



Assessing Pupils' Progress (APP) in **key stage 3 science**

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NATIONAL FOUNDATION FOR EDUCATIONAL RESEARCH

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for Educational Research

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1 Project aims

The overall aim of this research project was to look at the uptake and implementation of Assessing Pupils' Progress (APP) in key stage 3 science following its introduction in January 2009. The findings from this project will provide science specialists with an overall picture of the current assessment context and identify areas where further support is needed.

The project had three components.

1. A brief review of the policy context in which APP is being introduced.
2. The results of two questionnaires sent to all Local Authority (LA) secondary science consultants in England: one in May 2009 and the other in September 2009.
3. A review of materials and resources available for supporting APP in science at key stage 3.

The aim was to answer the following research questions.

- What is the recent policy history prior to the introduction of APP in science at key stage 3?
- What is the current situation in England concerning the implementation of APP in science?
 - How are LA science consultants supporting the schools in their LA?
 - How do LA science consultants perceive APP is being implemented in science lessons?
 - Do LA science consultants perceive any barriers to the implementation of APP in science?
 - What do LA science consultants expect to be the impact of APP in science?
- What support materials and resources are available to LA science consultants and teachers to help them implement APP in science?
 - What is the quality of the materials being used by science consultants and teachers?

- Can criteria be devised to identify features of good quality support materials and resources?
- What do LA science consultants and teachers need to help introduce APP?
- What do LA science consultants and teachers need to sustain effective APP?

2 Introduction

2.1 Policy context

2.1.1 What is Assessing Pupils' Progress (APP)?

The government is currently investing £150 million over three years (2008 – 2011) to help schools in England take a strategic approach to assessment, with the aim of securing consistent good practice. The government sees APP as a way of reliably linking National Curriculum levels to effective classroom day-to-day assessment.

APP is a structured approach designed to strengthen classroom assessment, resulting in a clear profile of pupils' achievements across a whole subject to inform and shape future planning and target setting. APP aims to enable teachers to:

- use diagnostic information about pupils' strengths and weaknesses to improve teaching, learning and rates of pupils' progress
- track pupils' progress over a key stage or longer.

The APP approach particularly supports *periodic* assessment, when teachers sum up progress over the medium term and adjust their curriculum planning. It also aims to provide support for *day-to-day* assessment and at *transitional* points between year groups, schools and phases. These three linked aspects of assessment are summed up in the government's *Assessment for Learning Strategy* (DCSF, 2008).

The view is that, through using APP materials, 'teachers can make more consistent level-related judgements in all National Curriculum subjects' (DCSF, 2009a, p3). APP aims to put the value back into teacher assessments so that teachers are always considered professionals, and it also aims to have common assessment criteria across key stages.

2.1.2 What are the principles of APP?

APP is a method of building up teachers' assessment judgements of National Curriculum levels by means of sub-categories known as assessment focuses (AFs). It supports planning for progression in learning, and should help

teachers to develop their skills and judgements in assessing pupils' progress. APP should be based on a wide range of evidence, be personalised and integrated into teaching and learning, and should yield both formative and summative information which feeds into curriculum planning (identifying gaps in teaching) and personalised learning (gaps in pupil understanding).

2.1.3 The APP resources

The National Strategies and the Qualifications and Curriculum Development Agency (QCDA), formerly the Qualifications and Curriculum Authority (QCA), have produced a range of resources to support LA science consultants and teachers implementing APP in key stage 3 science. The materials consist of:

- *Assessing Pupils' Progress in secondary science at key stage 3: Teachers' handbook* – this explains the whole-school context for assessment, and introduces APP as a tool for periodic assessment (DCSF, 2009a).
- *Assessing Pupils' Progress in secondary science at key stage 3: Standards files* – the Standards Files aim to help departments reach consistent and reliable judgements about National Curriculum levels in science and provide exemplifications of national standards (DCSF, 2009b).
- *Assessing Pupils' Progress in secondary science at key stage 3: Assessment guidelines* – set out level-related APP assessment criteria for science (see DCSF, 2009a). These are available in two formats: an A3 assessment guidance poster, covering levels 3 to 8 and a set of A4 versions, covering two National Curriculum levels on each sheet (DCSF, 2009c).
- *Assessing Pupils' Progress (APP) guidance for senior leaders* – contains additional support for departments implementing the APP approach (DCSF, 2009d).

2.1.4 Timescale and roll-out

APP in science at key stage 3 was launched by the National Strategies in January 2009. Prior to this, there had been a two-year trial period (2007–2008) during which eight LAs and 39 schools were involved in a pilot. The plan was for LA secondary science consultants to deliver the APP science training materials to a lead teacher from each school in England implementing APP (this is not all schools as APP is non-statutory). The selected lead

teacher then used a variety of teaching techniques and activities to trial APP during the spring and summer terms in 2009. In September 2009 those schools that opted to introduce APP were expected to thoroughly embed it into their year 7 science curriculum, with the view that by 2011 all key stage 3 classes will be taught using APP.

2.1.5 APP, science and assessment

The previous Programme of Study (PoS), introduced in 1999, was content based and viewed by some science specialists as too prescriptive. While others saw this as beneficial, it was generally felt the prescriptive nature limited how flexibly science could be taught in the classroom. In order to rectify this, a new PoS was introduced in September 2008, to be taught to the new year 7 intake from that year onwards. The new PoS in science aims to provide:

- a curriculum which is broader and more relevant to pupils at key stage 3
- a better balance between content and scientific processes or How Science Works (HSW) (covers areas of skills development: explanations, argument and decisions and practical and enquiry skills)
- less prescriptive range and content statements
- greater flexibility for teachers.

The intention of the new PoS is that the theories which underpin the study of science and HSW should be taught through the key concepts and key processes it sets out. This is where the link to APP becomes obvious as these two areas are skills based. APP is intended to support their assessment, and ultimately their development. ‘The more HSW opportunities on offer, the more opportunities to gather the evidence [for APP] will be found’ (Harden, 2009, p.26).

APP is a new approach to assessment as it focuses on skills rather than being content driven. It aims to provide a structured approach to teachers’ periodic assessments in science. The range and content sections of the PoS are not explicitly assessed through APP. However, the Framework for science (with strands of development that describe progression in learning and set out a minimum expectation for the progression in learning of most pupils) suggests that the range and content sections of the new PoS should be treated as contexts for developing knowledge, skills and understanding of HSW (and, therefore, APP), in addition to defining the knowledge to be acquired.

The APP assessment criteria ‘illustrate[s] the key characteristics of pupils’ performance, identifying the things that they say and do that indicate achievement at a particular National Curriculum level in science’ (Slade, 2009, p.10).

Science is split into five assessment focuses (AFs). Criteria are set for each level within each AF. The AFs are process based, assessing skills that can take their content from any part of the science curriculum.

