

Introducing the TAPS pyramid model

The Teacher Assessment in Primary Science (TAPS) project is a 3 year project based at Bath Spa University and funded by the Primary Science Teaching Trust (PSTT), which aims to develop support for a valid, reliable and manageable system of science assessment which will have a positive impact on children's learning.

Where did this start?

The Nuffield Foundation (2012) recommended that the rich formative assessment data collected by teachers in the course of ongoing classroom work in science should also be made to serve summative reporting purposes. They developed a pyramid model where assessment information flowed from classroom practice to whole school reporting – this is represented by the orange arrow.

Where did this come from?

The TAPS project team have worked with local project schools, the Primary Science Quality Mark and the PSTT College to create this model of teacher assessment and populate it with examples. It can be used as a whole-school self-evaluation tool to support schools in identifying strengths and areas for development in school assessment systems.

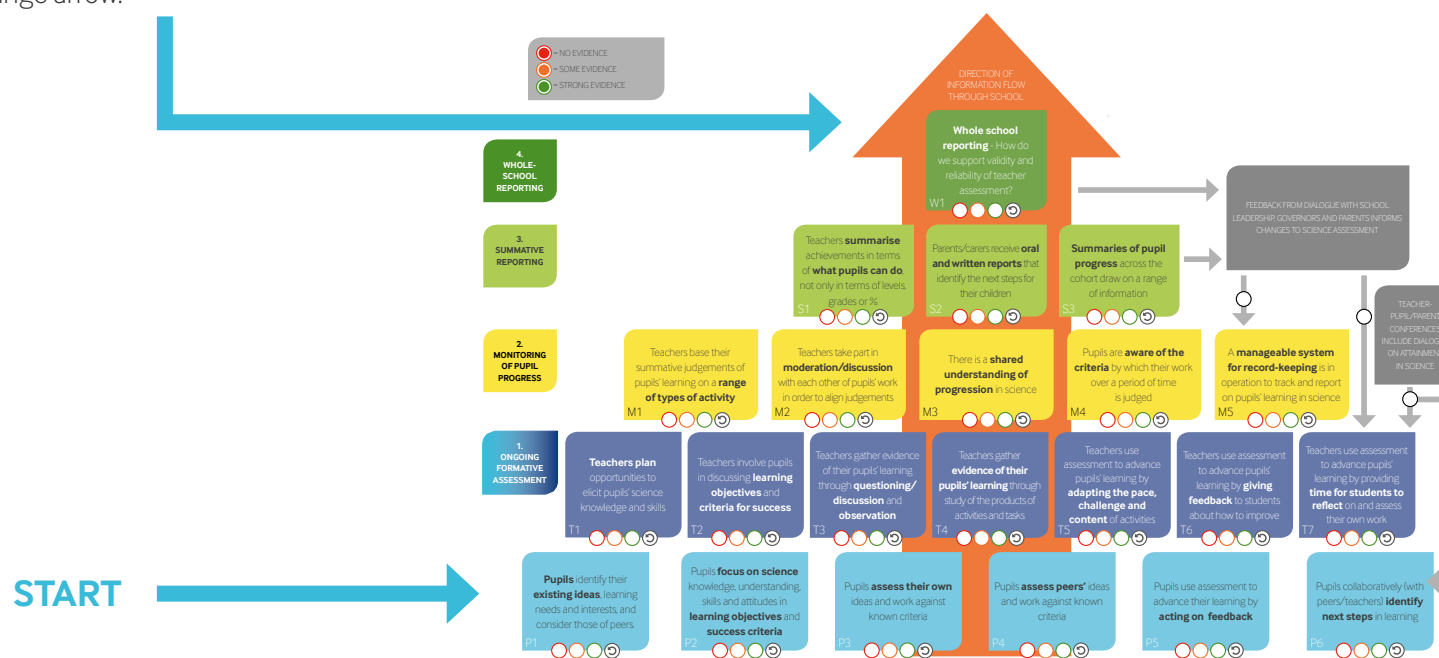
Where do we start?

The 'Pupil layer' and the 'Teacher layer' at the base of the pyramid encapsulate the principles of Assessment for Learning; schools should begin by focusing on these layers since this is not only the foundation of the whole system, it is also where changes will have the most impact on pupil progress in Primary Science.

What can we do with this?

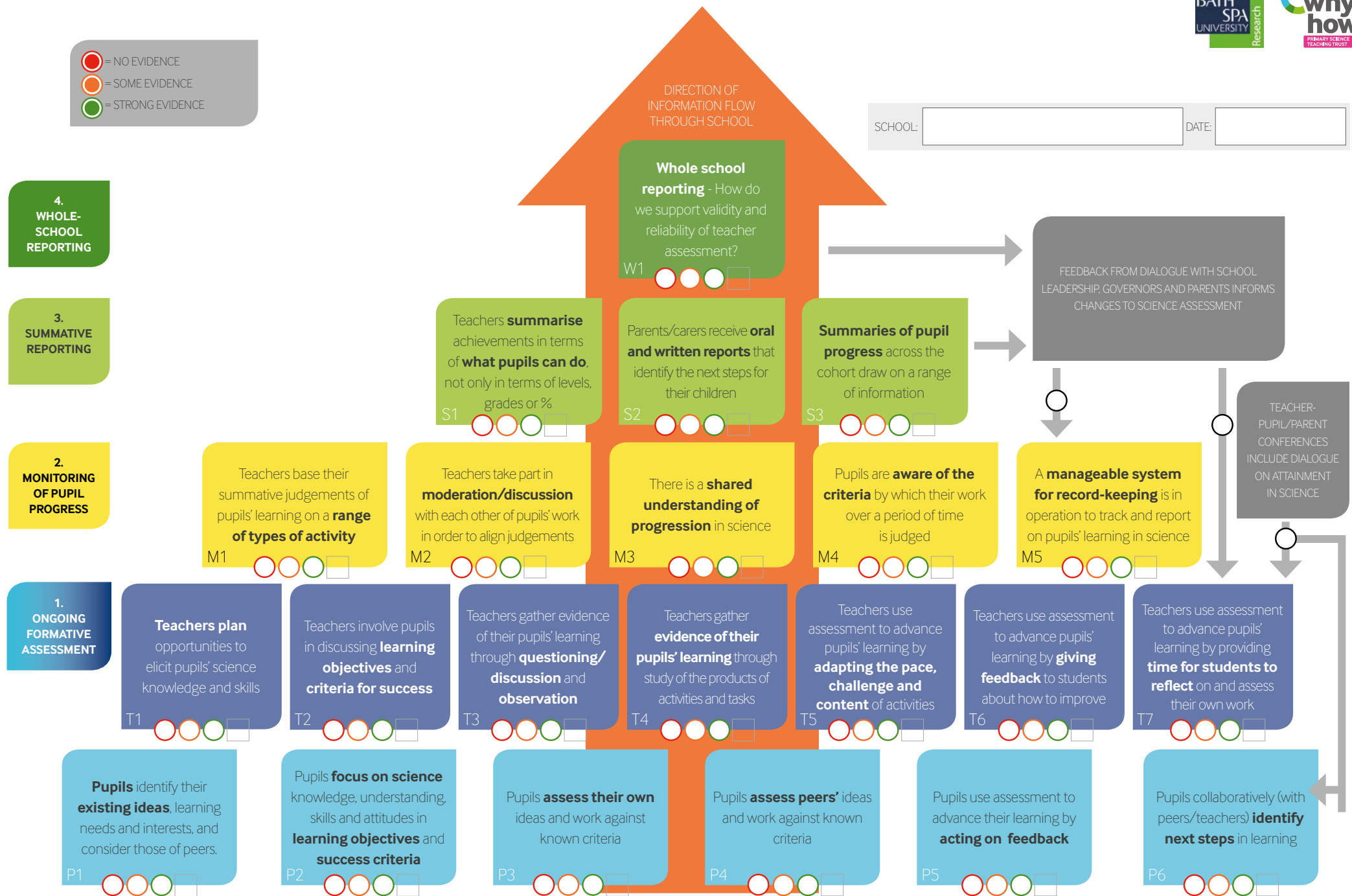
This pdf can be used as a supportive source of examples and/or as a structure to support school self evaluation. The interactive functions allow you to traffic light your assessment systems (on your own saved copy) and make notes on the approaches in your school.

On the pyramid page, each box will take you to examples if you click on it. The 'back to the top' button (bottom right) will take you back to the pyramid. Each box on the pyramid has buttons for red, amber, green and reset (if they are black in Adobe try clicking 'Highlight existing fields' on the toolbar). There is a page for making notes about your own school at the end of the document and a link for this on each page. If you prefer to do this on paper then a black and white pyramid for printing is also available on the PSTT website.



If you would like to offer further examples or provide the TAPS team with feedback, please email primary.science@bathspa.ac.uk

☐ = NO EVIDENCE
☐ = SOME EVIDENCE
☐ = STRONG EVIDENCE



SAVE MY PROGRESS

Notes  Next page 

E.g. mindmaps, annotated drawings, KWL grids, mini whiteboards, post its, talk partners.

A group elicitation at the start of lesson can be recorded collaboratively on large paper or sticky notes. For example, this Y5/6 class consider how materials can change.



Holt Primary School, Wiltshire

Giving children objects or pictures to sort can tell you a lot about their ideas, especially if the categories are chosen by the children.

For example, when Y1 children sorted food items it led to a discussion about where pasta comes from.

Beacon Rise Primary School, Bristol

Phoebe
"If you put sugar
in a cup of tea,
it will dissolve."

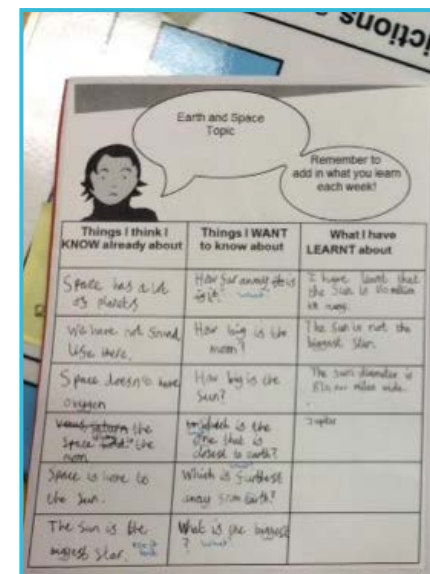
Responses in class discussions can be recorded by teachers, TAs or the pupils themselves. For example, at this Y3/4

statements regarding whether materials can be changed (materials included chocolate and sugar). The TA recorded responses during the whole class feedback.

Victoria Park Primary School, Bristol

Ask pupils to consider what they already **K**now about a topic and what they **W**ant to find out. At a later date, return to the grid to consider what they have **L**earnt.

This particular example comes from Active Assessment:
<http://www.millgatehouse.co.uk/product/active-assessment-science/>



St Paul's Catholic Primary School, Yate

Positive, Minus, Interesting

Group discussion can be structured by PMI: listing the Positive points, Minus points and the Interesting effects of a particular situation. This is one of a range of strategies for 'Bright Ideas Time'. For further details and other examples see <http://www.education.brookes.ac.uk/Partnerships/Primary-school-teacher-resources/Primary-Science/The-Bright-Ideas-Time/>

This could be in response to a question like: what if there was no friction? What if I had an ear in the middle of my hand?

'I like it because you get time to think and to get ideas off of other people.'

Y3 child

'I like that when you do it you can work with a partner and you are not working on your own.'

Yr 3 child

'I like it because you only have to write notes and you have time to rest and to think.'

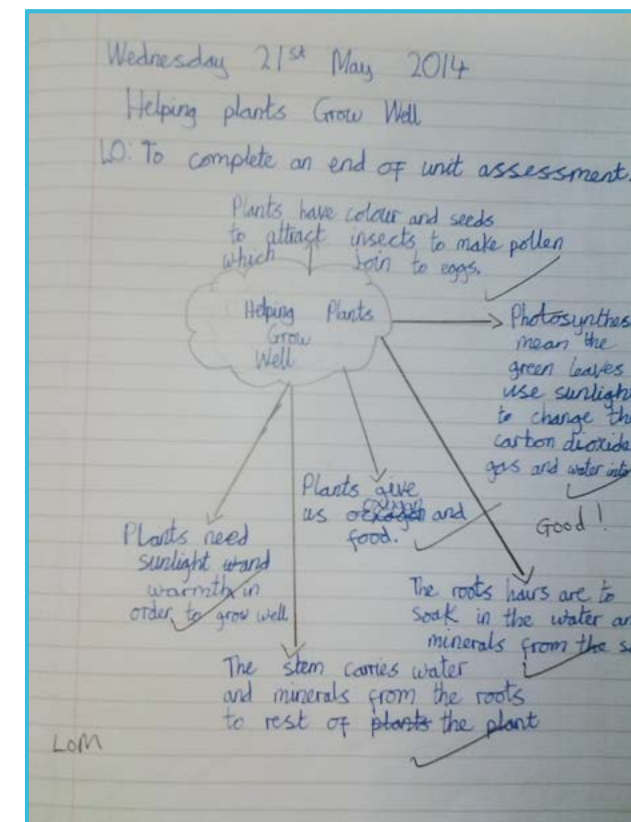
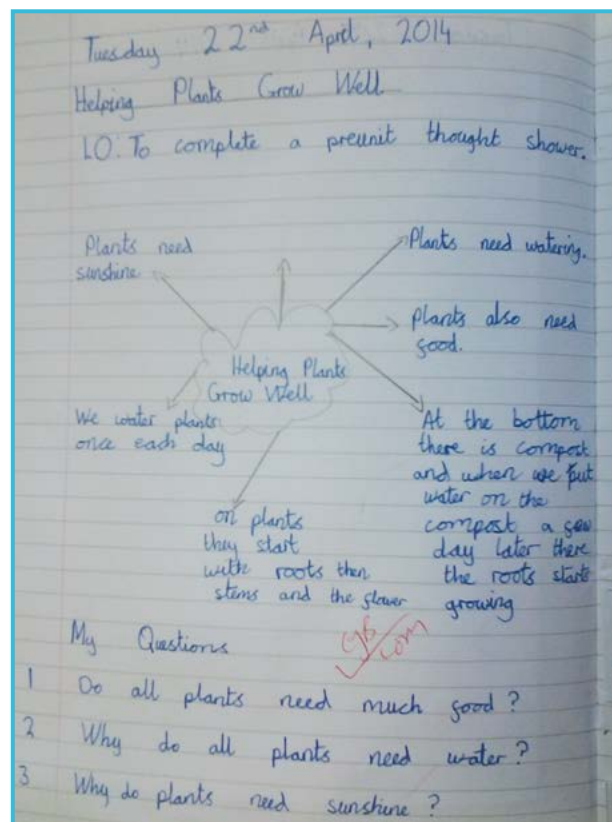
Yr 3 child

Staff now use this communication technique in other curriculum areas such as Geography, History and Literacy.

Burford School, Marlow

Pre and post unit thought showers

At Northbury Primary children complete Pre and post unit thought showers for each topic. For example, at the beginning of the Y3 unit on Plants the child described factors which affect plant growth. At the end of the unit the child described photosynthesis and reproduction.



Northbury Primary School, Barking

PUPIL BOX 2:

PUPILS FOCUS ON SCIENCE KNOWLEDGE, UNDERSTANDING, SKILLS AND ATTITUDES IN LEARNING OBJECTIVES AND SUCCESS CRITERIA.

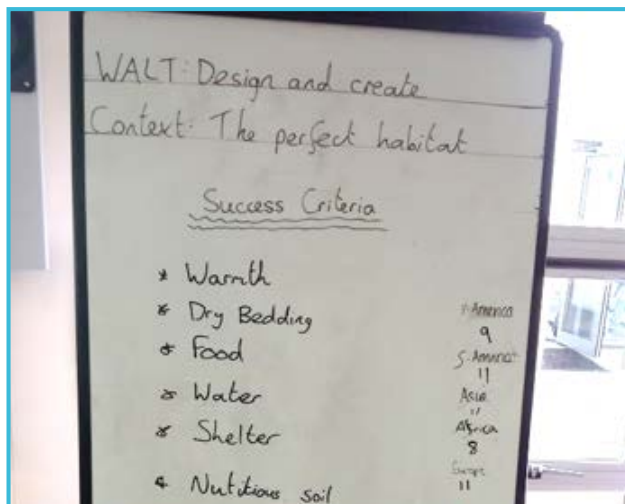
E.g. be clear about science focus rather than presentation etc.

Worlebury St Paul's CofE VA Primary School

These success criteria for designing a 'perfect habitat' for a small animal were generated by the children through a whole class discussion.

Could some have been bracketed together to simplify the list?

Could some have been expanded upon?



Worlebury St.Paul's Primary School, Weston-super-Mare

Homework Learning Logs

At Burford School Learning logs enable parents to become involved in their children's science learning.

Learning log tasks have allowed children to demonstrate their knowledge and skills in a variety of ways.

Cleapps competition

For learning log homework, children were asked to make a model of a sycamore seed. Best entries were presented in an assembly and entered in the competition.



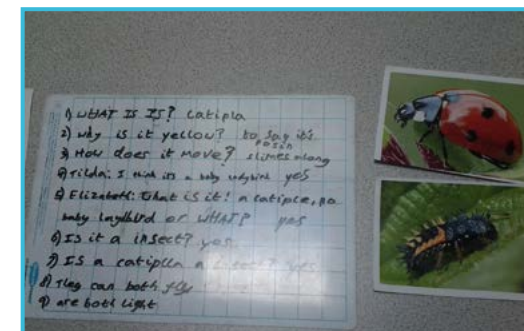
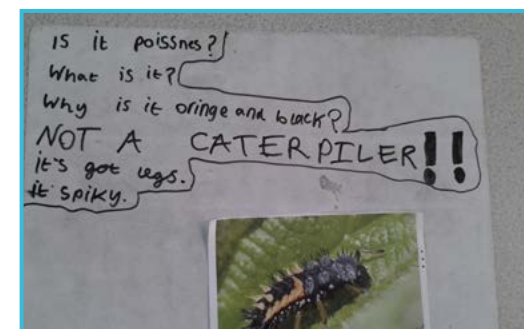
Children are invited to consider the effect no electricity would have on their day.

Burford School, Marlow

Focus on science objectives

By using talk partners and a challenging creature, the focus is on discussion, question raising and explanation:

What do you think it could be? Why?



Ashley Down Schools, Bristol

PUPILS ASSESS THEIR OWN IDEAS AND WORK AGAINST KNOWN CRITERIA

E.g. traffic lighting or highlighting objective, commenting on whether predictions are supported.

Making self assessment part of the lesson

Children are asked to decide whether they have met the objective.

For example, initials on the board when you have...

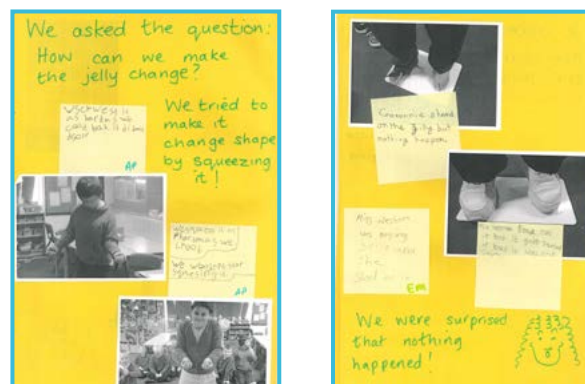
Stand on a chair if you have...



Malcolm Sargent Primary School, Stamford

Self assessment in a floorbook

'Sometimes we get children to record their initial ideas in a floor book. They can then revisit this at the end of a lesson or topic to review how their understanding has developed. Generally at the end of a lesson they would have the opportunity to say how they felt their learning went. They'd usually mark it with a coloured dot, like a traffic light, or a smiley face, and peer assessment we do sometimes get them to mark their own work. We will give them a set of criteria so they might give like a mark for the presentation, a mark if they gave a reason for their prediction, or something like that, and a mark for using scientific vocabulary.'

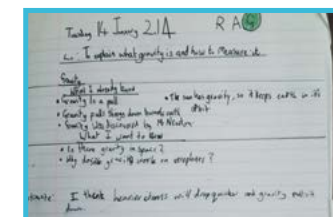


Oaktree Primary School, Swindon

RAG for self assessment

Children record Red/ Amber/Green at the end of the lesson to show how they feel about the Learning Objective.

