Taking the Lead with Primary Science Assessment

New curriculum, new challenges, new solutions

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October 2015
Objectives

Participants will:

Understand how to use and adapt the ‘Primarily Science’ and ‘Science Bug’ Progression, Assessment and Tracking Science tools-grids in their school

Make confident and reliable teacher assessments of science and identify planning for children's next steps

Use a range of Assessment for Learning strategies effectively to promote children's learning

Use enquiry and hands-on learning to provide opportunities for working scientifically
Timetable of change

Academic year 2014 to 2015

Teaching
Year 1, 3, 4 & 5 new national curriculum
Year 2 & 6 old national curriculum

Testing
No change to tests. Science sampling no sampling took place in 2015 and optional tests are no longer available.
Reporting arrangements will reflect old national curriculum

Academic year 2015 to 2016

Teaching
Year 1, 2, 3, 4, 5 & 6 new national curriculum

Testing
National tests and reporting arrangements will reflect new national curriculum. Science sampling should take place in 2016
Science Sampling - If it remains the same!

- Biennial basis the next tests are planned for June 2016.
- 9500 children will be randomly selected based on 5 children from 1900 schools.
- Schools will be notified at the end of April by letter.
- Children take the test if they are working at ‘level 3’ (now at expected levels?) or above in science.
- The test will consist of three papers. Each will take no longer than 25 minutes.
- Schools will be contacted in May to agree which day the test will be administered.
- The test will be overseen by external administrators. A member of the school staff should be present.
- The external administrator will bring and take away the tests.
- Schools will get detailed information about the administration process when they are informed in April.
- Test results will be reported in national data only. No individual school or child will be identified within the data.
- Results will not be used for school accountability or performance tables or returned to schools or children.
Assessment and Reporting arrangements

Updated 9th October 2015

https://www.gov.uk/guidance/2016-key-stage-1-assessment-and-reporting-arrangements-ara/section-2-key-changes
Performance Descriptors for use in KS1 and KS2 statutory teacher assessment for 2015/2016 (draft)

Draft released by department for Education 23rd October 2014

Final performance descriptor will be published in the autumn term 2015 – ....sadly not yet except for re-hash of National Curriculum statements

The following slides are taken from “Performance descriptors for use in key stage 1 and 2 statutory teacher assessment 2015/16” consultation document Oct 2014 DfE
Context

We will set high standards for what pupils should be able to achieve at the end of key stages, but between these points it is for schools to decide how to assess pupils against their curriculum.

There will continue to be statutory national tests (with results as a scaled score) and teacher assessments (using new performance descriptors) at the end of key stages 1 and 2 in key subjects.

The draft performance descriptors included here will underpin these assessments.

Ofsted will continue to examine schools’ assessment of pupil performance. Inspectors will look at how well the school understands each pupil’s progress and needs – and how clearly they communicate that to pupils, parents and Governors. As Sir Michael Wilshaw has said, what matters is that schools can show what their pupils know, understand and can do. He wrote to all schools in July 2014, highlighting changes to inspection following the removal of levels.
National Assessment

The teacher assessment of key subjects will contribute to the measures used for the new primary floor standard from 2016. At key stage 1, this is reading, writing and mathematics. At key stage 2 it is writing (alongside test results in reading and mathematics).

To ensure that a broad picture of children’s attainment is maintained, teacher assessment will also be statutory for science at key stage 1, and reading, mathematics and science at key stage 2. The teacher assessment of these subjects will not form part of the new floor standard.

To support teachers in making effective and consistent assessments of their pupils’ attainment, performance descriptors have been drafted for these subjects. These set out the performance of pupils at the end of key stages 1 and 2. Where applicable, teacher assessment will also be informed by the outcomes of the statutory end of key stage tests. Performance descriptors will not be written for other subjects.
Structure of the performance descriptors

The performance descriptors are closely aligned to the new national curriculum and have been drafted with experts. They are designed to assess pupils at the end of key stages 1 and 2 in 2016, once pupils have been taught the new programmes of study for two years. **Therefore, it is not advisable to use them for teacher assessment until this point, nor use them in assessment systems until September 2015 when the final versions have been published.**
Final Version? We wish...

Assessment Framework KS1

https://www.gov.uk/government/publications/interim-frameworks-for-teacher-assessment-at-the-end-of-key-stage-1  p.10

Assessment Framework KS2

Useful information on 2016 tests – but not always for science


https://www.gov.uk/guidance/2016-key-stage-1-assessment-and-reporting-arrangements-ara/section-2-key-changes


Using Descriptors

The performance descriptors are designed to only be used to inform teacher assessment at the end of each key stage.

The draft performance descriptors set out the characteristics of the performance of pupils in relation to the national curriculum programmes of study at the end of each key stage.

Teachers will be expected to make professional judgements by being familiar with the new performance descriptors.

They will be expected to use national exemplification to arrive at judgements consistent with national standards.
Using Descriptors

Teachers will need to confirm which description most closely matches a pupil’s overall attainment. There are currently no weightings given to any element within the performance descriptors, so pupils must demonstrate the majority of the elements described.

Teachers should refer to a range of evidence drawn from classwork and independent work, including the outcomes of statutory tests, where available. Our expectation remains that pupils will be taught the full national curriculum.

