

# Science Subject Leadership: PSQM Gilt

Before PSQM

Evidence pre PSQM

Actions during PSQM

Impact PSQM

Next Steps

**SL Aim:** Science subject leadership is strengthened and developed through:

## A. The creation and implementation of a clear vision for science

**Impact:** Clear visibility of the science vision, especially through displays, captured the attention of our pupils. It made science more engaging and relevant to their learning experiences. Pupils talk about it during lessons and discuss how the vision links to a particular activity or lesson in science.

**Before:** The current science policy is comprehensive, covering intention, implementation, and outcomes. Although it is well-documented on the website, its presence within the school, particularly in displays, is lacking. Additionally, the vision and principles of science have not been clearly communicated to both staff and students. There is a lack of examples demonstrating the vision in practice, making it challenging for staff and students to understand.

**Science Vision at Egerton Primary School...**  
 In our primary school, "SCIENCE IS" is the guiding principle that shapes our curriculum, teaching methods, and the way we nurture young minds to become scientifically literate, inquisitive, and responsible global citizens.



**Action:** Science Ambassadors working on our science principles.

**What is your vision for the science curriculum?**  
**PSQM Spotlight**  
**Ed Walsh, SRHL**  
**Action:** Science leads watched video:

**Action:** To address lack of clear vision, science leads organised a staff meeting to discuss the science vision, encouraging staff members to articulate their perspectives on what the vision of science at Egerton Primary School should entail.

- S** **Scientists and Careers:** We provide children with opportunities to interact with real-world scientists, learn about their work, and explore various career paths.
- C** **Curiosity Ignited:** We ignite the spark for passion, that drives children to question, explore, and seek answers to the wonders around them.
- I** **Inclusive Education:** We ensure inclusivity by tailoring lessons to different learning styles and abilities, making science accessible and engaging to all.
- E** **Enquiries:** Children explore a range of enquiries to foster a deeper understanding of scientific phenomena inside and outside the classroom.
- N** **Natural Connections:** Recognising the intricate web that links all branches of science, emphasising that biology, chemistry, physics, and more are interdependent.
- C** **Critical Thinking:** Empowering children with the ability to analyse, evaluate, and make informed decisions based on evidence, a cornerstone of scientific enquiry.
- E** **Enrichment:** Wider opportunities for children to participate in science-related activities beyond the classroom, including field trips and guest speakers.
- I** **Innovation:** We encourage creative thinking and problem-solving, cultivating a spirit of ingenuity and a willingness to explore new frontiers in science.
- S** **Sustainability:** We teach our children about the delicate balance of ecosystems, inspiring a commitment to sustainable practices for the betterment of our planet.

**Action:** The vision and principles have been shared on our website and included in our newsletter for parents and the wider community to see.

A well - defined science vision serves as a beacon for continuous improvement. It allows us to evaluate our current practices against our desired outcomes, identifying areas for growth and innovation. Through regular review and refinement of our vision, we can adapt to the evolving needs of our learners. Our aim is so our science vision inspires and motivates both staff and children. By articulating our aspirations and values regarding science education, we can ignite passion and curiosity for the subject, fostering a culture of enquiry and exploration.

**Science Lead**



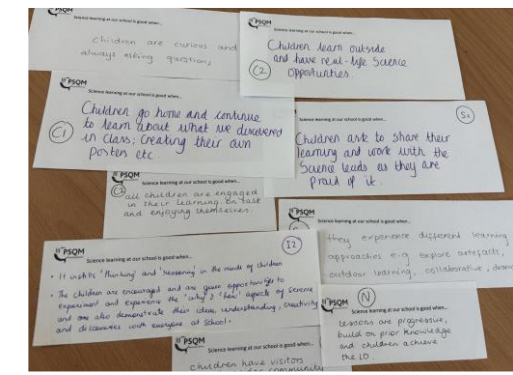
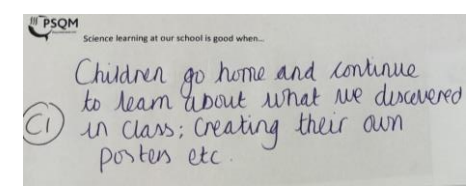
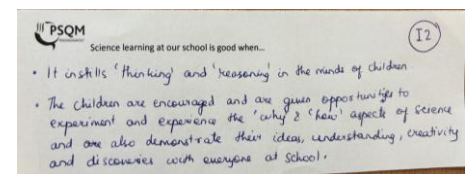
**Action:** New appointed Science ambassadors

When our teachers let us think for ourselves, come up with ideas, and figure things out, it makes us feel smart and capable.  
**Year 6 pupil**



**Action:** Science lead conducted whole school science voice: Science is good when... this has been used to feed into the vision and principles.

**Next Step:** Review principles, based on staff and pupil feedback/voice and monitoring of planning.



# Science Subject Leadership: PSQM Gilt

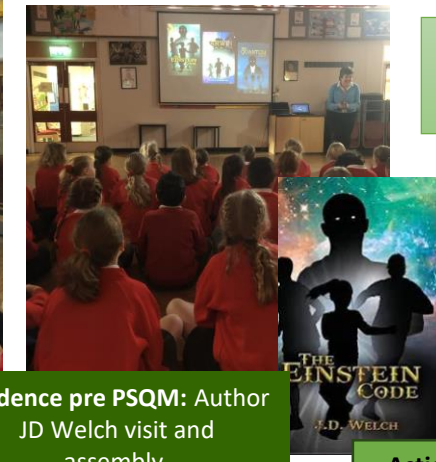
**SL Aim:** Science subject leadership is strengthened and developed through:

## A. Science vision and principles in action within the school.

**Action:** Year 6 workshop with STEM Ambassador, Tom, who is teaching the children how to program and fly indoor drones.



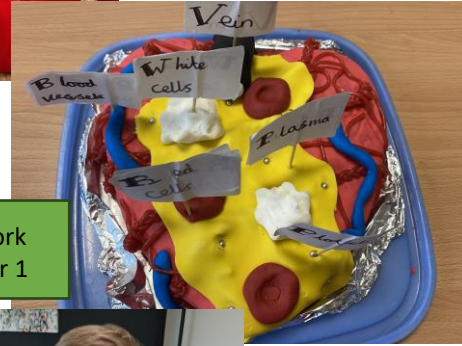
**Impact:** As the children worked collaboratively to create the vision they feel included in their learning and are more enthusiastic about Science lessons.



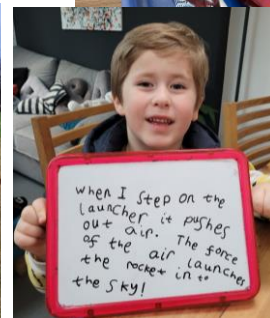
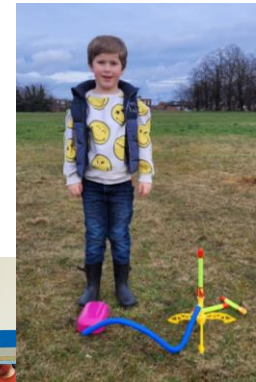
**VISION: Enrichment:** Wider opportunities for children to participate in science-related activities beyond the classroom, including field trips and guest speakers.



**Action:** Creative homework projects – Year 6 and Year 1



**VISION: Curiosity Ignited:** We ignite the spark for passion, that drives children to question, explore, and seek answers to the wonders around them.



**Action:** Secondary school Science teacher demonstrated an eye dissection to Year 6

**Impact:** Children have the opportunity to develop their communication skills by asking questions and actively participating in discussions with guest speakers. This helps them to articulate scientific ideas.

**VISION: Scientists and Careers:** We provide children with opportunities to interact with real-world scientists, learn about their work, and explore various career paths.

**Evidence pre PSQM:** Author JD Welch visit and assembly.

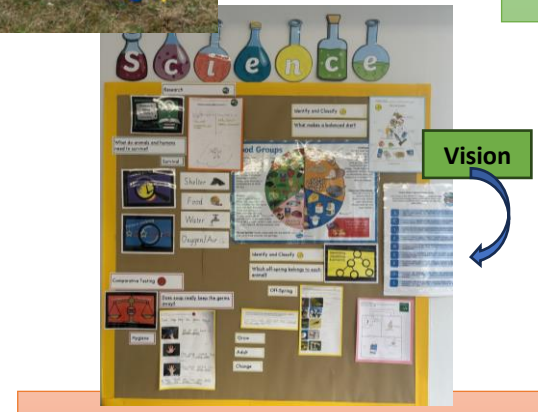


**Action:** Parent, geologist, workshop for Year 3 pupils



**Evidence pre PSQM:** : STEM Career Day – staff and children dressed up

**Action:** Year 5 Display on Careers in Science



**Next Step:** Review principles, based on staff and pupil feedback/voice and monitoring of planning.

# Science Subject Leadership: PSQM Gilt

**SL Aim:** Science subject leadership is strengthened and developed through:

**A. Science vision and principles in action within the school. SL A**

**Before:** Staff engaged in sustainability-related activities; however, these activities lacked a sequential structure and connection to Sustainable Development Goals. The selection of PLANT units did not prioritise the most impactful contributions to learning and the school environment.



Action: Year 2 children planting bulbs around the school

**Action:** A structured plan and sequence have been developed for the delivery of lessons on PLANTS for each class

<p>Year 2</p> <ul style="list-style-type: none"> <li>End of October (before half term) Plant bulbs (tulips and daffodils, snowdrops and crocuses), in front of the school, around the fence. MS to support EARLY POLLINATORS FRIENDLY FLOWERS</li> </ul>	<ul style="list-style-type: none"> <li>End of March (MS to support or plant with the children). Before Easter break. Plant meadow mix seeds; prepare extra bed with the children (group at a time). Classify different meadow seeds. As the plants grow, observe and match the seeds to the adult plant. SEE FRIENDLY FLOWERS</li> </ul>	<ul style="list-style-type: none"> <li>April, after Easter holidays. Plant vegetables so children can grow and harvest in June/July: lettuce different varieties (low in container in the greenhouse, replant outside to a bigger container by end of May) VEGETABLES</li> </ul>
<p><b>Plants</b></p> <ul style="list-style-type: none"> <li>Observe and describe how seeds and bulbs grow into mature plants.</li> <li>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul> <p><b>Living things and their habitats</b></p> <ul style="list-style-type: none"> <li>Identify and name a variety of plants and animals in their habitats, including microhabitats.</li> </ul>		
<ol style="list-style-type: none"> <li>Year 2 pupils should grow a range of bulbs and seeds, not just one type. It is recommended that these are predominantly grown in beds outside, although they may be started in the classroom or a greenhouse and then be replanted in the ground. If growing space in the school is limited, Year 2 should have priority for growing plants in the space available.</li> <li>Growing plants needs to be planned carefully as bulbs and seeds need to be planted at specific times of the year. Generally, bulbs will need to be planted in the autumn term and seeds in the spring term. When deciding what to grow, it is important to think not only about the diversity of plants but also the time when the plants will reach maturity. There is nothing more disappointing than pupils coming back in September to find dead tomato plants.</li> <li>Where possible, pupils should be responsible for deciding what to plant and researching how and when to plant it. They can look at the seed/bulb packets and decide which need to be planted in full or partial sunlight, at the front or back of the bed (according to their height), and how to space them. They will then need to tend and nurture their plants for them to reach maturity.</li> </ol>		

GET DIGGING AND SPREAD JOY TO YOUR SCHOOL COMMUNITY BY CREATING YOUR OWN FLOWER DISPLAY

STEP ONE SIGN UP YOUR SCHOOL

STEP TWO GET GROWING!

STEP THREE SHARE YOUR PICTURES AND STORIES

Actions:

- encourage wildlife - birded bug hotel
- save for nature - display
- Tower of London School Superbloom Project

PLANTS AND ANIMALS SURVEY

**Action:** Each year group has integrated Sustainable Development Goals into their curriculum, aligning them with relevant Science units and utilizing Explorify resources.

Sustainable Development Goals & Science Overview

**Action:** Pupils use SDGs and Explorify resources when learning about sustainability

What do humans need to survive?

Things that make me Happy: Toys, bed, Computer, car, Scooter.

Things that I need: good Shelter, oxygen, sleep, water.

Wednesday 19th October 2023

20th to analyse technology and demonstrate understanding in explaining simple concepts related to technology.

What if all transport was electric?