AF1: Thinking scientifically. This is concerned with how models or analogies can be used to develop and strengthen explanations. In doing so it aims to develop pupils’ evaluation skills. At the highest levels this AF requires pupils to analyse how new ideas and theories are challenged by the emergence of further evidence.

AF2: Understanding the applications and implications of science. This looks at the relationships between the application of scientific ideas and developments, and how they impact on individuals, society and the world. This AF also covers the ethical and moral consequences of technological developments. In addition, it includes the aspects of science that can be used within particular jobs or roles.

AF3: Communicating and collaborating in science. This requires pupils to develop skills to distinguish between opinion and evidence in contexts related to science, and to use evidence to support or challenge scientific arguments. It also aims to develop pupils’ skills in choosing appropriate methods to communicate qualitative and quantitative data. It also develops pupil understanding of the advantages of collaborative working in science.

AF4: Using investigative approaches. This applies scientific knowledge and understanding to the investigative approaches used to carry out safe practical work in science, and to collect reliable and valid data.

AF5: Working critically with evidence. This is concerned with how pupils analyse and interpret data to reach scientific conclusions based on evidence. It also develops pupils’ evaluation skills of the methods used and their limitations.

Adapted from *Changes in assessment: reality or illusion? Assessing Pupils’ Progress in Science* (Slade, 2009, p.10) and the *Assessment criteria: science* (DCSF, 2009a).

2.2 Research methods

2.2.1 Questionnaire for local authority secondary science consultants

LA secondary science consultants were surveyed because they are responsible for helping schools implement APP in science at key stage 3. Two online questionnaires were developed and sent out to all LA science consultants in England: one in May 2009 and the other in September 2009.

Questionnaire 1 (see Appendix 1a) consisted of 20 questions. Following an analysis of the respondents' answers, questionnaire 2 was developed further. Questionnaire 2 (see Appendix 1b) consisted of 26 questions. The increase in the number of questions was due to additional issues raised by the responses to questionnaire 1. Some of the questions remained the same from questionnaire 1 to questionnaire 2, but others were developed slightly in order to improve their functioning.

The majority of the questions in the questionnaire were open response (qualitative). This gave respondents the opportunity to respond in their own words rather than in a predetermined structure. In order to group similar responses, and make it easier to draw valid conclusions, many of the open response questions were coded.

For both questionnaires, all of the 150 LAs in England were asked if they could supply contact details for their secondary science consultants. All those LA science consultants for whom email addresses were obtained were sent by email a link to the online questionnaire, along with log in details and a password. Science consultants, whose LAs did not provide any email addresses, were sent the same email but it was sent to the NFER link person in each LA with the view they would forward the email to the appropriate person. The same procedure was followed for the second questionnaire in September 2009.

The target for completion of the questionnaires was 50 consultants from 150 LAs (33 per cent of the total number of LAs).

Table 2.1: Number and percentages of completed questionnaires

	Achieved		
	Number	Percentage of target (%)	Percentage of all LAs (%)
Questionnaire 1	57	114	38
Questionnaire 2	47	94	31

In total, 28 LA science consultants completed both questionnaire 1 and questionnaire 2.

Respondents to the questionnaires were asked to provide details of the number of LA secondary science consultants employed by their LA. The numbers ranged from one within the LA (55 per cent of all respondents to questionnaire 1 and 2) to four (four per cent of all respondents to questionnaire 1 and 2). A large proportion of science consultants were found to be working with between 11 and 20 schools in their LA.

3 Main findings

On balance, positive responses about APP outweighed negative ones, and this general feeling was the same between questionnaire 1 (May 2009) and questionnaire 2 (September 2009). The LA science consultants believed that APP in key stage 3 science will make a positive contribution to teaching and learning in science.

The majority (64 per cent in questionnaire 2, 61 per cent in questionnaire 1) said responses from teachers had also been positive. Despite this, 31 per cent of respondents from questionnaire 2 and 27 per cent from questionnaire 1, identified some concerns. Comments such as ‘good idea but complex to implement properly’ and ‘very positive amongst vast majority of teachers although still some concerns about the process’ typified these responses.

Of the schools the LA science consultants work with, the majority were reported as incorporating APP into their teaching of key stage 3 science. This is potentially surprising given APP is non-statutory. An article in *The Times Educational Supplement* made this very clear: ‘Teachers are being reassured that a scheme designed to help them to monitor pupil development [APP] [...] is not compulsory’ (Stewart, 2009, p.13). From the consultants who participated, only a small number of schools were reported as not incorporating APP into their teaching of key stage 3 science.

This high level of participation may have been due to the sample of LA consultants who responded to the survey. Consultants with a supportive view of APP may have been more likely to respond and may also have encouraged more of the schools they work with to take up the programme. Questionnaire 2 asked LA science consultants to explain why some schools have opted not to incorporate APP into key stage 3 science: 19 per cent said these schools felt their current systems for assessment were adequate and, therefore, APP was not necessary. A further 19 per cent said the schools had not given a reason.

3.1 Implications for science

A new National Curriculum at key stage 3 was introduced in September 2008, to be taught to the new year 7 intake from that year onwards. In science the previous PoS, introduced in 1999, was content based and viewed by some science specialists as too prescriptive and ‘overbearing’ (Oates, 2009). It was believed, by some, that this limited teachers’ flexibility in how they teach science in the classroom and reduced pupil engagement. The new PoS in science aims to provide:

- a curriculum which is broader and more relevant to pupils at key stage 3
- a better balance between content and scientific processes or How Science Works (HSW)
- less prescriptive range and content statements
- teachers with greater flexibility.

From the responses to the completed questionnaires it would seem that LA consultants feel that some of the approaches to the new PoS, facilitated by APP, are becoming evident in teaching and learning. Approximately a quarter of all respondents (from both questionnaire 1 and 2) believed that the introduction of APP was supporting the development of HSW from the Framework for secondary science. The Framework sets out the learning objectives of the knowledge, skills and understanding that need to be acquired in science across a period of time. HSW is one of five strands of science to be taught across year 7 to year 11. There were a large number of comments relating to APP ‘improving teachers’ understanding of HSW’, and supporting, focusing, emphasising and promoting the teaching of HSW. In response to an open question, 36 per cent of respondents in questionnaire 2 and 14 per cent in questionnaire 1 identified the skills-based nature of APP as a positive.

Eleven per cent (questionnaire 2, seven per cent in questionnaire 1) also held the view that the introduction of APP was allowing teachers to have greater creativity in how they teach science. One consultant stated: ‘It allows the new science PoS to be taught in a broad and creative sense.’ This is a view shared by Harden (2009):

If APP is the initiative that prompts departments to include a wide range of interesting and engaging opportunities for students (and is not treated as a straitjacket constraining the planning of the curriculum), it really could open up the way to a curriculum that engages and inspires our students.