The performance descriptors do not include any aspects of performance from the programme of study for the following key stage. Any pupils considered to have attained the ‘Mastery standard’ are expected to explore the curriculum in greater depth and build on the breadth of their knowledge and skills within that key stage.
Final report of the Commission on Assessment without Levels
September 2015

Chaired by John McIntosh CBE
Assessing and Tracking Progress

Trackers need to be manageable, accurate and used. Curriculum 2014 talks about a mastery model. Trackers should reflect this.

“Good teachers assess children regularly to inform teaching, provide feedback to pupils and to communicate children’s progress to parents. This assessment does not need government to prescribe how it should be done.”
DfE 2014
We know that children construct their understanding of the world through experience. To make learning real, children need to explore, ask questions, and assess their understanding.

1. Introduction and knowledge capture
   - Scene setting
   - Informal assessment of children’s initial ideas

2. Develop understanding
   - Teach using real-life examples
   - Practical work and stimulating activities

3. Apply understanding
   - Children use knowledge and skills to carry out an investigation or to apply to a situation

4. Reflect and review
   - Children present their learning in a variety of ways
   - Children look back to initial ideas and recognise what they have learned
Addressing misconceptions through cognitive dissonance
Science examples of misconceived ideas: Assessing knowledge

Mainstay of science assessment:

Find out what they know
Teach them the next bit
Make sure they’ve got it

We need to aim to have some sort of AfL (formative assessment activity) at the beginning of every topic if not every lesson in science.
Reflecting on learning

The very best assessment

I used to think this... and now I know that... because...

I used to think this... and I still think this... because...
What Makes Great Teaching?

Report from the Sutton Trust: compiled by the CEM Centre at Durham University

http://www.suttontrust.com/researcharchive/great-teaching/
The research behind Science Bug

Key findings of the Coe report

The two factors with the strongest evidence of improving pupil attainment are:

- teachers’ content knowledge, including their ability to understand how students think about a subject and identify common misconceptions
- quality of instruction, which includes using strategies like effective questioning and the use of assessment
Children’s learning in science

For effective progression in learning to take place we need to:

start with the child

use appropriate methods.

include much first-hand experience - ‘hands on’ (two out of three lessons – Brian Cartwright HMI science)

provide opportunities for children to think about what they know and think they know - ‘minds on’ (talk is important)

ask children to explain what they know, think they know and to interpret data and draw their own conclusions.
So what is effective? UK Evidence

https://educationendowmentfoundation.org.uk/toolkit/
Not just knowledge – skills too!

Let’s investigate!

What would you expect at
End of KS1?
End of LKS2?
End of UKS2?
Observations using all senses

When working scientifically keep progression in mind

Explore (observe)

Describe

Explain
Working Scientifically - observations
Working scientifically – seeking patterns

Do the biggest hands grab the most sweets?
Time for reflection

.....and lunch 😊
More on Working Scientifically
Assessing the Process Skills

• Observing
• Predicting

• Classifying
• Controlling variables

• Measuring
• Data handling

• Communicating
• Investigating
‘Working Scientifically’ includes:

- observing over time
- noticing patterns
- grouping and classifying things
- carrying out fair-tests
- finding things out using a wide range of secondary sources of information
Grouping and Sorting
Alive or not

Concept choices
Sort and be able to say ‘why’

Living/not living
Use ‘big fat questions’
How do you know the person next to you is alive?
Curriculum example: body systems digestion

Pupils should be taught to:

• describe the simple functions of the basic parts of the digestive system in humans

• identify the different types teeth in humans and their simple functions.
What’s inside? Suing Drawings to Assess Understanding

Draw around the silhouette of a human body and place in the following organs (correct size & location):

• Heart
• Brain
• Lungs
• Kidneys
• Liver
• Bladder
• Stomach
• Add any more you know
Starting with teeth…
Name and function
How do we digest?
A child’s view

What do you think happens to your food inside your body?

1. Your brain would tell you what to do.
2. The food would go in to the mouth.
   It gets chewed quite little by your teeth.
3. Down the throat, it goes next.
4. In to the stomach, it gets crushed.
5. Gets crushed here and moulded in to shapes that are easy to fall out of your bottom.
Teeth are the start of the digestive process: Using modelling to teach and assess
Key takeaway – the importance of feedback

Use evidence about learning to adapt teaching and learning to meet student needs

-three key elements-

- Identifying appropriate learning intensions
- Understanding where children are in their learning
- Providing effective feedback

(Your best strategy to improve learning. Don’t let anything get in the way)
Feedback should...

- Focus on the learning.
- Include a recipe for further action.
- Not give complete solutions, always leave something for the student to do.

“This is what you have to do to improve”

“This is how to go about it”

**Metacognition is the most important aspect of effective feedback**

Practical approaches that help with giving effective feedback in science

Random selection is important

Environment matters (It's good to be wrong!/ you learn lots from your mistakes)

Comment only marking
End test not at end
Working walls
Happy to help
Light up / thumbs up / cups up
Talk partners / collaboration cards
Two stars and a wish
WWW...............EBI
What Worked Well....Even better if
All together
vote on it... ABCD / true-false cards
mini white boards
Get in touch

If you need any further help

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