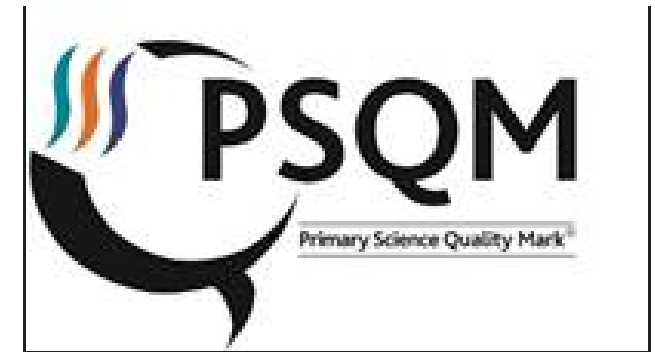


# The Bluecoat School PSQM portfolio



# Science Leadership : A

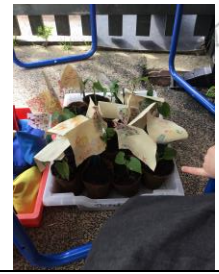
## Key need; Create and implement a shared science vision



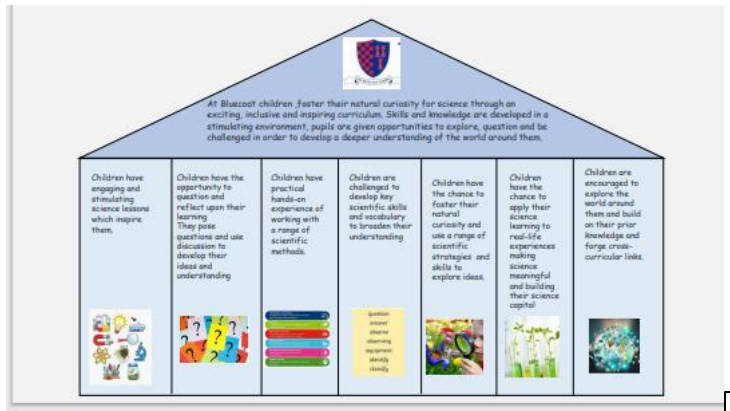
From the staff and pupil voice, the vision and principles document was created. This is shared and referred to in multiple places to enable everyone to see what we value most about out teaching and learning of science.

Recent learning walk and monitoring showed principles being displayed and used within teaching across most year groups. Pupil voice demonstrated that children understand and could share what principles they had been using in lessons.

I grew a beanstalk like Jack did. Mine wasn't as big. I planted the bean and water it. -EYFS child



EYFS children planted beans after reading Jack and the beanstalk- learning about plants and growth.



Vision and principles document

MTP on light with logos included

Lesson	Lesson Objectives	Learning Objectives	Learning Objectives/Key questions	Resources
1	... to ...	...	...	...
2	...	...	...	...

Lesson	Lesson Objectives	Learning Objectives	Resources
3	...	...	...
4	...	...	...



Staff meeting notes from teachers of what we want good science to look like in our school

I love science and feel great that I have been asked my opinion about it-Y6 child

Staff and children feel valued and listened to in decision making about science teaching and learning.

A teaching slide with logo for scientific skills and vocabulary

**Results**

Draw 2 labelled diagrams of your observations.

Light travels in \_\_\_\_\_ lines.

I know this because...

- torch
- light source
- travels
- straight
- bent
- coloured acetate

The logos for each principle on the document have been included in planning documents ensuring the principles are covered and these are transferred to the teaching slides to be referred to within the lesson. The children recognise these as they are displayed around the school and in their class room.

# Science Teaching: B



Key need: To establish what strategies are currently being used and their impact on T&L.

Identified areas of strength and gaps in provision to ensure children build understanding by experiencing a wide range of learning opportunities. Focus talk and higher order questions and vocabulary.

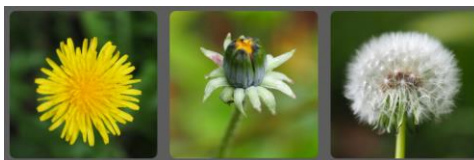
Sticky learning starter that children complete at the start of every lesson.

