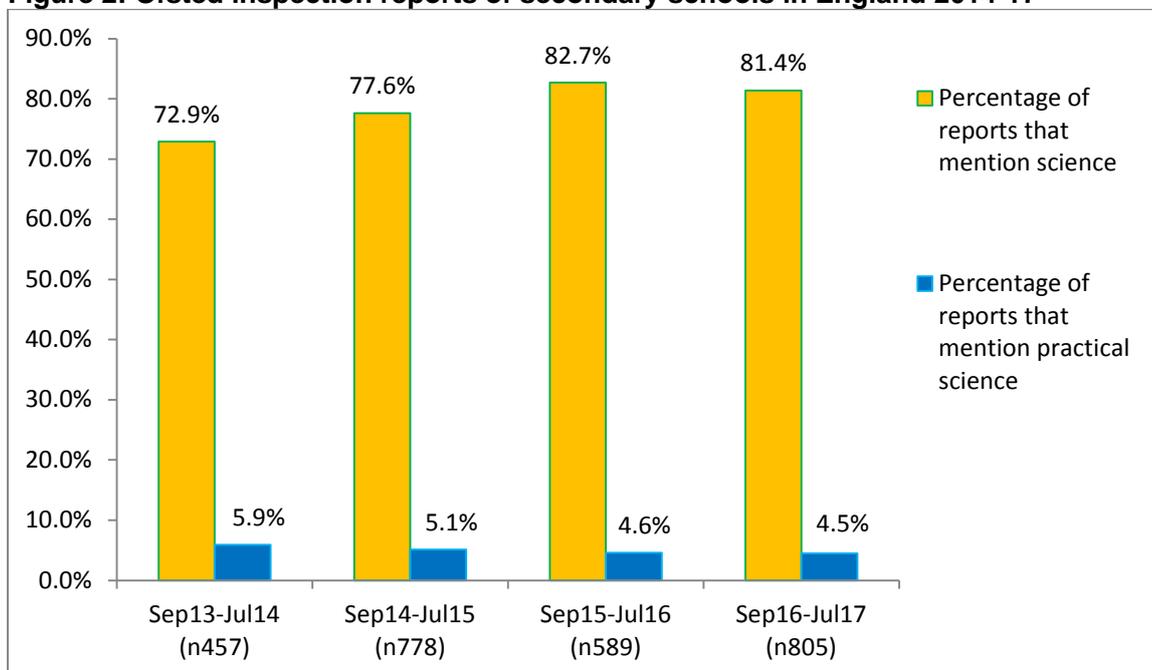
⁸ [TIMSS 2015 International results in science](#)

⁹ Wellcome Trust 2017, 19th September 2017

Secondary Schools

Secondary school Ofsted reports are far more likely to mention science than reports on primary schools. However, the percentage of reports in 2016/17 that mention science (81.4%) remains lower than those that mention mathematics (90.1%), and is comparable with 2015/16 (82.7%). The percentage of Ofsted reports that mention practical science remains very low at 4.5% in 2016/17.

Figure 2: Ofsted inspection reports of secondary schools in England 2014-17¹⁰



The Science Education Tracker, a 2016 nationally representative survey of young people in school years 10 to 13 in England, found that 35% of students said that they were encouraged to learn science by doing practical work and 58% wanted to do more of it.¹¹ The same research found that 29% of students in years 10 and 11 did practical work less than once a month, and while 54% of those from the least deprived areas reported doing hands-on practical work at least once a month, this fell to 36% for those from the most deprived areas.¹² **Ofsted should be using its oversight role to ensure that a high quality curriculum – including practical work - is delivered to all students regardless of the school they attend.**

Assessment is a key driver of teaching and from this year, performance in practical experiments no longer contributes to A level grades in science subjects or UCAS points.¹³ From 2018, practical experiments will also no longer contribute to grades at GCSE. Wellcome is concerned that changes in assessment may contribute to a reduction in the amount of practical work done at schools.

Given the number of significant changes to assessment, in addition to pressure on school budgets and substantial teaching shortages in science subjects, **Ofsted's observations and recommendations on the quality of science at secondary school are particularly important and should be included in every inspection report.**

¹⁰ See notes on methodology below

¹¹ Wellcome, [Science Education Tracker](#), 2017

¹² Wellcome, [Science Education Tracker](#), 2017

¹³ Instead teachers awarded students a 'pass' in the practical endorsement if they consistently and routinely demonstrated competency in relation to 12 practical activities and 15% of the written examination includes questions on practical work.

Notes on methodology

We used the following script to download and search¹⁴ inspections on Ofsted's website (<https://github.com/jdkram/ofsted-report-scraper>). Instructions <https://github.com/jdkram/ofsted-report-scraper/blob/master/README.md>. We manually checked the context of comments on science in 100 primary school reports selected at random from the years 2015/16.

September 2017

¹⁴ We used the search terms: 'scien', 'investigat', 'experiment' and then checked the context in which they were used.