- Electric transport could greatly reduce the pollution going into our air. Electric vehicles and transport would help because it wouldn't produce harmful substances and reduce the air. Like carbon dioxide and other pollutants. However, it is important to remember that even electricity is produced somewhat because as well as being made cleanly like solar, geothermal, hydro etc it can be made with non-renewable resources like fossil fuels. Over all though I think electric transport will help because it will help reduce pollution.
- Electricity can be generated in many ways some clean and some non-renewable. It can be generated by wind, water, turbines and solar panels. Wind can also generate electricity by using fossil fuels.

**VISION: Sustainability:** We teach our children about the delicate balance of ecosystems, inspiring a commitment to sustainable practices for the betterment of our planet.

**Evidence pre PSQM:** Pupils from Eco Ambassador group took part in a project together with The Tower of London – Superbloom. They created a meadow at the back of the school field to support biodiversity.

**Impact:** Linking science to SDGs encourages pupils to actively participate in addressing global challenges. It instils a sense of agency, empowering them to contribute positively to the world. Pupil Voice

Year 5 South America					
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Anglo-Saxons	Vikings	Extreme Environments	Natural Resources	The Ancient Mayans	Earth and Space
Properties and changes of materials	Living things and their habitats	Animals including humans	Animals including humans	Forces	Earth and Space
<p>Lesson 1</p> <p>L.O: Compare and contrast a substance naturally found on their properties</p> <p>WS: Answering questions</p> <p>WS: Support, ask pertinent questions. Begin to explore ideas and raise different kinds of questions about scientific phenomena.</p> <p>Enquiry: How can different materials be classified?</p>	<p>Lesson 1</p> <p>L.O: Explain how to measure a substance</p> <p>WS: Patterns reading</p> <p>WS: Observe what</p> <p>WS: Support, make decisions about what observations to make, what measurements to use and how long to make them, and whether to repeat them</p> <p>Enquiry: How can we use an experiment to separate salt from water?</p>	<p>Lesson 1 DE</p> <p>L.O: Explain the life cycle of mammals</p> <p>WS: Reporting and presenting findings</p> <p>WS: Support, including conclusions, causal relationships and explanations of a degree of trust in results. In oral and written forms such as displays and other presentations</p>	<p>Lesson 1 DE</p> <p>L.O: Identify the life cycle of mammals</p> <p>WS: Reporting and presenting findings</p> <p>WS: Support, including conclusions, causal relationships and explanations of a degree of trust in results. In oral and written forms such as displays and other presentations</p>	<p>Lesson 1</p> <p>L.O: Identify forces acting on objects</p> <p>WS: Reporting and presenting findings, using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing</p> <p>Enquiry: Can you label and name all the situations?</p>	<p>Lesson 1 DE</p> <p>L.O: Explain what a Solar System</p> <p>WS: Reporting and presenting findings</p> <p>WS: Support, including conclusions, causal relationships and explanations</p> <p>Enquiry: What is a Solar System and how is it formed?</p>
<p>Lesson 2</p> <p>L.O: Carry out a fair and comparative test to reflect the thermal conductive properties of materials</p> <p>WS: Taking measurements, using a range of identifiable equipment</p> <p>Recording data and results of increasing complexity using bar graphs</p> <p>Enquiry: Which material should your house use to keep their tea warm?</p>	<p>Lesson 1</p> <p>L.O: Explain how substances might be classified</p> <p>WS: Patterns reading</p> <p>WS: Support, make decisions about what observations to make, what measurements to use and how long to make them, and whether to repeat them</p> <p>Enquiry: How can we use an experiment to separate salt from water?</p>	<p>Lesson 2 DE</p> <p>L.O: Explain the life cycle in insects and amphibians</p> <p>WS: Reporting and presenting findings</p> <p>WS: Support, including conclusions, causal relationships and explanations of a degree of trust in results. In oral and written forms such as displays and other presentations</p>	<p>Lesson 2 DE</p> <p>L.O: Explain the life cycle in insects and amphibians</p> <p>WS: Reporting and presenting findings</p> <p>WS: Support, including conclusions, causal relationships and explanations of a degree of trust in results. In oral and written forms such as displays and other presentations</p>	<p>Lesson 2 DE</p> <p>L.O: Understand the influence gravity has on the solar system</p> <p>WS: Identifying scientific evidence that has been used to support or refute ideas or hypotheses</p> <p>Enquiry: Explore the life and work of Isaac Newton</p>	<p>Lesson 2</p> <p>L.O: Understand the difference between a homogeneous and an isotropic material of the same system</p> <p>WS: Identifying scientific evidence that has been used to support or refute ideas or hypotheses</p> <p>Enquiry: How are the planets different to each other?</p>
<p>Lesson 3</p> <p>L.O: Know and understand a range of stars, in which patterns and changes of stars can be traced</p> <p>WS: Support, make decisions</p>	<p>Lesson 3</p> <p>L.O: Know that the classification, patterns and changes of stars are reversible changes</p> <p>WS: Support, make decisions</p>	<p>Lesson 3 DE</p> <p>L.O: Identify the life cycle of birds</p> <p>WS: Reporting and presenting findings</p> <p>WS: Support, including conclusions, causal relationships and explanations of a degree of trust in results. In oral and written forms such as displays and other presentations</p>	<p>Lesson 3 DE</p> <p>L.O: Identify the life cycle of birds</p> <p>WS: Reporting and presenting findings</p> <p>WS: Support, including conclusions, causal relationships and explanations of a degree of trust in results. In oral and written forms such as displays and other presentations</p>	<p>Lesson 3 DE</p> <p>L.O: Understand how the force of gravity affects the time it takes to fall</p> <p>Outdoor Lesson</p>	<p>Lesson 3 DE</p> <p>L.O: Name key planets and understand the order of the solar system</p> <p>WS: Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate and taking repeat readings when appropriate</p> <p>Enquiry: Are all the planets the same distance from each other?</p>

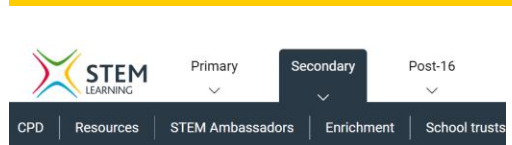
**Action:** MTP developed; enquiries LOGOS added

# Science Subject Leadership: PSQM Gilt

**SL Aim:** Science subject leadership is strengthened and developed through:

**B. Strategic support enabling improvement to take place SL B**

**Before:** No specific CPD on moderation was access by SL and the staff. Moderation of science work did not take place before PSQM journey.



**Evidence pre PSQM:** Science Lead registered on STEM ambassador program

## Request a STEM Ambassador

Connecting young people with STEM industry experts

**Action:** Science leader took part in various webinars/training on the PSQM repository

**Impact:** Exposure to diverse webinars and information sources contributes to continuous professional development. The subject leaders stay informed about current trends, best practices, and emerging research in the field of science education.

ACTION PLAN: Science		
<ul style="list-style-type: none"> <li>Key Improvement Priority Outcomes for Children.</li> <li>Review and develop the science curriculum to ensure it meets the needs of our children.</li> <li>Strengthen the school's approach to teaching Science. 5 enquiry types, assessment strengthens children's aspirations in and enjoyment of Science.</li> <li>Ensure that working scientifically objectives are embedded across the school – review skills and knowledge progression documents.</li> <li>Ensure resources support teaching and learning of science.</li> <li>Ofsted research report and guidance embedded in the curriculum: substantive and disciplinary knowledge.</li> <li>Handbook and self-evaluation of science embedded.</li> <li>Science curriculum from Year 1 closely linked to EYF5.</li> </ul>	Year: 2023-24	Finance Plan: Budgetary Implications <ul style="list-style-type: none"> <li>Leadership time,</li> <li>PDAs,</li> <li>Learning walks during directed teaching time</li> </ul>
Success criteria: <ol style="list-style-type: none"> <li>Children prior knowledge and focused vocabulary will be identified and met and they will make progress with their learning.</li> <li>Medium and Short Planning will be developed so it supports delivering Science lessons.</li> <li>All teaching staff will be involved in CPD in order to support themselves, colleagues and children in teaching effective Science lessons.</li> <li>Teaching staff will have an increased subject knowledge, pedagogical approaches and technology at their disposal. This will lead to more children meeting and exceeding expected attainment based on the last academic year.</li> <li>Through feedback, learning walks, observations and general monitoring activities, children will demonstrate an increased level of enjoyment for science.</li> <li>The science curriculum will have been reviewed and developed as needed for the children's needs. The changes will impact positively on enjoyment and attainment for most children.</li> <li>Curriculum planned and sequenced to ensure progression.</li> <li>Science display in each classroom.</li> <li>Refresh of displays in STEM AREA of the school in Spring Term.</li> <li>A reviewed policy which is fit for purpose and stakeholders are aware of amendments and the implications of these.</li> <li>Cross-curricular links and Outdoor learning opportunities will be identified – Ensure enrichment of Science.</li> </ol>	Focus on outcomes, specific, measurable impact on pupil <ol style="list-style-type: none"> <li>Children will make progress from their starting points.</li> <li>Staff will be able to articulate the strengths of their teaching and areas for development.</li> <li>Planning will be clear and will have prior knowledge, key questions and vocabulary stated.</li> <li>Children engagement and knowledge will be showcased during STEM Week; work will be recorded in topic books and displays.</li> <li>Displays will promote current scientific vocabulary.</li> <li>Science is timetabled and taught regularly.</li> <li>AS is used regularly to ensure progression within topics and across school; strategy is formed to ensure assessment is manageable, consistent and robust.</li> <li>Science profile will be raised – Science Week, parents invited.</li> </ol>	

**Evidence pre PSQM:** Action plan developed with Science and PSQM on SIP

## Evidence pre PSQM: Use of TAPS pyramid to support teachers in assessment



### Evidence pre PSQM: Support from PLAN with progression

**Science subject leader**

The PLAN primary science resources include a range of resources that are designed to support science subject leaders to implement effective and robust planning and assessment systems. The resources for science subject leaders are set out below.

If you are not familiar with the PLAN primary science resources and how they support planning and assessment, you may want to read our [Introduction to PLAN](#)

## Great Science Ideas & Enquiries

**Action:** Science Lead visited different websites to support planning with SDGs

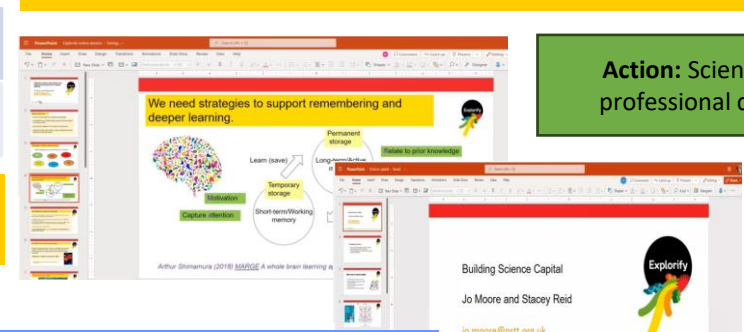
**Action:** SL attended virtual science subject leader meetings

Thursday, 30 November 2023 16:00

**Virtual Primary Science Subject Leader Meeting (2 of 6 for 2023/24)**

**Next Step:** To continue attending virtual science subject leader meetings and trust cluster group.

**Before:** The Science Lead has not been involved in any CPD training until a few years ago and is not part of any local science networks. The strategic development of science became a priority from 2020.



**Impact:** Teachers are better equipped to design assessments that align with learning objectives, providing more accurate and meaningful insights into pupils' understanding of scientific concepts.

**Action:** Subject Lead read the document for support with planning Inset and staff meetings

### Evidence pre PSQM: Support from Ogden Trust

**Action:** Subject Lead utilise information from Ogden Trust during moderation sessions

**Guidance for Subject Leaders: Whole School Approach**

**Action:** SL completed Outdoor learning CPD

**Action:** Science Lead visited different websites to support planning with SDGs

**Action:** Science leaders have engaged with a huge array of professional development opportunities in the last 3 years.

**Resources**

This section includes a range of curriculum resources for teaching and learning, as well as How to guides to help you encourage and develop physics at your school. Use the filters to help find the resources you are looking for.

**Reach Out CPD**

**Free topical resources**

Get the latest from our free primary science news service!

