

Ledbury Primary School



Developing Pupil Led Enquiry



Summary of Content

This is an excellent example of how you can raise the profile of enquiry based science and make it more child-led.

The school carried out an audit of their current practice and researched different ways of working to put into place new initiatives.

NB: please see the exemplar on “Assessment Opportunities” from this school which show how this method of working can result in interesting and meaningful assessments.

Our starting point



We highlighted what we thought good science looked like...

- Enquiry led, practical and investigative
- Creative and cross curricular
- Linked to children's interests
- Formative assessment informing next steps
- Questioning and hypothesising

We highlighted what we needed to do to achieve it....

- Develop child led investigations which are manageable in terms of resources but allow children to generate their own questions
- Build in differentiation and clear next steps
- Make recording relevant and meaningful

What we did

We created meaningful opportunities to investigate that were linked to our topics and the books we were reading.

We followed a Pirate map and discovered some treasure that was all mixed up. We also found some magnets. We decided to use the magnets to sort out the treasure. "These things are sticky" (to the magnet) "A magnet picks up metal things." "These are all balancing on the magnet."



In the treasure box were some very dirty coins that needed to be cleaned. We thought of different things we could use to clean the coins and tested them. "Let's try soap because that's what we wash our hands with." "We can wet coins to make them shiny." "We could try polish; my Mum uses it at home to make things shiny."

EYFS

This gave the children opportunities to come up with their own ideas about how to solve certain problems.



Under the Sea with the Rainbow fish we decided to investigate which tools would blow the biggest bubbles. "The straw made lots of little bubbles". "I turned the cup round to make a big bubble". The big hoop made the biggest bubble but it kept popping."



EYFS

We were learning about Space and in our story 'Whatever Next' baby bear came back with some strange alien substances we had to investigate. We used our senses and the digital microscope to get a closer look. "It feels floppy and soft." It looks like alien eggs." "It smells of pancakes." "It looks like the darkness in the sky."



We used the outdoor environment



We had fun with some very practical hands-on Science at Forest school led by the children's interests in making swings and see saws. The children experimented with tying knots around the tree. Some of the children wanted to make a swing so we helped them tie a rope to a high branch and choose a big stick to sit on. They tried it out and then made the seat bigger and lower to the ground before it was just right. Next the children decided to make a see-saw and had great fun experimenting with standing on each end to make it move up and down. Next they tried having someone balance in the middle and shift their weight to move the other two children up and down.

EYFS

Homework challenges

Engaging families as learners

Cleaning coins activity



We now have monthly science activities on our newsletter. Here is an example.....

Cleaning coins Activity

Add 1 teaspoon of salt to a small bowl of vinegar and mix

Drop in some 1p and 2p pennies.

Can you describe what happens?

Will the same work with other coins?

What about if you add more/less salt?

Science vocabulary

Dissolves

Solid

Liquid

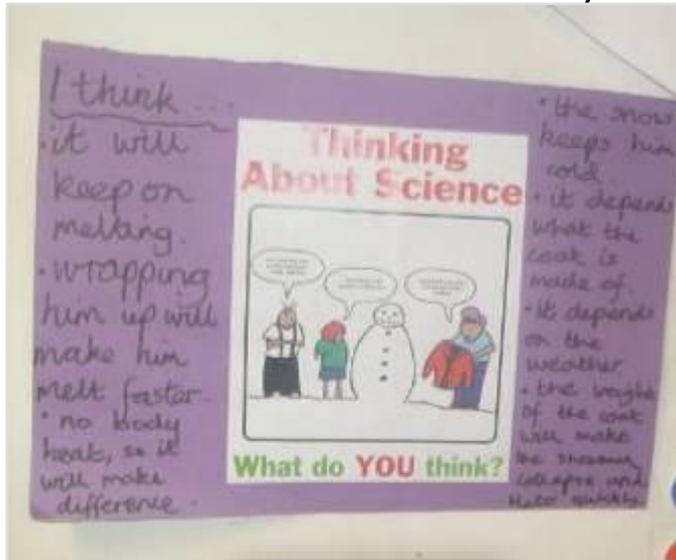
Cleaning coins explained

Pennies get dull over time because the [copper](#) in the pennies slowly reacts with air to form copper oxide. Pure copper metal is bright and shiny, but the oxide is dull and greenish. When you place the pennies in the salt and vinegar solution, the acetic acid from the vinegar dissolves the copper oxide, leaving behind shiny clean pennies. The copper from the copper oxide stays in the liquid. You could use other [acids](#) instead of vinegar, like lemon juice.

Whole school

Concept Cartoons

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.