In contrast, a major implication for science, related to APP but not directly, was highlighted by two LA science consultants. These two respondents felt that the non-statutory nature of APP and the lower status of key stage 3, due to the abolition of the science National Curriculum tests, were acting as potential barriers to the implementation of APP in key stage 3 science. One of these respondents said: ‘The priority in the curriculum to maths and English mean that science is lower down the school’s agenda – especially since the scrapping of KS2 and 3 SATs.’

3.2 Assessment

APP is a new approach to assessment as it focuses on skills rather than being content driven, and it uses evidence collected as part of teaching and learning to reach decisions about pupil progress. Teachers are expected to build assessment into their day-to-day teaching, ensuring their learning intentions are clear, giving focused feedback and encouraging peer- and self-assessment. These approaches are often described as Assessment for Learning (AfL). The information gained through these day-to-day interactions is summarised periodically using the APP AFs, which allow teachers to track pupils’ progress against the National Curriculum levels and to tailor their curriculum planning. In this way, APP aims to provide a structured approach to teachers’ periodic assessment in science. APP ‘involves generating evidence of progress through effective teaching and learning and then “stepping back” periodically to review pupils’ achievement in relation to National Curriculum levels’ (DCSF, 2009a, p.3).

In periodic assessment, consistent judgements become important. It is essential to ensure the levels are interpreted in the same way across teachers, schools and LAs. For this purpose, processes of moderation are required, providing opportunities to compare and confirm judgements against the APP criteria.

Assessment of pupils' work using APP has the potential to:

- increase the consistency and reliability of teacher assessment
- link day-to-day and periodic approaches to assessment
- provide high quality evidence to inform next steps in pupils' learning and reporting on pupils' progress
- integrate assessment into planning for progression
- provide a National Curriculum attainment target level when needed from an informed, holistic evaluation of progress against APP assessment criteria

(DCSF, 2009a, p.3).

When LA science consultants were asked what they thought the positive features of APP were, a large number of comments (67 per cent in questionnaire 2, and 43 per cent in questionnaire 1) were centred on the potential effect of this method of assessment on teaching and learning in schools.

The re-professionalisation of teachers

'[A positive is] the ability of teachers to use their professionalism.'

'Allow [teachers'] professional judgements.'

'Trust in teachers' professionalism.'

Increased teacher confidence

'Help teachers feel more confident about assigning levels to pupils as part of everyday teaching and learning.'

Promoting AfL

'It is a useful tool to support AfL practice particularly related to pupil feedback and setting of curriculum targets.'

The APP criteria make the next steps in pupils' learning clearer to both the pupil and their teacher

'Ability to gauge where they [the pupils] are at and inform next steps.'

‘Clarifies progression pathways for learning for teachers and pupils.’

‘It is a framework for directed feedback and assessment.’

Provides a consistent language for teachers to use when assessing pupils’ work and when working within department, across department, across schools and key stages

‘Consistent use of language cross-phase and inter/intra school.’

‘A common vocabulary.’

These types of comments were not present in the responses to the same question in questionnaire 1.

Nevertheless, when LA science consultants were asked if APP was being used as they envisaged, a large number (34 per cent in questionnaire 2) felt it was ‘too early to comment’. Comments such as ‘generally teachers are still experimenting so [it’s] too early to say’ were very common. Twenty-four per cent (questionnaire 2) of respondents stated that where there is evidence of teachers using APP, it is being incorporated as a once-a-term assessment task or activity. Currently it would seem schools are using APP periodically, which fits with one of the aims of APP: to strengthen periodic assessment. However, from the LA science consultant responses, views are mixed concerning day-to-day practice being used as evidence for periodic assessment. One LA consultant stated: ‘In many schools APP is being used to get summative evidence about pupils’ progress. There are few signs that it is being used formatively to raise standards yet.’ This is a concern shared by 13 per cent of consultants in questionnaire 2 that APP would become a ‘bolt-on’ rather than being integrated into the assessment of the science curriculum.

Furthermore, a lack of understanding of APP and AfL approaches was highlighted as a potential barrier to the implementation of APP in key stage 3 science (39 per cent of respondents in questionnaire 2, and 27 per cent in questionnaire 1). The teachers’ handbook does attempt to make it clear how APP contributes to the AfL strategy in relation to day-to-day assessment, periodic assessment and transitional assessment (see Appendix 3 for more details) but some LA consultants do not believe the message is being understood.

In relation to assessment, a number of negatives were highlighted in the two questionnaires. Forty per cent of respondents in questionnaire 2, and 25 per cent in questionnaire 1, described problems related to the APP criteria. These problems were associated with there being too many statements (in total there are 96 statements: split into five AFs, and National Curriculum levels 3 to 8) and the complexity of the language used in the criteria. Comments such as ‘too many statements’ and ‘some descriptors are extremely complicated or very vague making the interpretation of them difficult’ typified these responses. If teachers are struggling to ‘get to grips’ with these aspects of APP there could be problems when APP is used to assess pupils.

The range and content sections of the PoS are not explicitly assessed through APP. However, the Framework for science suggests that the range and content sections of the new PoS should be treated as contexts for developing knowledge, skills and understanding of HSW (and, therefore, APP), in addition to defining the knowledge to be acquired.

When the respondents to questionnaire 2 were explicitly asked how the range and content of the science PoS is being assessed in schools, a significant proportion (38 per cent) stated that this aspect of the science curriculum was being assessed by summative means only. A quarter of respondents stated that the assessments of the range and content were being embedded within APP. A further 28 per cent of respondents stated that schools were using a combination of summative assessments and APP to assess range and content of the science PoS.

3.3 Manageability

Managing the implementation of APP is an important consideration for schools: ‘Embedding APP practice should not be seen as an end in itself. Rather, the department should be working on reviewing and strengthening all aspects of teaching and learning, using the full range of resources available’ (DCSF, 2009a, p.10). The APP handbook suggests schools take a seven-step approach to implementing APP.

Step 1: over a period of time, decide on the outcomes to be assessed and generate evidence of pupils’ attainment from day-to-day teaching and learning.

Step 2: review an appropriate range of evidence.

Step 3: select the appropriate assessment guidelines sheet.

Step 4: highlight assessment criteria for which there is evidence.

Step 5: use the pupil’s developing profile of learning to decide upon a level and sub-level.

Step 6: moderating judgements.

Step 7: making any adjustments required to planning, teaching and intervention.

Adapted from *Assessing pupils’ progress in secondary science at key stage 3: teachers’ handbook* (DCSF, 2009a, p.7). Refer to Appendix 4 for more detail.