**Action:** SL completed Outdoor learning CPD

I have gained a wealth of knowledge and expertise and I feel confident in supporting the staff to develop Science further. The headteacher provided huge financial support, purchasing memberships, resources and funding CDPs as well as aligning SIP and PSQM priorities. This helped me to lead science in a very effective way. **Subject Lead**



# Science Teaching: PSQM Gilt

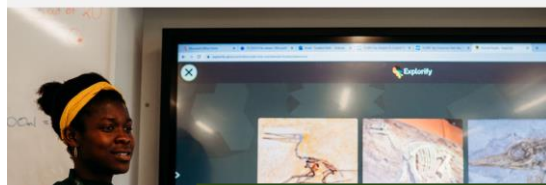
**T Aim:** Science teaching is strengthened and developed through:

**A.** Staff Engagement with professional development is regular and ongoing

**Before:** Over the past three years, there have been scheduled opportunities for staff CPD each term. During this time, staff have actively participated in and implemented various actions, including different types of enquiries, formative assessment strategies, summative assessment strategies, and retrieval practice, among others. While these initiatives have been introduced, there remains a need to revisit them to ensure they are fully integrated into our practices and that every staff member feels completely confident in implementing them. This necessity arises from monitoring processes and feedback from staff, indicating that additional support is still required for some staff.

## Free Explorify Planning Support

Would you like support finding just the right Explorify activities to enhance your science planning?



Animals including

Climate challenge

Electricity for age

Evolution & inheritance for ages 7-11

Forces for ages 7-11

Human body f

Human body f

**Action:** Based on staff voice - Time dedicated during staff meetings, staff guided to watch videos to enhance subject knowledge



**Action:** Moderation meeting Spring Term

Monika Sedgwick  
To: S N Dixon; Grace Garvey; Chloe Thorpe; Laura Capper; Laura Levinsohn; S Sumser; Mrs C. Lowe  
Fri 02/02/2024 19:07

Hi All,

A very big thank you for the moderation session we had yesterday. All science books look amazing with great evidence of knowledge and working scientifically skills. I'll photocopy all your paperwork and return next week.

We will have another moderation meeting later in the summer term to follow up on the identified next steps.

Hi All,

**Action:** Regular communication with staff

This is the link to TAPS pyramid: <https://taps.pstt.org.uk/>  
You will find different ideas for teaching strategies and asse

### RETRIEVAL PRACTICE:

Our focus is on retrieval practice and making sure information is stored in long term memories so comfortable when they move classes and need to access more complex context. As we know, quizzes require active participation, prompting learners to recall information from their memory rather than passively reviewing material. This active engagement enhances the encoding and retrieval processes in the brain.

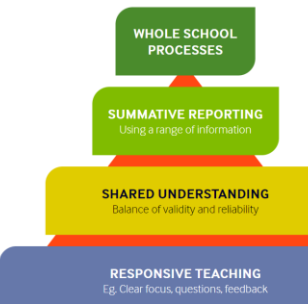
The website for different quizzes is **WORDWALL**, however, you will have to type into GOOGLE what you are looking for. Example: Circulatory system ks2 wordwall quiz or seasons ks1 wordwall quiz. **You can find many different topics, not just science related!**

<https://wordwall.net/resource/33979296/history/decline-of-maya-civilisation>

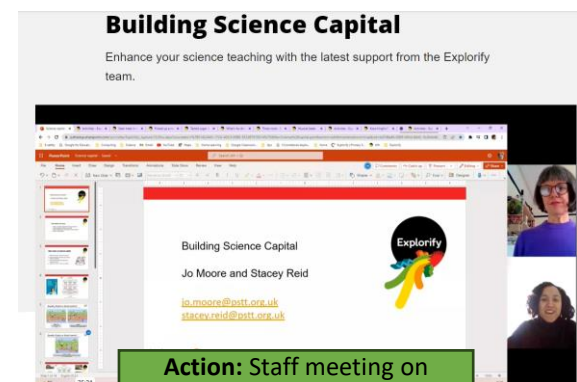


**Action:** Revisited - Staff CPD around assessment using TAPS; this involved peer-to-peer learning sessions to deepen understanding and implementation of effective assessment practices during science lessons. Impact slide 14, 15.

As a teacher, I find the planned CPD initiatives for science incredibly valuable and empowering. The regular updates and meetings provide us with dedicated time to collaborate, learn, and reflect on our teaching practices. I use the Explorify planning support videos on a regular basis.  
**KS2 Teacher**



**Impact:** Teachers have a solid understanding of the content they are teaching, enabling them to deliver accurate and up-to-date information to their pupils. Through shared experiences and collaboration, staff is able to exchange ideas and discuss activities. Through regular communication, formal (staff meetings, emails), informal chats, SL has a good understanding of the impact of CPDs and is able to act in a timely fashion to address anything that comes up.



**Action:** Staff meeting on building science capital. Impact on slide 16, 17.

Teachers incorporate... writing activities incorporate... where students ask questions, investigate, and draw conclusions.

It is evident that children are beginning to change their opinions of what a scientist is stereotyping is being reduced.

Institute guest speakers from various scientific fields to share their experiences and demonstrate the real-world impact of science.

Science Capital

Organise field trips to science museums, nature reserves, botanical gardens, or other relevant places to expose students to diverse scientific environments.

Establish science clubs or participate in science competitions to provide additional opportunities for students to delve deeper into scientific topics.

**Action:** Staff meeting for sequencing Plants unit and the use of school grounds. Impact slide 11

Class	Autumn	Spring	Summer
Year 2	<ul style="list-style-type: none"> <li>End of October (before half term)</li> <li>Plant bulbs (tulips and daffodils, snowdrops and crocuses) in front of the school, around the fence.</li> <li>MS to support EMILY POLLINATORS FRIENDLY FLOWERS</li> </ul>	<ul style="list-style-type: none"> <li>End of March (MS to support or plant with the children). Before Easter break.</li> <li>Plant meadow mix seeds; prepare extra bed with the children (group at a time). Classify different meadow seeds. As the plants grow, observe and match the seeds to the adult plant. <b>USE FRIENDLY FLOWERS</b></li> </ul>	<ul style="list-style-type: none"> <li>April, after Easter holidays</li> <li>Plant vegetables to children can grow and harvest in June/July: lettuce different varieties (sow in container in the greenhouse, replant outdoor to a bigger container by end of May) <b>EDIBLE VEGETABLES</b></li> </ul>

**Plants**

- Observe and describe how seeds and bulbs grow into mature plants.
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

**Living things and their habitats**

- Identify and name a variety of plants and animals in their habitats, including microhabitats.

- Year 2 pupils should grow a range of bulbs and seeds, not just one type. It is recommended that these are predominantly grown in beds outside, although they may be started in the classroom or a greenhouse and then be replanted in the ground, if growing space in the school is limited. Year 2 should have priority for growing plants in the space available.
- Growing plants needs to be planned carefully as bulbs and seeds need to be planted at specific times of the year. Generally, bulbs will need to be planted in the autumn term and seeds in the spring term. When deciding what to grow, it is important to think not only about the diversity of plants but also the time when the plants will reach maturity. There is nothing more disappointing than pupils coming back in September to find dead tomato plants.
- Where possible, pupils should be responsible for deciding what to plant and researching how and when to plant it. They can look at the seed/bulb packets and decide which need to be planted in full or partial sunlight, at the front or back of the bed (according to their height), and how to space them. They will then need to tend and nurture their plants for them to reach maturity.

Improving Primary Science  
Summary of recommendations

- 01 Develop pupils' scientific vocab**  
Identify science-specific vocabulary. Explicitly teach new vocabulary and its meaning, creating opportunities for repeated engagement and use over time.
- 02 Encourage pupils to explain their thinking, whether verbally or in written form**  
Create a collaborative learning environment. Capitalise on the power of dialogue. Cultivate reasoning and justification.
- 03 Guide pupils to work scientifically**  
Explicitly teach the knowledge and skills required to work scientifically, guiding pupils to apply this in practice, with opportunities for discussion and reflection.
- 04 Relate new learning to relevant, real-world contexts**  
Consider real-world contexts. Engage with science concepts supported by virtual models.
- 05 Use assessment to support learning and responsive teaching**  
Plan teaching that builds on existing knowledge and experiences. Monitor pupils' learning to inform responsive teaching, feedback, and next steps.
- 06 Strengthen teaching if effective CPD developments implement**

**Action:** SL shared EEF report. Staff engaged with EEF report and the summary of recommendations

# Science Wider Opportunities: PSQM Gilt

**T Aim:** Science teaching is strengthened and developed through:

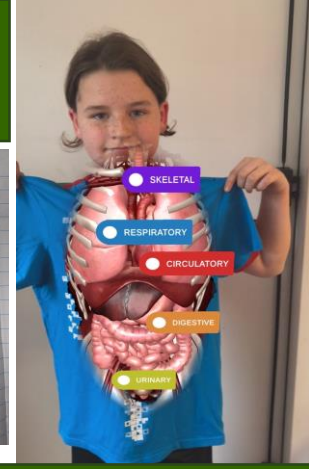
**B.** Use of a range of effective teaching and learning strategies

**Before:** Over the past three years, staff have developed and embedded various teaching strategies in science, ensuring that pupils are exposed to a diverse range of instructional approaches tailored to their individual learning needs and preferences. Feedback from pupils, parents and staff confirmed a deeper learning experiences - use of higher order thinking, vocabulary and questioning.

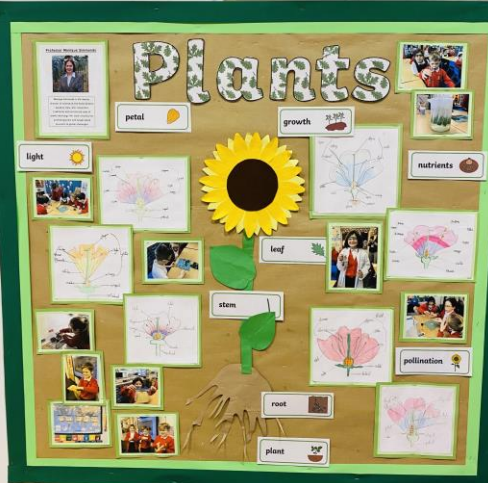
**Evidence pre PSQM:** Children in Year 6 using T-shirt and an app – Curios to learn about the circulatory system

Object	Material	Suitable or unsuitable? Why?
Cushion	Fabric	Fabric is suitable because it is soft and squishy. Also it is very comfortable.
House	Wattle and Daub	Wattle and daub is unsuitable because it can easily be on fire.

**Evidence pre PSQM:** Prediction in Year 1



**Evidence pre PSQM:** Year 3 display on plants with vocabulary



**Evidence pre PSQM:** Model building in Year 6

I absolutely love our science lessons, especially when we get to do practical activities and build models! Building periscopes was so cool! I got to work with my friends to assemble the parts and see how light reflects off mirrors. We even took our periscopes outside on the field to practice and see if they work. It was amazing to see how we could use them to look around corners and spy on each other! **KS2 Pupil**

As the subject leader, I am pleased to observe the diverse range of teaching and learning strategies being utilised within our classrooms. The implementation of varied approaches is essential to cater to the diverse learning styles, ensuring that each child has the opportunity to engage effectively with the curriculum. By incorporating a mix of instructional methods, such as practical investigations, play base learning activities, group discussions, we are able to accommodate different learning needs and promote deeper understanding and retention of concepts. **Subject Lead**

**Evidence pre PSQM:** Dissection of a plant in Year 5



**Evidence pre PSQM:** Classification in Year 6

@ExplorifySchool #HYE22 Year 6 have been looking into Have you ever found mould growing on bread at home. We mind map our information and watch few videos to deepen our understanding. @EgertonPrimary

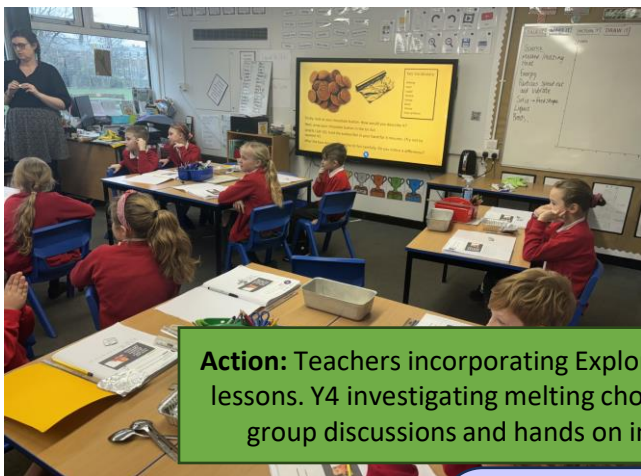


# Science Teaching: PSQM Gilt

**T Aim:** Science teaching is strengthened and developed through:

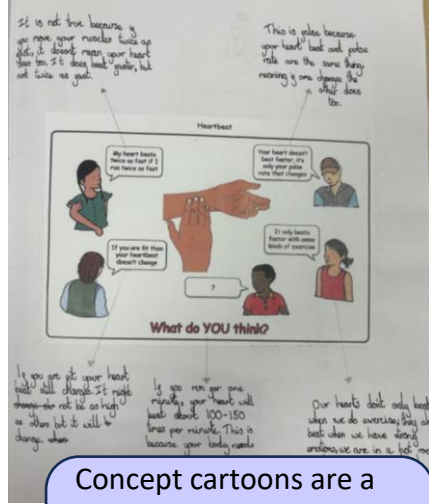
**B.** Use of a range of effective teaching and learning strategies

**Before:** Staff received CPD for a range of effective teaching and learning strategies in the last 3 years. Following staff voice and monitoring, many of the strategies are embedded; however, there was lack of recent training on science pedagogies. Some strategies needed to be revisited – concept cartoons, collaborative learning and a range of resources and ideas for EYFS to refresh the planning.

