

A response to the House of Commons Education Committee's inquiry on Primary Assessment

The **Association for Science Education (ASE)** is the largest subject association in the UK. Members include teachers, technicians and others involved in science education. The Association plays a significant role in promoting excellence in teaching and learning of science in schools and colleges. Working closely with the science professional bodies, industry and business, ASE provides a UK-wide network bringing together individuals and organisations to share ideas and tackle challenges in science teaching, develop resources and foster high quality Continuing Professional Development. The Association for Science Education can trace its origins back to 1900. Incorporated by Royal Charter in October 2004, the ASE operates as a Registered Charity.

The Association welcomes the opportunity to provide written evidence to the House of Commons Education Committee's inquiry into Primary Assessment. This submission has been formulated in consultation with ASE's national Primary Science and Science Teacher Development committees. Together these groups bring expertise in primary science education from a range of viewpoints, including classroom practitioners, educational research, teacher education and professional development.

The purpose of primary assessment and how well the current system meets this

1. Assessment serves two main and equally important purposes in education: to help learning and to summarise what has been achieved at particular times. The first of these, known as formative assessment, or assessment for learning, involves teachers and pupils in gathering, interpreting and using data about on-going learning in order to help children progress towards the goals of a lesson or series of lessons on a topic. There is an increasing corpus of research evidence showing that effectively implementing formative assessment improves learning¹. The second main purpose, known as summative assessment, or assessment of learning, is to provide information about pupils' achievement at certain points in their school careers. This information enables teachers, parents, schools and pupils themselves to keep track of pupils' attainment and progress in learning. Summative assessment also provides data for monitoring the progress of individual and groups of pupils and, together with other information, can be used for school evaluation, improvement and accountability. At the

¹ William, D. (2009) An integrative summary of the research literature and implications for a new theory of formative assessment, in (Ed) H.L. Andrade and G.J. Cizek, *Handbook of Formative Assessment*, New York: Taylor and Francis.

secondary level it is used to certify achievement and for selection into further and higher education.

2. Clearly formative assessment is important due to its role in promoting learning and the growing range of materials being made available to help teachers² is to be welcomed. At the same time, summative assessment is necessary and indeed, in contrast with formative assessment, is often a statutory requirement. For this reason, the focus of our submission is summative assessment. **However, we consider that an important principle guiding decisions about how to collect summative assessment data and how it is used, must be to protect and support the practice of formative assessment.**
3. There are many different ways of collecting data for summative assessment at the primary level: for example, by administering tests, summarising observations and records of learning, reviewing pupils' work over the period of time for which achievement is being reported, embedding special tasks in regular activities. Tests are often the method of choice on the grounds of 'fairness' since they appear to treat all children in the same way. It can be argued, however, that giving all pupils the same tasks is not the same as giving them equal opportunities to show what they know or can do. Written tests of a reasonable length can only cover a limited sample of learning outcomes and contexts, and a different selection can advantage some pupils and disadvantage others. Further, certain competencies and concepts cannot be adequately assessed in tests of the form that can be given to all pupils.
4. In recognition of these short-comings of tests, the current assessment system in England combines testing (SATs) with assessment by teachers (TA) that can encompass a wider range of learning outcomes. However, the apparent precision of tests creates a bias towards their use for high stakes purposes (such as evaluation of teachers and schools) which leads to well-documented³ impacts on teaching, teachers and pupils. These include anxiety in pupils, teaching to the tests, distortion of the curriculum by repeated

² For example a group of London-based consultants has produced a set of materials, called PLAN to help teachers identify aspects of pupils' work that indicate progress towards concepts in the National Curriculum <http://www.ase.org.uk/resources/primary/plan/>

Keogh, B., Dabell, J. and Naylor, S. (2008) *Active Assessment in English*. London: Routledge and Millgate House Publishing and Consultancy, Ltd.

Naylor, S. and Keogh, B. with Goldsworthy, A. (2004) *Active Assessment*. London: David Fulton and Millgate House Publishing and Consultancy, Ltd.