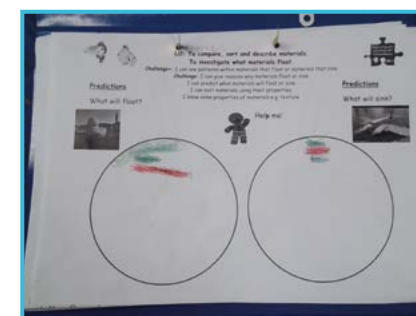
Ashley Down Y5



Reflecting on predictions

Children made predictions about what will float/sink. After testing the objects they then used colour to show whether their predictions were accurate or not.

Ashley Down Y1



Ashley Down Schools, Bristol

End of unit self assessment

Pupils complete a self assessment sheet at the end of a unit. They make judgements about whether they have achieved the unit objectives, e.g. I can describe the difference between a magnet and a magnetic material.

They also comment on their favourite part of the topic and the most interesting thing they have learnt.

Science Record of Achievement Name: _____

Unit 3E Magnets and springs

- ☒ I can tell you what happens when some materials are put near a magnet.
- ☒ With my teacher, I can make up an experiment to test an idea and make a comparison between results.
- ☒ I know that a force acts in a particular direction.
- ☒ I can describe the direction of forces between magnets or between a spring and someone compressing it.
- ☒ I can classify materials as magnetic or non-magnetic.
- ☒ I can describe some uses of magnets.
- ☒ I can decide how to test an idea by myself and explain how to make the test fair.
- ☒ I can spot patterns in results and use these to draw conclusions.
- ☒ I can describe the difference between a magnet and a magnetic material.
- ☒ When I explain the results of experiments I use my scientific knowledge and understanding in my explanations.

My favourite piece of work in this topic was:
When we done an experiment on magnets
which one?

I liked it because:
It was very interesting. why?

The most interesting thing I learned was:
When the world was a magnet.
Earth

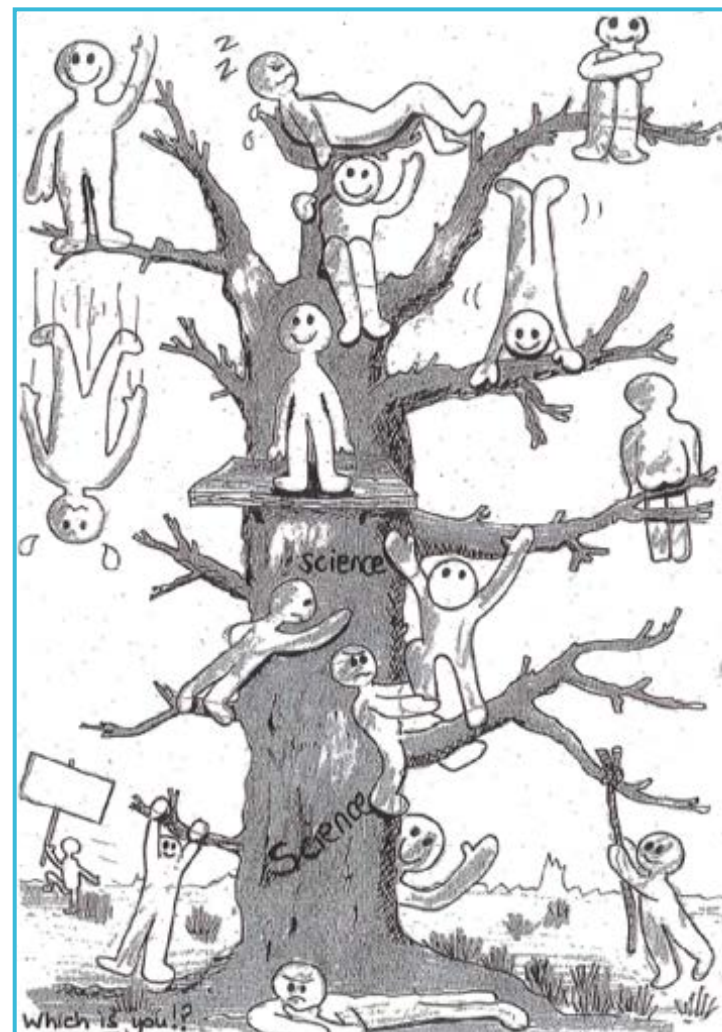
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Northbury Primary School, Barking

Self assessment of attitudes to Science

A self assessment of how you feel about science using a 'blob' diagram (www.blobtree.com).

Children select the one they identify with.



St Peter's Primary School, Stoke-on-Trent

PUPIL BOX 4:

PUPILS ASSESS PEERS' IDEAS AND WORK AGAINST KNOWN CRITERIA

E.g. comment on another group's presentation, give 2 stars and a wish for piece of work.

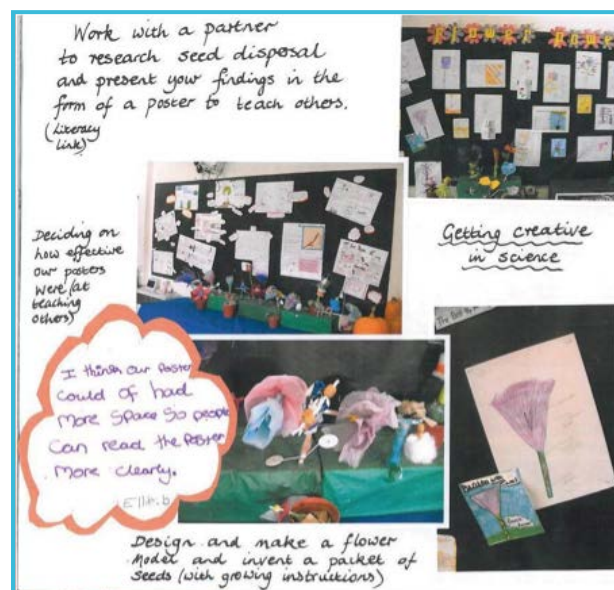
Responding to peer feedback

In a Year 5 lesson on Space the children were physically modelling the orbit of the Earth and moon using different sized balls. As they moved the balls they gave a commentary on what was happening, which was then peer assessed for clarity and accuracy. The groups gave advice to each other for how to improve their explanation to 'become 5* scientists who use scientific vocabulary accurately'.

This exemplifies assessment at Shaw: a clear framework for progression which is shared and used by both staff and pupils, enabling assessment to be used FOR learning.



Pupils evaluate their own and other's work. E.g. deciding how effective their posters were at teaching others about seed dispersal.



Shaw Primary School, Melksham

Peer assessment

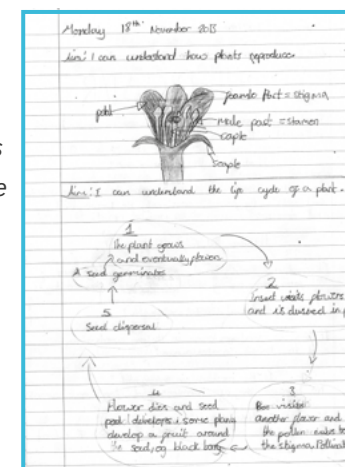
Drove Primary makes use of peer assessment to evaluate learning against known criteria and inform next steps. The following examples are drawn from peers annotating each other's work:

'I like your explanation about dissolving and your sentence about the liquid dissolving the powder. Improve: maybe label the other two jugs in the picture because I don't know what's in them.'

(Peer feedback)

'I like K's technical vocabulary like pollination. The labels are clear and go in the correct order.'

(Peer feedback)



Drove Primary School, Swindon

PUPIL BOX 5:

PUPILS USE ASSESSMENT TO ADVANCE THEIR LEARNING BY **ACTING ON FEEDBACK**

E.g. respond to mini plenary advice in second half of lesson, make improvements in next investigation.

Acting on feedback

At Shaw a high emphasis is put on speaking, listening and group work. This is combined with a focus on self and peer assessment in many lessons.

For example, in Year 4 the children had found it difficult to create a branching key in their books, so the next lesson began with pupils making keys with 'post its' in small groups. After talk partners had formulated yes/no questions to divide the animals, the children identified for themselves if they felt confident or not, with those who found it tricky being placed with those who did not.

After ten minutes creating their own keys, the pupils were given time to walk around to look at others' work. Rather than the teacher picking out good ideas, these were put forward by the pupils who then went back to improve their key.



Shaw Primary School, Melksham

Pupils make improvements in response to suggestions given

Comments made by observer:

At the start of the lesson children reviewed feedback comments made by teacher on work from previous lesson [Time was given to pupils to do this, and pupil responses to comments made were encouraged – written or oral]

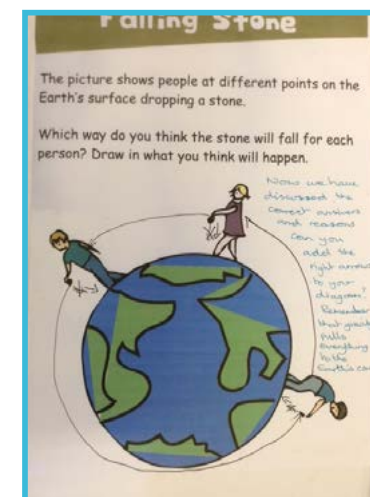
During the lesson adult intervention led to improvements particularly in recording of results.

St. Andrew's Primary School

Returning to a task

Here a pupil has completed a task, the teacher has given feedback and the pupil has had another go.

The pupil had started by drawing arrows around the world, after discussion with the teacher, the pupil then drew new arrows towards the centre of the Earth. This particular example comes from Active Assessment: <http://www.millgatehouse.co.uk/product/active-assessment-science/>



St Paul's Catholic Primary School, Yate

PUPILS COLLABORATIVELY (WITH PEERS/TEACHERS) IDENTIFY NEXT STEPS IN LEARNING

E.g. identify which part of the success criteria is missing, consider how to make the measurement more accurate.

Target cards at Crosshall Juniors

Children are given a **Target Card** which shows a clear **Learning Journey** for each topic.

They **self assess** at the beginning and end of each topic.

IMPACT

Children are challenged and supported in relevant ways.

Children are encouraged to take ownership of their learning.

Our Learning Journey

Aim: I can help the medical profession by developing ideal conditions for the growth of antibiotics.

Pre-assessment	Learning Intentions	Post-assessment
✓	I know the seven life processes common to all living things.	✓
✓	I can explain what a micro-organism is.	✓
✓	I know the conditions that micro-organisms prefer to live and grow in.	✓
✓	I can name at least three different ways that micro-organisms can be helpful.	✓
✓	I can name at least three different ways that micro-organisms can be harmful.	✓
✓	I can explain how to prevent the spread of harmful micro-organisms.	✓
✓	I know the conditions in which a micro-organism produces the most gas.	✓
✓	I can name some scientists who investigated micro-organisms and explain what they discovered.	✓

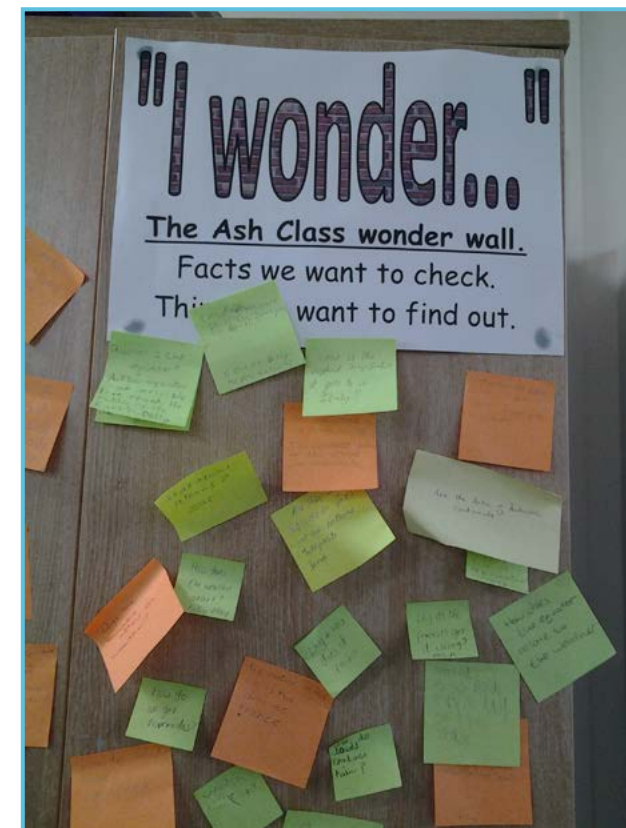
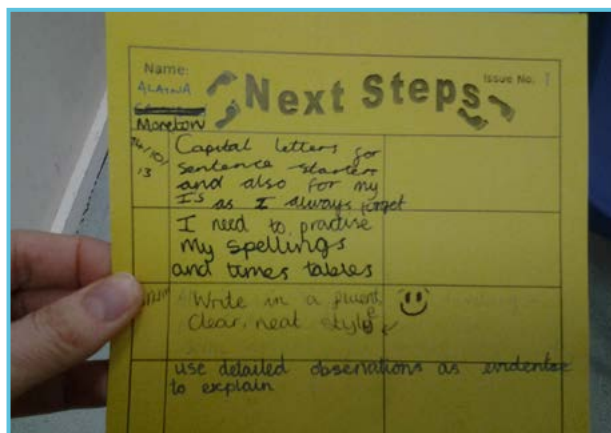
Crosshall Junior Academy Trust, St. Neots

Identifying next steps

Children put forward ideas for what they would like to learn next. For example, pupils can put their questions and queries on a class Wonder wall:

- Facts we want to check.
- Things we want to find out.

Individual next step cards can remind the children of a current focus. The example here includes capital letters for English, times tables for Maths and using observations for Science.



Holt Primary School, Wiltshire

TEACHER BOX 1:

TEACHERS PLAN OPPORTUNITIES TO ELICIT PUPILS' SCIENCE KNOWLEDGE AND SKILLS

E.g. plans show range of elicitation strategies at variety of times E.g. beg/mid/end lesson.

Pre and post assessments

Teachers find out what the children know at the start and the end of the topic. This helps to pitch the lessons and also clearly demonstrates progress.



For example, in a year 1 group discussion about animals, at the beginning of the topic the children knew little about amphibians or invertebrates. By the end of the unit, the children could name animals in these groups and describe some of their features.



Shaw Primary School, Melksham

Groups identify existing ideas

Groups of children are able to share what they know. For example, as a class they list animal groups and features, then go into groups to list animals of each type.

This activity was in preparation to make an animal 'guess who' game. It also gave the teacher a chance to consider the children's understanding of classification and calculate their next steps.



Victoria Park Primary School, Bristol - Y2

At Burford we use interactive displays to celebrate science.

Year 6 questions at the beginning of the lesson. Children love sticking up their ideas on the interactive board.



As the topic progresses they see how their ideas and understanding change compared to the beginning of the topic.



Post-it notes promote questions and answers.



Clip on vocabulary words can be taken down during the lessons to help with writing.



Children in Y4 recorded classroom temperature at different times of the day.

A science display board in the front entrance is updated regularly and shows that science is valued as a subject featuring 'Science in the News' or an 'Amazing Science Fact of the Week'.

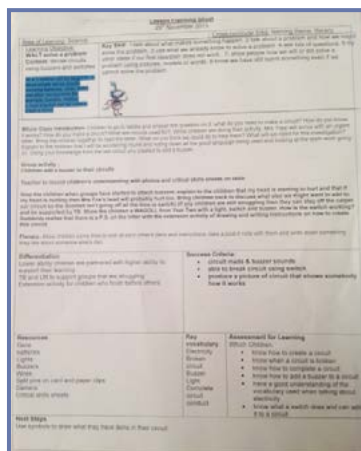


Real objects are linked to real scientists.

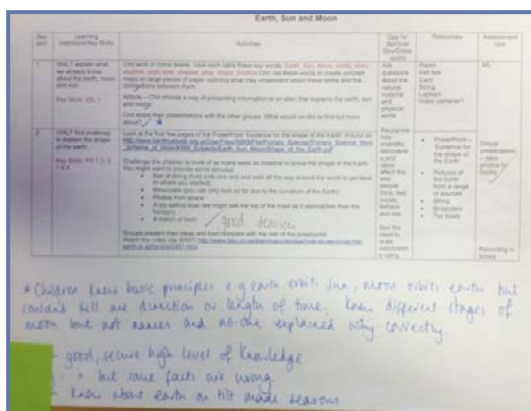
Burford School, Marlow

Annotated planning

Lesson planning including WALT, success criteria and evidence being looked for AFL.



Worlebury St Paul's CoFe VA Primary School annotated medium term planning showing assessment of both whole class and notable individual children



Worlebury St Paul's Primary School, Weston-super-Mare

Teachers plan opportunities to elicit

Plan focused group exploration of materials with torches with teacher who writes comments on children's sheets.



ELL skills Learning with others See & Tactile (Have a go! Get (Asking questions) Ask 'What is, when did, who was questions Share my thoughts with others and work with them to achieve a goal. Plan to do things that need to happen in a particular order. Talk to others and share how something might be done.			SMSC skills Article 12: You have the right to give your opinion and for adults to listen and take it seriously. Deal: I can stop and think before acting.		Talk skills 5: short tasks to about what he/she is doing and observing. 1: depends to answer instructions. 10:1: Take complete others and begin to respond to what others say.		
Research Project Weekly Planning Term: 2 Date: W/C 25.11.13							
Our Research Project question is: Let there be light. How is light used?							
Lesson number & NC link	Learning Objectives	Learning Skills	Success Criteria Have a go at:	Introduction	Main Teaching and Learning Time (including differentiation information)	Penary/ Opportunities & Key Questions	Learning Questions/ Discussions
Tuesday 26th November Session Science Investigation	To observe closely using simple equipment Performing simple tests Gather data to help answer a question	SMSC: Article 12: You have the right to give your opinion and for adults to listen and take it seriously.	Observing closely Using different equipment Helping think of a question to answer Describing properties of materials Making simple statements to show what you found out	Working with a group of children present them with a variety of materials including opaque, transparent, translucent, magnifiers and torches to explore. What do they notice? Which materials can they name? Record answers on Post its	Model turning their ideas into a question: Which materials would be good for a window/ mirror/ dark tent? Children test the materials and sort into groups. Introduce the vocab opaque, transparent, translucent. Which vocab matches which materials? How could they record what they found out?	What other materials could they find to add to their collection? What else could the materials be used for?	
	To make simple statements about what results show. To describe the simple physical properties of variety of everyday materials	Talk Focus: S: Chooses some relevant vocabulary. L: Responds to simple instructions. GD&I: Talk relates to the task being undertaken.		Supp Observe closely and use different equipment	Core Observe closely and use different equipment Describe properties of different materials Make simple statements to show what they found out	Ext Also help think of a question to answer	

Ashley Down Schools, Bristol - Y1

TEACHER BOX 2:

TEACHERS INVOLVE PUPILS IN DISCUSSING LEARNING OBJECTIVES AND CRITERIA FOR SUCCESS

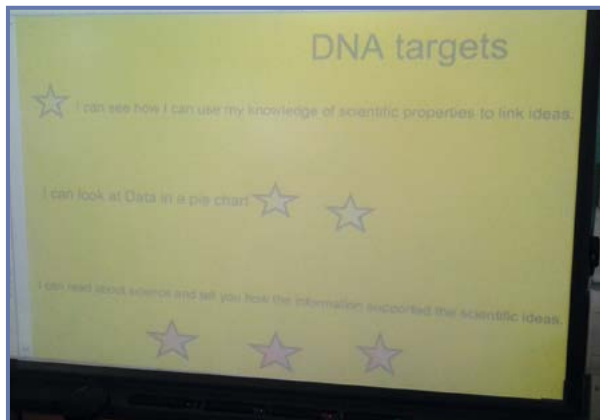
E.g. discuss what good observation or conclusions look like.