Recap from your Year 3/4 learning

1. Label the main parts of a flower.

2. Match the plant parts to their function.

3. What does a daisy need to survive and grow?



Example teaching slide and odd one out from explorify

Key Vocabulary - Note - Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably.	
<b>Electrical circuit</b>	A path in which electricity can flow.
<b>Complete circuit</b>	A complete path in which electricity can flow.
<b>Open circuit</b>	An incomplete path which does not allow electricity to flow.
<b>Voltage</b>	The force of electricity, measured in volts.
<b>Component</b>	A part of a circuit.
<b>Circuit diagram</b>	A visual display of an electrical circuit using either basic images (Y4) or symbols (Y6).
<b>Symbol</b>	A picture used to represent an electrical component. (Note - All children to use symbols rather than pictorial representations at this stage instead, which is an advancement from Year 4.)
<b>Cell, positive, negative</b>	A device used to generate electricity. A cell has two ends, labeled + (positive) and - (negative). A cell pushes electricity from the positive terminal round to the negative one.
<b>Battery</b>	One or more cells connected.
<b>Crocoble clip</b>	A metal clip that connects to another component.
<b>Bulb</b>	A glass bulb that produces light.
<b>Switch</b>	A component that controls whether the electrical circuit is open or closed.
<b>Buzzer</b>	A component that produces sound.
<b>Motor</b>	A component that produces rotational movement.
<b>Key Scientists</b>	Alessandro Volta - invented the electric battery (link to the word voltage). See Ogden Trust History Forum E7.

Expand on definition: Voltage can be thought of as an electric force that causes electrons to flow. It could be considered the 'push' that forces electricity around. Voltage may come from a battery or a power plant. Voltage is measured with a Voltmeter. The units for voltage are volts (V). We label voltage by the battery or cell. Discuss appropriate voltage.

**How does voltage affect the brightness of a lamp?**  
At this stage in the year, pupils should be able to decide how they will set up their investigation, record and conclude.  
Set expectations and allow them to complete independently.

- Identify Variables
- Include labelled scientific diagrams with appropriate symbols.
- Gather your results in a table.
- Write a conclusion of your findings (may want to provide stem sentences for this).
- Challenge: Draw scatter graph

Recognising and controlling variables.

Take repeat readings and an average.

Draw a table.

Use a data logger.

Form a conclusion.

Draw a scatter graph (challenge element)

Link to voltage across battery, the fact 1 has 2 but there could be multiple cells in the car battery etc.

SEN: Provide Table and Supported Conclusion frame/word bank.

**Next Steps:**  
Simple Image with different voltages marked on circuit diagrams. Circle which will be the brightest lamp. Challenge is to explain why.  
Super depth - give a definition of voltage.

Explorify is used by all teachers in their teaching for a talking activity, for verbally reasoning and for assessment.

Using explorify has increased the children's ability to reason and their correct use of vocabulary. The children really enjoy zoom in zoom out and have become more flexible with their thinking as a result - even children who find this difficult. I will use explorify if we have a spare few minutes in the day too! - Y6 teacher

Explorify activities are planned on MTP to use in teaching.

Children can retrieve previous learning and recall key facts allowing deeper thinking and higher order questioning skills.

Vocabulary

Vocabulary explicitly taught and displayed on working walls

**Vocabulary**

Key vocabulary for this lesson  
Draw the scientific image next to each of the words cell

battery  
bulb  
wire  
switch

Planning for and introducing key vocabulary each lesson helps children increase their scientific vocabulary and use it correctly in their talk and written work.

Vocabulary used in writing.

Who was Carl Linnaeus?

A Swedish Swedish scientist who created the classification system in the 1700s

Vertebrates: spine  
Invertebrates: No spine

Mammals: live birth  
Insects: A bug which give egg birth

Bird: A animal which can fly  
Fish: animal which lives in the sea

Reptiles: cold blood  
Amphibians: land and water creatures: toad, Frog, Salamander

# Science Learning : A

Key need: Explore children's awareness of/use of the five different enquiry types.

Pupil voice online survey form recorded results about scientific enquiry types and what they were. Out of the 67 children who took part, 55 could name the enquiry types and match their associated symbol. 51 children gave an example of one that they had undertaken in class this term.



Pupil voice in September indicated that not all children were aware of the 5 enquiry types and what they were. Following a whole school assembly to re-launch them and teacher training the children were able to say what the enquiry types were and what symbol/colour represented the different ones.

Book monitoring shows that children are undertaking different enquiries and using the correct scientific vocabulary associated with the enquiries.

3Q Which material is the most absorbent? Date: 9.2.23  
Which material would be best for making a rain cap? (most of the things you have seen and also not during previous experience)

material	symbol	representative for a type?
felt	☺☹	✓ Jud
paper towels	☺☹☹	X Soggy rippled
cotton wool	☺☹☹	Pray
tin foil	☺☹☹	HAPPY?
tissue paper	☺☹☹	wake
cardboard	☺☹☹	

Disc made as a

Year 1 work with symbol on sheet.

In Nursery and EYFS, there has been a wider range of science-based continuous provision for the children to explore which follows these working scientifically skills.

Monitoring and sharing of our best practice has supported staff development and ensured that children's science is balanced across all 5 enquiry types.

Planning and display resources now clearly indicate the type of enquiry being developed/focused on.



Investigating if length of a paper rocket affects the distance it travels, before recording results and answering their question.

Children are asking and investigating their own scientific questions using the relevant enquiry type.

Monday 7th November 2022 ✓

Can you use your knowledge of water to explain a compostable tea?

Next steps:  
What would life be like if you were missing:  
• Molars?  
• Canines?  
• Incisors?