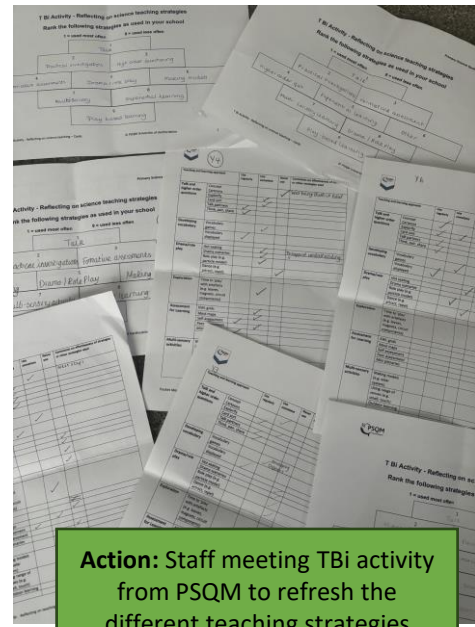


**Action:** Teachers incorporating Explorify resources in lessons. Y4 investigating melting chocolate through group discussions and hands on investigation

**Impact:** Teachers have proactively enhanced their teaching practices by further exploring an extended range of teaching strategies and utilising various educational websites such as Outstanding Science, Developing Experts, and Explorify. This has allowed for the development of concept cartoons, new explorify activities, and more collaborative lessons. This broaden pupils` exposure to different learning activities, catering to diverse learning styles and preferences. Children in EYFS enjoy “Zoom In” activities from Explorify. They are eager to talk about what they discussed in class.



Concept cartoons are a great way for the children to critically think about their learning.  
**Teacher Year 6**



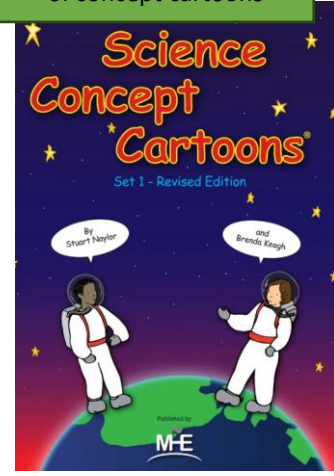
**Action:** Staff meeting TBi activity from PSQM to refresh the different teaching strategies

The best part of Science is when we get to ask questions and figure out the answers together. We can discuss ideas first and share what we think. **Year 5 pupil**

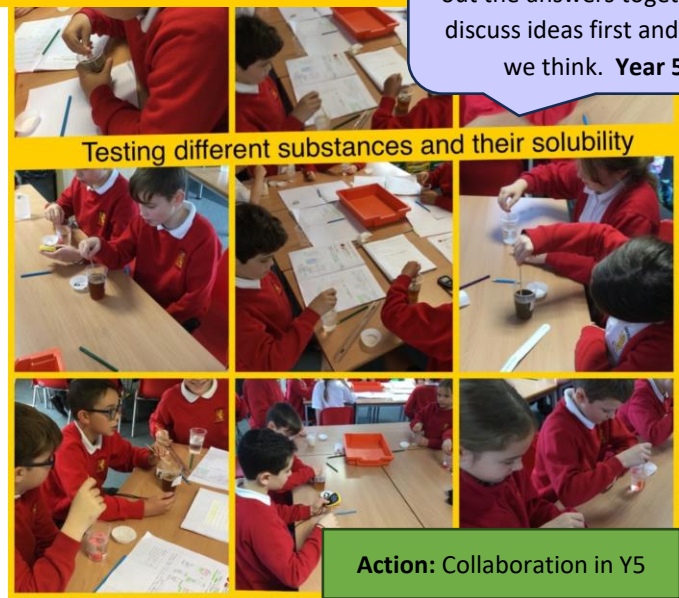
The links with the different explorify activities are very handy. I use the all the time with my Reception class. They love doing Zoom In or watch the short videos when we introducing new ideas.  
**Teacher EYFS**

**Action:** EYFS exploring dinosaurs` skeletons. A multisensory approach to Science reflects our principle of curiosity and further supports all learners access high quality Science learning opportunities

**Action:** Purchased a set of concept cartoons



Attending the staff meeting focused on various teaching pedagogies provided me with valuable insights to refresh my approach in the classroom. I found it highly beneficial to engage in ongoing exchanges of ideas and collaborate closely with my colleagues. I particularly enjoy using the concept cartoons as it is a great tool to discuss misconceptions. Children in my class really enjoy using them, even the less confident children.  
**Teacher Year 4**



**Action:** Collaboration in Y5

**Early Years**  
Explorify planning support



Curriculum statements	Explorify activities	Details
<b>Animals</b>		
Name and describe some plants and animals children are likely to see, encouraging children to recognise familiar plants and animals whilst outside.	<a href="#">Have you ever carded for a baby animal?</a>	<b>HYE</b> Get your children chatting about something they have all experienced.
	<a href="#">Black legs</a>	<b>ZIZO</b> Dog
	<a href="#">Stripes and patches</a>	<b>ZIZO</b> Dog
	<a href="#">Wavy hair</a>	<b>ZIZO</b> Donkey
	<a href="#">Watery homes</a>	<b>ZIZO</b> Frog
I have observed living things in the environment over time and am becoming aware of how they depend on each other.	<a href="#">Spiky spikes</a>	<b>ZIZO</b> Hedgehog
	<a href="#">Snowed lines</a>	<b>ZIZO</b> Goat
	<a href="#">Fluffy and leggy</a>	<b>ZIZO</b> Horse
	<a href="#">Speckled and soft</a>	<b>ZIZO</b> Horse
	<a href="#">Brown hair</a>	<b>ZIZO</b> Rabbit
	<a href="#">Fluffy and white</a>	<b>ZIZO</b> Rabbit
	<a href="#">Curly locks</a>	<b>ZIZO</b> Sheep
	<a href="#">Green scales</a>	<b>ZIZO</b> Snake
	<a href="#">Small and hairy</a>	<b>ZIZO</b> Spider
	<a href="#">Thin strands</a>	<b>ZIZO</b> Squirrel
	<a href="#">Tangled up</a>	<b>ZIZO</b> Squirrel
	<a href="#">Shiny sections</a>	<b>ZIZO</b> Worm
I can recognise that plants and animals are living things which grow.	<a href="#">Down to dust</a>	<b>LWCY</b> Birds
	<a href="#">Out and about</a>	<b>LWCY</b> Woodpecker, aeroplane, person walking
	<a href="#">Life in the wild</a>	<b>LWCY</b> Elephant, rattle snake and chimpanzee
	<a href="#">Old MacDonald</a>	<b>LWCY</b> Cow, sheep and pig



**Action:** SL shared planning support documents with EYFS staff

**Next Step:** Facilitate time during staff meeting to discuss different teaching and learning strategies on a regular basis. Develop drama and role play as one of the strategies.



# Science Teaching: PSQM Gilt

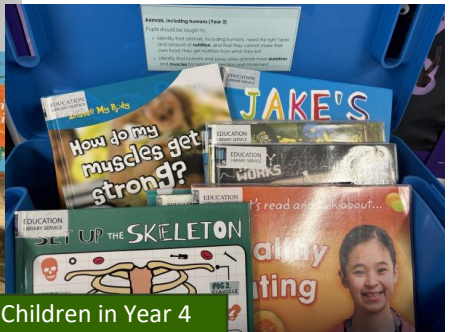
**T Aim:** Science teaching is strengthened and developed through:

**C.** Regular and safe use of up-to-date quality resources TC

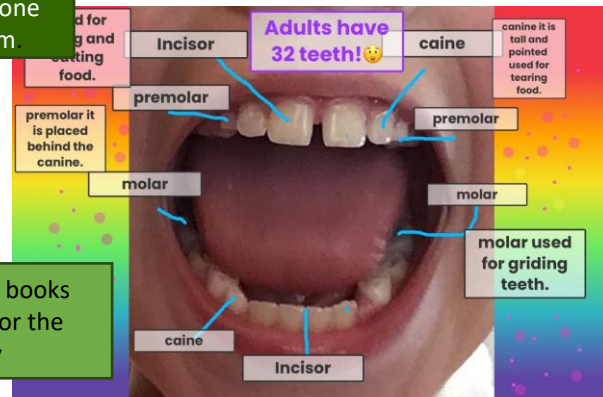
**Before:** Teachers place orders for resources and books linked to Science topics through the Cheshire Library Service, to which the school holds a membership. It is the responsibility of each teacher to ensure that the orders are placed before the end of the term, facilitating delivery after the half-term break when we commence teaching new topics.



**Action:** Books and other resources from the Cheshire Library Service in EYFS, Y3 and Y4 on display, accessible for children



**Evidence pre PSQM:** Children in Year 4 utilizing iPads to capture images of one another's teeth and annotate them.



**Action:** New books purchased for the library

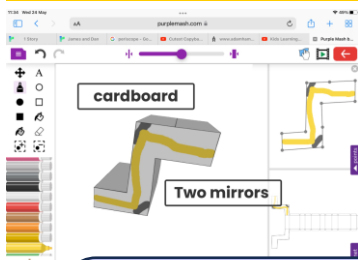


**Impact:** Quality equipment encouraged our pupils to explore and ask questions. It stimulated curiosity and a sense of wonder, promoting a proactive approach to learning as children seek to understand the "why" and "how" behind scientific phenomena.



**Action:** Children in Year 5 testing materials as the best thermal insulators

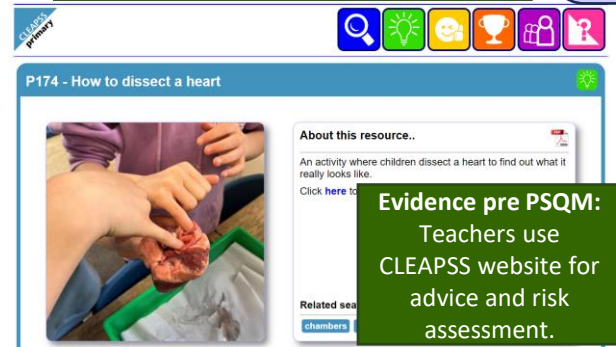
**Before:** Science resources were audited and organised a year ago. All is clearly labelled and accessible for staff in central place. (2022)



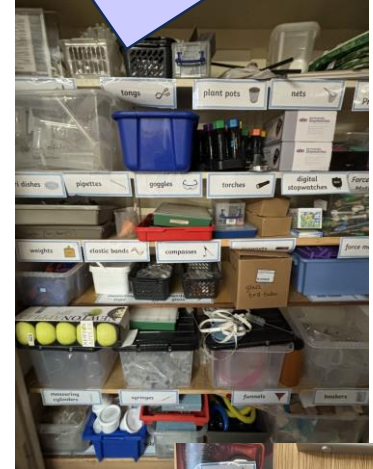
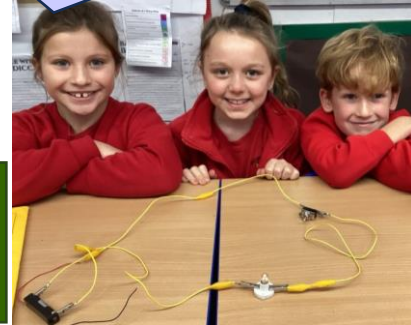
**Action:** Year 6 use Purple marsh website to design periscopes

"We had so much fun using the science equipment to learn about electricity! It was like being real scientists. The experiment with circuits and wires made it very interesting. **Year 4 Pupil**"

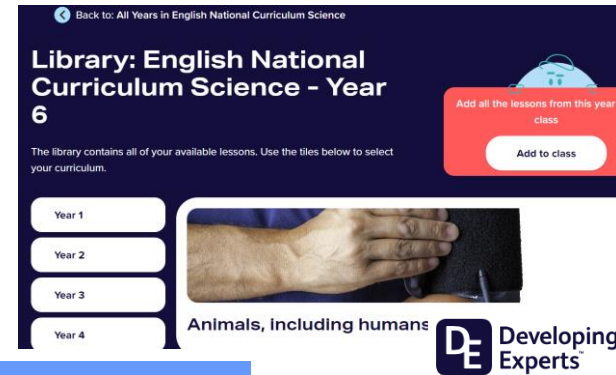
"I'm thrilled to share that our science cupboard is now impeccably organized! We've revamped the resource science cupboard, making it a well-arranged haven for all our teaching materials. This organized space not only enhances accessibility but also streamlines lesson preparations. **Message from SL**"



**Evidence pre PSQM:** Teachers use CLEAPSS website for advice and risk assessment.



**RESOURCES ORGANISED**



**Evidence pre PSQM:** Teachers have access to Developing Experts and Outstanding Science websites

**Impact:** With resources neatly arranged and clearly labelled, teachers spend less time searching for materials. This time savings is redirected toward more meaningful instructional activities, improving overall productivity in lesson preparation. Pupil voice evidenced the impact of high quality resources on their learning - staff confident in tackling higher risk activities due to CLEAPSS support resources



**Next Step:** Continue to monitor and order new resources. Establish sustained partnerships with cluster schools to pool training opportunities and share best practice and resources. Ask staff at the end of each unit, if there is enough resources for their topics.