Discuss the LO

Learning objectives are shared and differentiated

Eg

- * I can see how I can use my knowledge of scientific properties to link to ideas
- ** I can look at data in a pie chart
- *** I can read about science and tell you how the information supported the scientific ideas



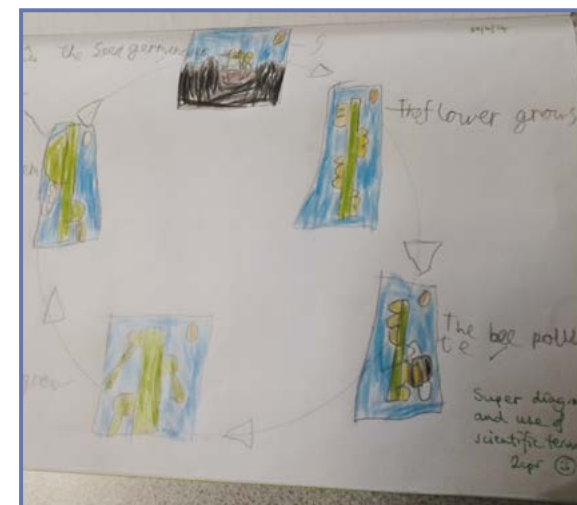
Malcolm Sargent Primary School, Stamford

Learning objective is the focus throughout the lesson

Pupils are supported to focus on the learning objective (which is may be different from the 'title')

Eg LO: to set up a fair test, title: how to kill a plant).

Marking comments draw attention to areas of success eg use of scientific vocabulary.



Ashley Down Schools, Bristol - Y3

Ledbury Challenges....

an example of Year 6 challenges designed to find out what the children knew

Circuit Challenges

Can you draw a diagram of the following circuits?

Don't forget to use a ruler clearly.

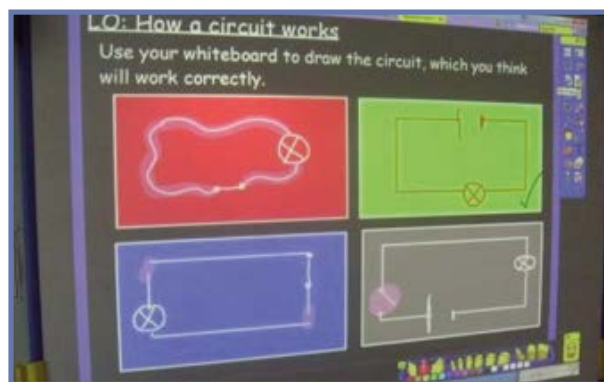
Ready = Make one bulb light up.

Steady = Make two buzzers work.

Go = Make 2 bulbs very bright. Then, draw a circuit, which makes 2 bulbs very dim.

GoGo = Add a switch that turns off both bulbs. Is this a series or parallel circuit?

SuperSonic = Add a switch that turns off only one bulb. Is this a series or parallel circuit?



Ledbury Primary School, Herefordshire

Ledbury differentiated outcomes

Y5 Group Activity

How can we prove that there are gases around us?

Show concept cartoon and explain Wizard Wow's problem.

Explain that Wizard Wow is very clumsy and spills his potions. He needs something that will absorb any spills quickly and effectively.

Learning Objective	To know that air exists	To know what solids dissolve completely in water.	To be able to identify what makes a solid absorb liquids successfully.
Assessment			
Ready	I can find a way to prove that air exists.	I can identify which solids completely dissolved.	I can say which solid was the best at absorbing.
Steady	I can also explain my reasoning.	I can also explain why.	I can predict with a reason which will be the best.
Go	I can even find multiple ways to show air exists and give reasoning for each.	I can even use the terms transparent, translucent and opaque to explain my reasoning.	I can even explain my results using scientific reasoning.

The "ready, steady, go" criteria help children to upgrade their work by giving them clear targets

Ledbury Primary School, Herefordshire

TEACHER BOX 3:

TEACHERS GATHER EVIDENCE OF THEIR PUPILS' LEARNING THROUGH QUESTIONNING/DISCUSSION AND OBSERVATION

Concept Cartoons for Formative Assessment

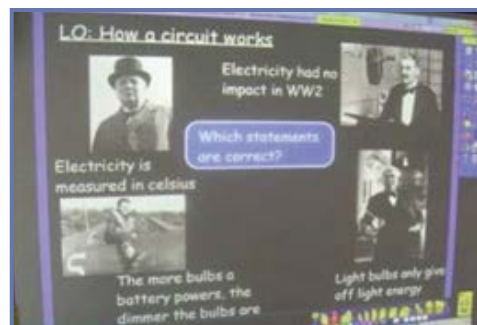
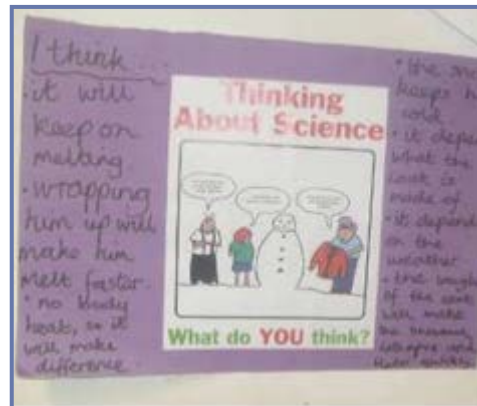
At Ledbury we began to use Concept cartoons as starting points to stimulate discussion and investigation. We gathered children's ideas and encouraged them to think about how they could investigate to find a solution.

Concept cartoons evolved as teachers began to use them in different ways:

- As a 'cold' task to find out what children already know about a topic
- As an assessment tool to find out what children have learnt
- By making their own to fit to a specific topic
- To generate questions about a topic

See conceptcartoons.com for further information.

In Year 5, children used the concept cartoon about the snowman to help them think about how best to insulate their magic potions as part of their magical materials topic. In Y2 the children used a similar cartoon to help them solve the problem of how to stop the dinosaur eggs from melting.



Using concept cartoons:

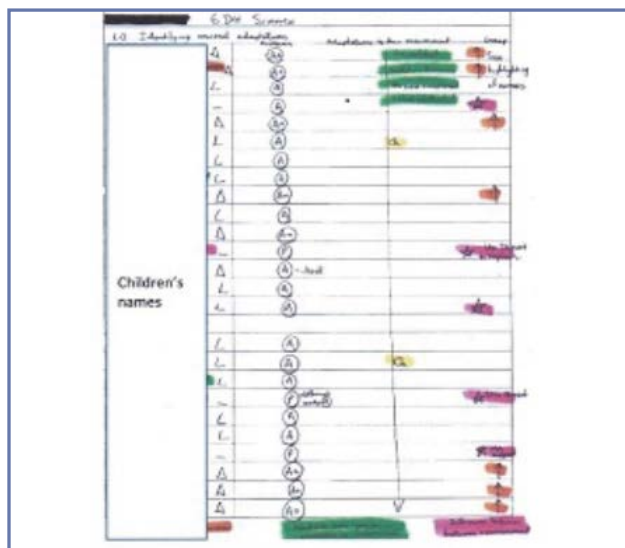
Teachers

- Concept cartoons are ace. As a teacher they give me a starting point to go from.
- I think they can be used in different ways and not just for science, for other subjects too!
- Great for getting the children thinking about the subject and trying to formulate their own ideas.
- They are great for assessment and for using scientific language.
- I love the concept cartoons as a tool for learning and a support for teaching.
- Children can refer back to them as they refine their ideas.
- They open up the lesson making the children more in control of the direction of learning.

Ledbury Primary School, Herefordshire

Using observations

We decided to build in challenges and up-levelled tasks to provide more differentiation. We modelled observations leading to next steps based on good practise in EYFS.



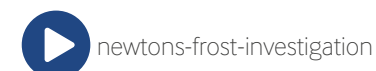
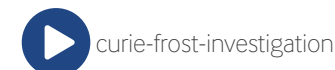
Teachers use a class list and use a triangle symbol as a quick way to record what is observed in a lesson, through discussion or in work. The amount of triangle drawn indicates how well the child is meeting the objective (from 1 line to 3 lines). After the lesson the teacher decides if a child has achieved the level, partially achieved it or achieved above it. This information is then used to plan the next steps for the different groups of children.

Ledbury Primary School, Herefordshire

Recording discussion

Ipads can be used to capture discussions with children. For example, Soundcloud can be used to record children's initial ideas, capture group reflections on what they have discovered, or provide an opportunity for children to listen back and reflect on their progress.

Research on recording assessment 'In the Thick of It' is based at Manchester University's Science and Engineering Education Research and Innovation Hub <http://www.fascinate.manchester.ac.uk/projects/>



Great Moor Infant School, Stockport - Class 1

Recording discussion in floorbooks

A teacher or TA scribes the children's comments in response to a stimulus eg magnetic materials.

This recording takes place in a group or class book which creates a record of how the children's ideas have developed.

For further information on how to use floorbooks go to

<http://www.pstt.org.uk/resources/continuing-professional-development/floorbooks.aspx>

Stack: Science book.

Science Planning

Subject: Materials Autumn Term 1 and 2 Mrs Clarke's class - Yr 1

Week	Vocabulary	Skills focus	Knowledge levels	New curriculum	Activity	Evaluation
1	Bendy Hard Smooth Soft Strong	Collecting data - Sorting and classifying - Using our senses we can tell our friend what things are like. Presenting findings - Record findings - We can talk about what we have found out using simple language.	Level 1 - Observe different materials from our everyday lives. Level 1 - use words like hard, soft, bendy, rigid, waterproof, smooth, rough, cold, warm, shiny, dull. Level 2 - Sort materials into groups based on hardness, flexibility etc.	Compare and group together a variety of everyday materials on the basis of their physical properties.	I can group materials around me based on their hardness, flexibility using words like soft, hard, rough, smooth.	Children used the imagination tray well to sort the objects and use the vocabulary.
2	Magnetic Not magnetic Metal	Collecting data - Sorting and classifying - Using our senses we can tell our friend what things are like. Presenting findings - Record findings - We can talk about what we have found out using simple language.	Level 1 - Record what different material look, feel, sound, taste, smell like. Level 2 - Sort materials into groups based on magnetism.	Compare and group together a variety of everyday materials on the basis of their physical properties.	I can group materials around me based on whether they are magnetic or not magnetic.	Children enjoyed this activity. They used their imagination tray well to sort the objects and use the vocabulary.
3	Light Heavy Float Sink	Collecting data - Sorting and classifying - Using our senses we can tell our friend what things are like. Presenting findings - Record findings - We can talk about	Level 2 - Sort materials into groups based on whether they float or sink.	Compare and group together a variety of everyday materials on the basis of their physical properties.	I can predict whether an object will float or sink. Then group them into objects which float and sink.	Children made some good predictions about how things would float and sink. Only Mr. M. was able to give a reason.

The screw will stick to the magnet because I tried it before.
I think the measuring jug will not stick to the magnet because it is plastic.

I think a spring is magnetic because I tried it before and it stuck to my magnet.
A stone is not magnetic because it's not metal.
I was surprised the peg was magnetic.

Which material is magnetic?

I think the spring is magnetic.
The balloon is not magnetic because it is made of plastic.

The washer is magnetic because it is metal.
The balloon is made of elastic so is not magnetic.

The marble is magnetic because it is shiny.
The peg is not magnetic because there's nothing magnetic on it. James said there is metal on it so it will be magnetic.

Shaw Primary School, Melksham - Y1

Teachers gather evidence through class discussion

Class discussions: ideas gathered on paper or electronic flipchart, names next to ideas.

What I want to find out...

How plastic is made? (Claire)

How are different materials made? (Rachel)

What are materials + how they are made? (Emily)

Making them stick + smooth (Gos)

How is wood made? (Polly)

Factories (Star)

Are materials made in factories? (Izabela)

How do they make, shape, paint metal? (Rachel)

Why are materials made? (Oliwen)

Where do materials come from?

LO: To investigate changing materials

What did we find out?

Looked different and hot + hard (Mr) RAVAN

(Desat) Water → smooth Sinking

Soft

Dissolved Salt (Gos)

How did it go? What would you change next time?

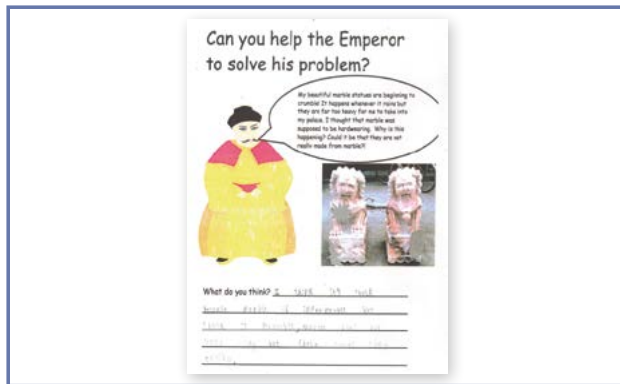
Ashley Down Schools, Bristol - Y1

TEACHER BOX 4:

TEACHERS GATHER EVIDENCE OF THEIR PUPILS' LEARNING THROUGH STUDY OF THE PRODUCTS OF ACTIVITIES AND TASKS

E.g. any recording, models, sorting

Applying knowledge at Forres Primary



Children consider why the statues might be crumbling when it rains - are they really made of marble?

Child's work:

I think it's chalk because marble is impermeable but chalk is permeable. Marble does not wear away but chalk wears away easily.

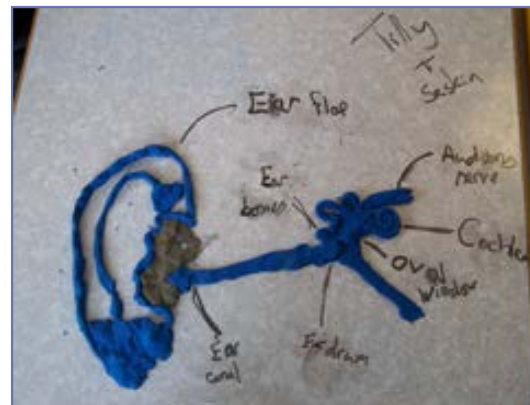
Child's work:

I think it's chalk because marble is impermeable but chalk is permeable. Marble does not wear away but chalk wears away easily.

Forres Primary School, Hoddessdon

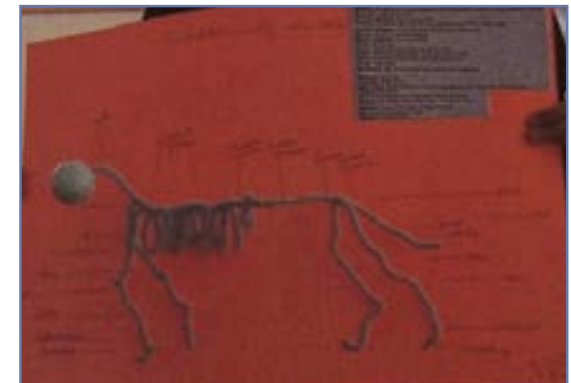
Model making

At Dame Bradbury we have experimented with model making as a learning and recording strategy - a method that differentiates by outcome, but is fully accessible to all children.



I used: pipecleaners and card and Poldy Styrene. I am proud of my model because I labelled it carefully and I used my pipe cleaners well.

Y5 children modelled the structure of the ear using plasticine. They used whiteboard pens directly onto the Science tables to label their models.

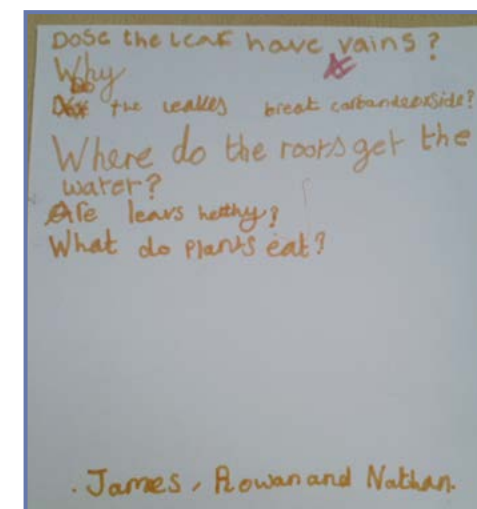
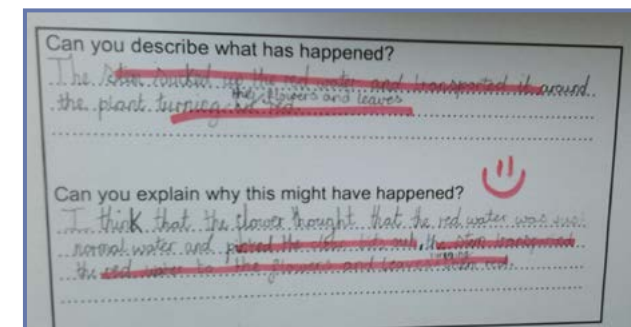
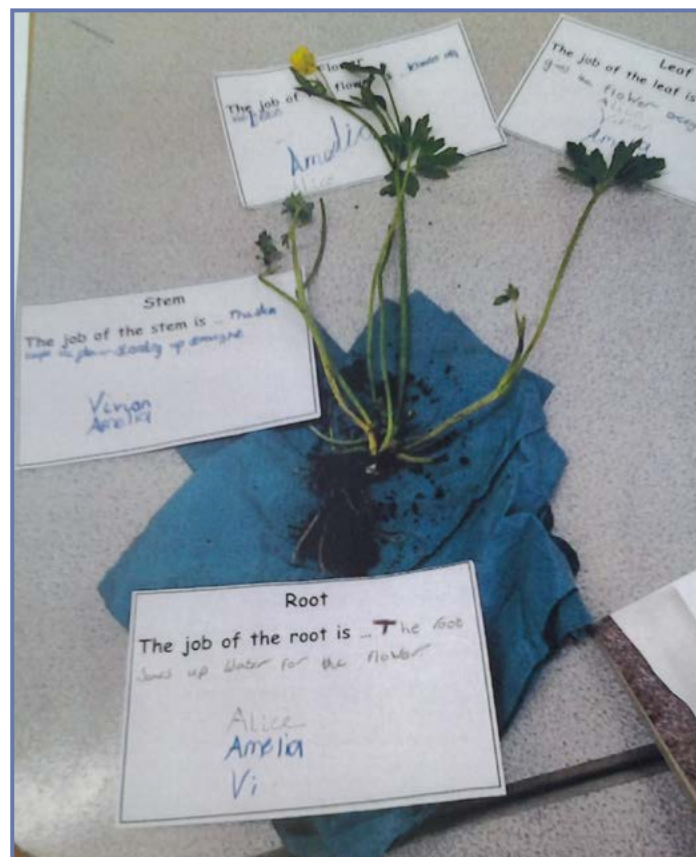


Y4 children made model skeletons at home. They had to research and choose their skeleton, materials and labelling method. The models were displayed at school and the children self assessed their work.

Dame Bradbury's School, Saffron Walden

Evidence of learning

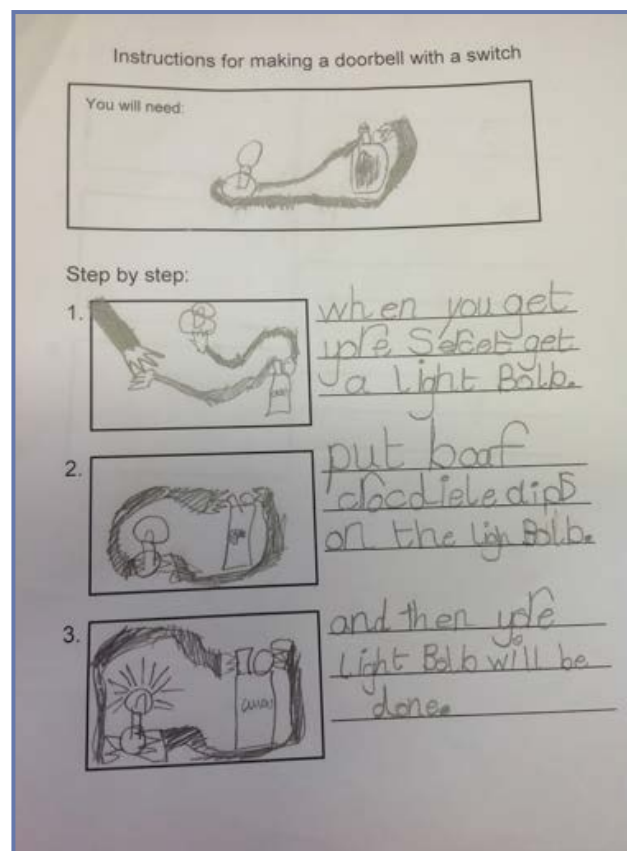
Evidence of learning can be individual (on left) or as part of a group (on right). Plus that which is not written down eg acting out/modelling seed dispersal.



