Department for Education: Primary assessment and accountability under the new national curriculum

Response by the Wellcome Trust

October 2013

Key points

- Effective assessment is integral to high quality teaching. Assessment of science must examine knowledge, conceptual understanding and hands-on, practical skills, and should also be linked to the assessment of mathematics.

- The status of science as a core subject must be reflected in school curriculum and assessment processes, and must be included in school accountability measures – floor standards and the secondary ready thresholds.

- Accountability must not lead to narrowing of schools' science curricula. We recommend that research is commissioned to explore the best way to balance the need for science to be taken seriously through inclusion in accountability measures, but not taught to test, and investigating the possible role of teacher assessment in accountability measures.

- All primary school teachers will need to participate in science-specific continuing professional development (CPD) to prepare them for changes to the science curriculum and support them to develop and deliver robust formative and summative assessment. It will be very challenging for primary school teachers to be ready for roll-out of the new curriculum and assessment requirements from September 2014.

- Primary science specialists need to be developed and we urge the Department for Education to support the roll out of the National Science Learning Centre's Primary Science Specialist CPD[1] from September 2014 to prepare the primary workforce for higher standards in science. Funding should also be provided for primary science specialists in Initial Teacher Training.

Introduction

1. The Wellcome Trust is committed to supporting science education. We work to ensure inspirational, high-quality science education is available to all young people. This will help nurture the next generation of scientists and ensure that all students have the skills and knowledge they need to live in an increasingly technological age.

2. We are pleased to respond the Department for Education's consultation on primary assessment and accountability under the new national curriculum. Our response builds on our submissions to other consultations and reviews relating to the national curriculum and accountability[2,3].

[1] National Science Learning Centre Primary Science Specialist CPD Course https://www.sciencelearningcentres.org.uk/cpd/04ef9a20-aa03-47d6-a228-bd040aad110a/primary-science-specialist/

[2] Reform of the National curriculum in England http://www.wellcome.ac.uk/stellent/groups/corporatesite/@policy_communications/documents/web_document/wtp052330.pdf

[3] Key stage 2 testing and accountability review

3. This response is focused primarily on questions relevant to science education; however some of our comments are applicable to all core subjects.

Consultation questions

Assessment

Question 1: Will these principles underpin an effective curriculum and assessment system?

4. Effective assessment is integral to high quality teaching and we welcome opportunities for schools to deliver the core curriculum in a challenging and relevant way for all pupils. We are also pleased that proposed changes to the national curriculum for primary science emphasise the importance of working scientifically; hands-on, practical work is a defining feature of scientific observation and inquiry.

5. It is important that assessment is used effectively to enable children to progress in learning, building upon developmentally appropriate frameworks. **Assessment in science must consider knowledge, practical skills and conceptual understanding and should be closely linked with assessment of mathematics.** Teachers must have appropriate knowledge of the concepts they are teaching and should assess pupils' development of science understanding and inquiry skills during the course of regular teaching[4].

6. Assessment must be developed to follow, not drive, what is taught. The removal of attainment levels and sub-levels may support this principle, enabling schools to develop a rich curriculum that builds upon all elements of learning, not just essential knowledge. We welcome the provision of good exemplars for schools and note the need for further research to underpin excellent practice in developing robust assessment systems. Teachers will need clear guidance and exemplification to be able to report progress effectively.

Question 2: What other good examples of assessment practice can we share more widely? Is there additional support we can provide for schools?

7. We fully support the increased emphasis on teacher assessment but teachers must be supported to make excellent judgements about progression and attainment. Latest data show that just 5.2% of the primary workforce has a science-related degree[5,]and teachers typically have no more than a science GCSE; it is therefore unsurprising that they report weaknesses in science subject knowledge[6,7]. This will impact upon the quality of science teaching, their ability to design and undertake accurate assessment[8,9].

8. **All primary school teachers will need to participate in science-specific continuing professional development (CPD) to prepare for changes to the science curriculum**, including embedding the principles of working scientifically throughout science teaching,

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http://www.wellcome.ac.uk/stellent/groups/corporatesite/@policy_communications/documents/web_document/wtvm050919.pdf

4 Harlen, W. (2008). Science as a Key Component of the Primary Curriculum: a rationale with policy implications. In Perspectives on Education. The Wellcome Trust, London.

5 23 300 teachers in primary education have a science-related first degree, School Workforce Census (2012).