³ Alexander, R. (Ed) (2010) *Children, their World, their Education*. London: Routledge

Harlen, W. and Deakin-Crick, R. (2003). Testing and motivation for learning, *Assessment in Education*, 20(2) 169-207.

Harlen, W. (2014) *Assessment, Standards and Quality of Learning in Primary Education*. York: Cambridge Primary Review Trust

practice tests, neglect of subjects that are not tested and even less attention to pupils too far below the target level.

5. These general considerations can apply to the assessment of all subjects of the curriculum, core and foundation. The ASE's experience is, of course, in science education. Therefore, in addressing the remaining topics of the Education Committee's inquiry we refer particularly to the assessment of science, notwithstanding the application of most points to other curriculum areas.

The advantages and disadvantages of assessing pupils at primary level

1. Science has a unique position in the primary national curriculum for England in that it is designated as a core subject but is not, since 2010, assessed by both SATs and TA as are the other core subjects. There is also unique experience in science education of the effects of withdrawal of SATs, which highlights some advantages and disadvantages of testing at primary level.
2. Shortly after the withdrawal of SATs for science, and following a panel discussion on assessment at an ASE conference, a working group of science teachers and teacher educators was convened to consider alternatives to testing in summative assessment of primary science. The group considered reported experience of national testing that confirmed the general points made in 4 above but with the added negative impact on practical enquiries in science when teachers felt constrained to focus on factual knowledge that was required by the tests. The resulting report of the working group, published by the Nuffield Foundation, recognised that, although there are learning outcomes of science education that can be assessed by short tests, 'it is not possible for all the aims of primary science education to be validly assessed through external written tests.'⁴ This point was also made in the Bew report⁵ and was accepted in the government's response⁶ to the Bew report.
3. To put alongside the disadvantages of testing is the experience of not testing. This was highlighted in a survey conducted by the Wellcome Trust⁷ at the end of 2011: when SATs were removed, teachers reported less time being spent on science and a general reduction in the status of the subject in schools, while English and mathematics remained the top priority. At the same time, these negative changes were outweighed

⁴ Nuffield Foundation (2012) *Developing Policy, principles and Practice in Primary School Science Assessment*. London: Nuffield Foundation p13

⁵ Independent Review of KS2 testing, assessment and accountability (Bew report) p17.

⁶ Department for Education (2011) Independent Review of KS2 testing, assessment and accountability: Government Response.

⁷ Wellcome Trust (2011) *Primary Science Survey Report*. London: Wellcome.

by freedom from being driven by tests and opportunity to include more practical enquiries. **Based on this and other evidence from its membership, the ASE is in no doubt that there should be no return to national tests in science.**

4. The ASE endorses the view that ‘teacher assessment is the most appropriate form of assessment for science at the end of KS2.’⁸ This approach recognises that the situations in which pupils learn also provide opportunities for their learning to be assessed. It also offers the potential to bring together the two purposes of assessment, through using for summative assessment data gathered for formative assessment purposes. A mechanism for doing this was proposed in the Nuffield Foundation report and is taken further in the TAPS⁹ materials supporting TA. In outline, the mechanism involves gathering together evidence of pupils’ learning relating to the curriculum objectives during the period of time for which achievement is being reported. This evidence is then compared with performance descriptor (expected attainment) for the end of that period of time. The suitably moderated judgement is expressed in terms of whether the performance descriptor has been met. No judgement in terms of levels is involved; the result may be expressed as the performance descriptor being ‘achieved’ or ‘not yet achieved’, or using a third point ‘working at greater depth’.
5. Such an approach has much in common with the interim assessment arrangements for 2016. The ASE agrees with several features of these arrangements, in particular:
 - the removal of levels for reporting achievement;
 - the principle of identifying performance descriptors which summarise the curriculum objectives. ;
 - the continuation of sample testing in the form currently being used;
 - the use of data gathered from a wide range of pupils’ work including practical investigation and enquiry
 - the requirement for moderation of teachers’ judgments.