In order to complete these steps teachers and schools need time. In the first questionnaire, 46 per cent of respondents felt that lack of time was the largest potential barrier to the implementation of APP. In questionnaire 2, respondents were asked if this was still the case, and 81 per cent still felt this was an issue. They highlighted this by describing how teachers were not being given enough time to prepare resources (31 per cent in questionnaire 2), and how not enough time was being put aside to train teachers within schools (47 per cent in questionnaire 2).

Both these issues relate to the support provided by senior leadership teams (SLTs) in schools. Where SLTs are engaged it could be assumed that time for teachers to train and develop resources is being made available, but in schools where this is not the case, sufficient time is not being made available. Eleven per cent of respondents actually stated that the availability of time was very dependent on the support of SLTs: ‘Where SLTs are effectively leading APP there is a better appreciation of the need for department time for planning and implementing it.’ In relation to time, 11 per cent of respondents commented that teachers have a lot of additional pressures, such as triple science and GCSE exam results, and, therefore, they do not have the time to get to grips with APP. Also eight per cent (questionnaire 2) considered it important to note ‘teachers are still trying to embed [changes] at key stages 4 and 5, [and] these key stages are considered to have a higher priority’.

Concerns about increases in teachers’ workload persisted between questionnaire 1 (39 per cent) and questionnaire 2 (40 per cent). The cause of this was identified as a shift in practice and mindset about the new skills-based approach.

Another negative feature, identified by 27 per cent of respondents in questionnaire 2 and 14 per cent in questionnaire 1, is a concern about the recording and monitoring of pupil progress. Currently there is ‘lack of quality guidance on how to record achievement efficiently’ and ‘recording for a large number of pupils is seen as an issue’. At this stage of implementing APP there is a lack of clarity about this amongst LA consultants and teachers, and it would seem that this is causing a certain degree of anxiety.

3.4 Support

The National Strategies have supported the implementation of APP in key stage 3 science. LA science consultants were initially trained in how to use APP by strategy consultants. LA consultants have then been at the forefront of training teachers and aiding the implementation of APP in schools. As part of questionnaire 2, respondents were asked how they were supporting the schools within their LA, and they were asked to rank a number of options in terms of their effectiveness (1 being the most effective). They were given the following options to choose from:

- meetings with senior leadership teams
- meetings with heads of departments
- meetings with key stage 3 science coordinators
- one-to-one mentoring of teachers
- training sessions for whole science departments
- participating in exemplar teaching and lessons
- observing lessons, followed by discussions with the class teacher
- providing tasks for teachers to incorporate into their lessons.

The two options which were ranked most highly were meetings with heads of departments and training sessions for whole science departments (chosen by 33 and 27 people respectively). The two least common options were participating in exemplar teaching and lessons, and observing lessons, followed by discussions with the class teacher (chosen by five and two respondents respectively). A few respondents did rank these two options but given that they are potentially very time-consuming it is not surprising to find them occurring infrequently.

The modes of moderation of APP in key stage 3 science have yet to be fully established in the LAs who responded to the questionnaire. There is a section within the teachers' handbook that suggests some examples of standardisation tasks science departments could carry out. For example, 'each teacher assesses one of their own pupils, and agrees their level judgement with a colleague by comparing and contrasting the pupil's work with that of a Standards File pupil at that level' (DCSF, 2009a, p.19). The actual moderation of APP is briefly mentioned in the teachers' handbook, in one paragraph:

Moderation activity generally involves a group of teachers reviewing a sample of class teachers' initial assessments, reconciling any disagreements and agreeing a final judgement. The Standards Files are essential tools in this process of bringing differing views to agreement in an evidence-based way that is in line with national standards (DCSF, 2009a, p.20).

The consultants were asked about what methods of moderation they were promoting or developing for use within their LA. Approximately half of respondents (48 per cent in questionnaire 2, 55 per cent in questionnaire 1) stated schools were participating in departmental moderation. A further 30 per cent in questionnaire 2 and 45 per cent in questionnaire 1 were promoting or developing network groups with schools from the same LA. Fifteen per cent of all LA science consultants from questionnaire 2 (25 per cent questionnaire 1) gave an explicit description of visiting an individual school to help with the moderation. Seven per cent of respondents presented concerns about external moderation. One respondent stated: 'It would be better if it was clearer as to what form of external moderation or national sampling was to be done.'

The LA consultants were asked what additional materials or resources would be useful for LA consultants and teachers to support the implementation of APP in key stage 3 science. Nearly half (49 per cent in questionnaire 2 and 32 per cent in questionnaire 1) felt that assessment tasks linked to APP would be beneficial. A further 30 per cent (questionnaire 2) felt that more guidance on managing the process and exemplars of recording outcomes would be helpful. Other comments worthy of note include a request for more examples of level 7 and level 8 pupil work and examples of activities at these levels, tasks which have clear links to AfL, and more guidance on giving feedback to pupils.

A particular focus of the investigation was to develop criteria to use when reviewing APP materials that are currently published and being used by schools. In questionnaire 1, LA science consultants were asked:

- In your opinion, what characteristics should effective support materials and resources have to help the implementation of APP in key stage 3 science?

- In your opinion, what characteristics make ineffective or unhelpful support materials and resources with reference to the implementation of APP in key stage 3 science?

From the responses a list of criteria for the evaluation of resources was developed.

Criteria for identifying ‘good’ support materials:

- easy to use
- clear links to Assessment Focuses
- activities across a range of levels
- not too lengthy
- provide clarity.

Criteria for identifying ‘poor’ support materials:

- complicated
- lengthy and time-consuming to use
- materials which consist of checklist, level-assessed tasks or worksheets
- narrow range of levels targeted.

Other things to consider included:

- type of material, for example, resource paper based, online or a CD-ROM
- the resources included, for example, worksheets or a PowerPoint presentation
- cost.

In order to identify which materials and resources to review as part of this research, respondents to questionnaires 1 and 2 were asked:

*In addition to the ‘APP: The Standards Files’ provided by the National Strategies, what materials/resources are you, as a LA, using to **train** and **support** teachers? (Please be as specific as possible, giving publications, publishers, websites etc.)*

The most common materials and resources named were:

1. Badger assessments
2. Ox box – Oxford University Press
3. Exploring Science/ Go Science! – Longman/ Pearson
4. Upd8 Wikid

Three of the four most popular resources (1 to 3 above) have been purchased and reviewed using the criteria described above. It was decided not to purchase Upd8 Wikid due to costs (Year 7 programme is £699, year 7 and year 8 bought together is £948, both are one-off purchases). In addition, in questionnaire 2, respondents were asked to rate the quality of the materials and resources they had been using. A detailed review of each of the resources purchased can be found in Appendix 4.

4 Conclusions and recommendations

From the research carried out during the course of this project it is clear that good progress is being made to the introduction of APP. It is making a positive contribution to science teaching and learning. However, it is also clear that much still remains to be done.