# Science Teaching: PSQM Gilt

**T Aim:** Science teaching is strengthened and developed through:

**C.** Quality science texts so children have regular and easy access to texts that are modern, relevant and age appropriate

**Before:** Several years ago, the school acquired a subscription to Literacy Shed, facilitating access to high-quality reading texts associated with science topics. Subsequently, the Reading Lead implemented a guided reading approach school-wide, ensuring that pupils dedicate time each week to engage with texts that are thematically linked to science, geography, and history subjects. This has been an ongoing focus to improve vocabulary across the school and literacy skills.

**The Human Heart**

Cells throughout the body take oxygen from the blood for survival, and excrete waste products, such as carbon dioxide, into it.

Blood from around the body, low in oxygen and containing waste products such as carbon dioxide, enters the heart via the right atrium.

The oxygenated blood leaves the left ventricle and enters the aorta. The aorta branches into smaller arteries throughout the body.

The oxygen-rich blood re-enters the heart through the left atrium and passes into the left ventricle.

The blood is pumped out of the right ventricle and into the pulmonary artery, which carries the deoxygenated blood to the lungs.

Angi gas exchange occurs between the blood in the lungs and the oxygen in the air. The oxygen enters the blood and the carbon dioxide leaves the blood.

The blood is pumped out of the left ventricle and into the aorta.

The aorta carries oxygenated blood to the rest of the body.

The body needs oxygenated blood so you stay alive.

**Action:** Teachers do cross-curricular reading sessions when they analyse a text linked to science unit.

**How Electricity Works**

Electricity is a source of energy that is produced in the natural world. It is a form of energy that can be used to power many things.

Electricity is produced by the movement of electrons. Electrons are tiny particles that are found in atoms. They are attracted to the positive charge of the nucleus and repelled by the negative charge of the electrons.

When an atom is excited, its electrons can jump to a higher energy level. When they fall back to their original level, they release energy in the form of light or heat.

**Why do some people need glasses?**

The eye is a complex organ that allows us to see. It is made up of several parts, including the cornea, lens, and retina. The cornea is the front part of the eye and helps to focus light. The lens is a small, clear structure that can change shape to focus light on the retina. The retina is the back part of the eye and contains cells that convert light into electrical signals that the brain can understand.

Some people have problems with their eyes, such as nearsightedness or farsightedness. This is because the shape of the eye is not quite right, so light does not focus correctly on the retina. Glasses can help to correct these problems by bending light so that it focuses correctly on the retina.

**The Eye**

The eye is about as big as a ping-pong ball and sits in a little hole below the skull.

Your eyes are at work from the moment you wake up to the moment you go to sleep. They take in information about the world around you - shapes, colours, movement, and more. Than they send 'what you see' to the brain and the brain knows what is going on outside of your body.

**Parts of an eye**

**Cornea:** The clear, curved front part of the eye. It helps to focus light.

**Lens:** A small, clear structure that can change shape to focus light on the retina.

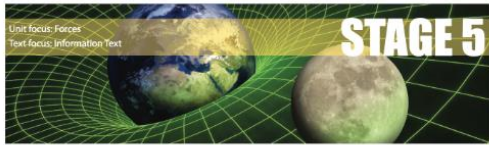
**Retina:** The back part of the eye. It contains cells that convert light into electrical signals that the brain can understand.

**Evidence pre PSQM:** Writing linked to Science units in Y6

**Why do some people need glasses?**

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**What Is Gravity?**

Gravity is all around us. Everything that has a mass creates a gravitational pull - even the smallest grain of sand. The larger something is, the stronger its gravitational impact. Believe it or not, your gravitational pull is trying to pull things towards you all the time. Because you don't have a very large mass, it is very weak, and so you don't notice it.

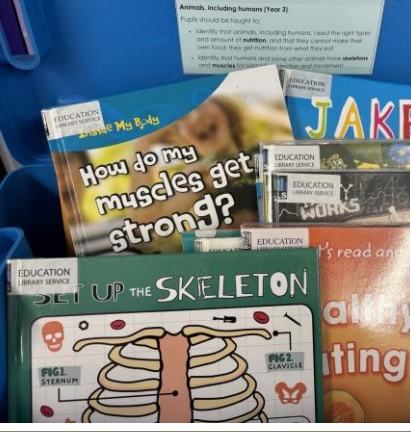
There is an important difference between weight and mass. Weight is the mass of an object in a specific strength of gravity. Mass is how much of something there is. Because most of the things we weigh are on Earth and have the same strength of gravity acting on them, then the difference doesn't matter much. However, if you travelled to a planet with much stronger gravity, you would weigh a lot more. If the gravity was weaker, you would weigh a lot less. However, your mass would be the same no matter which planet you were on.

The gravitational pull of a planet is measured in metres per second, per second (or metres per second squared). This is because it is an acceleration force. Earth's gravity is just over 9m/s<sup>2</sup>. It means that when you are in freefall towards the centre of the Earth (freefall means that there is no air resistance or friction), you speed up by 9 metres per second, every second.

As you move away from the source of gravity, the strength of the force gets weaker. However, with large objects such as planets, you have to get a very long way away to notice an effect. There will be a small difference at the top of the tallest mountains (although not enough to notice), but even when you get into the Earth's orbit, the force isn't that much weaker. Astronauts on the International Space Station are still subject to Earth's gravitational pull. That means it is 90% as strong as it would be on Earth. It isn't enough to allow them to float around in the way that they do, so we

**Impact:** Access to various books have improved research skills and subject knowledge over the last 2 years. This has been strengthened with cross curricular writing. This increased engagement in boys writing lessons linked to Science. Cross-curricular reading sessions, helped to improve use of scientific vocabulary.

**Next Step:** Continue to develop the use of scientific language and links to English by regular reading sessions linked to science topics studied.



**Evidence pre PSQM:** Staff regularly order books from Cheshire Library Service that link to Science Units of work

**Action:** Year 4 writing based on the digestive system

**10. Write a story using interesting vocabulary.**

It was a rather boring day for Sophie, who lived in a dark, old house. She was all alone in the house, and her best friend Sophie had left. She was all alone in the house, and her best friend Sophie had left. She was all alone in the house, and her best friend Sophie had left.

All of a sudden, she could see 8 ghosts, 4 carvings, 8 pre-moles, 8 moles, and 8 windows. She was quite scared since it all happened like lightning and that scared some home she bled. So she at first she thought it was magic, but she soon came over that thought. What all was back to dress! and all of a sudden she was being chopped on instead of being scared like most of my friends would. I was I was scared since I knew there would be an epic adventure ahead... when I was suddenly scared with what seemed to be a shadow. I got like I was in a swimming pool full of it. So I wanted to make the most of it. So I had a little swim, but when I got to the end of the month I was underwater!

Since it was so dark and just she barely saw if had happened but for had 2 or 3 seconds she panicked that she was in a 25m tube slide but instead of just going down she was being over and on a massage. Plus the water in the tube was pink. Her hair was blue. All of the old water helped her journey down the oesophagus.

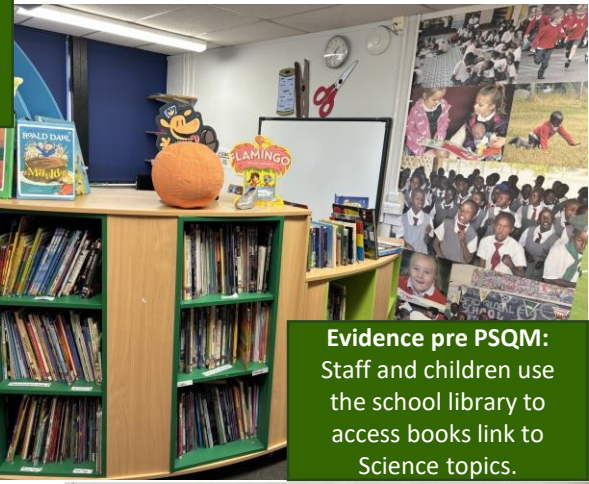
The books help me to get a better understanding of the topics we're studying, and they make learning even more interesting.

**Year 5 pupil**

**Evidence pre PSQM:** SL shared a list of books with the staff linked to Science topics

**Science & Story Links - Light**

Story	Suitable for	Possible Questions to Investigate
The Dark—Lemony Snickett	KS2	Does The Dark really behave like it does in the story?
The Gruffalo's Child—Julia Donaldson	EYFS, KS1, KS2	How could the mouse make his shadow even bigger/smaller? How could the mouse change the shape of his shadow?
Can't You Sleep Little Bear?—Martin Waddell	EYFS, KS1	What could little bear use to make it brighter in the cave? Can you see the owl in the dark? If not, how do they hunt? What is dark? Can you explain why Plop needn't be afraid?
The Owl Who Was Afraid of the Dark	KS1, KS2	Which material will be best to blackout our windows? What light can we find at night? What if we didn't have electric lights at school? How are shadows formed? How can we change the shape/size of shadows? Which materials would be best for a book like this that casts shadows?
Goodnight Mr Tom—Michelle Morgan	KS2	
Blackout—John Rocco	EYFS, KS1	
The Game in the Dark—Herve Tullet	EYFS, KS1, KS2	



**Terrific tree dwellers**

I think the forsy is the odd one out because it is the only cold-blooded animal out of the 4 shown. They also have gills when they are young and lungs when they grow up. They are neotropical cecilians which live part of their life in water and part on land.

I think the sloth is the odd one out because they have quite a slow metabolism, it gives birth to live young. They're also mammals.

I think the crimson sunbird is the odd one out because it lives in S. America East Asia and has a beak. It is a bird that collects nectar and pollinates flowers in its feathers and wings.

**T Aim:** Science teaching is strengthened and developed through:

**C. Outdoor Science - Increased engagement and motivation (also LA and LC).**

**Before:** Outdoor science education was limited, with numerous opportunities for learning science in the open air being overlooked. There was no mention of outdoor learning in our science policy. Staff felt that they need more support with planning outdoor lessons.

"I really liked going on a material hunt today! We walked around the playground, and our teacher gave us a list of things to find. We found different materials like wood, metal, and plastic. I touched them and talked about how they felt."

**Action:** Year 1 children on a material hunt around the school grounds



**LO:** Investigate how mould grows  
**WS:** Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary  
**WS:** Reporting and presenting findings from enquiries -  
**Enquiry:** What conditions causes mould to grow?

**Lesson 8**

**LO:** Understand the basics behind how light is refracted, how a rainbow is made and what happens when light hits a bubble  
**WS:** Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary  
**WS:** Reporting and presenting findings from enquiries -  
**Enquiry:** How is light use other than for us?

**Lesson 10**

**LO:** Understand that shadows change length depending on how far away they are from a light source  
**LO:** Understand how to collect data  
**WS:** Recording data and results of increasing complexity using scientific diagrams and classification keys, tables, scatter graphs and bar and graphs  
**WS:** Taking measurements and using a range of equipment with increasing accuracy and precision;  
**Enquiry:** How does my shadow change over the day?

