

The background features several large, stylized swirls in light green, light blue, and light purple. Interspersed among these swirls are numerous small, yellow, triangular shapes that resemble sun rays or confetti, scattered across the white background.

Primary Science

2009/2010

Christine Farmery



Brief

- Update on science in primary schools.
- What is really happening?
- Are we maintaining the status of science?
- What do schools want/expect from students?

A decorative graphic on the left side of the slide features three balloons in shades of green, blue, and purple, each with yellow streamers and triangular flags trailing behind them.

Response to Brief

- My personal journey to science 2009.
- Primary science in Rotherham schools.
- The national picture.
- Practical examples.



My Journey

- B Ed (Hons) Primary Science
- Visiting Lecturer in Primary Science
- Writing about Primary Science
- Rotherham Schools' Primary Science Coordinators
- ASE

What is Primary Science Anyway?

- A way of working and thinking - the organised and logical steps that are needed and the *thinking* behind the practical activity
- Includes *scientific attitudes* - curiosity, asking questions, seeking answers, working through problems and arriving at conclusions and *positive attitudes towards science* essential for adults living in a technological and scientific world

It is the interplay of:

- A body of knowledge
- The skills used in the development of knowledge
- The thinking that provided the interpretation of the evidence
- The understanding a discovery leads to
- The attitudes the learning develops

The reasons for studying science show that it is the skills and attitudes that will be taken into adult life, rather than the recall of popular facts



Emulsions and Suspensions

A suspension is a liquid or gas that contains small particles of another material. There are several types of suspensions including:

- A solid in a gas, such as particles of smoke drifting in the air
- A liquid in a gas, such as fog, which is water vapour in the air
- A solid in a liquid, such as the cloudiness seen in a muddy pond.
- A gas in a liquid, such as the foam used in fire extinguishers.
- A liquid in a liquid, such as water-based paints.

A suspension that contains extremely small particles is called a colloid. The particles in many colloids can only be seen with the aid of a microscope. The tiny globules of suspended fat in milk are an example of a common colloid.

An emulsion is a type of colloid that is produced when one liquid is evenly dispersed in another. It is not a solution – the two liquids do not dissolve in each other – but tiny drops of one liquid are suspended in the other liquid. Some common substances, such as cosmetic lotions and paints, are emulsions.

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Science in Action

Our approach to primary science accepts that knowledge is only one part of the curriculum.

The development of skills - through discovery, thought, interpretation and discussion – are vitally important.

The key to success in the KS2 SATs has depended upon the ability to apply scientific skills, in different contexts.



End of KS2 SATs Question Breakdown

| Question Type | Marks Available |
|------------------------|------------------------|
| Recall of facts | 53 |
| Explanation | 9 |
| Interpretation of data | 18 |



End of KS2 SATs

The End of Primary Science SATs – The End of the World?

John Holman – Director, National Science Learning Centre
offers his opinion.

<http://content.sciencelearningcentres.org.uk/centres/national/video/word/press/breakingnews.html>



Ofsted – Success in Science

Key findings - Of the schools visited, those with the highest or most rapidly improving standards ensured that scientific enquiry was at the core of their work in science. Pupils were given the opportunity to pose questions and design and carry out investigations for themselves. (p5)

<http://www.ofsted.gov.uk/Ofsted-home/Publications-and-research/Browse-all-by/Post-16-learning-and-skills/Read-about-this-new-section/Curriculum/Success-in-science>



Ofsted – Success in Science ITT

Preparing pupils to behave like scientists is a focus of successful teaching and learning in science..... At primary and secondary level, the highest achievement in science occurs most often where pupils have frequent opportunities for experimentation, investigation and analysis.

(p32)

There is not enough emphasis on training new teachers to use science to promote the core skills of numeracy and literacy. Some good links are made between science and ICT but these tend to be limited. (p32)



ASE Key Messages 1

- Investigations, investigations, investigations
- Investigations set in context of real world
- Give children a real problem to solve
- Use different stimulus – email, memo, letter, object, statement, film clip
- Use investigations to give a meaning for developing knowledge
- Let children demonstrate prior knowledge through discussion then move onto investigation



ASE Key Messages 2

- Discussion in science crucial – currently research carried out into effects of modelled discussions
- Writing straight away inhibits thought – need talk/discussion before writing
- Thought needs scaffolding



ASE Key Messages 3

- Use a range of strategies to ensure all learners are catered for
- Don't use text books
- Quality First teaching
- Don't overuse ICT
- Include poetry, drama, modelling to record knowledge
- Use games – including for assessment

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The Key Message

Science in the real world is open-ended and
scientists talk together;
re-create this in the classroom

Independent Review of the Primary Curriculum: Final Report

Scientific and technological understanding

Learning in this area should include an appropriate balance of focused subject teaching and well-planned opportunities to use, apply and develop knowledge and skills across the whole curriculum.