The majority of schools the respondents were working with were incorporating APP into the key stage 3 curriculum. However, this may not be a fully representative finding as the LA consultants who responded to the questionnaire may be supportive of APP and may also have encouraged more of the schools in their LA to take up the programme. Those schools not opting in did so because they felt their current assessment systems were adequate – given that APP is non-statutory, this should not be surprising.

4.1 Implications for science

As a result of the introduction of the new key stage 3 PoS in 2008 the science National Curriculum has been streamlined and become more focused on developing pupils' skills through HSW. APP positively supports the development of HSW at key stage 3. LA consultants also believed teachers are able to be more creative in the classroom, which has the potential to have a positive impact on pupils as greater engagement and motivation are encouraged.

Despite the positives related to the implementation of APP in key stage 3 science there are a few reasons for caution. Firstly, APP is non-statutory. Potentially this could lower its profile and, in turn, its priority in schools leading to it not being fully utilised to assess pupils. Secondly, and more generally, the abolition of key stage 2 and key stage 3 science National Curriculum tests may result in science having an overall lower priority in schools.

This report recommends:

- continuing to actively promote APP in key stage 3 science, focusing on the link between using APP for assessment and HSW
- continuing to highlight the importance of science.

4.2 Assessment

There are a number of positives concerning APP in relation to assessment. Most notably is the way APP can be seen to support teachers' classroom assessments in a structured manner. This contributes to the re-professionalisation of teachers in terms of putting the trust back into their professional judgement, and increases their confidence. APP also supports teaching and learning by promoting AfL in the classroom, providing feedback to pupils and information regarding the next steps in their learning, as well as providing a consistent use of language amongst teachers and pupils.

Overall, a large number of consultants who completed the questionnaires said it was too early to comment on whether APP was being used as envisaged. However, in those schools using APP periodically it was not being influenced by day-to-day practice. Concerns were raised about APP becoming a 'bolt-on' assessment rather than embedded within current practices.

Potential reasons for these concerns were teachers having a lack of understanding of APP and AfL approaches and problems related to the APP criteria, including too many statements and statements being overly complicated or too vague.

This report recommends:

- more guidance and examples of how to gather evidence from day-to-day assessment which can then be used to inform periodic assessment
- making it clearer that APP, whilst central, is not the only means of assessment and it can be used in conjunction with more traditional forms of summative assessment such as tests
- more examples of pupils' work which has been levelled, moderated and has examples of the feedback which could be given to pupils
- more examples of level 7 and level 8 pupil work which has been assessed using APP
- guidance on how to record pupil attainment efficiently.

4.3 Manageability

The manageability of APP is possibly the largest area of concern highlighted by the LA science consultants and the teachers they work with. It would seem the more support there is in schools from senior leadership teams (SLTs) the easier the implementation of APP can be. If SLTs are ‘on board’ with the principles of APP then sufficient time to train teachers and for teachers to develop resources is made available. In those schools where this is not the case the introduction of APP has the potential to be seen as an increase in teacher workload.

Concerns regarding recording and monitoring of pupils’ progress were raised in the questionnaires. It is clear that using APP will provide a wealth of information about individual pupils. However, the amount of information has the potential to feel overwhelming and unmanageable.

This report recommends:

- more information for SLTs so they have an even clearer understanding and appreciation of APP in their schools
- SLTs set time aside within school timetables, say, once a term, specifically for moderation.

4.4 Support

Most LA consultants are supporting schools with the initial implementation of APP by having meetings with heads of science and running training sessions for whole science departments.

In terms of support for the moderation of pupils’ work assessed using APP this is yet to be fully established. This is due to the implementation of APP being in its early stages and due to time limitations. LA consultants are promoting inter-department moderation and network groups amongst schools within LAs. The consultants who responded to the questionnaires did raise concerns about whether there would be external moderation of pupils’ work and what form this would take.

This report recommends:

- in schools where APP is being used, sufficient time be made available for teachers to understand the APP criteria, evaluate current practices in light of APP, and develop existing schemes of learning and practice assessment using APP
- an online community for teachers using APP to share good moderation practice.

4.5 Future research agenda

Further research is needed in order to see the true impact and implications of APP in key stage 3 science. In particular, studies of the following kinds could provide valuable further evidence.

- Secondary science teacher questionnaire – this is a natural progression after collecting the views of LA secondary science consultants. The questionnaires used in this research provided information about the implementation of APP in key stage 3 science. A teacher questionnaire would provide information concerning the use of APP in practice. The NFER suggests sending a questionnaire (paper based or online) to all key stage 3 science teachers in England.
- A project investigating the implementation of APP in primary science. This could be conducted in a similar way as this piece of research.

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5.1 Additional resources

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6 Appendices

1. a Questionnaire 1
b Questionnaire 2
2. How does APP contribute to the AfL strategy?
3. Seven steps of implementation
4. Review of APP materials/resources

Appendix 1a: Questionnaire 1 – May 2009

- 1) How many secondary LA science consultants/coordinators are employed by your LA?
- 2) In total, how many secondary schools do you/your LA work with?
- 3) How many schools in your LA are involved in incorporating Assessing Pupils' Progress (APP) into their teaching of KS3 science?
- 4) Were you/your LA involved in the trials of APP in KS3 science? Click on the most appropriate answer.
Yes No
If yes, online questionnaire automatically takes them to question 5
If no, online questionnaire automatically takes them to question 7
- 5) Were you/your LA involved in the trials from the beginning or did you join part of the way through? Click on the most appropriate answer.
Involved from the beginning.
Joined part of the way through.
Other – Please specify below

6) In your opinion, did the Assessment Focuses (AFs) improve during the course of the trials?

Yes

No

Stayed the same

If you answered yes, how did they improve? Please give specific improvements if possible. If you answered no, please explain why.

7) In your opinion, what are the positive features of APP in KS3 science?

8) In your opinion, what are the negative features of APP in KS3 science?

9) How is your LA supporting schools with the implementation of APP in KS3 science? Select as many options as appropriate.

Meetings with Heads of Department.

Meetings with KS3 science consultants/coordinators.

10) Mentoring teachers one-to-one.

Training sessions for whole science departments.

Participating in exemplar teaching/lessons.

Observing lessons, followed up by discussions with the class teacher.

Providing tasks for teachers to incorporate into their lessons.

Other – Please specify below

11) In addition to ‘APP: The Standards Files’ provided by the National Strategies, what materials/resources are you, as a LA, using to **train** and **support** teachers? (Please be as specific as possible, giving publications, publishers, websites, etc.)

If you have been developing your own materials, please forward copies of them to (These materials will only be reviewed to see what sorts of activities schools/teachers are using and not used for any other purpose.)

12) What materials/resources are you, or the schools you work with, using to **aid** the implementation of APP in KS3 science in the classroom? (Please be as specific as possible, giving publications, publishers, websites, etc.)