Burscough Village Primary School, Lancs - Y3

Structuring evidence

Evidence that a child understands how to connect up a bulb with a battery to make it light

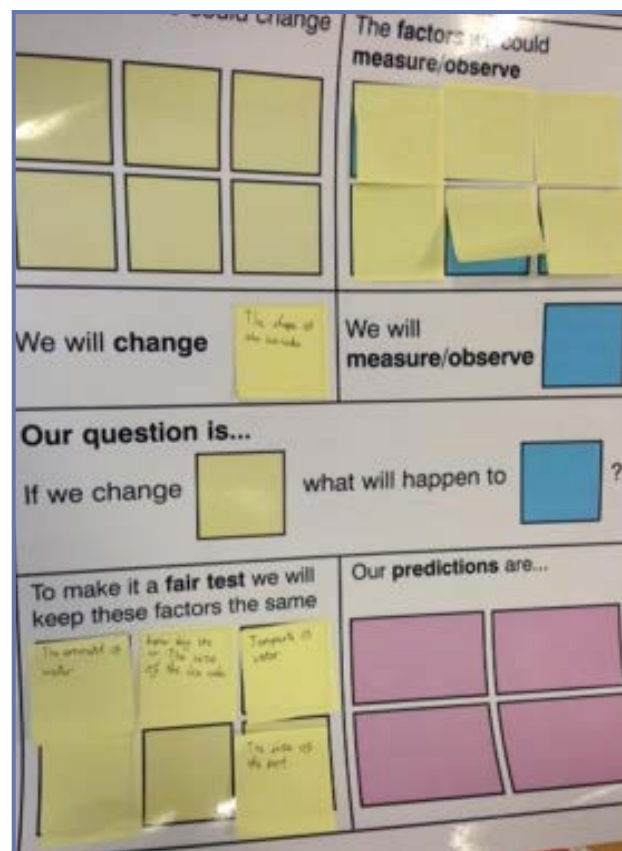


Worlebury St.Paul's Primary School, Weston-super-Mare

Gathering evidence of children's learning

A 'post it' investigation planner under construction.

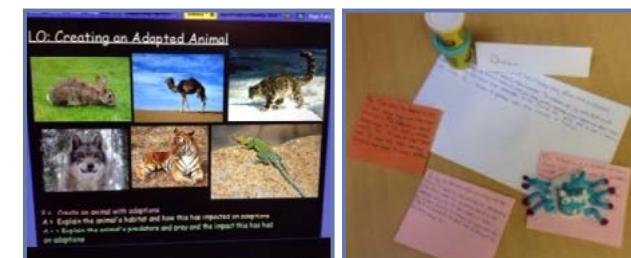
The finished planner can be photographed as evidence of a group's understanding of science investigation planning



St Paul's Catholic Primary School, Yate

Recording in a range of ways at Ledbury

As a result of feedback from children we explored different ways of recording to make it more manageable and less onerous.



Creating play dough animals and explaining their adaptations.



Y3 demonstrated what they had been learning about during their assembly for parents. They performed a dance to explain how rocks are formed and talked about different types of rocks and their uses.



Taking photos with the ipad

Ledbury Primary School, Herefordshire

E.g. support or challenge in response to pupils.

Adapting planning

The plans for the term are not written beforehand, the focus and order for lessons is flexible to take account of children's interests, topical events and, most importantly, the needs of the individuals within the class.

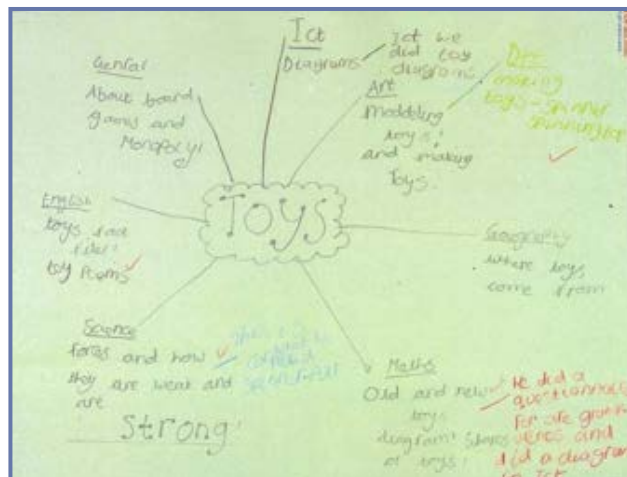
Staff record coverage on a Planning Framework which contains the yearly objectives, to help decide what to do next. This provides a record of learning opportunities, there is no assumption that all children in the year will be focusing on the same objectives in each lesson, since the focus may change for particular individuals within the class.

For example, in a lesson on properties of materials: for some, the objective would be to name the materials; for others, it would be to identify properties; whilst a further group's objective would be to link properties to their uses. Thus lesson plans can list a range of objectives representing the variety of opportunities within the lesson.

Great Meor Infants Science Planning & Assessment Framework - Plants							
Investigation type							
Brief Title							
Comments/tasks questions about aspects of their familiar world.							
Talks about things they have observed							
Talks about why things happen and how things work							
Looks closely at similarities & differences, patterns and change							
asking simple questions and recognising that they can be answered in different ways							
using relevant questions and using different types of scientific enquiries to answer them							
observing closely, using simple equipment							
making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of evidence, including thermometers and data loggers							
performing simple tests							
Setting up simple, practical enquiries, comparative and fair tests							
Identifying and classifying							
identifying differences, similarities or changes related to simple scientific ideas and processes							
using their observations and ideas to suggest answers to questions							
using straightforward scientific evidence to answer questions or to support their findings							
gathering and recording data to help in answering questions							
gathering, recording, classifying and presenting data in a variety of ways to help in answering questions							
recording findings using simple scientific language, drawings, labelled diagrams, lists, bar charts, and tables							
representing findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions							
Tells about plants							
Develops an understanding of growth decay and changes over time							
Shows care and concern for living things and the environment							
Looks closely at similarities & differences, patterns and change							
Knows about similarities and differences in relation to living things							
Makes observations about plants and explains why some things occur/change							
Identify & name a variety of common wild & garden plants							
Identify & name a variety of common deciduous trees							
Identify & name a variety of common evergreen trees							
Identify & describe the basic structure of a variety of common flowering plants							
Careen & describe how seeds and bulbs grow into mature plants							
Find out and describe how plants need water, light & a suitable temperature to grow & stay healthy							

Great Moor Infant School, Stockport

Using children's ideas to inform planning



At Woodley Primary we find out what the children already know and what questions they have, then use this to inform our planning e.g. Y2 topic of Toys

As we work through the topic the children can add comments to the map to extend their ideas and see where their learning is going.

We use mind maps to capture children's ideas and how they would like to investigate.

Date: 18-3-13	Theme: TOYS	Year: 2	Classes: 8	Teachers: LH
Objectives:	Activities:	AFL		
Science and Technology I can recognise that when things speed up, slow down or change direction there is a cause. I can say what will happen and why.	Follow the clip on the BPs website on forces. Then develop own ideas but using the bouncy balls - what might we want to find out about and how can we do this? Plan an experiment and record and show results. - rolling balls - Science activities in the week as it is science week - put a coin in a balloon, shaving mouse and what happens to it, make zippy zoomer P8, bubbling wizards brew P6, pig cars P12, floating ball game P24	knows how an exp. needs to be fair Set up a test.		
Review: Investigation on bouncy balls led to rolling balls as this was easier! Matthew/Matthew/Oliver - closed surface exp - used measures + good observes. Hannah/Gael/Denise needed support but began to recognise that fair tests were up + could predict.		bouncy balls were up + could predict.		
Objectives:	Activities:	AFL		
History I can find out about the changes in materials and technology of the toys.	Look at the pictures on the website- children to talk about what the toys are made of from the past - choose whether to make a peg doll or a teddy! Finish Questionnaire and the family tree if not done	Understand what find out about the past.		

Children are encouraged to think independently and generate their own questions which they can then investigate.

"The mindmaps make the learning more fun and purposeful."

"I like the mindmaps because I can see where the children want me to go in their learning."

The children lead me through the topic and it really makes my planning easier.

The children are more engaged and take pride in their topic books.

Woodley Primary School, Stockport

Adapting the challenge

Some groups are guided with how much of each substance to mix and prompt questions for observing, others are prompted to use scientific vocabulary for irreversible changes.

Materials	Description of materials	Prediction / hypothesis	Description of changes during mixing process	Outcome: Was a new product made? Reversible / irreversible?
Baking powder + cold water				
Baking powder + vinegar				
Alka seltzer + warm water				
Bicarbonate of soda + lemon juice				
Andrews salts + warm water				
Sherbert + water				
Bicarbonate of soda + vinegar				
dried yeast + sugar + water				
Wine wool + vinegar + air				

Materials	Scientific description of materials	Prediction / hypothesis	Description of changes during mixing process	Outcome: Was a new product made? Reversible / irreversible? Measure / record research product data. Explain / predict.
Baking powder + cold water				
Baking powder + vinegar				
Alka seltzer + warm water				
Bicarbonate of soda + lemon juice				
Andrews salts + warm water				
Sherbert + water				
Bicarbonate of soda + vinegar				
dried yeast + sugar + water				
Wine wool + vinegar + air				

Holt Primary School, Wiltshire - Y5/6

At Forres Primary planning is informed by what the children already know and would like to know.

Rocks and Soils		
What we know already	What we think we know	What we'd like to know
- They make structures out of rock. - Rocks are alive. - A rock can smash a window. - Plants live in soil. - rocks are very hard. - Soil is brown.	- the moon is made of rock. - black is the colour of coal.	- what's the most common? - the most popular size. - how does soil get older. - where do rocks come from.

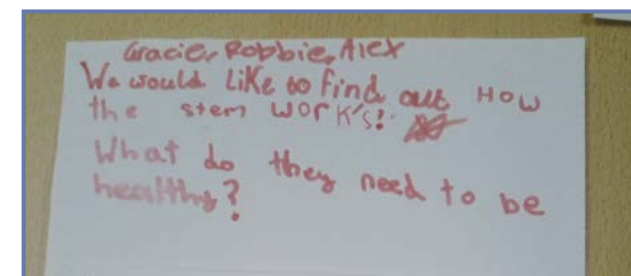
This example is from the Rocks and Soils topic, linked to a "Creative Learning Journey" through China. Each new topic is started in this way.

This is to establish what the children already know and what they would like to find out. Teachers are able to build on existing knowledge and can make the topic better suited to the children's needs. This also links to the teaching principles as children are able to ask questions and be inspired to know more.

Forres Primary School, Hoddesdon

Adapting to learners

Use children's questions as starting point for next lessons.



Date:	Year: Year 3	Assessment Focus	
Sequence 4	Topic: Plants	Knowledge & Understanding	Working Scientifically
Context: Mini Truffles for		NOTICE how water is transported in plants	Recording of observations
Today's Question (Child)			
What is the job of the stem?			
Learning Objective:			
Can you NOTICE how water is transported around a plant?			
Learning Sequence:			
Write a sentence or draw a picture in a jug of water with red food colouring leave overnight / ASK: the children to DISCUSS and DESCRIBE what they NOTICE about the flower or celery / ASK: How has the water moved around the plant? How do you know? / Children to DRAW what has been observed or RECORD in writing			
Assessment	Year 2	Year 3	Year 4
Expectation	Observe and record (draw) to represent	Record observations focusing on the	relationship between structure and function
Assessment comments:			
Suggestions for next steps:		Our next steps: (Assessment to plan future Learning)	

Burscough Village Primary School, Lancs - Y3

TEACHER BOX 6:

TEACHERS USE ASSESSMENT TO ADVANCE PUPILS' LEARNING BY GIVING FEEDBACK TO STUDENTS ABOUT HOW TO IMPROVE

E.g. marking, oral feedback, next steps, extension Qs.

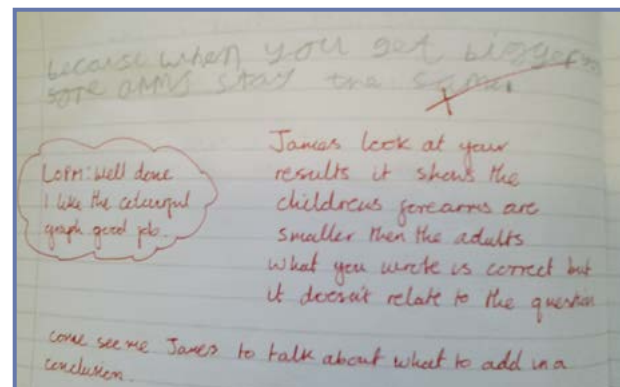
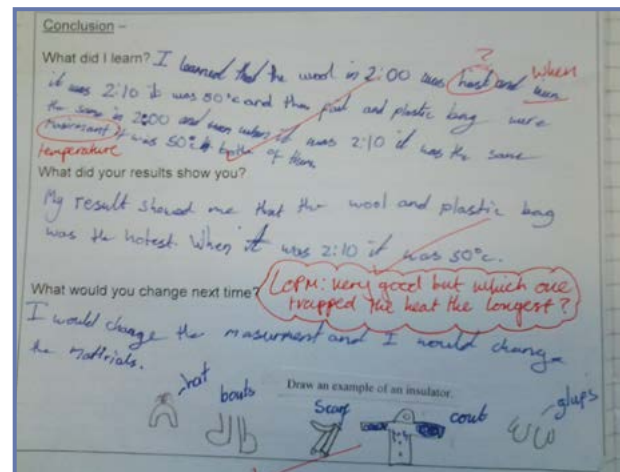
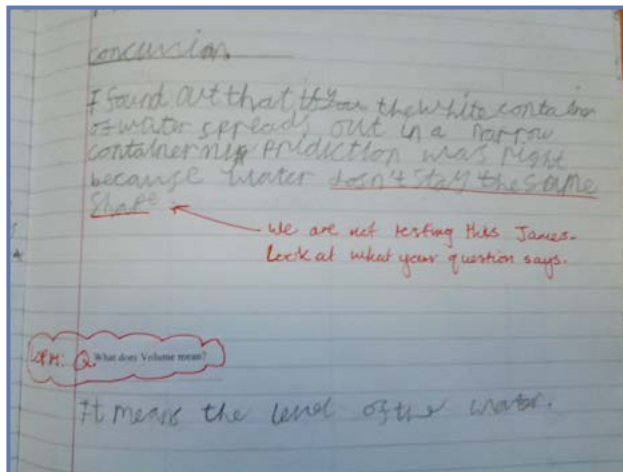
Feed-forward marking

Northbury Primary:

Feed-forward marking: examples of support Y4

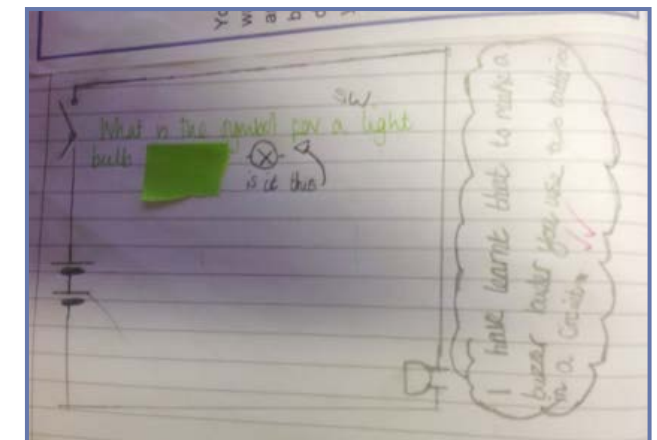
LOM = Learning objective met, children often given extension question (see eggs in 'time to respond' section)

LOPM = Learning objective partially met, teacher comment/question given to support



Giving options so that responding does not involve more writing

Marking requires and provokes a response from the child.



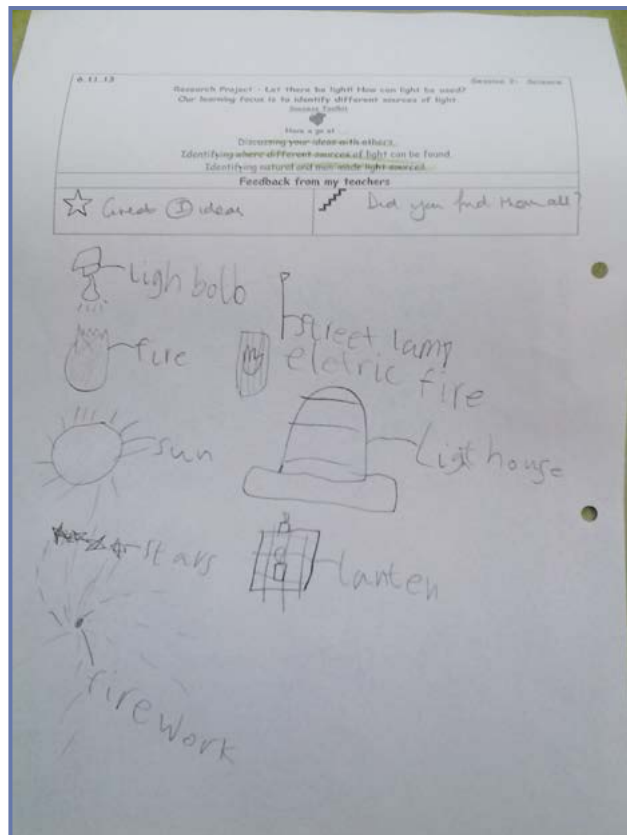
Worlebury St.Paul's Primary School, Weston-super-Mare

Teachers give feedback

Succinct feedback structure:

Colour success criteria if achieved.

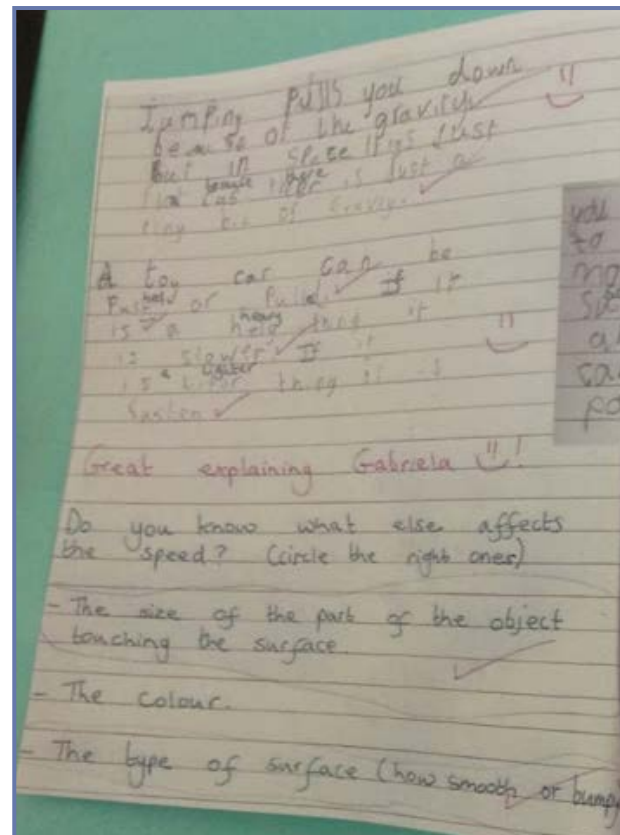
Give one 'star' and one 'step'.



Ashley Down Schools, Bristol - Y1

Marking requires the child to respond and takes their ideas further.

The teacher offers a multiple choice the child has to circle to provoke further thought.