**Action:** Science linked homework in Year 1

**Action:** Outdoor lessons highlighted in green on planning documents. Children have more understanding about outdoor learning than last year.

**LO:** Investigate how mould grows  
**WS:** Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary  
**WS:** Reporting and presenting findings from enquiries -  
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**Action:** Year 1 using equipment to measure leaves

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**Enquiry:** How does my shadow change over the day?

**Action:** Year 1 using equipment to measure leaves

**Impact:** Outdoor environments provide our children with rich, real-world contexts for learning, where theoretical knowledge can be applied in practical situations. Students enthusiastically engage with lessons conducted outdoors and eagerly share what they have learned. Moreover, identifying specific outdoor locations for learning activities allows teachers to seamlessly integrate outdoor elements into their lesson plans, thereby enriching the curriculum and offering students diverse learning opportunities. In collaboration with staff, the School Leader (SL) developed a Plant unit of work for each year group, resulting in the incorporation of more outdoor activities into the curriculum.

**Action:** Y3 using the outdoor area and resources when learning about skeletons



Science is all around us - sitting on a chair links with gravity. Things we invent for the world. New inventions to make life easier. Year 4 pupil



**Action:** Planting bulbs in Y2



Science Policy, Egerton Primary School, September 2023.

**Outdoor Learning**

In addition to the above, Egerton Primary School recognises the immense value of utilising the school grounds for outdoor learning experiences, particularly in the context of Science education. The outdoor environment provides a rich and dynamic setting for students to explore, observe, and engage in hands-on scientific investigations.

Outdoor learning experiences are integrated into the Science curriculum to align with the school's commitment to learning outside the classroom. Teachers are encouraged to take advantage of the school's outdoor spaces, including the pond, garden, and school field, as extensions of the classroom. Practical experiences in these areas involve using equipment, conducting experiments, and building arguments, fostering a deeper understanding of scientific concepts.

The school embraces the philosophy that outdoor learning not only enhances academic achievement but also contributes to the overall well-being of students. Exposure to the natural environment fosters a connection with the world around them, encourages curiosity, and promotes a sense of responsibility for the living and non-living components of their surroundings.

Furthermore, the school actively seeks opportunities for outdoor workshops with experts and visits to places of scientific interest, ensuring that students' classroom setting, cross-curricular connections, and outdoor learning.

By incorporating outdoor learning into the exploration and discovery, nurturing their approach aligns with the school's vision and appreciation for the wonders of the natural world and the scientific principles that govern it.

**Action:** SL updated Science policy

**Action:** SL lead PDM on outdoor learning

**Outdoor Learning in the National Curriculum**

**Why take learning outside?**

Evidence shows that healthier pupils have higher educational attainment. There is substantial research that indicates that spending time outside increases levels of physical activity and mental health and wellbeing.

Teachers taking part in the Natural Connections project, funded by Defra, Natural England and Historic England and delivered by Plymouth University, reported that learning in natural environments had a positive impact on their pupils.

- Enjoyment of lessons (95%)
- Engagement with and understanding of nature (94%)
- Social skills (93%)
- Engagement with learning (92%)

**Action:** Year 1 children on a material hunt around the school grounds

**Action:** SL updated Science policy

**Action:** SL lead PDM on outdoor learning

**Action:** Y3 using the outdoor area and resources when learning about skeletons

**Action:** Year 3, children carried out an investigation to see whether plants need the same amount of soil nutrients in order to grow well.

**Action:** Planting bulbs in Y2

**Action:** Year 1 using equipment to measure leaves

**Action:** Science linked homework in Year 1

**Action:** Outdoor lessons highlighted in green on planning documents. Children have more understanding about outdoor learning than last year.

**Action:** SL updated Science policy

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**Action:** Planting bulbs in Y2

**Action:** Year 1 using equipment to measure leaves

**Action:** Science linked homework in Year 1

**Action:** Outdoor lessons highlighted in green on planning documents. Children have more understanding about outdoor learning than last year.

**Next Step:** Conduct Audit on the school grounds. Develop partnership with local environmental organisations and community groups to further enrich outdoor learning

tigtag | Imperial College London

Reach Out CPD

Congratulations to:  
 Chloe Thorpe  
 from  
 Egerton Primary School  
 completing the following primary school science CPD courses:  
 Outdoor Science (16/11/2023)

**Action:** SL completed Outdoor learning CPD, reviewed planning and together with staff plotted where outdoor learning should take place

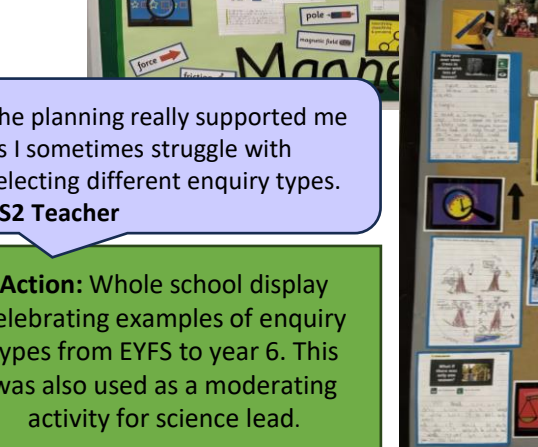
**L Aim:** Science teaching is strengthened and developed through:

**A. The purposes and process of science enquiry**

**Before:** Prior to the implementation of PSQM, five enquiry types were introduced to the staff and CPD delivered around planning and teaching the different enquiries; however, after staff voice, it became clear that not all staff members felt confident in delivering all of them. Consequently, pupils sometimes did not have the opportunity to experience a complete range of enquiries in every year group. Before PSQM, we had developed Working Scientifically skills by using PLAN and NC and sequenced all. This has been used in the below document, linked to Los and enquiry. WS skills are sequenced so children develop more independence over time.

Year 5 South America					
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Anglo-Saxons	Vikings	Extreme Environments	Natural Resources	The Ancient Mayans	Earth
Properties and changes of materials		Living things and their habitats	Animals including humans	Forces	
Lesson 1 1.0. Compare and miss everyday materials based on their properties WS: Answering questions With support, ask pertinent questions. Begin to explore ideas and raise different kinds of questions about scientific phenomena. <b>Explain:</b> How can different materials be classified?	Lesson 1 1.0. Explore how to observe a substance from a solution WS: Observations With support, make decisions about what measurements to use and for how long to make them, and whether to repeat them. <b>Explain:</b> How can we use an equation to separate salt from water?	Lesson 1 DE 1.0. Understand the life cycle of mammals WS: Reporting and presenting findings from enquiries - including conclusions, causal relationships and explanations of and a degree of trust in results - in oral and written forms such as displays and other presentations	Lesson 1 DE 1.0. Identify development during each stage of a human life cycle WS: Recording data and results of increasing complexity using relational diagrams and labels, classification keys, tables, scatter graphs and bar and line graphs	Lesson 1 1.0. Identify forces acting on objects WS: Record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams as writing <b>Explain:</b> Can you label and name all the forces acting on the objects in each situation?	Lesson 1 DE 1.0. Explain the Solar System WS: Reporting findings from enquiries - including conclusions, causal relationships and explanations <b>Explain:</b> Why are the planets different to each other?
Lesson 2 1.0. Carry out a test and compare results to test the thermal conducting properties of materials WS: Taking measurements, using a range of scientific equipment Recording data and results of increasing complexity using bar graphs <b>Explain:</b> Which material should your teacher use to keep their tea warm?	Lesson 2 1.0. Decide how materials should be separated - support WS: Pattern seeking Look for different causal relationships in their data and identify evidence that refutes or supports their ideas <b>Explain:</b> How can mixtures be separated?	Lesson 2 DE 1.0. Compare the life cycle of insects and mammals WS: Reporting and presenting findings from enquiries - including conclusions, causal relationships and explanations of and a degree of trust in results - in oral and written forms such as displays and other presentations <b>Explain:</b> What is the difference between the life cycle of an insect and mammal?	Lesson 2 DE 1.0. Use data and accurate evidence that refutes or supports ideas WS: Pattern seeking Look for different causal relationships in their data and identify evidence that refutes or supports their ideas <b>Explain:</b> Do bigger animals have a longer gestation period than smaller animals?	Lesson 2 DE 1.0. Understand the influence of the sun on the climate WS: Identifying scientific evidence that has been used to support or refute ideas or arguments <b>Explain:</b> Why are the planets different to each other?	Lesson 2 1.0. Understand the difference between a hypothesis and a prediction WS: Identifying scientific evidence that has been used to support or refute ideas or arguments <b>Explain:</b> Why are the planets different to each other?
Lesson 3 1.0. Record and understand a range of ways in which properties of materials can be tested WS: With support, make decisions about what observations to make, what measurements to use and for how long to make them, and whether to repeat them.	Lesson 3 1.0. Decide how substances should be separated, support and consistent WS: Answering questions Begin to explore ideas and raise different kinds of questions about scientific phenomena. <b>Explain:</b> Which materials dissolve and which do not?	Lesson 3 DE 1.0. Understand the life cycle of birds WS: Reporting and presenting findings from enquiries - including conclusions, causal relationships and explanations of and a degree of trust in results - in oral and written forms such as displays and other presentations <b>Explain:</b> What is the difference in the life cycle of a bird and mammal?	Lesson 3 DE 1.0. Identify the changes experienced in climate WS: Recording data and results of increasing complexity using relational diagrams and labels, classification keys, tables, scatter graphs and bar and line graphs <b>Explain:</b> What changes are experienced during puberty?	Lesson 3 DE 1.0. Understand the characteristics of a planet and understand the nature of the climate from the Sun WS: Taking measurements, using a range of scientific equipment with increasing accuracy and precision, taking repeat readings when appropriate and taking repeat readings when appropriate <b>Explain:</b> Are all the planets the same distance from the sun?	Lesson 3 1.0. Understand the difference between a hypothesis and a prediction WS: Identifying scientific evidence that has been used to support or refute ideas or arguments <b>Explain:</b> Why are the planets different to each other?

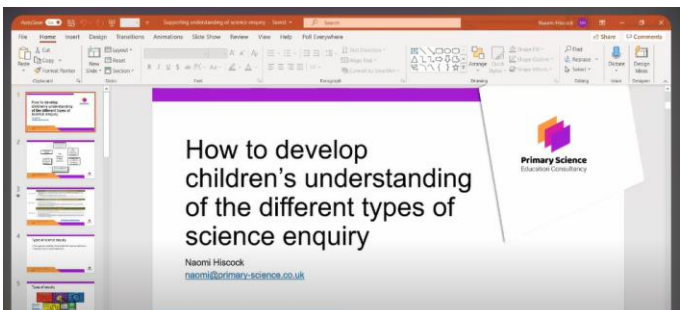
**Action:** SL and staff used STP to sequence LOs, WS and enquiries. There is a document for each year group outlining all the enquiries and learning objectives.



The planning really supported me as I sometimes struggle with selecting different enquiry types.  
**KS2 Teacher**

**Action:** Whole school display celebrating examples of enquiry types from EYFS to year 6. This was also used as a moderating activity for science lead.