- 13) In your opinion, what materials/resources would be useful for LA consultants and teachers to support the implementation of APP in KS3 science?
- 14) In your opinion, what characteristics should effective support materials/resources have to help the implementation of APP in KS3 science?
- 15) In your opinion, what characteristics make ineffective or unhelpful support materials/resources with reference to the implementation of APP in KS3 science?
- 16) In order to ensure consistency of teacher assessments produced by using APP in KS3 science, what methods (if any) of moderation are you promoting/developing for use across your LA?
- 17) From your perspective, what are the current barriers (if any) to the implementation of APP in KS3 science?
- 18) What is the general feeling amongst the teachers you work with concerning APP in KS3 science?
- 19) How do you envisage APP in KS3 science being used in schools?
- 20) What do you think the impact of APP in KS3 science will be in the classroom?

Please rank in order of their impact (1 = most impact, 6 = least impact).
Use each number once.

Raise pupil attainment.

Increase teacher knowledge and skills.

Prepare pupils for GCSE science.

Engage pupils.

Personalise the science curriculum.

Improve pupils' scientific understanding.

Others in addition to those above – Please specify

Please also provide any additional comments concerning the impact of APP.

Appendix 1b: Questionnaire 2 – September 2009

- 1) Were you involved in completing the first online questionnaire concerning APP in Key Stage 3 science?

Yes No Unsure

If yes, online questionnaire automatically goes to question 4

If no, online questionnaire automatically goes to question 2

If unsure, online questionnaire automatically goes to question 2

- 2) How many secondary LA science consultants/coordinators are employed by your LA?

- 3) In total, how many secondary schools do you/your LA work with?

- 4) How many schools in your LA are involved in incorporating Assessing Pupils' Progress (APP) into their teaching of KS3 science?

If answered no or unsure to question 1 then continue to question 5

If they answered yes to question 1 then go to question 8

- 5) Were you/your LA involved in the trials of APP in KS3 science?

Yes No

If yes, online questionnaire automatically goes to question 6

If no, online questionnaire automatically goes to question 8

- 6) Were you/your LA involved in the trials from the beginning or did you join part of the way through? Click on the most appropriate answer.

Involved from the beginning.

Joined part of the way through.

Other – Please specify

7) In your opinion, did the Assessment Focuses (AFs) improve during the course of the trials?

Yes

No

Stayed the same

If you answered yes to the previous question, how did the Assessment focuses (AFs) improve during the course of the trials? Please give specific improvements if possible.

If you answered no to the previous question, please explain why the Assessment Focuses (AFs) did not improve.

8) If schools have opted not to incorporate APP into KS3 science what are their reasons for this?

9) If schools have opted not to incorporate APP into KS3 science what are they using instead to assess pupils? Select as many options as appropriate.

School developed tests.

QCDA Optional tests.

Old National Curriculum tests.

AfL materials other than APP – Please give details in the appropriate box below.

Assessment materials produced by publishers – Please give details in the appropriate box below.

Other – Please specify and give details in the appropriate box below.

AfL materials other than APP	Assessment materials produced by publishers	Other
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10) In your opinion, what are the positive features of APP in KS3 science?

11) In your opinion, what are the negative features of APP in KS3 science?

- 12) a) How is your LA supporting schools with the implementation of APP in KS3 science? From the options below please rank the top three strategies in terms of their effectiveness (1=most effective)

Options	Rank top 3 (1–3)
Meetings with Senior Leadership Teams	
Meetings with Heads of Department.	
Meetings with KS3 Science Consultants/Coordinators.	
Mentoring teachers one-to-one.	
Training sessions for whole science departments.	
Participating in exemplar teaching/lessons.	
Observing lessons, followed up by discussions with the class teacher.	
Providing tasks for teachers to incorporate into their lessons.	
Other – Please specify below	

b) Please explain your reasons for ranking the options in this way.

- 13) Which methods in question 12 have you found most effective?
- 14) Which methods in question 12 have you found least effective?
- 15) In addition to the ‘APP: The Standards Files’ provided by the National Strategies, what materials/resources are you, as a LA, using to **train** and **support** teachers? (Please be as specific as possible, giving publications, publishers, websites, etc.)

If you have been developing your own materials please forward copies of them to (These materials will only be reviewed to see what sorts of activities schools/teachers are using and not used for any other purpose.)

- 16) How would you rate the quality of the materials/resources you have been using?

On this screen please state the name of the two main materials/resources you have been using. You will then be asked to rate them on the following screens.

Name of first material/resource

Name of second material/resource

Please rate them as very good, good, satisfactory, poor, or very poor.

Name of material/resource	Criteria	Very good	Good	Satisfactory	Poor	Very poor
Pre-populated	Ease of use Clear links to Assessment Focuses (AFs) Activities across a range of levels Length of material/resource Clarity of material/resource Ease of translating pupils' work into a level Any additional comments					
Pre-populated	Ease of use Clear links to Assessment Focuses (AFs) Activities across a range of levels Length of material/resource Clarity of material/resource Ease of translating pupils' work into a level Any additional comments					

17) In your opinion, what materials/resources would be useful for LA consultants and teachers to support the implementation of APP in KS3 science?

18) In order to ensure consistency of teacher assessments produced by using APP in KS3 science, what methods (if any) of moderation are you promoting/developing for use across your LA?

19) In your opinion, how consistent are the methods of moderation currently being employed by schools in your LA? Please provide an explanation.

20) In the first questionnaire 46% of respondents felt time, or rather a lack of time, was a major barrier to the implementation of APP. Is this still the case?

Yes No

Please comment.

21) From your perspective, what are the current barriers, other than time, to the implementation of APP in KS3 science?

22) What is the general feeling amongst the teachers you work with concerning APP in KS3 science? Has this changed since its introduction in January 2009?

23) How is APP in KS3 science being used in schools? Is APP being used as you envisaged?

24) In the first questionnaire some respondents felt that APP would be used as the main assessment tool to replace end of topic tests. If so, how do you envisage the range and content of the Science Programme of Study (PoS) being assessed given that APP mainly assesses skills?

25) What do you think the impact of APP in KS3 science will be in the classroom?

Please rank in order of their impact (1 = most impact, 6 = least impact).
Use each number once.

Raise pupil attainment.

Increase teacher knowledge and skills.

Prepare pupils for GCSE science.

Engage pupils.

Personalise the science curriculum.

Improve pupils' scientific understanding.

Others in addition to those above – Please specify

26) When asked about the impact of APP in the first questionnaire, 55% of respondents ranked 'preparing pupils for GCSE science' as either 5th or 6th out of six options. In your opinion, why do think this was the case?

Please also provide any additional comments concerning APP.