Think about the function of each tooth - would you have to eat different things?

Our scientific question:  
Will the temperature affect the calcium in the egg?

Independent variables	Control variables
liquid water	egg size of the shells
egg shells	shape of eggs
nothing	amount of liquid

Results

Time (days)	Diagram	Observations
2		bricks = supply with - cracked shell cokes = 3/4 broken, 1/4 whole
3		milk + water = same milk + water - fine orange = 1/2 solid cokes = 2/3 broken
4		orange = 1/2 whole milk + water = same cokes = broken

Use of comparative, prediction and results in this writing.



Different outside activities linked to science

I have been seeing what will float and sink - EYFS child  
I have changed my ramp (pipe) height and raced the cars down. The higher it is - my car goes a longer way - EYFS child.



Following a question about where chickens come from, children in EYFS incubated eggs and found out!

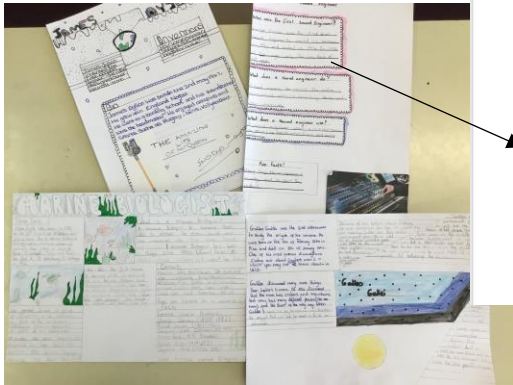
# Science Learning : C



Key need: To develop all children's science capital through opportunities and visits.

Whole school science week demonstrated how activities could be planned for, in school ,to develop children's science capital.

Children read about different science careers which resulted in some fantastic writing



Science Week Monday 13<sup>th</sup> March - 17<sup>th</sup> March 2023  
'Connections'  
(a relationship in which a person or thing is linked or associated with something else)

This year the theme for science week is 'connections' and whilst there are many connections that can be made within science, we are going to be making connections between our planet and the rest of the solar system. The rationale for this is that our children, and indeed many children, find abstract ideas hard to understand, our solar system being one.

Friday 10<sup>th</sup> March - Cake sale to assist funding ask parents and teachers to donate. Sale after school 3.15-3.45

Friday 10<sup>th</sup> March - Newsletter whole school poster competition (every child to be given piece of paper.) Design a poster about connections.

Monday 13<sup>th</sup> March - Launch with whole school assembly.

Friday 17<sup>th</sup> March- Prizes for poster comp and rocket comp.

During the week the children will learn:

- Where Earth is in relation to other planets? Assembly
- How do we know about the other planets? Assembly
- What jobs are involved in learning about other planets/space? Reading lessons
- Transport to space- whole school science investigation and competition 'Rockets' Science and maths
- Bringing their learning to life with a visit from a planetarium- every class to visit and see our solar system close up.
- Pupil voice - every child to reflect on the week
- Whole school display - photographs and children's quotes



Following the planetarium visit children extended their learning to answer their own enquiry question 'What is Earth made from?' and created layered model Earth planets.

STEM club – children make links to other STEM subjects and how these are linked to their world. Children are able to apply their scientific skills to a range of projects , building resilience and independence, whilst learning the principles behind the project.



Opportunities for children to make links with their world through experiences that they wouldn't usually have . Children were able to extend their learning and investigate their own questions. Teachers gave feedback that the children were engaged and that they found the experience beneficial for their own teaching around the solar system.

Chance to learn about careers ,which need science knowledge, through reading and researching excited the children and produced high quality writing. Teachers have since planned more science reading in their reading lessons.

**Other ideas:** Links in Reading to Isaac Newton and his work on Prisms, Eyeglasses, Evolution of the eye to link to previous topic.

Example from planning about light-Y5/6

## Wider Opportunities : B



Key need: To use current issues and science in the news better to enhance children's science enrichment

Following pupil voice feedback and in line with our school value of responsibility, children have cared for our school environment, including learning about sustainability. Children value the responsibility of ensuring we all play our part in looking after the environment and in turn helping our planet for the future.



A cooking club provided children the opportunity to reinforce the importance of a healthy diet. Children prepared the fresh ingredients, cooked and ate their meals together, developing their awareness of sustainability and carbon footprint as well as team work and social skills.



I have loved learning new skills and the food was amazing! I tried raw ginger and it was disgusting- my mum thought that was funny.

Each class planted trees, donated by The Woodland Trust, to further develop our woodland area.



The outside learning environment is looked after and cared for by the children, with the recent addition of a community allotment on the school ground. Teachers and children planted seeds, trees and fruits and regularly visit to water and maintain them. As it develops the allotment will be used for teaching opportunities and when there is produce, it will be eaten by the children. Children enjoy the allotment time benefitting their well-being.



Community allotment work underway!