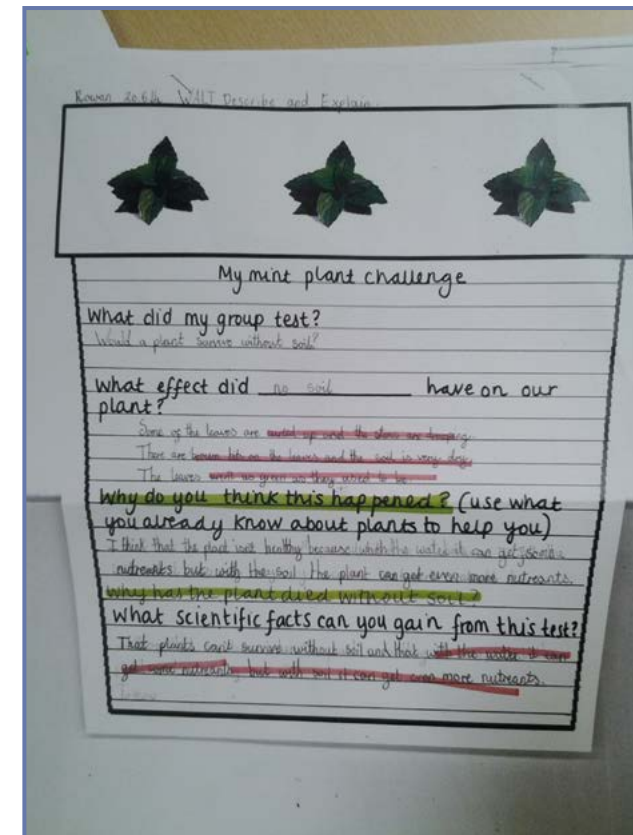


Worlebury St.Paul's Primary School, Weston-super-Mare

Teachers give feedback

Teacher highlights:

Ticked pink and green for growth



Burscough Village Primary School, Lancs - Y3

TEACHER BOX 6:

TEACHERS USE ASSESSMENT TO ADVANCE PUPILS' LEARNING BY PROVIDING TIME FOR STUDENTS TO REFLECT ON AND ASSESS THEIR OWN WORK

E.g. read and respond time.

Fix it time

We use a formative way of marking that gives the children information (which is highlighted) about what they have done well - **green is good** - and what they need to do next - **pink to make you think**.

Children then have 'Fix it' time to respond to the comments made, this gives them time to respond.



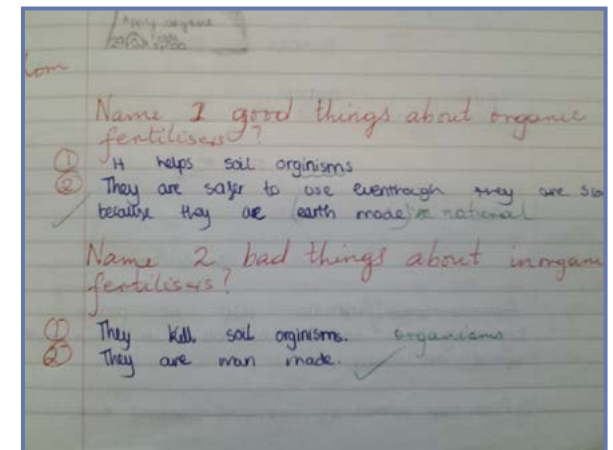
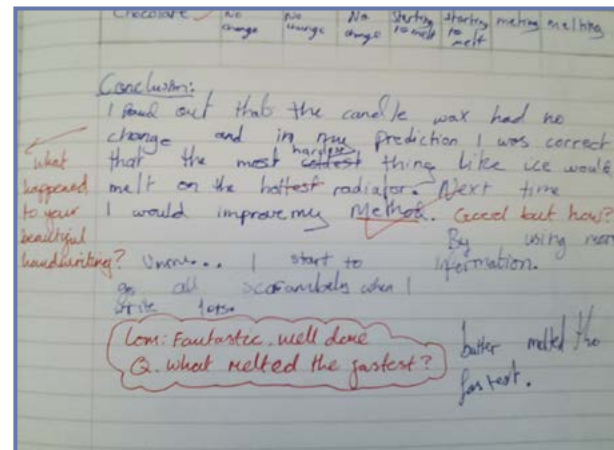
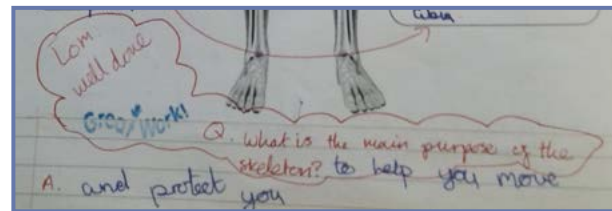
Marking the direction of forces

Ledbury Primary School, Herefordshire

Northbury Primary:

feed-forward marking examples where children are given time to act on feedback

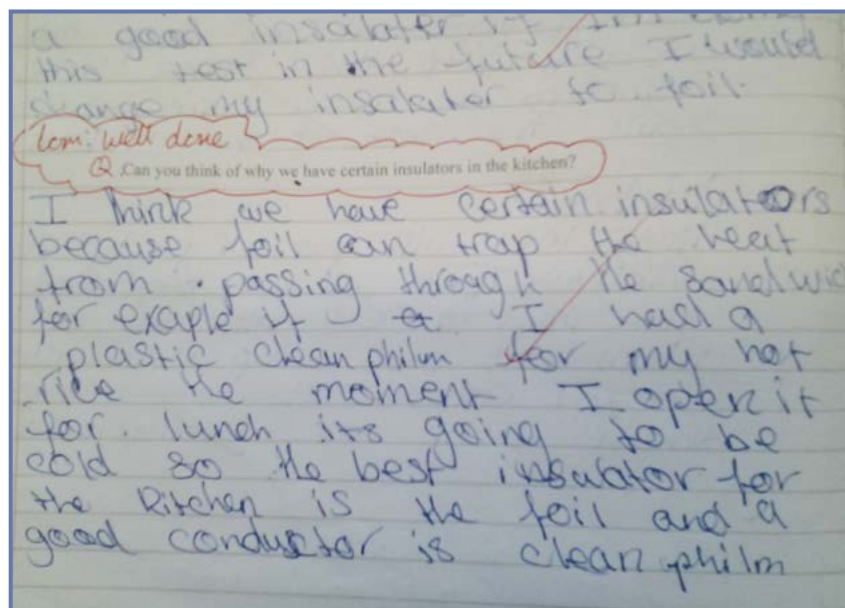
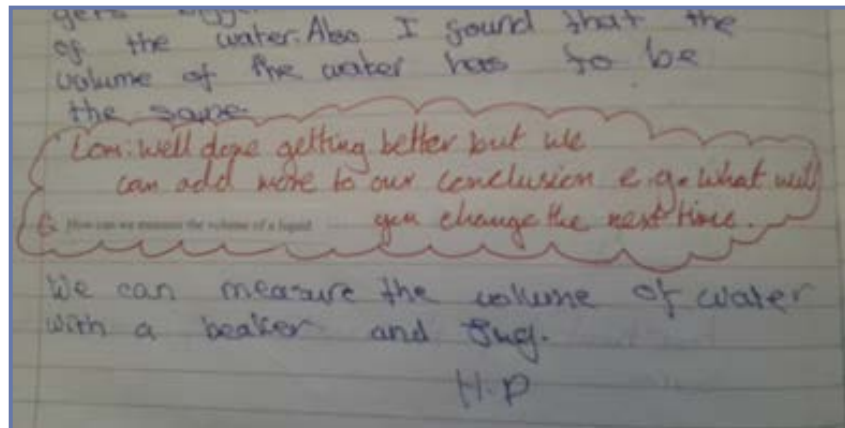
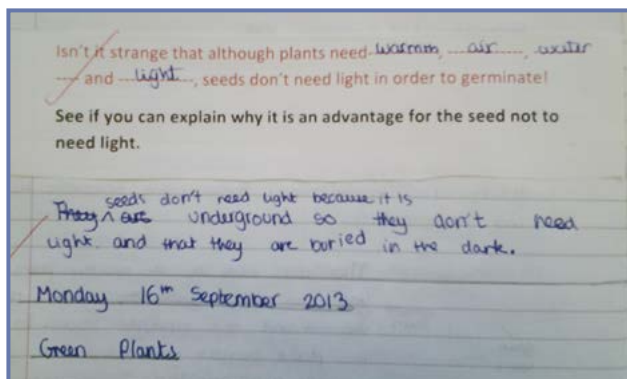
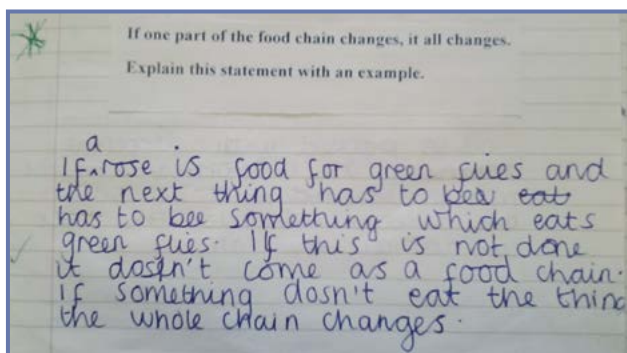
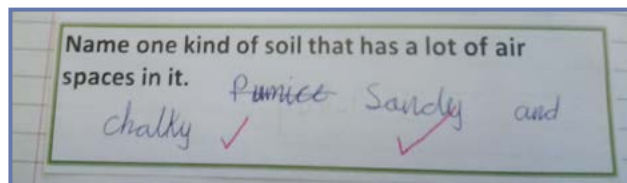
A question to reinforce or extend:



Northbury Primary School, Barking

The next step question or task could be pre-prepared

A combination of pre-prepared question and comment



Northbury Primary School, Barking

MONITORING BOX 1:

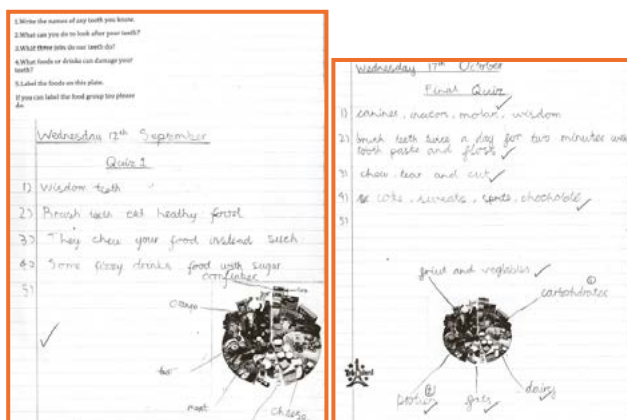
TEACHERS BASE THEIR SUMMATIVE JUDGEMENTS OF PUPILS' LEARNING ON A RANGE OF TYPES OF ACTIVITY

i.e. not reliant on one snapshot to make overall judgement.

Crosshall Junior assessment processes

Crosshall Junior wanted to find a way to show progress in the books without taking time away from the practical activities in science. Teachers now give children a pre-assessment and two-thirds assessment so they can adjust the teaching and learning for their class as necessary.

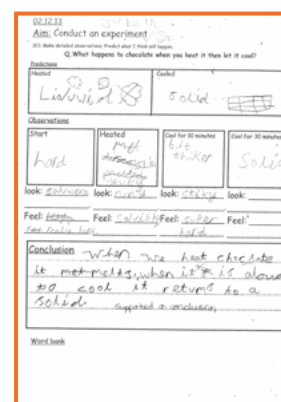
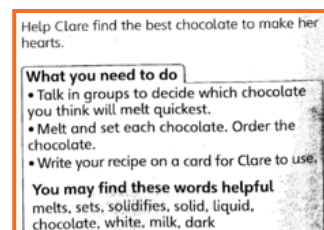
Target cards also get children to self assess and think about their own knowledge and SC1 skills.



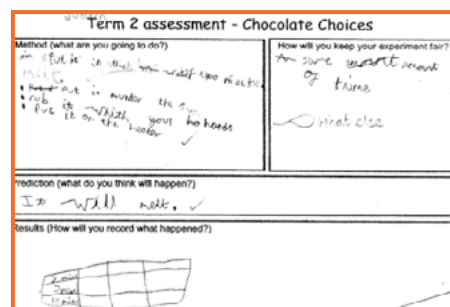
Crosshall Junior Academy Trust, St. Neots

Range of evidence

At Drove judgements are made using both the child's ongoing work in science and the APP task work (e.g. how to make the best chocolate).



Ongoing work and assessment task

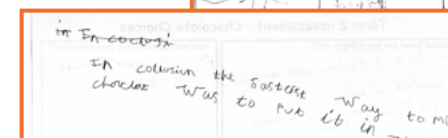


Aim: Investigate what materials change shape.
Skill: Record evidence in a table

object	stretch	twist	bend	squash
stone	X	X	X	X
playdough	✓	✓	✓	✓
eraser	X	X	✓	X
sponge	X	✓	✓	✓
ruler	X	X	✓	X
elastic band	✓	✓	✓	✓
string	✓	X	X	X
ball	X	X	X	✓
fabric	✓	✓	✓	X
plastic straw	X	X	✓	✓
metal spoon	X	X	X	X
piece of wood	X	X	✓	X
Record how many objects	X	X	X	X

AIM: to observe how bread changes when it is heated.
SC1: make detailed notes of my observations.

Write words to describe how it...	looks	smells	tastes	feels	sounds
Bread before heating	brown	no smell	no taste	no feel	no sound
Bread after heating	golden brown	strong smell	toasty	soft	crispy



Drove Primary School, Swindon

A range of evidence

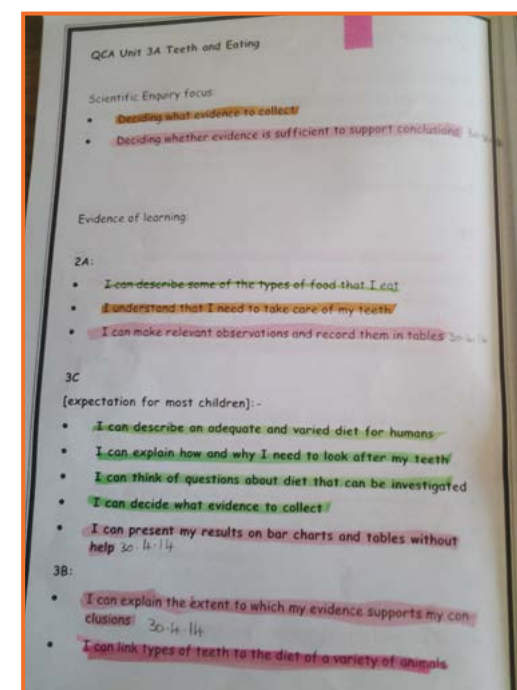
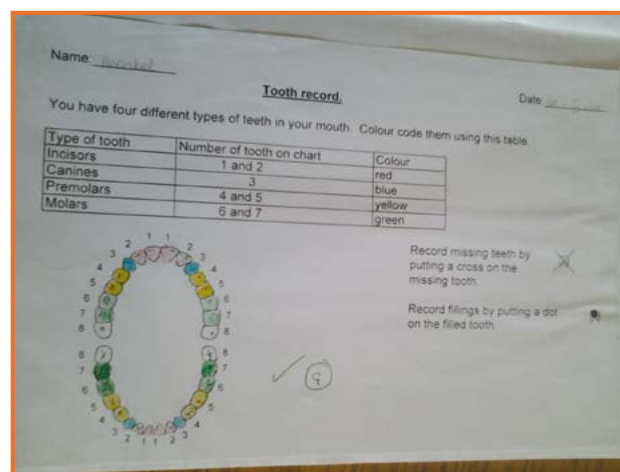
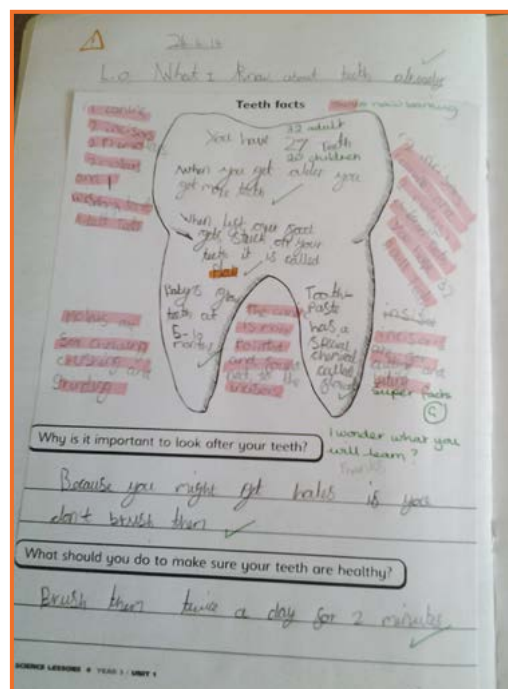
Written and oral work throughout the unit is used to highlight objectives at different times on the tracking booklet

Coke	20% delay 50% stain
Diet coke	10% delay 100% stain
Orange juice	50% delay 20% stain
Water	0% delay 0% stain
Milk	0% delay 5% stain
Blackcurrent	10% delay 100% stain

Conclusion I found that blackcurrent dissolved the egg shell the most. It also stained the egg shell the most. I found the best was water because it didn't delay or stain the egg shell. However, we did not find out how long it took for water to dissolve the egg shell. We found that water is the best for cleaning the egg shell because it didn't delay or stain the egg shell. We found that water is the best for cleaning the egg shell.

Does your evidence support your conclusion? Why? No, not for every because we didn't dilute the blackcurrent. We used it as is. It might be better for our test because we usually put water in our blackcurrent.

38



Malcolm Sargent Primary - Y3

MONITORING BOX 2:

TEACHERS TAKE PART IN MODERATION/DISCUSSION WITH EACH OTHER OF PUPILS' WORK IN ORDER TO ALIGN JUDGEMENTS

E.g. staff meeting discussions of science work.

Teachers take part in moderation discussions

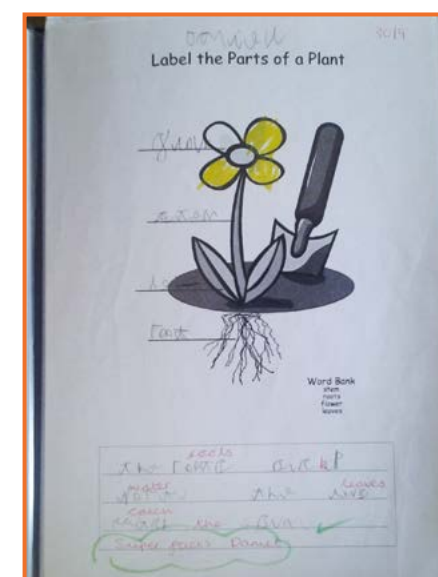
Staff confidence in levelling is supported by regular moderation. The subject leader set up a series of 10 minute science moderation slots which take place within staff meetings across the year. Each slot consists of one class teacher bringing along some samples of work, which could be children's writing, drawings or speech, and the staff agreeing a level for each piece. This led to lengthy discussions at first, but the process became quicker as staff developed knowledge of what to look for.

"Moderating regularly in small manageable chunks helps us to maintain a high profile for science, gives teachers confidence and means we have super evidence of children's attainment." (SL)

Such moderation has led to the creation of a portfolio of evidence, examples of which can be found in a PSTT exemplar at: <http://www.pstt.org.uk/science-teaching/primary-science-quality-mark/exemplar-materials.aspx>

Best work folder for moderation

Some 'best work folders' were put together for end of KS1 moderation



Shaw Primary School, Melksham

Malcolm Sargent Primary School, Stamford

Moderation grafitti wall

Science subject leader Kate Porter did a work scrutiny of science e books and displays in all classes that led her to be concerned that aspects of working scientifically were not being explicitly taught in a progressive way across the school. She also had questions about how differentiation was being managed as this was not evident in the books. To feedback the positive aspects and identity concerns collectively, Kate led a moderation meeting in which progression from Y1 to Y6 was shown on a 'graffiti wall' – a roll of paper with samples of the children's work in each year group annotated. The work samples focussed on working scientifically. This did not use levels, instead it drew on the skills progression in the National Curriculum as a point of reference.

Writing in green picks out aspects of working scientifically that are being addressed.

