

A review of Ofsted inspection reports: in relation to science and maths

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Overview

This document describes Wellcome's most recent review of how Ofsted school inspections comment on science, including in comparison to maths. In England, science is a core subject which must be taught to all children in primary and secondary schools. However, in recent years, performance measures have focused more on the other core subjects of maths and English, with science receiving less consideration. Ensuring science is considered during Ofsted inspections is a critical part of the accountability system and will also help to highlight the important status of science to schools and teachers.

To understand how science is reviewed by Ofsted inspectors during their inspections, we analysed their reports for 2017/18 and compared how frequently the word 'science' is used, particularly in comparison to 'maths', given that they are both core subjects in England.

Key findings

- Science mentions in primary school inspection reports have risen over the years, and in 2017/18 were included in 61% of reports, but this is still much less than the 100% of reports that mention maths.
- In secondary school reports, mentions of science also increased, to 87%, only 12% behind maths

Recommendations

Similar to previous years, we make the following recommendations, drawing upon those put forward by Ofsted itself.

- Ofsted inspections should contribute to the raising of the quality of science in all schools. Every effort should be made to ensure science is mentioned in every short and full inspection report, equal to that of maths and English. Ofsted's consideration of science should be guided by the recommendations in Ofsted's 2013 report, *Maintaining Curiosity*, that schools should deliver:
 - sufficient weekly curriculum time for science
 - subject-specific continuing professional development for subject leaders and teachers that improves the quality of assessment and feedback for pupils in science
 - regular monitoring of pupils' progress in science to ensure they are supported effectively to reach their potential.
- Hands-on, practical science is an invaluable part of science education. All Ofsted reports, especially full inspection reports, should comment on the quality and quantity of a school's provision of investigative or experimental work.

Background: Science in the national curriculum

Science is a statutory core subject alongside English and mathematics for primary and secondary schools in England and is studied until at least the age of 16. 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 reinforces learning in English and maths. Science qualifications open the door for young people to a rich range of fulfilling careers, and at a societal level it is vital to the UK's future prosperity.

Wellcome believes that schools should give science the same attention as English and mathematics and one way of achieving this is by ensuring that Ofsted inspectors consider science and that teachers and school leaders are aware of this by the subsequent visibility of science in Ofsted reports. Wellcome has analysed Ofsted reports to gain insight into how mentions of science compare with those of maths and English since 2014.

Wellcome's previous reviews of Ofsted

Primary schools

- In 2014/15 we reviewed a sample of 100 Ofsted full primary school inspection reports and found that only 32% of them mentioned science, but 100% mentioned mathematics; 16% of reports mentioned investigation or experiment.
- In 2015/16, we looked at all full primary school inspection reports and found that 49% of them mentioned science, while 100% mentioned mathematics. In comparison, in Wales 100% of primary school reports sampled mentioned science, reflecting the Welsh schools' inspection guidance which specifically states that inspectors should consider results and trends in science. 19% of these reports mentioned investigation or experiment.
- In the 2016/17, we again reviewed all Ofsted full school inspection reports and found that the number of mentions was down slightly to 48% of reports mentioning science, still far behind the 99% reports that mentioned maths. 15% of reports mentioned investigation or experiment.

Secondary schools

- In the 2014/15 sample of 100 reports, 78% of secondary full school inspection reports mentioned science, whereas 100% mentioned maths; 5% of reports mentioned investigation or experiment.
- In the 2015/16 analysis, 83% of reports mentioned science, an improvement, but again far short of the 100% that mentioned maths; 5% of reports mention investigation or experiment.
- In the later analysis in 2016/17, 81% mentioned science and 5% mention investigation or experiment.

Methodology

We wrote a script in Python which:

- downloaded a list of Ofsted reports between September 2017 and July 2018, collecting details about the type of school (academy, special, independent, etc.) and report (full inspection, monitoring visit, etc.)
- downloaded the most recent report for each school as a PDF and then converted the PDF into a plain text document
- searched for the following terms (as a regular expression)
 - 'math'
 - 'scien'
 - 'investigation' or 'experiment'
- saved the results from each step in a comma separated values (CSV) file.

We then consolidated the data from the CSV files into an Excel workbook and analysed the results. In this report, we restricted our analysis to full inspections (as opposed to short or monitoring visits) carried out in mainstream state schools.

The script, the data it generated and the Excel file we used to do the final analysis are all available at <https://github.com/mathickman/ofsted-analysis>.