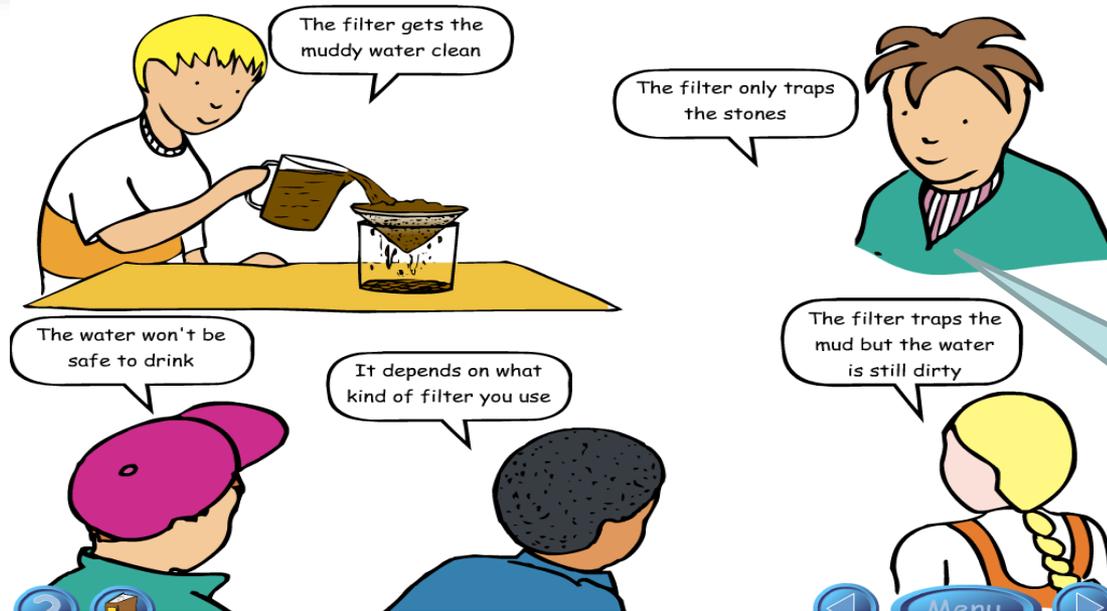
Y2

Y5



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.

We link our cartoons into our whole class topics such as India in Y4 and flight in Y1 shown here....



Which ball falls fastest? In KS1 we used Concept stories to support the children in their investigations

This concept cartoon was linked to a topic on India and the need to find a way to clean dirty water.

We worked scientifically in different ways.....



EYFS



Y3

Investigate how different liquids melt at different rates
 1. Fill four test tubes with different liquids
 2. Watch, making observations and discuss their findings

Observation sheet
 Start time: 5:15

Liquid	1 st observation	2 nd observation	3 rd observation	4 th observation
Orange Juice	is melting	has got a bit melted	is gone	
Lemonade	is melting	has got a bit melted	has been melted	
Cool Whip	is melting	has got a bit melted	is so soft	✓ good description
Milk	is melting	is melting by itself	is almost gone!	

Y2

Making observations and measuring over time, such as the time taken for different liquids to melt and the change in the frogspawn in our pond.

Researching using books and ICT. Identifying and classifying.

Feedback was very positive

Comments form teachers and children

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!

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.

Great for getting the children thinking about the subject and trying to formulate their own ideas.

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.

Whole school

Pupil voice...

They are a fun way to find things out.

I like talking about the problem and listening to other people's opinions.

They are like solving problems.

I enjoy working with my friends to test things out.

I like predicting what will happen and then trying it out.

They give me good ideas for what to do.

Whole school

Impact for our school



- The children and teachers at school are buzzing about science.
- The enquiry stimulated by the concept cartoons is far more child led, their ideas are valued and as a result the children are very much involved.
- As it is linked to our topics it is also meaningful and purposeful.
- More able children are being challenged and less able are being supported.
- Children are learning science through linking ideas across subjects.

Next steps

- **Big books** – we are going to try out whole class big books to record our science. We think they will be more meaningful to the children, less time consuming and be a good resource to refer back to.
- **Child led** – to further develop the freedom given to the children to investigate in their own way we are going to aim to steer them less and allow them more choices e.g. over the equipment they want to use or the way they want to record their findings.
- **Science club** - weekly investigations and practical hands-on fun.
- **Science week** – in the Summer term we are going to hold a carnival on the theme of Space. We thought it would be great to run a science week at the same time culminating in a science fair where parents can come and find out what we have been learning about. As part of this week we are going to have a visiting planetarium to support our learning.