Writing in red notes how the work sample indicates a child is

A – attained as expected

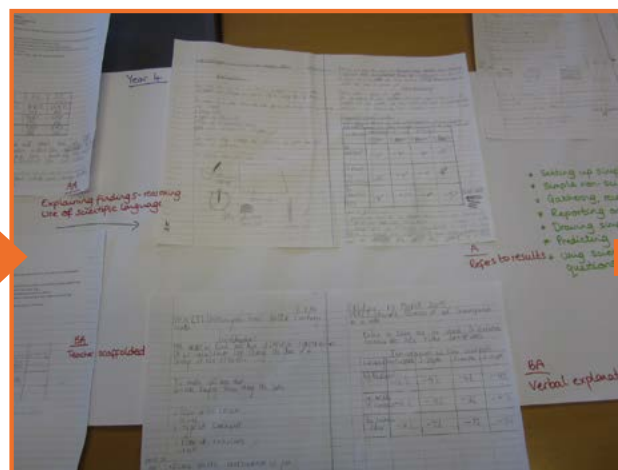
BA – below attainment expected

AA – above attainment expected

Outcomes of moderation

- One outcome of discussion was that staff were able to explain to Kate that differentiation had been by teacher working with a group, which had not been obvious in the books.

- The staff together decided that there was evidence of progression and talked about specific ways individual children could be moved on, such as using more scientific language, and in conclusions giving reasons.
- Another outcome has been to plan to focus on aspects of WS in more depth in each term e.g. analysing data so that staff can support each other and moderation discussions can be focussed.
- Also they developed a more general model of progression across the school so that the aim was for children to become more independent as they progress through the school.
- The next step will be to make judgments together about whether a sample of individual children have met, not met or exceeded the expectations for their year group.

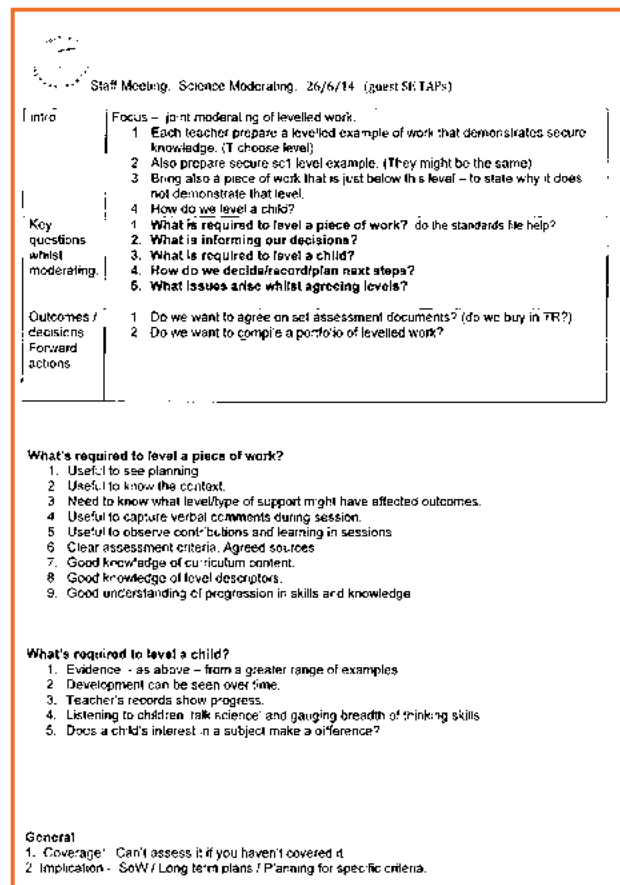
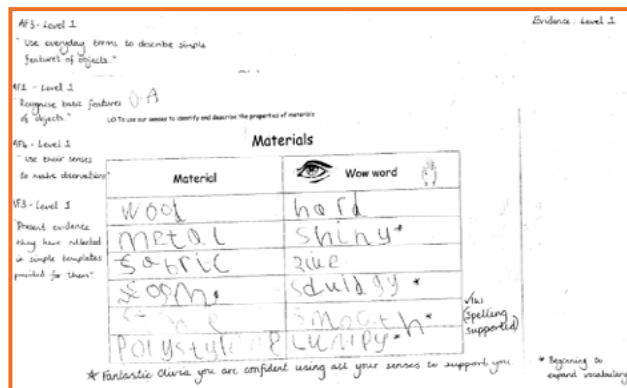
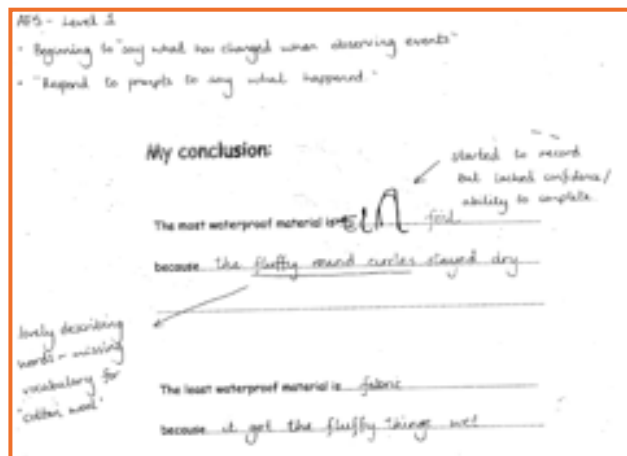


Staff created a moderation graffiti wall to consider progression from Y1 to Y6

Worlebury St. Paul's Primary School, Weston-super-Mare

Moderation staff mtg

Staff bring along 2 pieces of work which they have levelled for discussion – a secure piece and a piece which is just below (explain why not yet there).



Moderation - how meeting works

At Drove teacher judgements are moderated between groups of three colleagues, three times per year. These 'triangulation' groups look at planning, science books and assessment judgements (currently APP levels) together, using a sub-sample of children's work drawn from three points in the attainment range. As part of the White Horse Federation, Drove colleagues also have the opportunity to moderate with colleagues in other primary schools, all of which the Assessment Co-ordinator believes has improved the reliability of teacher assessment:

'since APP's come in, I've noticed at moderation, it's more consistent (at moderation between schools)... So that if you do move schools, you know that a 2c at that school is the same as another school.' (Assessment co-ordinator Jan 2014)

Science Moderation - Term 6 2014				Completed by CS, KS, JS
Class:	Agree	Disagree (moderated level)	Comments	
LA (Level -)		1C		
AA (Level -)	x	1A - AF2	AF2 - stand where there - How could you gather it?	
MA (Level -)		1B	Look at AF2 - How can you gather evidence. Difference between 1A and 1B - they are all the same complexity	
Class:	Agree	Disagree (moderated level)	Comments	
LA (Level -)				
AA (Level -)				
MA (Level -)	2A	See comments	Does the sheet reflect the piece of work that was done on to your feedback topic board?	
Class:	Agree	Disagree (moderated level)	Comments	
LA (Level - 2a)			in levels Dates Range of evidence	
AA (Level - 5c)			Showed skills	
MA (Level - 3d)			Insufficient evidence to judge level.	

Holt Primary School, Wiltshire

Drove Primary School, Swindon

MONITORING BOX 3:

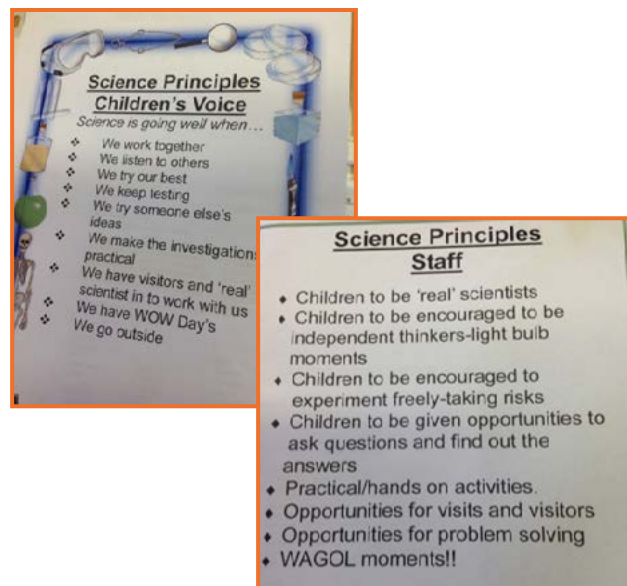
THERE IS A SHARED UNDERSTANDING OF PROGRESSION IN SCIENCE

E.g. staff map progression of skills, TAs are involved in assessments.

Good science teaching

Worlebury St Paul's CofE VA Primary School children and staff discussed and agreed what good science teaching and learning looks like.

Developing such principles is one of the first steps towards the Primary Science Quality Mark <http://www.psqm.org.uk/>



Worlebury St.Paul's Primary School, Weston-super-Mare

Working Scientifically

Victoria Park Primary are trialling a progression grid to support coverage and progression in Working Scientifically.

Support for coverage and progression of Working Scientifically (NC objectives, guidance to support progression in <i>italics</i>) DRAFT3 S.Earle Dec2014							
	Plan		Do		Review		
	Ask Qs + Predict	Plan enquiry	Set up enquiry	Observe + Measure	Sort + Record	Interpret + Report	Evaluate
Support for <i>progen</i>	Provide time for pupils to explore.	Provide experiences of different enquiries	Provide resources which will enable comparisons.	Ask pupils to describe, draw and compare.	Prepare a range of formats to support pupils to record.	Create a science word bank with pupils	Remind pupils of their original questions.
KS1 Develop close obs	Ask simple questions. Begin to predict.	Recognise that Qs can be answered in different ways.	Perform simple tests.	Observe closely, using simple equipment.	Identify and classify. Gather and record data to help in answering questions.	Communicate what they found out using simple scientific language.	Use their observations and ideas to suggest answers to questions.
Support for <i>progen</i>	Provide question stems. Ask pupils to explain their predictions.	Provide opportunities for setting up different enquiries.	Ask pupils to make decisions in the setting up of investigations.	Provide access to a range of equipment. Discuss how to make increasingly accurate measurements.	Ask pupils to create their own tables and charts.	Support pupils to identify key findings, noting patterns and relationships.	Ask pupils to use their observations to make new predictions.
Lower KS2 Develop systematic approach	Ask relevant questions. Make predictions using previous experience.	Use different types of scientific enquiries to answer questions.	Set up simple practical enquiries, comparative and fair tests.	Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	Gather, record, classify and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Identify differences, similarities or changes related to simple scientific ideas and processes.	Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Use straightforward scientific evidence to answer questions or to support their findings.
Support for <i>progen</i>	Challenge pupils to ask a range of questions.	Provide a structure for group planning	Ask pupils to identify variables.	Ask pupils to take repeat readings.	Ask pupils to create own tables, charts and, with support, line graphs.	Ask pupils to identify patterns and relationships in data.	Ask pupils to explain conclusions in terms of scientific concepts.
Upper KS2 Develop independence	Ask testable questions. Base predictions on scientific understanding.	Plan different types of scientific enquiries.	Recognise and control variables where necessary.	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.	Use test results to make predictions to set up further comparative and fair tests. Identify scientific evidence that has been used to support or refute ideas or arguments.
Support for <i>progen</i>	Ask pupils to sort questions raised into types of enquiry.	Ask pupils to plan independently.	Ask pupils to identify which are key or cannot be controlled.	Ask pupils to explain the need for repeat readings.	Ask pupils to select how data is analysed eg averages and graph type.	Ask pupils to identify and suggest reasons for outlying results and spread of repeated measures.	Ask pupils to evaluate their own and others' evidence, recognising limitations.

Types of enquiry: observing changes over time, noticing pattern, grouping and classifying, comparative and fair tests, using secondary sources.

Victoria Park Primary School, Bristol

Crosshall Junior skills grid passed on to the next class teacher.

Sc1 skills (currently based on APP but could be adapted to working scientifically)

Children in class

SC1 Science	Name	Alia	Benjamin B	James	Harvey C	Chloe	Sasha	Samuel T	Haydn	Emma J	Reggie	Harvey G	Sam G	Jason	Archie	Megan	Ben	Edward	Faye	Finn	Sophia	Joshua	Daniel	Emma S	Sadie	Richie	Willy	Oliver	Naveh
Level	APP Statement																												
Ideas and questions	1 Ask questions using a narrow range of items - How? Why?																												
	2 Ask questions leading to a scientific enquiry with help																												
	3 Ask questions and offer own ideas for a scientific enquiry																												
	4 Ask questions which have a clear scientific purpose																												
	5 Use an appropriate approach to asking and answering scientific questions																												
Creating an approach	1 Respond to observed features of objects - my dad's car goes faster than the toy one																												
	2 Respond to suggestions about how to find out, begin to make own suggestions																												
	3 Respond to suggestions and act forward own ideas, use simple tests to find information																												
	4 Decide on an appropriate approach to answering a scientific question																												
	5 Select from a range of sources of information to identify an appropriate approach																												
Planning	1 Make simple suggestions about what to do and what to look for																												
	2 Plan what to do, what observations or measurements to take, recognise some hazards																												
	3 Plan the main steps in an enquiry, refer to equipment, recognise all the main hazards																												
	4 Plan in detail, including what to measure or observe, whether to take repeat readings, how to control risks																												
	5 Recognise that a range of sources is needed, use ICT to collect, store and present information																												

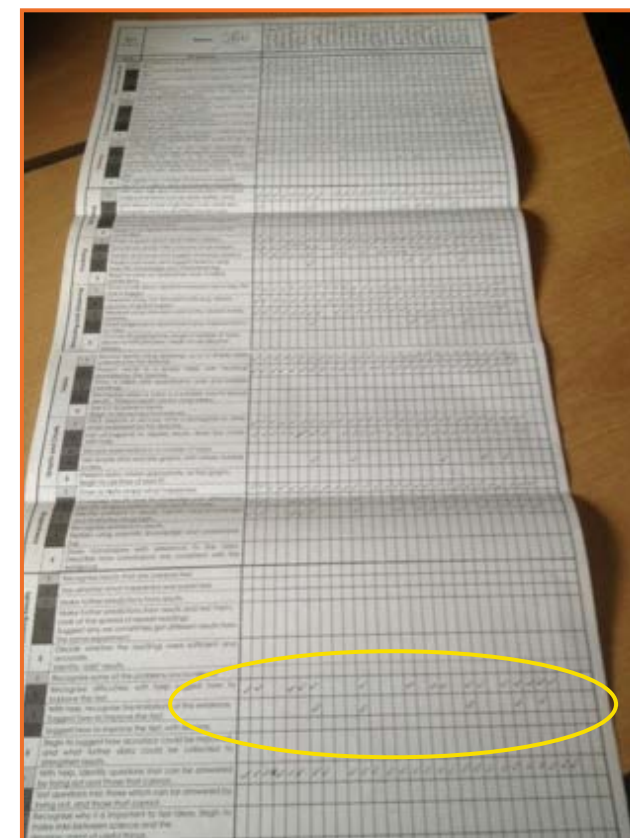
The impact for our school was

We know where are children are and what they need to learn next. So do they.

The SC1 tracking sheet allows teachers to know what concepts have been covered and identifies skills that need to be taught.

IMPACT

- Clear evidence of progress.
- Gaps in learning can be identified.



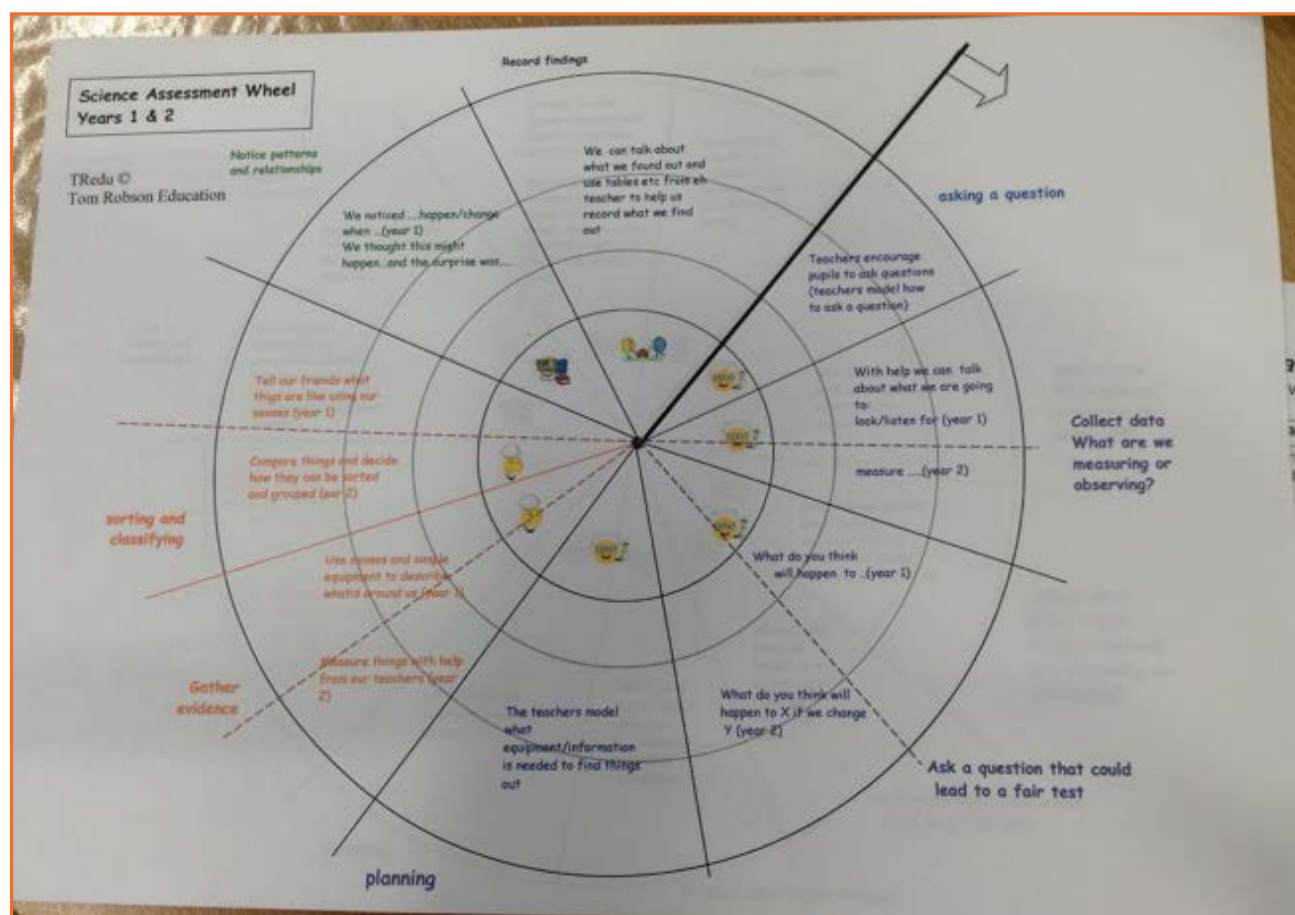
Now science is on the transfer sheet we can pass on information about Science knowledge, Understanding and skills to the child's next class teacher.

Crosshall Junior Academy Trust, St. Neots

Shared understanding of skills

Skills grids like Tom Robson's skills wheel (tredy.co.uk) support a shared understanding.

Such skills overviews can be used by teachers when planning, and during lessons when children can identify the skills focus.



St Paul's Catholic Primary School, Yate

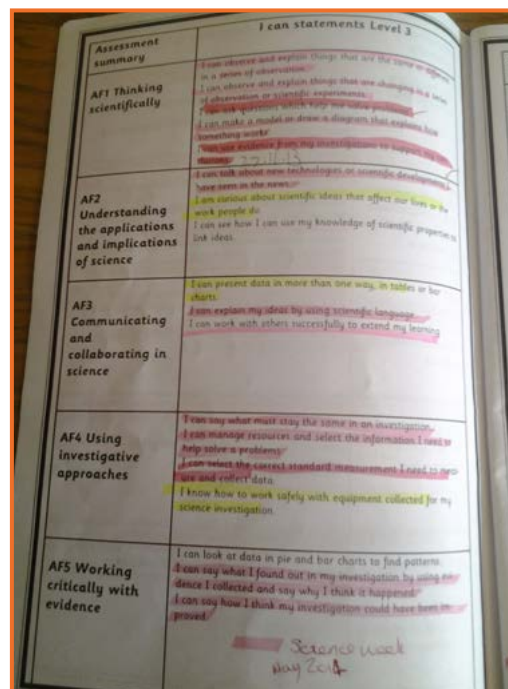
MONITORING BOX 4:

PUPILS ARE AWARE OF THE CRITERIA BY WHICH THEIR WORK OVER A PERIOD OF TIME IS JUDGED

E.g. examples of what good science looks like are displayed.