**Impact:** Teachers now exhibit increased confidence in employing various types of enquiry. Each classroom features a dedicated science display showcasing the five enquiry skills. During lessons, teachers openly communicate with children about the specific enquiry skill they are focusing on, fostering a more interactive and informed learning experience. **Pupils remember the different enquiries and can explain each of them.**



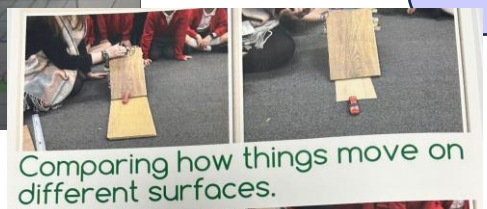
**Action:** Staff meeting delivered on different types of enquiries - revisited

STRAIDS	KS1	LKS2	KS2	UKS2	
	Year 1	Year 2	Year 3	Year 4	
ASKING QUESTIONS	<p>Ask simple questions, and with help find out the answers to them</p> <p>Demonstrate curiosity, e.g. ask 'why?' or 'how?' about the world around them.</p> <p>Begin to understand the concept of a question.</p> <p>Be able to ask a simple question.</p> <p>Begin to suggest one way of finding an answer to a question.</p> <p>With help, identify evidence that can be used to answer questions.</p> <p>With help, present evidence.</p>	<p>Ask simple questions and recognise that they can be answered in different ways</p> <p>Understand the concept of a question.</p> <p>Be able to ask a question</p> <p>Be able to suggest one way of finding an answer to a question.</p> <p>Understand that some questions can be answered by testing.</p> <p>Identify evidence that can be used to answer questions.</p> <p>Present evidence.</p>	<p>With guidance, ask more relevant questions and become aware of different types of scientific enquiries to answer them</p> <p>Begin to raise more relevant questions.</p> <p>Begin to make own decisions about which method of enquiry is best to answer a question.</p> <p>Begin to refine a question.</p>	<p>Ask relevant questions and use different types of scientific enquiries to answer them</p> <p>Raise relevant questions.</p> <p>Make own decisions about which method of enquiry is best to answer a question.</p> <p>Refine a question.</p>	<p>Plan, with support, different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <p>With support, ask pertinent questions.</p> <p>Begin to explore ideas and raise different kinds of questions about scientific phenomena.</p> <p>Refine a scientific question so that it can be tested.</p> <p>Understand that some scientific questions cannot be answered by a particular investigation.</p> <p>With guidance, suggest changes to questions following collection/analysis of data.</p>
	<p>With support, make careful observations to support identification, comparison and noticing change</p> <p>Understand that we can gather information through our senses</p> <p>Understand that observation involves all of the senses.</p> <p>Use simple equipment provided, e.g. hand lenses, to make more accurate observations.</p> <p>With support, select appropriate equipment to observe.</p>	<p>Make careful observations to support identification, comparison and noticing change</p> <p>Understand that we can gather information through our senses.</p> <p>Understand that observation involves all of the senses.</p> <p>Select appropriate equipment to observe.</p> <p>Independently, use simple equipment provided, e.g. hand lenses, to make more accurate observations.</p>	<p>With support, make systematic and careful observations</p> <p>Select appropriate equipment to observe and measure.</p> <p>Guided, use a range of equipment for measuring length, time, temperature and capacity.</p> <p>Begin to use standard units for their measurements.</p> <p>With support, use new equipment such as data loggers.</p>	<p>Make systematic and careful observations</p> <p>Accurately, select appropriate equipment to observe and measure.</p> <p>Use a range of equipment for measuring length, time, temperature and capacity.</p> <p>Accurately, use standard units for their measurements.</p> <p>Use new equipment such as data loggers, appropriately.</p>	<p>Begin to take measurements, using a range of scientific equipment</p> <p>With support, make decisions about what observations to make, what measurements to use and for how long to make them, and whether to repeat them.</p> <p>Choose the most appropriate equipment to make measurements and explain how to use it</p> <p>Begin to recognise that some measurements or observations may need to be repeated</p>

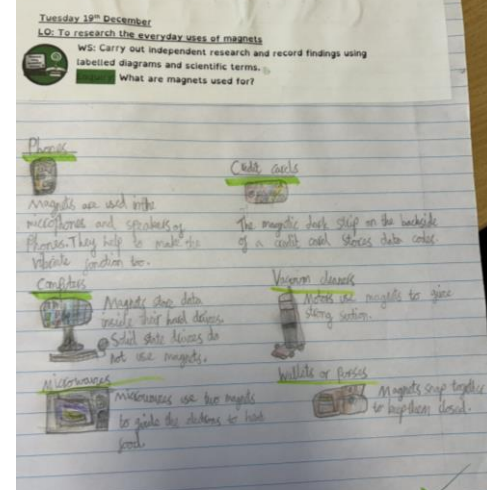
**Evidence pre PSQM:** Working Scientifically skills, sequenced and in line with NC – developed before PSQM

I find the enquiries we engage in quite enjoyable, and having the logos next to our learning objectives is really helpful. It helps my memory and makes it easier for me to understand what we are learning about.  
**Year 6 pupil**

**Action:** Enquiry logos introduced in Science books, next to learning objective



What did you find out?



L Aim: Science teaching is strengthened and developed through:

A. The purposes and process of science enquiry

**Working scientifically**  
Develop children's skills in pattern seeking

Age 5-11 years

Introduction

**Action: Revisited - Ogden trust resources shared with big question ideas for each year group for each enquiry type.**

**Big questions**

Here are some examples of 'big questions' that can be explored through pattern seeking in KS1 and KS2. There is at least one for every area of the curriculum, so it is easy to plan opportunities for children to revisit this type of enquiry and develop their skills:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Do you ever get bigger before you are an adult?	Do bigger mammals grow and bigger animals?	What colour flowers do pollinating insects prefer?	How has the use of renewable energy affected the population?	Are there a lot of animals in the rain forest?	Do all flowers have the same number of petals?
Is there a pattern in children's hair when growing on the head?	What conditions do animals prefer to live in?	Do all mammals have four legs?	Are there a lot of animals in the rain forest?	Are there a lot of animals in the rain forest?	Is there a pattern in the size and shape of a magnet?
Do you get better at anything as you get older?	What are the most common types of plants in a garden?	Do you get better at anything as you get older?	Do you get better at anything as you get older?	Do you get better at anything as you get older?	Do you get better at anything as you get older?
Does the wind always blow the same way?	Which habitat do you think is the best for a rabbit?	Are you more likely to have long hair and to wear glasses if you are older?	Is there a pattern in the size and shape of a magnet?	Is there a pattern in the size and shape of a magnet?	Is there a pattern in the size and shape of a magnet?
Is there a pattern in the size and shape of a magnet?	Do magnetic materials always conduct electricity?	Does the size and shape of a magnet affect how strong it is?	Which material is the best for a rabbit?	Which material is the best for a rabbit?	Which material is the best for a rabbit?

**Action: Year 1 observing over time**

Monday 4<sup>th</sup> November  
LO: Recognise that some observable features may change over time

WS: observing closely, using simple equipment

How does the horse chestnut tree change over the year?

The sky was cloudy. People are wearing coats, hats, scarves and gloves. I can see brown, yellow and orange leaves.

some leaves are on the floor. It was cold. It was blustery. I think it is winter because it is snowing.

Monday 22<sup>nd</sup> January  
LO: Recognise that some observable features may change over time

WS: observing closely, using simple equipment

How does the horse chestnut tree change over the year?

**Action: Part of Year 3 display**

Research using secondary sources

Does the size and shape of a magnet affect how strong it is?

It was cold. It was blustery.

As someone who works in the field of STEM, I found it rewarding to talk with my children about their recent science activities and hear them mention the enquiries they've been conducting in class.  
**Parent KS2**

**Action: Year 5 pattern seeking and observing over time**

Wednesday 20<sup>th</sup> November 2023

So when you separate something it is splitting them. When materials are mixed together it is possible to separate them.

Examples: Filtering, sieving and magnetism.

Mixture: Glitter + water  
I would separate these materials by using filter paper. Then the glitter will remain and the water will sit on the bottom.

Mixture: Marshmallows and flour  
I would separate these materials by sieving. Because the marshmallows will not disappear because they are bigger than the flour. The flour will pass through the sieve.

Mixture: Sand and iron  
The sand is magnetic so I will use a magnet to separate it.

**Action: Year 2 observing over time**

Thursday 12<sup>th</sup> February  
LO: Understand that some questions can be answered by testing

WS: Predicting, observing, investigating and recording

Would a paper boat float forever?

How could we find this out?  
We are going to make a paper boat and test if it can float in water forever!

What do you think will happen?  
I think the paper boat will not float because it will get too wet and fall over.

What happened? Why?  
We found out that a paper boat won't float forever because paper is absorbent.

**Action: Year 4 pattern seeking**

Friday 2<sup>nd</sup> February  
LO: Explain how the teeth in animal skulls show they are carnivores, herbivores, or omnivores

What are the functions of the teeth in animal skulls?

Diagram showing teeth in sheep, fox, and hedgehog skulls.

I think sheep are herbivores because they get grass and they have small sharp canines that tear the meat apart. They only have one type of tooth.

I think foxes are carnivores because they have really sharp canines that tear the meat apart. They only have one type of tooth.

I think hedgehogs are omnivores because they eat worms and insects. They have a mix of sharp canines and flat teeth.

**Action: Year 6 research**

Our experiment:  
We are going to investigate the rate of rusting. We will place a piece of iron into a small beaker filled with a liquid. We will observe it over time to see the rate of rusting.

Diagram showing beakers with Vinegar, Water, Salt water, and Lime juice.

The book monitoring revealed a uniform approach to teaching various types of enquiries across the school. Students demonstrate a consistent ability to discuss their activities and provide justifications for their answers. **Science Lead**

**Action: Year 4 research**

Friday 2<sup>nd</sup> February  
LO: Give reasons for classifying objects and animals based on specific characteristics, describing animal groups

WS: Reporting and presenting findings from enquiries

What is a platypus?

**THE PLATYPUS**

The platypus is no doubt one of the most unusual animals in the world. It is described in the mammal category but it has features of reptiles and birds. Platypuses live only in 2 parts of the world; on the east of Australia and in Tasmania.

Common name: Platypus  
Scientific name: Ornithorhynchus anatinus  
Age: Mammal  
Height: 3 ponds

Platypuses are the most poisonous of any mammal. If they hold the venom in their webbed, shaggy feet and when they scratch another animal the venom will be injected into their skin.

We don't know which classification group the platypus should go in; it has duck-billed nose and mouth like a duck, it has fur like mammals, and it lays eggs like reptiles.

**FUN FACT**

**Action: Year 4 research**

Friday 15<sup>th</sup> September 2023  
LO: Describe the functions of the organs in the digestive system

Please see our videos for the description of the Organs.

Firstly, we placed some crackers and a banana into a plastic bag. The bag represented our Stomach.

We then added orange to represent acid and water to represent Saliva.

Next, we mushed everything together to create the Chyme in the Stomach.

After it looked like porridge, we then transferred the food to a piece of tight. The tight represented our Small Intestine.

Finally, we transferred the stool from the Rectum where it was stored, out of the body via the Anus.

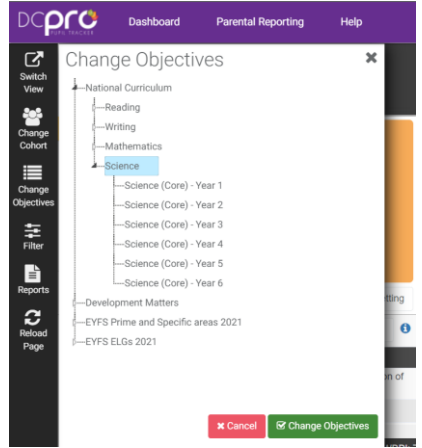
**Next Step:** Continue to plan staff meetings with the aim of enhancing teachers' subject knowledge of various enquiry types. This will empower teachers to guide children in independently determining their own enquiry types during investigations.

# Science Learning: PSQM Gilt

**L Aim:** Science teaching is strengthened and developed through:

**B.** The purposes of science assessment and current best practice

**Before:** The DCPro assessment system monitor students' progress. Teachers use it regularly to assess each objective. It is worth noting, however, that discussions about science did not take place during the termly progress meetings.



**Action:** SL used DcPro system to generate reports and summative overviews. This was shared with SLT. Progress meetings include discussion about progress in science.

Academic Year: Last Year

Include Points: Grades and Converted Points

ARE or Flight Path: Use End of Year Expectations

Colour: None

Order the data by: Subject

ATTAINMENT GROUPS 2022/2023

Based on end of year expectation in: Egerton 1-6

Year 6	Below	Age Related	Above Related	Age Related & Above
Gender				
Male	Aut 2022/23: 7 / 30 (23.3%) Spring 2022/23: 5 / 30 (16.7%)	19 / 30 (63.3%)	4 / 30 (13.3%)	23 / 30 (76.7%)
Female	Aut 2022/23: 7 / 30 (23.3%) Spring 2022/23: 5 / 30 (16.7%)	19 / 30 (63.3%)	4 / 30 (13.3%)	23 / 30 (76.7%)

**Properties and changes of materials**

compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets

know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution

	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
	EXS	EXS	EXS	EXS	EXS
	EXS	EXS	EXS	EXS	EXS

**Before:** DcPro – each teacher assess knowledge and scientific skills. Group tracking reports provide detailed information about how individuals have progressed through the year. Data is passed and discuss during transition meetings at the end of the year.

Match up the stages of human evolution with a number so that they are in the correct order.