6 SCORE (2013) Resourcing practical science in primary schools
http://www.score-education.org/media/11808/score%20resourcing%20primary.pdf

7 Murphy, C. & Beggs, J. (2005). Primary Science in the UK: a scoping study. The Wellcome Trust, London

8 Ofsted, 2011, Successful Science: an evaluation of science education in England 2007-2010

9 Royal Society, 2010, State of the nation- science and mathematics education 5-14, The Royal Society, London

and to support them in developing and delivering robust formative and summative assessment of science. **It will be very challenging for primary school teachers to be ready for roll-out of the new curriculum and assessment requirements from September 2014.**

9. While all primary teachers will need science CPD, we also believe that they should have access to specialist expertise in their schools typically through a well-trained science subject leader. We believe that every school should have, or have access to, an expert primary science specialist — an action supported alongside other organisations such as the Royal Society and the Campaign for Science and Engineering. The Wellcome Trust has developed a definition for Primary Science Specialists that has been endorsed by the Royal Society Education Committee[10]. The Trust has also initiated work with the National Science Learning Centre to start to address the deficit in primary science expertise by developing an intensive Primary Science Specialist CPD course the impacts of which are currently being assessed in a randomised control trial[11]. **We urge the Department for Education to support national roll out of this course from September 2014** to prepare the primary workforce for higher standards in science.

10. The Government has committed to funding bursaries for primary maths and PE specialists in Initial Teacher Training. **We believe that there should also be funding for primary science specialists in Initial Teacher Training as set out in the implementation plan for ITT in 2011**[12].

Accountability

11. In 2010, combined targets in primary English and maths were introduced and external science assessments (SATs) eliminated; thus science was not prioritised in primary school accountability measures. The Wellcome Trust and many others welcomed the removal of science SATs in 2010, because it was hoped that it would lead to richer science teaching instead of 'teaching to test'. Unfortunately, there has since been a decline in the status of science in primary schools with reduced teaching time, limited resources and less practical exploration[13,14]. We therefore believe that the core status of science needs to be reflected in school accountability measures, but in such a way that does not lead to a narrowing of the curriculum.

12. Both the floor standards and the secondary-ready threshold should include science, reflecting the status of science as a core subject. The floor standards appear to focus entirely upon the outcomes of statutory assessment in mathematics, reading, spelling and grammar. In the absence of attainment levels, the secondary-ready threshold needs explicit definition for all stakeholders; we anticipate that schools and governors particularly will require clarification of the outcomes expected from statutory assessment to mark this threshold.

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[10] Primary Science Specialist definition (http://www.wellcome.ac.uk/Education-resources/Education-and-learning/Our-work/Teacher-training/WTS052326.htm) is agreed and endorsed by the Royal Society, Campaign for Science and Engineering and the Association for Science Education

[11] National Science Learning Centre Primary Science Specialist CPD Course https://www.sciencelearningcentres.org.uk/cpd/04ef9a20-aa03-47d6-a228-bd040aad110a/primary-science-specialist/

[12] http://webarchive.nationalarchives.gov.uk/20130401151715/https://www.education.gov.uk/publications/standard/publicationDetail/Page1/DFE-00083-2011

[13] The Wellcome Trust, 2011, Primary Science Survey Report http://www.wellcome.ac.uk/stellent/groups/corporatesite/@msh_peda/documents/web_document/wtvm053596.pdf

[14] SCORE, 2013, resourcing practical science in primary schools http://www.score-education.org/media/11808/score%20resourcing%20primary.pdf

13. **We recommend that research is commissioned to explore the best way to balance the need for science to be taken seriously through inclusion in the accountability system, but not taught to test and investigating the possible role of teacher assessment.** In science it is essential that pupils understand how to work scientifically and this should be assessed through observation of hands-on tasks[15]. We would be interested in exploring how teacher assessment could be made sufficiently robust, perhaps by incorporating peer-to-peer benchmarking across different schools.

14. A wide range of school performance indicators, including curriculum enrichment and impact of CPD should be used in a rounded way to hold schools to account beyond the current focus on formal assessment. Schools must provide rich science experiences beyond the national curriculum requirements to provide a firm foundation for science in key stage 3 and beyond.

15. We are pleased that science sampling tests will continue to be used to provide information about science learning at the national level. We suggest that evidence-based research is commissioned to assist schools when comparing their progress and achievements in science with that of other schools.

16. We would be happy to discuss any of these points in more detail if it would be helpful.

[15] Gatsby Charitable Foundation and Wellcome Trust Policy Note: Assessment of Practical Work in Science (2013) http://www.gatsby.org.uk/~/media/Files/Education/Practical%20Science%20Policy%20Note.ashx