Judgements are made in the lesson

Pupils understand how judgements are made because they are often done in the lesson - Teacher/child can highlight the tracking booklet eg Y3 talk to a table at a time: 'tell me how you did this objective' – the child is responsible for proving they have done it.

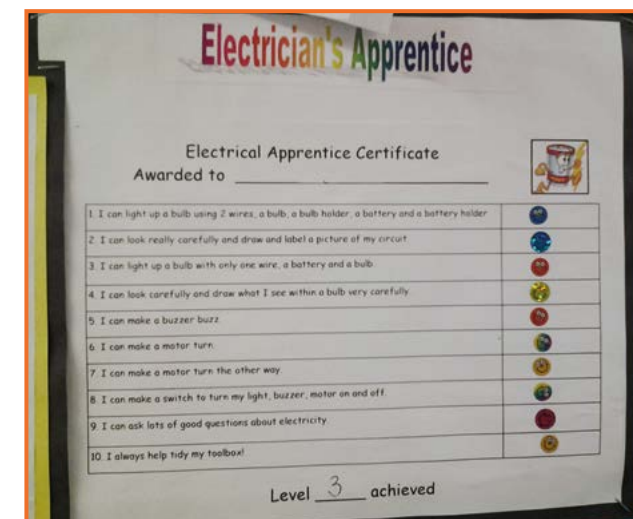


Malcolm Sargent Primary School, Stamford

Pupils know what they are aiming for

Children keep a record of which criteria they have met each lesson, creating an 'I can' certificate by the end of the unit.

This could be the result of written work, model making, completing a challenge or a discussion with a teacher, TA or peer in a plenary.

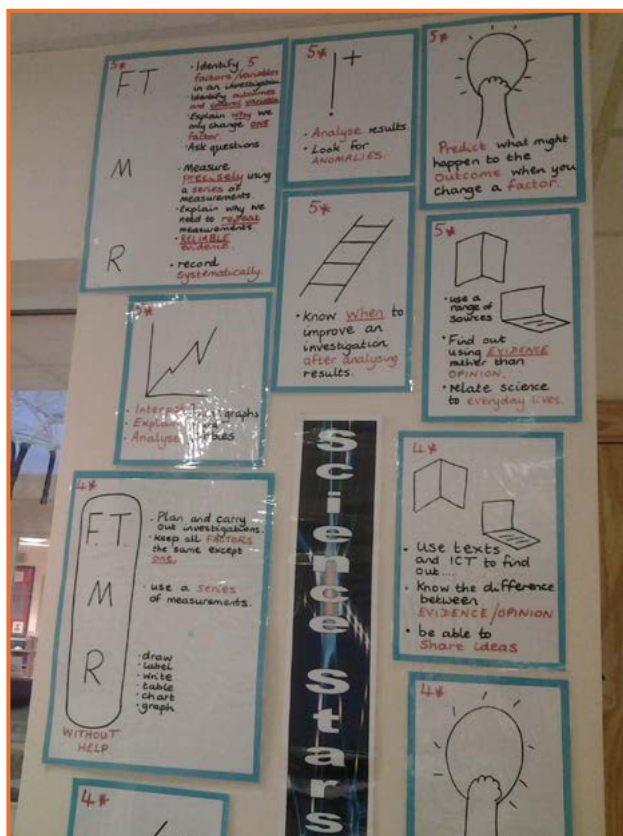


Burscough Village Primary School, Lancs - Y2

Science stars are displayed

Science 'stars' (levels) are displayed in classroom showing key features of progression in enquiry.

The science 'stars' provide details of, for example, what a 4* scientist looks like – the key features of a level 4 in scientific enquiry. The science stars are also embedded in the planning which details success criteria for the sequence of lessons.

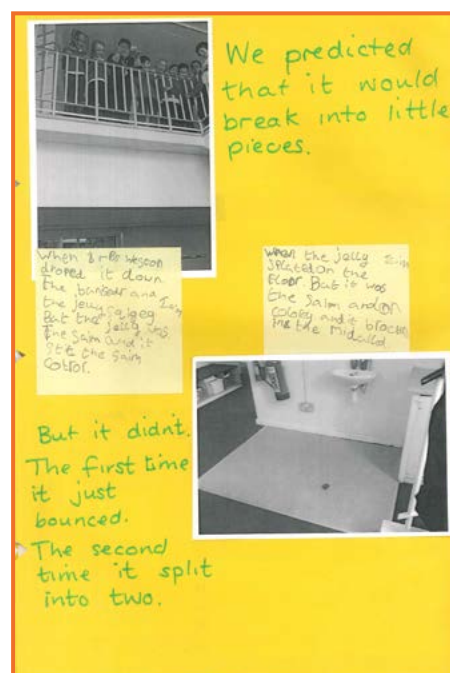


Shaw Primary School, Melksham - YKS2

Pupils judge whether they have met the criteria

"Generally at the end of a lesson they would have the opportunity to say how they felt their learning went. They'd usually mark it with a coloured dot, like a traffic light, or a smiley face, and peer assessment we do sometimes get them to mark their own work. We will give them a set of criteria so they might give like a mark for the presentation, a mark if they gave a reason for their prediction, or something like that, and a mark for using scientific vocabulary."

Oak Tree quote from Assessment Co-ordinator



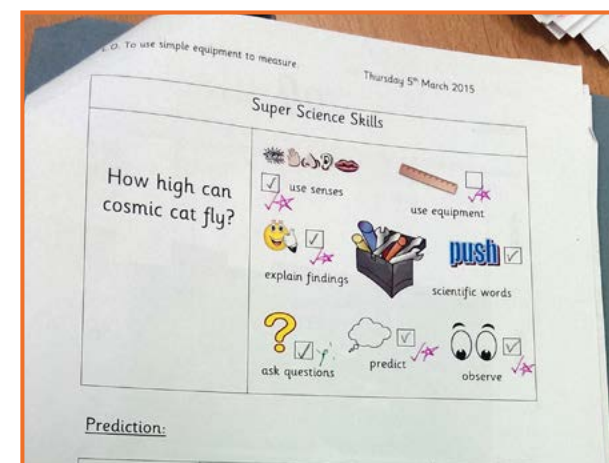
Oaktree Primary School, Swindon

Science skills toolkit

Year 1 at Holt have developed picture based success criteria for Working Scientifically which can be used by both pupils and teachers.

This supports pupils to focus whether they have been able to:

- Use senses
- Use equipment
- Explain findings
- Ask questions
- Predict
- Use scientific words



Holt Primary School, Wiltshire

MONITORING BOX 5:

A MANAGEABLE SYSTEM FOR RECORD-KEEPING IS IN OPERATION TO TRACK AND REPORT ON PUPILS' LEARNING IN SCIENCE

E.g. expectations on planning which annotate, end of topic grids, I cans.

Combining planning and assessment

Assessment notes are made on planning. These notes provide a record of children's achievements or questions or areas for development. These could be in the form of noting those who had not yet achieved the objective (emerging) and those who had gone further (exceeding), the rest having met the objective (expected). The notes also support the planning of the next lessons which are adapted to meet the children's needs.

Topic: Plants	Knowledge & Understanding	Working Scientifically
Current: What do flowers do for _____	Explore the part that flowers play in the life cycle (L.A.S.S.I.P.P.Y.)	Classifying
Today's Question (Child)		
How do seeds leave a plant?		
Learning Objective		
Can you UNDERSTAND the different methods of seed dispersal?		
Learning Sequence		
Write the name of each type of seed dispersal on the board: wind, water, explosion, animals (eating, hooking) / give a group of children a seed or fruit: pass in pairs, blackberries, red berries, coconut etc / children to "NOTICE" the seed or fruit to DISCUSS and IDENTIFY: For which method they suggest would be used by the seed and WHY / each group of children to EXPLAIN their decision to the rest of the class / each table given a further seed to classify (40 minutes)		
Assessment Expectation	Year 2 Classify according to features	Year 3 Use observations to classify
Assessment comments		Year 4 going missing
Suggestions for next steps		
Make a model of a given method of seed dispersal (see REMEMBERING)		
Our next steps: (Assessment to plan future Learning)		
- Gather ideas to include in a model		
- Assign a method of dispersal for each group		

Record keeping

Staff select their preferred structure for record keeping. For example, for a focused assessment activity the teacher may make notes on a class list. Other teachers prefer to use a grouped grid on planning which can be annotated during/after the lesson.

Topic: Plants	Knowledge & Understanding	Working Scientifically
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Make a model of a given method of seed dispersal (see REMEMBERING)		
Our next steps: (Assessment to plan future Learning)		
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- Assign a method of dispersal for each group		

Can you? think of a label to describe the material's property (why is it good for its job?)

Children to observe the items we photographed last week - can we show a label on the item of the property to help that material be a **good** material? (what is it good for?)

Target Level 2: children to think of a label to describe the material's property. What material might we use if we use it **well**? (what is it good for?)

Target Level 3: children to think of a label to describe the material's property. What material might we use if we use it **well**? (what is it good for?)

Our next step ideas:

- Children to think of a label to describe the material's property. What material might we use if we use it **well**? (what is it good for?)
- Children to think of a label to describe the material's property. What material might we use if we use it **well**? (what is it good for?)
- Children to think of a label to describe the material's property. What material might we use if we use it **well**? (what is it good for?)

Can you? Sort the photographs of materials in different ways? (how many?)

Children to think of a label to describe the material's property. What material might we use if we use it **well**? (what is it good for?)

Target Level 2: children to think of a label to describe the material's property. What material might we use if we use it **well**? (what is it good for?)

Target Level 3: children to think of a label to describe the material's property. What material might we use if we use it **well**? (what is it good for?)

Our next step ideas:

- Children to think of a label to describe the material's property. What material might we use if we use it **well**? (what is it good for?)
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- Assign a method of dispersal for each group		

Burscough Village Primary School, Lancs

Holt Primary School, Wiltshire

Tracking sheets for scientific enquiry

Sheet follows science ability group through the school (children may move groups).

Different colours for different years.

Tracking sheet for scientific enquiry at Northbury Primary School, Barking. The sheet is divided into columns for different years (Year 1 to Year 6) and rows for different scientific enquiry skills. It includes a section for 'mobile abilities' and a 'Group 2' section.

Northbury Primary School, Barking

Active record keeping

Coverage is mapped on termly planning grid (during the term, not before). This helps staff plan for opportunities for learning and working scientifically, targeting areas which have not yet been covered in that term.

Active record keeping sheet at Great Moor Infant School, Stockport. The sheet is a grid with columns for different years (Year 1 to Year 6) and rows for different scientific enquiry skills. It includes a section for 'mobile abilities' and a 'Group 2' section.

Active record keeping sheet at Great Moor Infant School, Stockport. The sheet is a grid with columns for different years (Year 1 to Year 6) and rows for different scientific enquiry skills. It includes a section for 'mobile abilities' and a 'Group 2' section.

Great Moor Infant School, Stockport

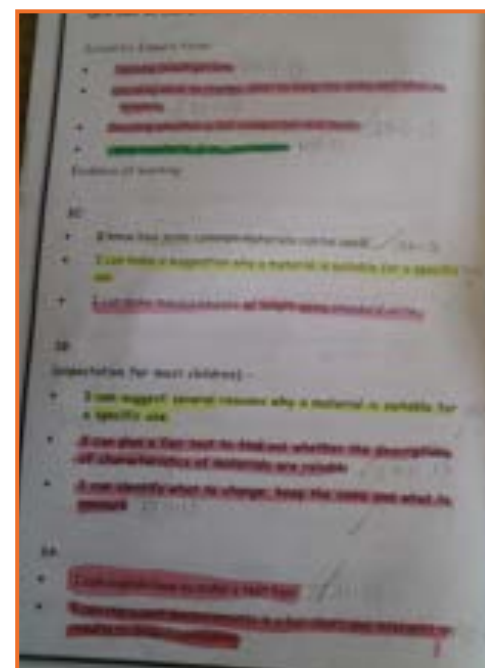
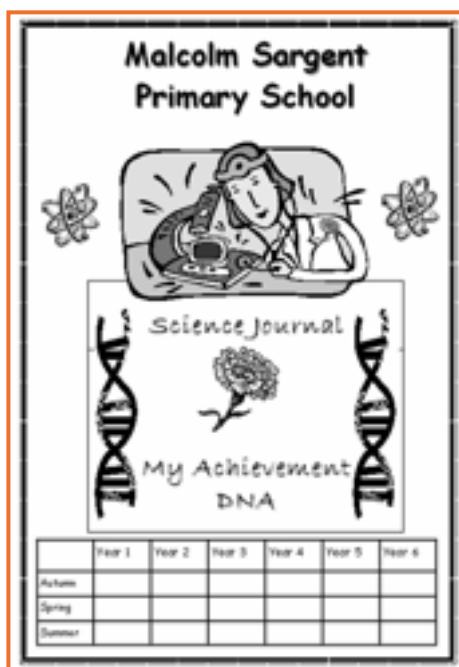
Group assessment sheets help to guide the questions asked by the teacher within the lesson. For example, with the group sheet to hand, the teacher can target their questions to the next step for the group or individual.

Group assessment sheet at Great Moor Infant School, Stockport. The sheet is a grid with columns for different years (Year 1 to Year 6) and rows for different scientific enquiry skills. It includes a section for 'mobile abilities' and a 'Group 2' section.

Record keeping

Each child has a paper tracking booklet (a 'DNA journal') and the child uses it with increasing independence as they move through the school.

Highlighting can be done by pupil/teacher, in/after lesson.
The criteria (APP for skills, QCA I cans for kn) are used for lesson objectives and differentiation.



Record of levels My DNA								
	Unit A	Unit B	Unit C	Unit D	Unit E	Unit F	Unit G	Unit H
Year 1	1a	1a	1a	2a	2a	2a		
Year 2	3a	3a	3a	3a	3a	3a		
Year 3	3b	3b	3a		3b	3a		
Year 4								
Year 5								
Year 6								

	Af1	Af2	Af3	Af4	Af5
Level 1	1a	1a	1a	1a	1a
Level 2	2a	2a	2a	2a	2a
Level 3	3a	3b	3a	3a	3b
Level 4					
Level 5					
Level 6					

Malcolm Sargent Primary School, Stamford

Recordkeeping - APP levelled sample

At Drove, teachers' APP judgements are recorded on Excel spreadsheets and backed up by evidence, including examples of work, annotated photographs and responses to questions linked to particular AF sub-levels:

'In conclusion the fastest way to melt chocolate was to put it in water... when it is aloud (sic) to cool it returns to a solid...

Metal: hard strong, flexible, smooth. Wood: hard, strong, flexible, rough. Glass: hard, breaks easily, rigid. Paper: smooth, breaks easily, flexible.'

(child's responses to APP unit linked as evidence to APP grid)

This evidencing process is currently involves photocopies of work put in behind the APP sheet.

Annotation provides scope for additional contextual information – such as the degree of teacher scaffolding – to be included, providing a degree of flexibility in the matching of evidence to particular sub-levels:

'... we put things on there like whether they were supported so that, when we track back, and do the APP, we know whether it was the independent, things like that...'

(Assessment co-ordinator, Jan 2014)

2C

Science APP Levels 1 to 5 all on one sheet. PrimaryTools.co.uk

AF-1 Thinking Scientifically	AF-2 Understanding How Science is Used	AF-3 Communicating and Collaborating in Science	AF-4 Investigating	AF-5 Collecting and Reflecting on Results
Ask questions stimulated by their exploration of their world	Identify a link to science in familiar objects or contexts	Use everyday terms to describe simple forming or actions of objects, living things or events they observe	Respond to prompts by making some simple suggestions about how to find an answer or make observations	Respond to prompts by say what happened
Recognise basic features of objects, living things or events	Recognise scientific and technological developments that help us	Present evidence they have gathered in simple templates provided for them	Use their senses to design equipment to make observations	Say what has changed when observing objects, living things or events
Care on their everyday experience to help answer questions	Express personal feelings or opinions about scientific or technological phenomena	Communicate simply the uses or components of objects, living things or events they have observed in appropriate forms	Make simple suggestions about how to find things out or how to collect data to answer a question or what they are investigating	Say what happened in their experience or investigation
Respond to suggestions to identify some evidence (in the form of inference, observation or measurement) that has been used to answer a question	Describe, in familiar contexts, how science helps people do things	Show their own ideas and ideas to the ideas of others	Identify things to measure, observe that are related to the question or what they are investigating	Say whether what happened was what they expected, not including any suggested measures
Draw on their observations and ideas to offer answers to questions	Identify people who use science in daily life	Present their ideas and evidence in appropriate ways	Consider how equipment provided to make observations and measurements	Respond to prompts to suggest different ways they would have done things
Make connections between basic features or components of objects, living things or events	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify straightforward patterns in observations or to data presented in various formats, including tables, pie and bar charts
Sort and group objects, living things or events on the basis of what they have observed	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Describe what they have found out in experiments or investigations, linking cause and effect
Respond to suggestions to identify some evidence (in the form of inference, observation or measurement) needed to answer a question	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Suggest improvements to their working methods
Identify differences, similarities or changes related to simple scientific ideas, processes or phenomena	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify patterns in data presented in various formats, including line graphs
Respond to ideas given to them to answer questions or suggest solutions to problems	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify patterns in data presented in various formats, including line graphs
Represent changes in the real world using simple physical models	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify patterns in data presented in various formats, including line graphs
Use straightforward scientific evidence to answer questions, or to support their findings	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify patterns in data presented in various formats, including line graphs
Use scientific ideas when describing simple processes or phenomena	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify patterns in data presented in various formats, including line graphs
Use simple models to describe scientific ideas	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify patterns in data presented in various formats, including line graphs
Identify scientific evidence that is being used to support or refute ideas or suggestions	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify patterns in data presented in various formats, including line graphs
Use ideas given or offered or reactions and say when describing processes or phenomena	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify patterns in data presented in various formats, including line graphs
Explain processes or phenomena, suggest solutions to problems or answer questions by drawing on their ideas or readily	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify patterns in data presented in various formats, including line graphs
Use simple scientific questions that do not yet have definitive answers	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify patterns in data presented in various formats, including line graphs
Identify the use of evidence and creative thinking by scientists in the development of scientific ideas	Identify scientific or technological phenomena in everyday life	Respond to prompts by using simple words and phrases to describe their ideas	Make measurements using standardised non-provided data as appropriate	Identify patterns in data presented in various formats, including line graphs

Key:
Level 1
Level 2
Level 3
Level 4
Level 5

www.PrimaryTools.co.uk

9.12.13
Kim

I know that particles of different sizes can be separated by sieving.

What We Did

Fast we used the sieve to separate the mixture. We used the sieve to separate the mixture. We used the sieve to separate the mixture.

What We Found Out

Have you used a sieve before? Why?

No

How did you separate the mixture?

Fast we used the sieve to separate the mixture. We used the sieve to separate the mixture. We used the sieve to separate the mixture.

* Well done Samuel, you have met the aim.
* Well done you have used all of these science words.

sieve particle pebbles sugar oats

Drove Primary School, Swindon

E.g. progress in skills is passed onto the next teacher.

Science Assessment Wheel Years 1 & 2

The wheel is divided into 12 segments, each representing a science skill. The segments are arranged in a circle, with an arrow pointing clockwise from the top, indicating the progression of skills from Year 1 to Year 2.

- asking a question** (purple segment): We can talk about what we found out and use tables etc. from ex. teacher to help us record what we find out.
- Collect data What are we measuring or observing?** (light blue segment): Teachers encourage pupils to ask questions (teachers model how to ask a question).
- measure (year 2)** (light blue segment): With help we can talk about what we are going to look/listen for (year 1).
- What do you think will happen to (year 1)** (orange segment): measure (year 2).
- What do you think will happen to X if we change Y (year 2)** (orange segment): What do you think will happen to (year 1).
- The teachers model what equipment/information is needed to find things out** (yellow segment): What do you think will happen to X if we change Y (year 2).
- Measure things with help from our teachers (year 2)** (yellow segment): The teachers model what equipment/information is needed to find things out.
- Use simple and simple equipment to describe what's around us (year 1)** (green segment): Measure things with help from our teachers (year 2).
- Compare things and decide how they've changed (year 2)** (green segment): Use simple and simple equipment to describe what's around us (year 1).
- Tell our friends what things are like using our senses (year 1)** (light green segment): Compare things and decide how they've changed (year 2).
- Notice patterns and relationships** (light green segment): Tell our friends what things are like using our senses (year 1).
- Record findings** (purple segment): Notice patterns and relationships.