Individual subjects

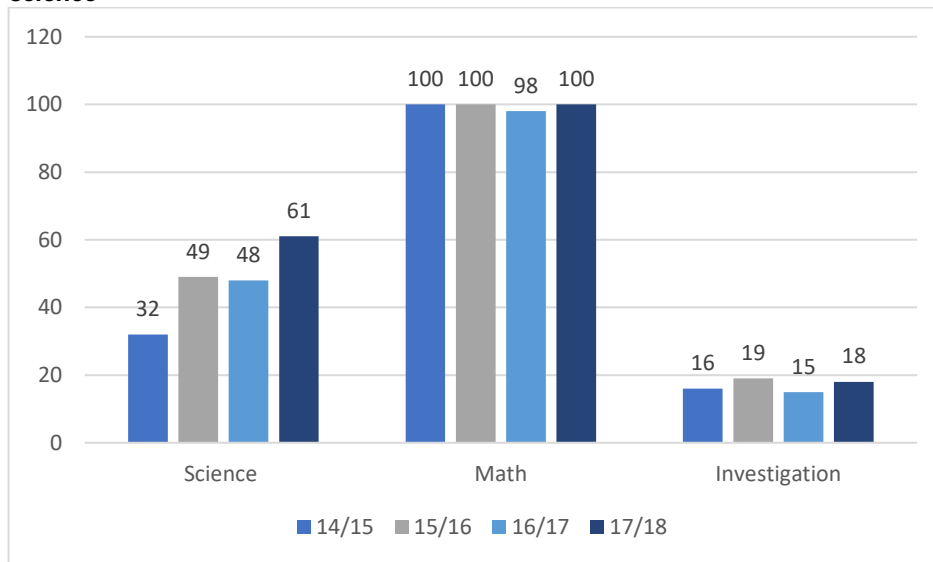
We also explored the mentions of individual science subjects (biology, chemistry, and physics). The individual subjects were mentioned in few reports (7%), and in all but one, science was also mentioned in these reports.

Primary schools 2017/18

The mentions of science in primary school reports have improved upon previous years, with 61% of full inspection reports mentioning science. While this is a positive trend, it still falls short of the mentions of maths (100%).

Primary school reports also saw a slight decrease in the number of investigation/experiment mentions from 20% in 2016 to 18%.

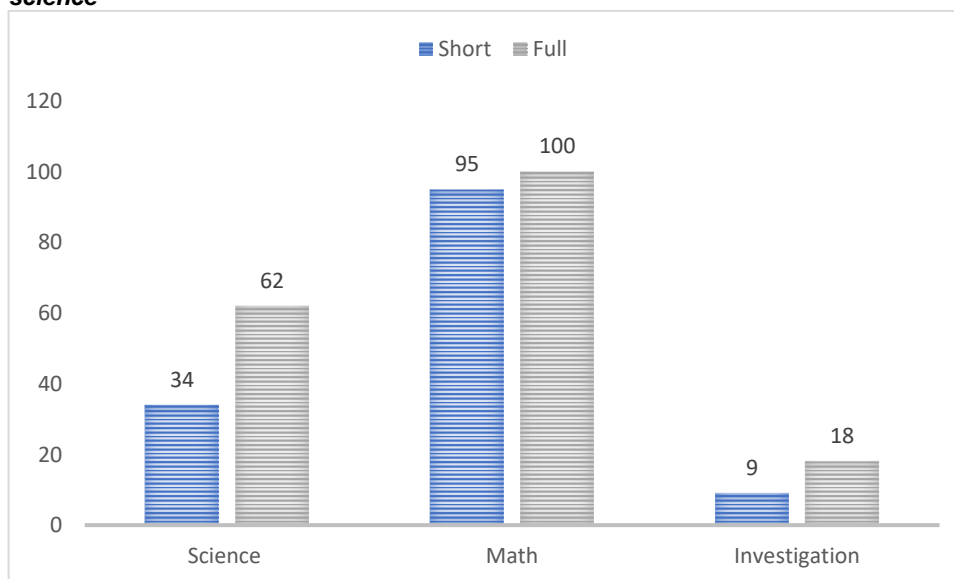
Figure 1. Percentage of Ofsted full inspection reports of primary schools in England that mention science and practical science



Short Reports

We also explored the amount of times science was mentioned in short reports as well as full inspection reports. There was nearly a 50% decrease in science mentions while maths was far more consistent with mentions in the full report.

Figure 2. Percentage of Ofsted short inspection reports of primary schools in England that mention science and practical science