Appendix 2: How does APP contribute to the AfL strategy?

APP provides systematic support for the three linked aspects of assessment:

Table A1: Link between the AfL strategy and APP

Aspect	AfL strategy	APP contribution
Day to day	<p>Learning objectives made explicit and shared with pupils</p> <p>Peer- and self-assessment in use</p> <p>Pupils engaged in their learning and given immediate feedback</p>	<p>APP encourages recognition of a wide range of evidence from pupils' ongoing, day-to-day work</p>
Periodic	<p>Broader view of progress across subject for teacher and learner</p> <p>Use of national standards in the classroom</p> <p>Improvements to medium-term curriculum planning</p>	<p>APP enables the review of evidence to be systematic by focusing closely on level-related criteria in each of the assessment focuses (AFs)</p>
Transitional	<p>Formal recognition of pupils' achievement</p> <p>Reported to parents/carers and next teacher(s)</p> <p>Use external tests or tasks</p>	<p>APP strengthens teachers' assessments and their understanding of pupils' progress, so that this more formal sharing can be valid, reliable and detailed</p>

The DCSF's AfL strategy describes how AfL is not an isolated activity but it feeds into the school's cumulative understanding of pupils' achievements. This comes from both day-to-day and periodic assessment, with evidence contributing to an increasingly well-informed, rounded and reliable picture of an individual pupil's performance. APP will support senior leaders in schools to ensure that their approach to AfL is part of a manageable and school-wide system. (DCSF, 2009a, p.4)

Appendix 3: Seven steps of implementation

APP step by step

Step 1: Over a period of time, decide on the outcomes to be assessed and generate evidence of pupils' attainment from day-to-day teaching and learning

As part of the planning of teaching and learning for any class, teachers will identify relevant assessment criteria. Evidence is then generated over a period of time and forms the basis of the APP process of periodic assessment, which involves stepping back from the daily and weekly process of teaching, and assessing progress made across the subject over a longer period – perhaps a whole term.

Step 2: Review an appropriate range of evidence

Teachers will need to take account of a manageable range of evidence to inform and support APP assessments against the APP criteria. Teachers in the pilot project found that open-ended, less scaffolded tasks and activities allowing pupils to demonstrate more independent understanding were a rich source of evidence. Teachers will also need to consider more ephemeral evidence of pupil achievement, such as discussions between pupils and between teacher and pupils. (Note: Additional APP guidance will support this.)

Step 3: Select the appropriate assessment guidelines sheet

Each pupil will need an assessment guidelines sheet that will be used to record assessments by highlighting relevant criteria. The A3 version of the guidelines sets out all levels from 3 to 8, making it easier to develop a sense of progression through the levels. Alternatively, the A4 versions of the assessment guidelines each cover two National Curriculum levels, with overlaps. For example, there are forms covering levels 3 and 4, 4 and 5, 5 and 6, and so on. If working with the A4 versions, teachers should choose an appropriate form for each pupil (they should start with a broad idea of the National Curriculum level that a pupil is working from, usually based on prior assessments) so that periodic assessments can build up a profile of the pupil's learning over time. Follow the instructions set out in Section 4: 'How to make APP assessments'.

Step 4: Highlight assessment criteria for which there is evidence

Teachers should now consider the APP criteria in relation to the assembled evidence and highlight the criteria that have been met. For many teachers, it will take time before this process becomes quick and efficient; however, the experience of the pilot project suggests that the process of agreeing levels within the department, based on the guidance in the Standards Files, will help teachers to develop a better feel for levels and progression. The pilot also highlighted the value of inter-school moderation. The Appendix to this handbook contains full guidance on using the Standards Files.

Step 5: Use the pupil's developing profile of learning to decide upon a level and sub-level

As successive assessments are made by highlighting criteria in the table, a profile of learning is established. For each strand shown on the table, a box can be ticked to indicate that a particular level has been reached. Alternatively, 'IE' can be chosen to indicate that there is currently insufficient evidence to judge progress in a particular strand or 'BL' if the judgement is that progress is below level. The periodic judgement can be refined into 'Low', 'Secure' or 'High' within the level.

At intervals, teachers will use the process described in Section 4 of this handbook to arrive at an overall National Curriculum level for individual pupils. This is done by taking into account how independently, how consistently and in what range of contexts pupils demonstrate their attainment across the separate strands. The overall level can be recorded in one of the boxes provided at the bottom of the form.

Step 6: Moderate assessments

Assessment against APP criteria inevitably involves a degree of interpretation and professional judgement. Departments will need to ensure that, before they start to use APP, teachers have the chance to become familiar with the assessment criteria, and how these are consistent with national standards (standardisation). Once they begin to make their own judgements, they need to have the chance to explain and justify a sample with other teachers to ensure consistency (moderation). The Standards Files will help

both these processes, as explained in the Appendix. Teachers should make regular reference to the Standards Files to strengthen their understanding of the levels across the National Curriculum strands, and to help to resolve ambiguous or borderline assessments. Regular collaborative assessment and discussion are important means of ensuring that assessment standards across the department are reliable and consistent.

Step 7: Make any necessary adjustments to planning, teaching and intervention

A key purpose of APP is to inform and strengthen planning, teaching and learning. This aspect of APP can have a direct and positive impact on raising standards, and can assist in the personalisation of learning. (DCSF, 2009a, p.7–8)

Appendix 4: Review of APP materials/ resources

1) Badger KS3: Y7 APP in Science – The Level-Assessed Approach – Badger Publishing

The Badger Assessment for Learning tasks were being used and developed by a number of schools the LA science consultants were working with. This resource is Badger Publishing's latest addition to the range and specifically focuses on APP. It was published in September 2009. It consists of paper-based and digital resources.

Badger claims that it has purposefully set out to focus on the non-traditional aspects of the new KS3 Science Framework. Badger states: 'We consider our level-assessed activities to be ideally suited to inform periodic assessment, a process that the APP Teacher Handbook (DCSF, 2009a) suggests should take place no more frequently than once per term.'

The book is made up of level-assessed tasks with four level-assessed tasks for each AF. Each task:

- states the learning outcomes
- provides an introduction to the task for the teacher
- details the previous learning (differentiated by level) which may be beneficial before carrying out the task
- resources/equipment required – PowerPoint presentation (provided when resource purchased)
- any additional notes which may help the teacher
- links to the Framework for science and APP
- covers a different range of levels
- provides a pupil level ladder (which is in 'pupil speak') – this describes to pupils the steps they could take in order to move up a level.

The activities are designed to provide evidence for only a single strand in the APP assessment criteria and cover a variety of levels.

2) OxBox Science Works – Oxford University Press

LA consultants said that OxBox Science Works is being used by a number of schools they work with. OxBox is a very comprehensive package for key stage 3 science and covers year 7, year 8 and year 9. For each year group the following resources are available:

- resources and planning pack
- interactive resources and planning CD-ROM
- assessment CD-ROM
- student textbooks.