This area of learning develops children's ability to explore and understand... It builds on their natural curiosity, inventiveness and wonder and helps them make sense of the world around them.

http://publications.teachernet.gov.uk/eOrderingDownload/Primary_curriculum_Report.pdf

Independent Review of the Primary Curriculum: Final Report

Children learn to frame and answer questions and solve problems using experimental methods and other practical techniques, drawing on their scientific understanding to inform their designing and making.



They develop valuable skills, such as generating and testing ideas, gathering and making sense of evidence, developing possible solutions, and evaluating processes and outcomes.

Independent Review of the Primary Curriculum: Final Report

They learn to distinguish evidence from opinion and communicate their findings in a variety of ways.



As their understanding grows, children gain awareness of the ways that learning in science and design and technology inform other areas of learning, including historical, geographical and social understanding.

This will help them to make informed choices about the way they want to live in and shape the natural and made worlds.



Science Skills

Scientific skills - transferable across the curriculum:

- asking questions,
- playing with ideas,
- trying out ideas,
- finding out,
- predicting,
- reflecting,
- interpreting,
- linking ideas,
- searching for information,
- critical thinking,
- problem-solving,
- communication – discussing with others, presenting ideas,



3 Part Science Lesson

Starter – a game, thinking skills activity,
big question

Main part of the lesson

Plenary – a game, recap, sharing of
learning, big question to move thinking
on

A decorative graphic on the left side of the page features three balloons in shades of green, blue, and purple, each with a yellow streamer and several yellow triangular flags. The balloons are arranged vertically, with the green one at the top, the blue one in the middle, and the purple one at the bottom.

Find Your Partner

Use your picture to find a partner.

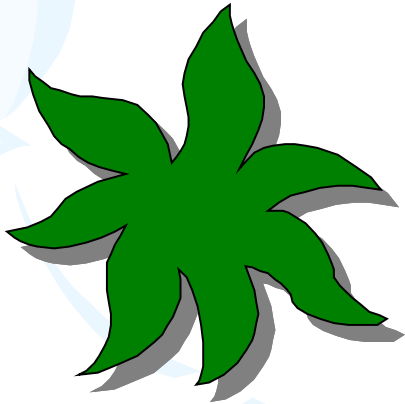
Why are you partners?

Now find another partner using the same picture

Thinking Activities

The answer is a plant.

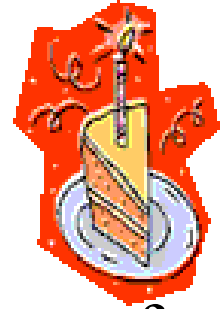
What is the question?



Describe as many ways as possible that warmth can be seen.



Big Question



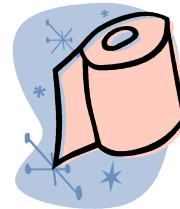
What would your life be like if you had no sense of taste?

Plus, Minus, Interesting

What are the positives and negatives about having no sense of taste?

What would be interesting?

**Which paper is best
for wrapping up a present?**



Rapunzel



What if Rapunzel didn't have long hair, how could she have escaped from the tower?

Using Stories

Primary Science Review 92

ASE Primary Journal

<http://www.ase.org.uk/>



Using stories for science :

- Illustrates a concept
- Provokes identification of an enquiry
- Describes how a breakthrough was made or a point understood.

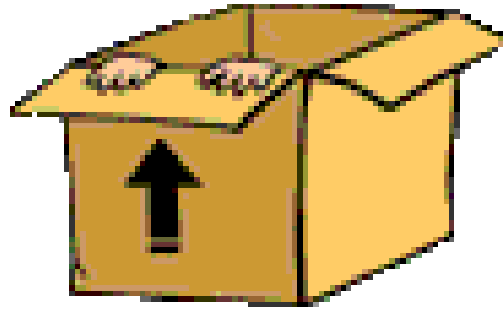
Using Stories

Complete the story:

- ❖ What was Humpty investigating when he jumped off the wall?
- ❖ How could the King's men have helped break his fall?
- ❖ What did the three little pigs do when they saw the flood-waters rising?



Investigation Boxes



How many investigations can you think of using the box on your table?



Key Word Poems

The first line is **one** word - names the scientific idea.

The second line has **two** words - describes what the word in the first line means.

The third line has **three** words - describes what the word in the first line does.

The fourth line has **four** words - elaborates on the first three lines with a personal view, statement or observation.

The fifth line renames the science idea in the first line in a single word.

FORCE

Push, pull.

Makes things move.

Is measured in newtons.

WEIGHT

HEART

Body organ.

Pumps blood around.

Food and oxygen to cells.

MUSCLE

SCIENCEBUSTERS



ASE CD Rom



http://www.ase.org.uk/htm/book_store/detail.php?SIID=176

Content on-line at:

<http://www.sycd.co.uk/primary/index.htm>



Review of Brief

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