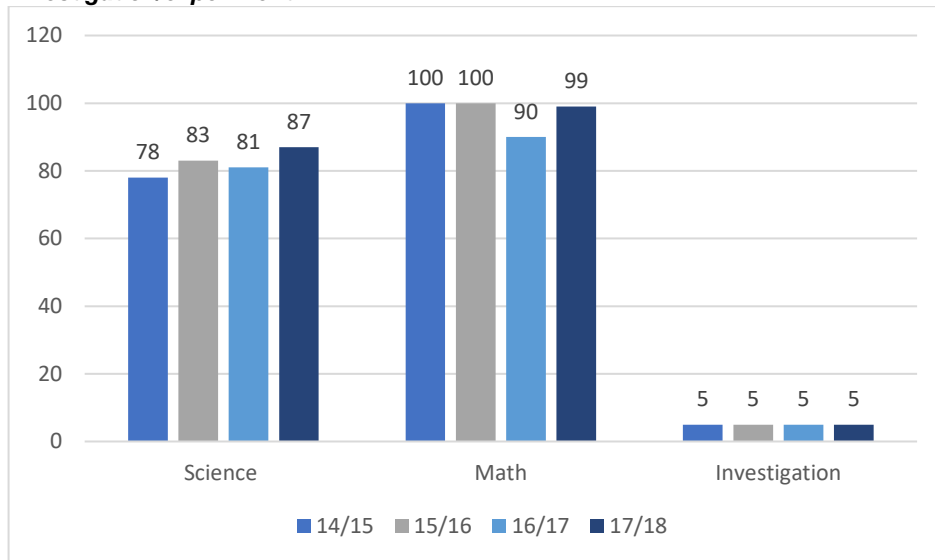


Secondary schools 2017/18

Science mentions in secondary school reports have again improved upon previous years, with just over 88% of full inspection reports mentioning science. While this is a positive trend, it still falls short of the mentions of maths (99%).

Secondary school reports mentioned experiment or investigation at a similar frequency over the years of 5% of reports.

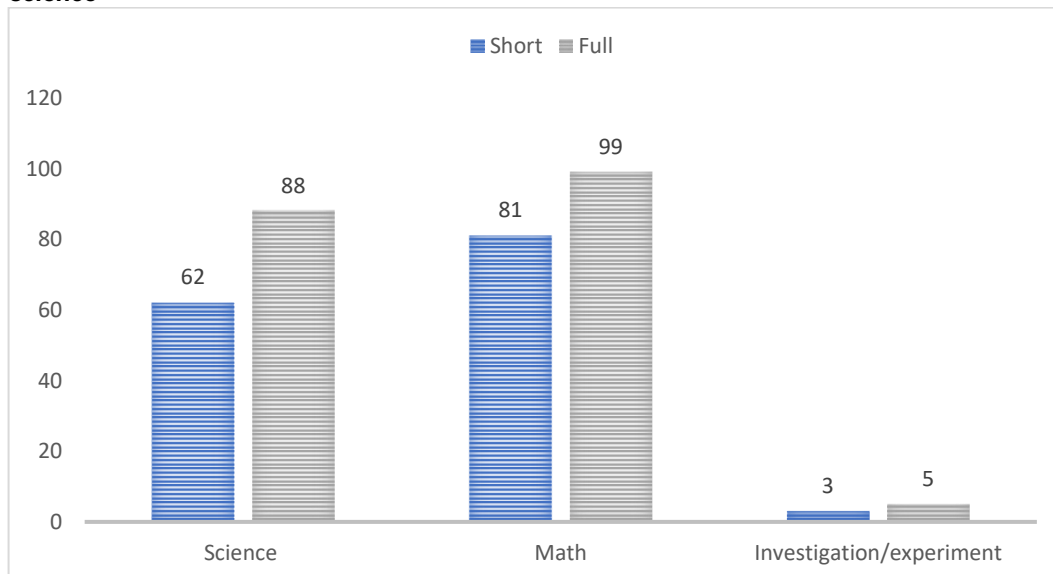
Figure 3. Percentage of Ofsted inspection reports of secondary schools in England that mention science, math, and investigation/experiment



Short Reports

For secondary schools, the difference of 25% of science mentions between the full and short was greater than the difference of 18% for maths mentions. For the short reports, 62% mentioned science compared to 81%.

Figure 4. Percentage of Ofsted short inspection reports of secondary schools in England that mention science and practical science



Conclusion

Over the last four years, Wellcome has been monitoring how many Ofsted reports mention the word science. Ofsted should be applauded for improving consideration of science in their inspection reports. However, science is a core subject and we would expect it to be mentioned in all reports as with maths.

Science is still not being mentioned in 39% of primary school full reports, suggesting that Ofsted may need to advise those that carry out the visits at primary schools to ensure science is inspected and their conclusions reported on. Significant progress has been made with secondary schools; with only 13% of reports omitting mention of science, it will be interesting to see where this sits in next year's analysis.

Of ongoing concern is the lack of focus on investigation and experiments. Given that science is an inherently practical subject, and practical skills are part of the curriculum, more effort needs to be made to ensure schools are placing enough emphasis on practical work and that the quality of these practical experiences are of a high standard. This is particularly important given recent changes to practical assessment.

As Ofsted is developing its new inspection framework and looking more widely at students' experiences beyond their results, we hope that it will consider how to ensure that science is taught in a rounded manner, across the different disciplines and with due consideration of knowledge and skills and the links between them.

We plan to run these analyses next year and we are hopeful of seeing continued growth in science mentions as evidence of the importance in which science is held in the curriculum and by Ofsted inspectors.

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