OxBox was released in 2008 and has additional grids developed and added to the website to accommodate the introduction of APP.

OxBox Science Works claims to be ‘the only KS3 curriculum course to fully integrate APP and HSW – for year 7, year 8 and year 9’. The resources are linked to How Science Works, the science Framework, and APP. OxBox Science Works 1 consists of 12 units, split into six lesson plans which have various activities for pupils to carry out. The resources and planning pack consist of lesson plans which include links to resources such as PowerPoint presentations and worksheets, access to How Science Works materials, and customisable schemes work which enable teachers to develop their own plans, activities and resources.

3) Exploring Science: How Science Works – Assessing Pupils’ Progress Teacher Pack – Longman (Part of Pearson)

LA consultants said that Exploring Science is being used by a number of schools they work with. Exploring Science: How Science Works – Assessing Pupils’ Progress Teacher Pack is a new addition to the Exploring Science package, and was launched in 2009. It consists of paper-based and digital resources.

The resource is designed to help schools embed APP by suggesting a range of tasks that could be carried out with pupils. The pack covers all the AFs and all abilities from level 3 to level 8. It also provides teachers with level ladders for each task. The level ladders aim to help pupils understand what

they need to do to progress to the next level. The pack consists of 33 tasks/projects in paper-based form and electronically. Each task consists of:

- teacher notes
- list of resources
- links to the programme of study, science Framework and APP
- an overview of the worksheets, etc. to use, which is split into groups of levels e.g. lower level 3–5, and higher level 6–8
- worksheets – different versions of the same task dependent on ability
- details of which AF(s) to assess and at which level(s).

The tasks and supporting resources have been written so they can be assessed by a class teacher, by the pupils themselves or by peer review. Exploring science suggests that assessment of the work is done using the level ladders which are specific to the task the pupils have undertaken. There is not any additional guidance provided for teachers.

Table A2 summarises the characteristics of three APP materials/resources by various evaluation criteria.

Table A2: Characteristics of three resources

Evaluation criteria	Badger	OxBox	Exploring Science: How Science Works – Assessing Pupils’ Progress Teacher Pack
Type of resource	Paper based and CD-ROMs	Paper based and CD-ROMs (depending on which is purchased)	Paper based and CD-ROMs
What is included?	Teacher’s book which consists of: <ul style="list-style-type: none"> • lesson plans • worksheets – paper based and electronic • all tasks have level ladders which provide pupils with information about how to progress to the next level • PowerPoint presentations for a school’s VLE (Virtual Learning Environment) 	Full package can include: <ul style="list-style-type: none"> • resources and planning pack – lesson plans and worksheets • interactive resources and planning CD-ROM • lesson plans and worksheets • assessment CD-ROM – paper-based tests and mark schemes, and interactive tests • student textbooks 	A ring binder containing: <ul style="list-style-type: none"> • 30 tasks specifically written to cover the AFs and a range of levels • the tasks have teacher notes • all tasks have level ladders which provide pupils with information about how to progress to the next level • 3 projects – longer tasks which cover all AFs • pupil speak version of the APP level descriptors CD-ROM contains all of the above and an Excel Tracker Progress spreadsheet to record pupil progress. A second CD-ROM containing all of the above which can be put onto a school’s VLE.

Table A2: Characteristics of three resources cont.

Evaluation criteria	Badger	OxBox	Exploring Science: How Science Works – Assessing Pupils’ Progress Teacher Pack
Ease of use	<ul style="list-style-type: none"> Clearly defined sections within book, with clear sub-headings. Text is spread out and not densely packed, thereby making it user friendly. All resources are ready for use without any adaptations. 	<p>CD-ROMs (Resources and planning, Assessment)</p> <ul style="list-style-type: none"> Lesson plans have clearly defined sections. Electronic inks in lesson plans to resources to be used during the lesson. Resources are ready to be used but can be adapted if needed. CD-ROMs are easy to navigate through and are user friendly. 	<ul style="list-style-type: none"> Teacher notes on the tasks are clear but are possibly too short and concise. Text is spread out and not densely packed, thereby making it user friendly. All resources are ready for use without any adaptations.
Clear links to Assessment Focuses (AFs)	Very clear links as each individual activity has been written purposefully for individual Assessment Focuses.	An additional grid has to be used in order to find the link to the AF. This is fine but it would obviously be better if this information was already included in the lesson plan.	Very clear links to AFs.
Activities across a range of levels	Activities are split across levels. For example, the basis of one activity may cover levels 3–8 but the resources, language used and potential outcomes are assessed and levelled appropriately using guidance split into levels 3–6 and levels 6–8.	Lesson plans and activities provide suggestions for differentiation and cover three or four levels.	Activities are split across levels. For example, the basis of one activity may cover levels 3–8 but the resources, language used and potential outcomes are assessed and levelled appropriately using guidance split into levels 3–5 and levels 5–8.

Table A2: Characteristics of three resources cont.

Evaluation criteria	Badger	OxBox	Exploring Science: How Science Works – Assessing Pupils’ Progress Teacher Pack
Length	Quite a lot of information to read on how to use the Badger materials at the beginning of the book. However, each activity is relatively short.	Many pieces of information to refer to: one grid for APP links, one grid for science framework links, lesson plans, pupils resources, excel spreadsheets (assessment CD-ROM). Therefore, a lot of information to take in prior to using OxBox. However, the actual lesson plans themselves are short and clear.	An appropriate amount of information about how to use the resource prior to the details of tasks. The information provided for each task may be slightly too limited – limited information regarding the context of each task.
Clarity	Each individual activity is concise.	A lot of information from several different sources. Takes time to process information and understand clearly how everything links together.	Each individual task is concise.
Does the resource contain checklists, level-assessed tasks or worksheets?	One-off, level-assessed tasks – four per AF, which pupils attempt throughout the year. Worksheets.	Full lesson plans linked to APP. Worksheets. Not one-off, level-assessed tasks.	One-off, level-assessed tasks.

Table A2: Characteristics of three resources cont.

Evaluation criteria	Badger	OxBox	Exploring Science: How Science Works – Assessing Pupils’ Progress Teacher Pack
Costs	Year 7 book £100.00 Year 8 book £100.00 Year 9 book £100.00 TOTAL for KS3 = £300.00	OxBox Science Works 1 • Interactive resources and planning CD-ROM £395.00 • Assessment CD-ROM £275.00 Science Works 1 = £670.00 Science Works 2 = £670.00 Science Works 3 = £670.00 Total for Key Stage 3 = £2010.00 Also available for Science Work 1, 2 and 3: Student book £13.99 Resources and planning pack £165.00	£250.00 (covers key stage 3)



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