Boroughville Primary School - National Curriculum 2014 - Working Scientifically - Year 3 Assessment				
Key	Nature of science Year 3	Nature of science Year 3	Nature of science Year 3	Class
Observing	Observing and recording the appearance of objects and materials.	Observing and recording the appearance of objects and materials.	Observing and recording the appearance of objects and materials.	Observing
Measuring	Measuring the length, mass, volume and temperature of objects and materials.	Measuring the length, mass, volume and temperature of objects and materials.	Measuring the length, mass, volume and temperature of objects and materials.	Measuring
Planning	Planning a simple investigation to answer a question.	Planning a simple investigation to answer a question.	Planning a simple investigation to answer a question.	Planning
Experimenting	Experimenting with objects and materials to answer a question.	Experimenting with objects and materials to answer a question.	Experimenting with objects and materials to answer a question.	Experimenting
Evaluating	Evaluating the results of an investigation.	Evaluating the results of an investigation.	Evaluating the results of an investigation.	Evaluating
Communicating	Communicating the results of an investigation.	Communicating the results of an investigation.	Communicating the results of an investigation.	Communicating
Thinking	Thinking about the results of an investigation.	Thinking about the results of an investigation.	Thinking about the results of an investigation.	Thinking
Working Scientifically	Working Scientifically	Working Scientifically	Working Scientifically	Working Scientifically

Burscough Village Primary School, Lancs

Individuals within a group

Group tracking sheets provide a wealth of information about how individuals have progressed through the year.

The sheets can be passed onto the next class teacher.

Group Science Assessments					
Curric Area Class/Grp Dates Unit covered	Working Scientifically	Childrens names			
EY Comments/asks questions about aspects of their familiar world. Talks about things they have observed Talks about why things happen and how things work					
UKS1 Gathers and records data to help in answering questions. Observes closely, using simple equipment Performs simple tests Identifies and classifies Uses their observations and ideas to suggest answers to questions Asks simple questions and recognises that they can be answered in different ways					
UKS2 Reports on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Makes systematic and careful observations and, where appropriate, takes accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Sets up simple, practical enquiries, comparative and fair tests Identifies differences, similarities or changes related to simple scientific ideas and processes Uses straightforward scientific evidence to answer questions or to support their findings. Gathers, records, classifies and presents data in a variety of ways to help in answering questions Records findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Asks relevant questions and using different types of scientific enquiries to answer them					

Toby Tyler: Great Moor Infants 2014

Great Moor Infant School, Stockport

The Crosshall Junior School Transfer Form includes science, so it can be discussed at transfer meetings

Transfer form		Year of Intake: 2012																																					
Name		CF																																					
DOB		IEP																																					
Y2 CT		Statement																																					
Y3 CT		Pupil Premium																																					
Y4 CT		Vital Few																																					
Y5 CT																																							
Present Group / Set Information																																							
	Y2 Book Band	AR Level	Writing																																				
Y2																																							
Y3																																							
Y4																																							
Y5																																							
Other Intervention/Extension/G&T			Overlay																																				
Y2																																							
Y3																																							
Y4																																							
Y5																																							
Y6																																							
<table border="1"> <thead> <tr> <th></th> <th>Excellent</th> <th>Very Good</th> <th>Average</th> <th>Below Av.</th> <th>Poor</th> </tr> </thead> <tbody> <tr> <td>Attitude to Work</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Organisation</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Homework</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Parental Support</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Behaviour</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					Excellent	Very Good	Average	Below Av.	Poor	Attitude to Work						Organisation						Homework						Parental Support						Behaviour					
	Excellent	Very Good	Average	Below Av.	Poor																																		
Attitude to Work																																							
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Homework																																							
Parental Support																																							
Behaviour																																							
Attendance Issues																																							
Not Punctual		Attendance (under 95%)																																					
Medical Information																																							
Asthma	Allergies	Epilepsy																																					
Hearing Problems	Visual Problems	Other																																					
Dyslexic Tendencies	Dyspraxic Tendencies																																						
Honour Awards		Future Me Awards																																					

Crosshall Junior Academy Trust, St. Neots

Brookside Report to Parents / Carers

Achievements discussed in terms of what pupil can do

Child 1

- She provides reasons for her ideas and predictions, using some scientific knowledge to do so.
- She understands that light travels in straight lines and can identify the pathway of light on a diagram.
- She is also beginning to show an understanding of how light refracts when it changes from water to air.
- She can draw circuits and their components accurately, explaining what will happen to the energy and the components when, for example, a switch is opened or a power source is removed/added.

Child 2

- He recognises the importance of carrying out a fair test and can explain why.
- He provides reasons for his ideas and predictions, using his increasing scientific knowledge to do so.
- He understands that light travels in straight lines and can accurately identify the pathway of light on a diagram. He can explain how we see different objects using this scientific knowledge.
- He can draw circuits and their components accurately, explaining what will happen to the energy and the components when, for example, a switch is opened or a power source is removed/added.

Brookside Academy, Somerset

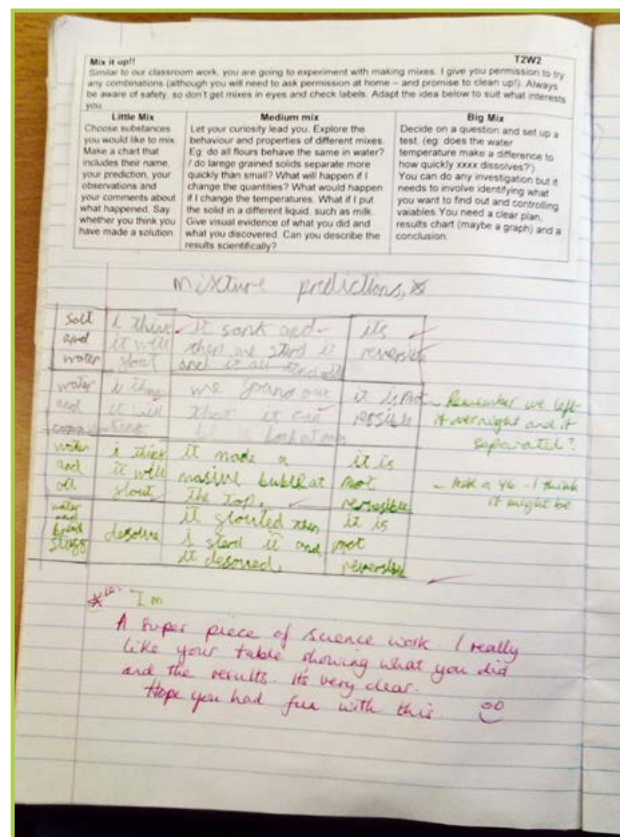
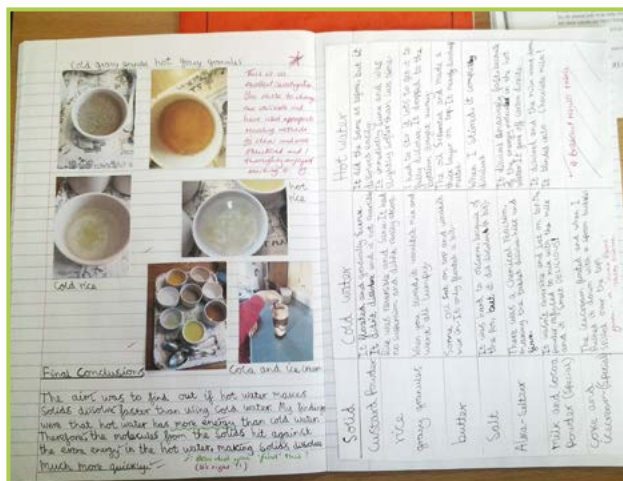
SUMMATIVE BOX 2:

PARENTS/CARERS RECEIVE ORAL AND WRITTEN REPORTS THAT IDENTIFY THE NEXT STEPS FOR THEIR CHILDREN

E.g. at parents' evening, comments on homework.

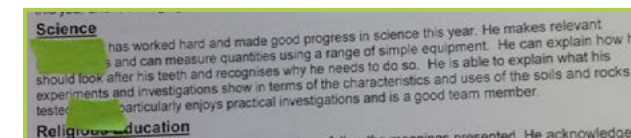
Parents are involved with a dialogue about home

Parents are encouraged to be involved in homework tasks, for example, mixing solids and liquids. They can see feedback from the teacher in homework books and when science books are sent home for sharing.



Reports consider scientific knowledge, understanding, skills and attitudes

End of year report to parents provides detail about conceptual understanding and attitude to working scientifically.



Holt Primary School, Wiltshire

Worlebury St.Paul's Primary School, Weston-super-Mare

Report identifies next steps

Science	Achievement				Effort		
	Exceeding expected level	Meeting expected level	Slightly below expected level	Below expected level	Always works hard	Normally works hard	Requires more motivation, concentration
Investigative skills	✓				✓		
Knowledge and understanding	✓				✓		
Science Comment: ***** has shown a good understanding of the scientific ideas taught this year. She has been able to make sensible predictions based on prior knowledge and accurately record and explain her findings. ***** has compared the habitats of different animals and started to think about how animals adapt to their surroundings. She is able to order animals and plants into a food chain and identify producers and consumers. She is also able to explain ways in which solids and liquids can change state and whether the changes made are reversible or irreversible. She is also able to identify electrical conductors and can group materials accordingly.							
Next Steps: To evaluate investigations by identifying ways in which they could be improved.							

Brookside Report to Parents: Targets shared

Child 1 (linked to topic on electricity)

- To select the most efficient and suitable apparatus to carry out an investigation.
- To understand the difference between a series circuit and a parallel circuit.

Child 2 (linked to topic on light)

- To understand the importance of carrying out experiments numerous times and independently plan this into his own investigations.
- To look at how a pathway of light changes when it travels through water into air.

SUMMATIVE BOX 3:

SUMMARIES OF PUPIL PROGRESS ACROSS THE COHORT DRAW ON A RANGE OF INFORMATION

E.g. learning across a range of contexts is used to decide support or extension needs

Summative teacher assessment uses a range of information

At Shaw the strong enquiry structure supports ongoing formative assessment to move the children forward each lesson, but also enables the staff to be confident about making summative assessments. The subject leader is keen that levels are not based on testing: "There is agreement that assessment should not be rigid or an exercise in filling in boxes. Paper testing is limiting and does not necessarily give an accurate measure of attainment."

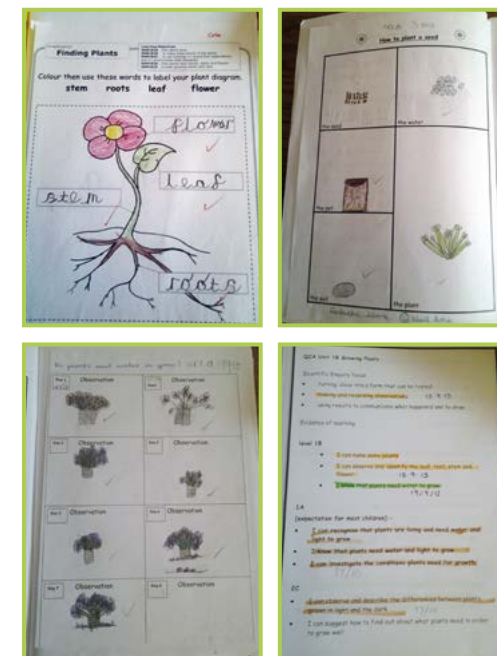
Teachers use evidence gathered in pupil books or group floor books, together with their knowledge of how the children have responded in lessons, to provide a best fit level at the end of each topic.

3	Light Heavy Float Sink	Collecting data - Sorting and classifying - Using our senses we can tell our friend what things are like. Presenting findings - Record findings - We can talk about	Level 2 - Sort materials into groups based on whether they float or sink.	Compare and group together a variety of everyday materials on the basis of their physical properties.	I can predict whether an object will float or sink. Then group them into objects which float and sink.	Chn made some good predictions about what would float and sink. Only MNC who could give a reason.
---	------------------------------	--	---	---	--	---

Shaw Primary School, Melksham

A range of evidence

Written and oral work throughout the unit is used to highlight objectives at different times on the tracking booklet. Each term this is summarised into a best fit level.



Malcolm Sargent Primary School, Stamford

A range of assessment information feeds into summaries of pupil progress at Whitehouse Primary

in Science

Name: [] My target is: []

3E Magnets And Springs

1. I can describe the difference between a magnet and a magnetic material. A

2. I can describe the forces when I stretch or compress a spring. G

3. I can say how magnets can be used to solve a problem. A

4. I know that some materials are magnetic but others are not. G

5. I can order springs according to their strengths. A

6. I know that there are forces between magnets and that magnets can attract or repel each other. G

7. I can give an example of where a magnet is used. G

8. I can give an example of where a spring is used. G

9. I know what happens when a paper clip is put next to a magnet. G

10. I know that some magnets are stronger than others. G

11. I know that magnets can stick together and push away from each other. G

12. I know that magnets stick to some objects. G

Level 3

Level 2

Level 1

Start Date: []

"Aiming High" self assessment.



Formative and summative mind-map.

Test

1. How many different types of magnets are there?

2. How many different types of springs are there?

3. How many different types of materials are there?

4. How many different types of forces are there?

5. How many different types of magnets are there?

6. How many different types of springs are there?

7. How many different types of materials are there?

8. How many different types of forces are there?

9. How many different types of magnets are there?

10. How many different types of springs are there?

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96. How many different types of forces are there?

97. How many different types of magnets are there?

98. How many different types of springs are there?

99. How many different types of materials are there?

100. How many different types of forces are there?

Written tests to support teacher judgements.

Plan for Focused Assessment of Science Enquiry

Unit Year 3 (7-8 year olds)
Magnets and Springs

Which is the strongest magnet?

Scientific Enquiry Focus
Planning, Considering evidence and evaluating - devising a way of answering a question, comparing different approaches

Learning Objectives

- To decide on an approach to compare the strength of different magnets
- (for some) To evaluate the validity of different tests.

Activity
Provide the children with a collection of magnets and other materials (e.g. card, fabric, tissue, thin wood, aluminium foil, paperclips) to explore. Ask them to find out whether the magnets are all equally strong (see below for differentiated approach). As a class discuss the different ways of testing the same thing, and talk about the advantages and disadvantages of each approach. Discuss why it is a good idea to try different ways of answering a question (to get a more reliable answer). Carry out the investigations and ask the children to report their findings verbally.

Key Questions:

- How can we find out which magnet is the strongest?
- Can you now put the magnets in order from strongest to weakest?
- Can you think of any other ways to test which is the strongest?
- Which magnet was the strongest? Did you get the same results with every way you tested it?

Differentiated Activity
Lower attainers - Ask which magnet is the strongest. Ask 'How do you know?' and use the response to help the children plan to systematically test each magnet. Middle attainers - ask children to devise their own method and use it consistently. (e.g. how many pieces of card does it work through? how many paperclips will stay on the magnet in a chain?) Challenge them to order the magnets from strongest to weakest. Higher attainers - challenge the children to find several different ways of measuring the strength of magnets and see if they result with the magnets in the same order of strength.

Science Enquiry Assessment Indicators
L2 With support can make suggestions about how to find which magnet is the strongest.
L3 Can decide on an approach to answer the question, and what observations/measurements need to be made.
L4 (low) Can compare different ways of answering the question and whether they lead to the same sequence of strength of magnets.

Focused skills assessments from PSTT - these are currently being updated by the TAPS team. The original planning sheets are available here: <http://www.pstt.org.uk/resources/curriculum-materials/focused-assessment-of-science-enquiry.aspx>

A1 SC1 Life Processes and living things		A3 SC3 Materials and their properties				A4 SC4 Physical processes	
Keeping healthy	Life Cycles	Changing State	Gases around us	More about dissolving	Reversible and irreversible changes	Moon, sun and earth	Changing sounds
4c	3b	4c		4b		4b	4b
3b	3a	3b		3a		3a	3a
3b	3a	3b		3a		3a	3a
3a	4c	3a		4c		4c	4c
3a	4c	4c		4c		4c	4c
4c	3b	4c		4b		4b	4b
3b	3a	3a		3a		3a	3a
3a	4c	3a		4c		4c	4c

A comprehensive picture of pupil achievement for skills and knowledge is built up with data recorded each half term.

Whitehouse Common Primary School, Sutton Coldfield

WHOLE SCHOOL REPORTING - HOW DO WE SUPPORT VALIDITY AND RELIABILITY OF TEACHER ASSESSMENT?

Is the summary of pupil achievement VALID?

Is it an assessment of primary science?

Are knowledge, understanding, skills and attitudes considered?

Have a range of types of activity been taken into account?

Is the summary of pupil achievement RELIABLE?

Would other teachers agree with the assessment?

Is there a shared understanding?

Is there consistency?

How do you go from everyday formative assessment to making summative judgments?

Conversation with science subject leader Kate Porter, Worlebury St Pauls:

Q: You clearly do a lot of formative assessment here. How do you make your summative judgments about whether children have achieved the expectations for each year group?

A: Well we do a focussed assessment each term so that we make detailed notes about each child and their working scientifically, and we have the other knowledge of them from what we have seen in other science lessons and in their books. At the end of term we simply use the evidence from the task, books and what is in our heads to make a judgement about what the child has met, not met or exceeded the expectations. Of course we know what we want the children to learn from our planning, so we are always looking out to see if children have got it.

Q So how can you be sure the teachers are making good judgments?

A: Because I do a work scrutiny of science three times a year and we as a staff look together at what kind of progression we expect at moderation meetings we can trust our judgment. But its an ongoing thing, you have to keep making sure everyone has a shared idea of what to look for.



Staff created a moderation graffiti wall to consider progression from Y1 to Y6

NOTES:

Pupil 1 - identify existing ideas

Pupil 2 - focus on science obj

Pupil 3 - assess own ideas

Pupil 4 - assess peers

Pupil 5 - act on feedback

Pupil 6 - identify next steps

Teacher 1 - plan elicitation

Teacher 2 - discuss LO and SC

Teacher 3 - use Q, discn and obn

Teacher 4 - gather evidence

Teacher 5 - adapt teaching

Teacher 6 - give feedback

Teacher 7 - time to reflect

Monitoring 1 - judge range of activity

Monitoring 2 - moderation/discussion

Monitoring 3 - shared und of progn

Monitoring 4 - pupils aware of criteria

Monitoring 5 -manageable record-keeping

Summary 1 - descriptive summaries

Summary 2 - wr and oral reports

Summary 3 - use range of info

Whole school processes

SAVE MY PROGRESS

Acknowledgements

Our thanks goes to all the children and staff at:

Ashley Down Schools, Bristol

Beacon Rise Primary School, Bristol

Brookside Academy, Somerset

Burford School, Marlow

Burscough Village Primary School, Lancs

Crosshall Junior Academy Trust, St. Neots

Dame Bradbury's School, Saffron Walden

Drove Primary School, Swindon

Fleet Wood Lane School, Spalding

Forres Primary School, Hoddesdon

Great Moor Infant School, Stockport

Holt Primary School, Wiltshire

Ledbury Primary School, Herefordshire

Malcolm Sargent Primary School, Stamford

Northbury Primary School, Barking

Oaktree Primary School, Swindon

Shaw Primary School, Melksham

St Andrew's Church School, Taunton

St Paul's Catholic Primary School, Yate

St Peter's Primary School, Stoke-on-Trent

Victoria Park Primary School, Bristol

Whitehouse Common Primary School, Sutton Coldfield

Woodley Primary School, Stockport

Worlebury St.Paul's Primary School, Weston-super-Mare

The TAPS team:

Sarah Earle, Dan Davies, Kendra McMahon, Chris Collier, Alan Howe and Rebecca Digby

If you would like to offer further examples or provide the TAPS team with feedback, please email primary.science@bathspa.ac.uk

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and

All the teachers who have given us feedback on the pyramid through its stages of development.



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