How the most recent reforms have affected teaching and learning

1. The use of the word ‘interim’ has caused concern as it portrays a lack of long term stability. Schools have been uncertain as to the extent to which they should consider the interim framework when devising their assessment policies and procedures or when developing systems that best meet their current needs but may leave them open to criticism. The ASE would like to see the government put in place a framework with a

⁸ Department for Education (2011) Independent Review of KS2 testing, assessment and accountability: Government Response.

⁹ TAPS (Teacher Assessment in Primary Science) is a development supported by the Primary Science Teaching Trust which has produced a framework and guidance material to help teachers with their TA in science.

longer shelf-life as a result of careful consideration of the alternatives and of experience in other jurisdictions. For example, the moderation of TA in Wales, where there have been no SATs since 2004, is conducted in school clusters involving primary and secondary teachers. A 2016 Estyn review of moderation¹⁰ provides some findings that are relevant to designing moderation in the new assessment arrangements in England. For example, it revealed a need to help teachers distinguish between moderation and standardisation, raised issues about whether all work carried out by pupils should be reviewed or the 'latest and best', and emphasised that the selection of pupils' work for moderation should focus on borderline cases rather than work which is clearly meeting, or not meeting, descriptors.

2. The exemplification materials provided by the Standards and Testing Agency provide a limited set of examples, which may lead teachers to think a pupil can meet the standard through a single activity rather than basing judgements on a range of evidence. Further, the examples included only work produced by children in Year 6, although judgments about curriculum objectives taught in previous years are required to complete the summative end of key stage assessment. Work exemplifying the standard when the topic was last taught in KS2 e.g. for chemistry Year 5, should be included. A broader set of materials would also provide examples of quality science teaching to aid effective planning.
3. The original date set for submitting data last year, at the end of May, would have left teachers with the choice of rushing through the curriculum to ensure coverage of all statements before the submission date or accepting that there would not be evidence for all the statements taught in Year 6 and facing the dilemma of whether a child could be secure without meeting these. The revised end of June date was more realistic to enable teachers to teach all the statements in sufficient depth.

Training and support needed for teachers and senior leaders to design and implement effective assessment systems

1. There was a lack of clarity from the government to support teachers with using the interim framework performance descriptors. This, in conjunction with teachers assessing against statements designed for a new curriculum that had not been in place long enough for the Year 6 children to have been taught all the required knowledge, led to schools submitting very variable data. This data ranged from 0% to 100% of pupils meeting all the statements.
2. It is imperative that clear guidance is now given as to whether a child needs to meet all the statements, partly meet all the statements or meet a given percentage of

¹⁰ Estyn (2016) *Moderation of teacher assessment at key stages 2 and 3: a review of accuracy and consistency*. Cardiff: Estyn.

statements to meet the standard. **The Association's view is that a requirement to meet all the statements is necessary so that learning, and assessment for learning, in all areas is prioritised equally and there is coherence across the curriculum.** It is also vital that the government continues to emphasise the point that teachers in Year 2 and 6 are not expected to assess or reteach statements that have been covered in previous years, but instead should use evidence collected at the time of learning, as good practice, to make summative judgements at the end of each key stage.

3. Teachers would benefit greatly from being provided with professional development to support them with effective science planning that builds in formative assessment opportunities. This will enhance the quality of teaching and learning by enabling teachers to use formative assessment to challenge and support all pupils.
4. Publication of the national science sample test outcomes with commentaries on areas where pupils performed well and not so well would be beneficial to teachers when planning teaching and learning, and when moderating pupils' work.
5. Statutory moderation in science would enable better consistency in assessment but would require the training of moderators. This has not been put in place in the past for science, as it has for English and Maths.

Next steps following the most recent reforms to primary assessment

1. **The Association strongly recommends a continuation of the current arrangements for primary science assessment in 2016/17, and beyond, to allow time for the national curriculum to become embedded and for teachers to gather and track pupil data over sufficient years to make moderated judgements against all the performance descriptors.** This welcome period of stability would enable the TAPS and PLAN (see footnote 2) resources, amongst others, to be widely disseminated and used by teachers in a professional learning environment to confidently and consistently assess their pupils' primary science learning and achievements.