- Homo habilis
- Homo sapiens
- Australopithecus
- Homo erectus
- Homo heidelbergensis

can use a special scent to attract and trap insects

this slows rich fat as a form of nutrition

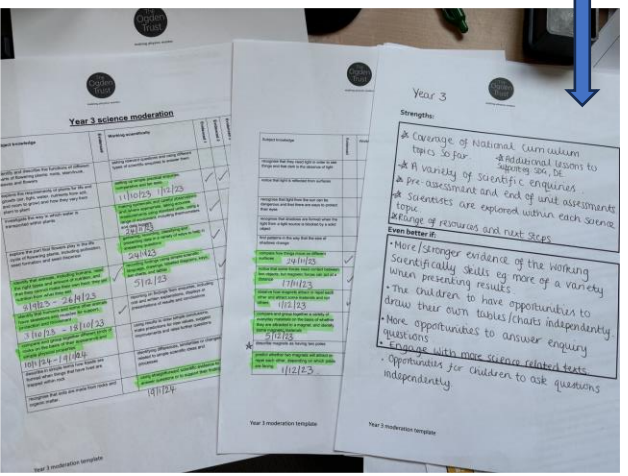
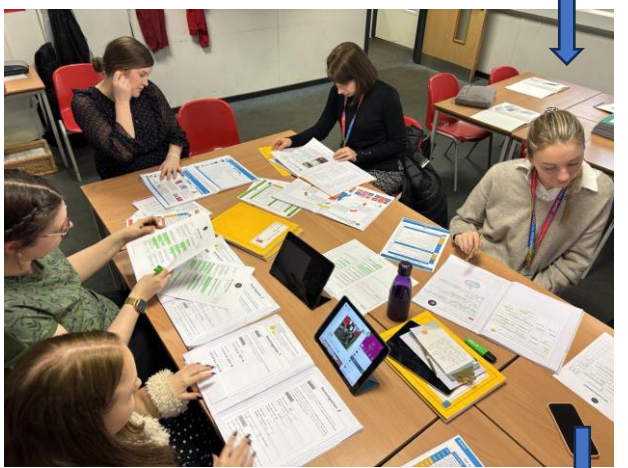
thick layers of fat and fur provide insulation

can change the color of their skin to camouflage against predators

can grow on the surface of another plant instead of in the soil

**Evidence pre PSQM:** Example of end of unit test from Developing Experts used after each unit

**Impact:** Additionally, incorporating science discussions into progress meetings has fostered a more holistic approach to student assessment and support, ensuring that science education receives the attention it deserves within the school's academic framework.



Examples of Work

Max

Living things and their habitats - Year 2

Primary Science

THE ASSOCIATION

Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.

Key vocabulary: Leaf, flower, stem, root, bark, wood, fruit, seed, branch, vein, leaf, vein, stem, bark, wood

Common misconceptions:

- Plants are flowering plants just with colored petals and leaves and a stem
- There are not plants
- All leaves are green
- All leaves are green
- A tree is not a plant
- Plants are not alive

Possible evidence:

- Can describe some of the key features of deciduous trees and plants e.g. the shape of the leaves, the structure of the root system
- Can explain the difference between deciduous and evergreen trees
- Can explain the difference between deciduous and evergreen trees
- Can explain the difference between deciduous and evergreen trees
- Can explain the difference between deciduous and evergreen trees

**Action:** Teachers used exemplification materials for assessment when moderating work

Topic: Living things and their habitats

Examples of work

Assessment

Max uses the previous experience to find some animals. He decided to look under the logs, as he has found animals there in the past.

Working scientifically

How to lead a primary science moderation meeting

A guide to the how and why of science moderation meetings.

**Action:** Moderation took place in Spring Term. Use of templates from the Ogden Trust supported the process.

**Before:** Documents shared with staff. Although, the planning matrices serve the dual purpose of aiding in lesson planning and teaching, as well as functioning as a document for moderation, they were not fully used when planning and assessment by all staff

**Impact:** Teachers refer to the documents outlining the progression of skills and knowledge to review both past and upcoming information. Staff voice highlighted that these documents serve as valuable tools for teachers in planning lessons and conducting assessments.

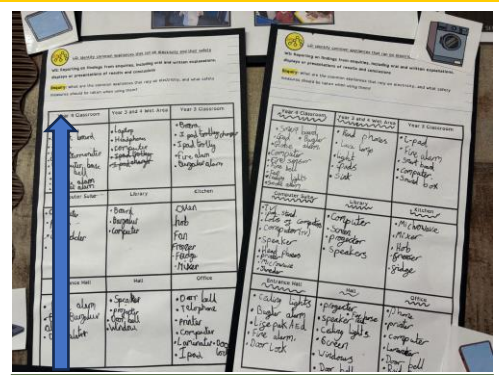
**Next Step:** Moderation meeting to take place again in the summer term and focuses on identified next steps for each year group. Impact report for governors to be written in Summer term.

The materials are exceptionally clear and well-structured. The detailed breakdown of assessment criteria is particularly helpful, providing a comprehensive framework that guides me in evaluating children performance.. **Teacher Voice**

**L Aim:** Science teaching is strengthened and developed through:

**B.** The purposes of science assessment and current best practice. Slide shows evidence from before and during PSQM

**Before:** Many different assessment strategies were introduced a few years ago. SL makes sure staff have access to new approaches by facilitating dialogues between staff during staff meetings. Staff uses assessment to inform planning and amend if necessary.



**Action:** Focused LO - objective and WS during each lesson; recorded in books and discussed with children

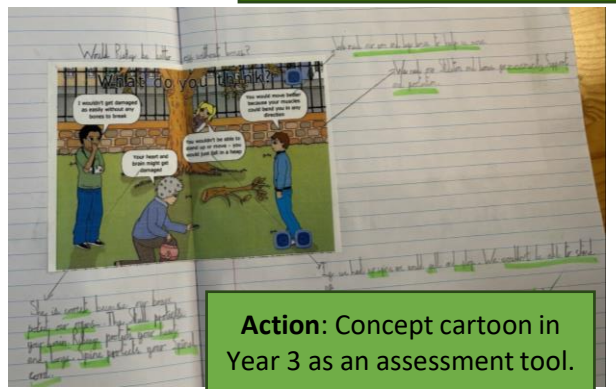
When we focus on one exciting thing at a time, it's like following a treasure map. It helps us have more fun during experiments and makes everything less tricky to understand.  
**Year 5 pupil**

**Evidence pre PSQM:** To reinforce prior learning, and support short interventions, retrieval starters have been revisited, quizzes, covering material from various timelines, including the previous week, month, or even year.

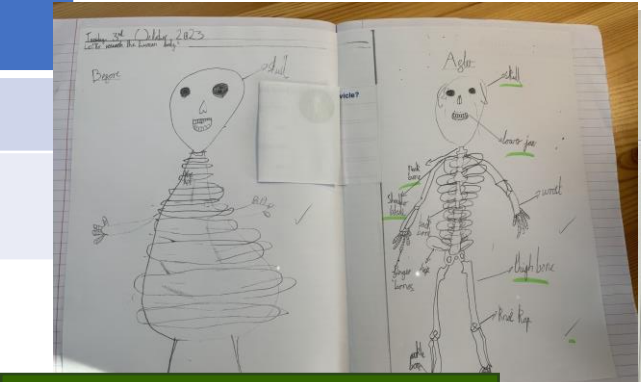
**Before:** Learning objectives were clear, however working scientifically skill was not included next to the LO.

**Impact:** Being clear about which part of Working Scientifically is the focus for the lesson helps to make the teaching and any pupil recording more manageable. Having one element as the focus helps to manage the cognitive load of practical activities. **Staff Voice**

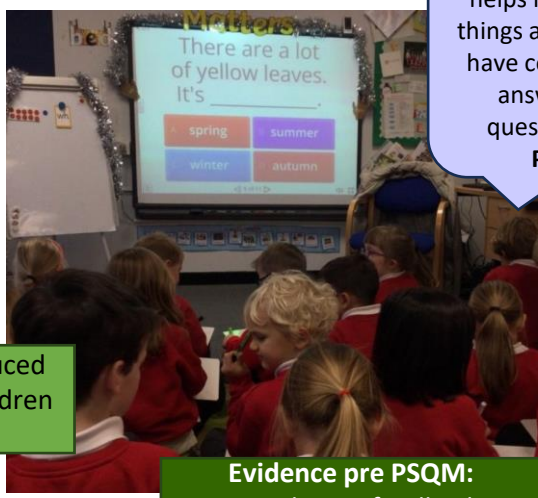
**Action:** New website WORDWALL introduced in Autumn term – quizzes and games. Children enjoy playing different games.



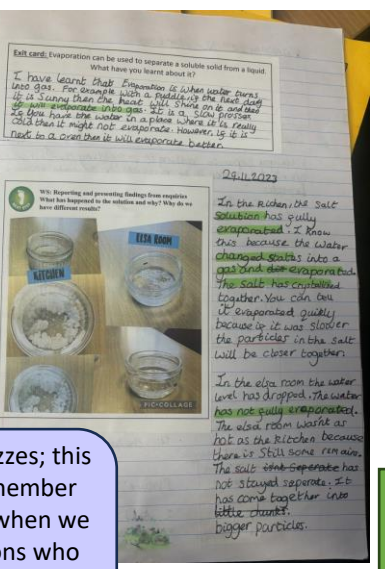
**Action:** Concept cartoon in Year 3 as an assessment tool.



**Evidence pre PSQM:** Pre and pot assessment in Year 3



**Evidence pre PSQM:** Responding to feedback in Y6

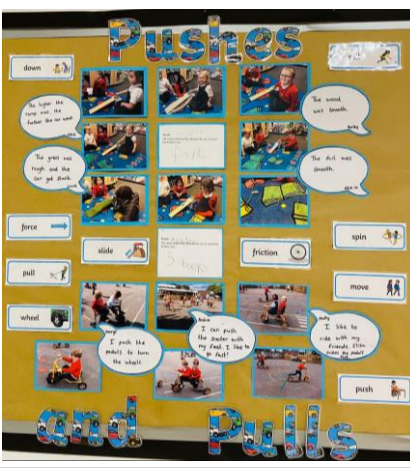
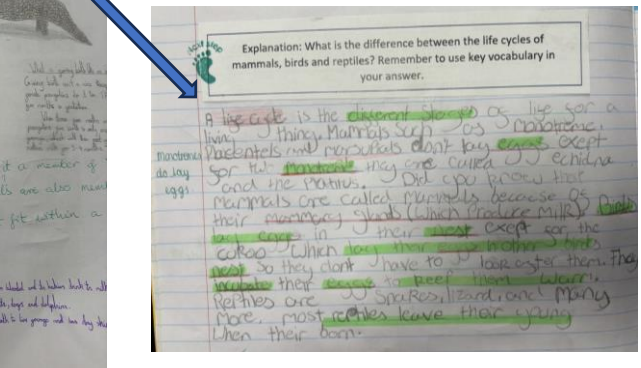


I enjoy doing quizzes; this helps me to remember things and I like when we have competitions who answers the most questions correctly.  
**Pupil Voice**

**Evidence pre PSQM:** Teachers annotating planning and adding next steps to deepen pupils understanding

**Year Group:** Year 6  
**Subject:** Science  
**Unit:** Electricity  
**Teacher:** Mrs Sedgwick  
**Term:** Autumn 1  
**Duration:** 6 weeks

Type of Enquiry Resources	Prior Learning	Learning Objective Activities, Input	Key Questions Vocabulary	Assessment Next Steps
Week 1	YEAR 4 Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.	LO: Describe the function of electrical components and match them to their symbols <a href="https://www.monikababinska.com/Desktop/Summer%201%202021/Science/Electrical%20Components.pdf">https://www.monikababinska.com/Desktop/Summer%201%202021/Science/Electrical%20Components.pdf</a> <a href="https://www.bbc.co.uk/bitesize/topics/z44jqs">https://www.bbc.co.uk/bitesize/topics/z44jqs</a> <a href="https://www.youtube.com/watch?v=9Y1PMhHE1hQ">https://www.youtube.com/watch?v=9Y1PMhHE1hQ</a>	Battery – a source of electrical energy Circuit – a closed loop around which electricity can travel Electricity – a form of energy used to power a wide range of objects Switch – a component that provides a break in the circuit that can be opened or closed	Not all children felt confident by the end of the lesson: At the start of the next lesson, conduct this activity. Peer Assessment: Encourage students to work in pairs or small groups and have them assess each other's circuits, providing feedback on accuracy and completeness.



**Action:** EYFS children are learning about forces – display as an assessment wall

**L Aim:** Science teaching is strengthened and developed through:

**C.** The importance of, and strategies for, developing all children's science capital

**Before:** There were many opportunities already incorporated in our Science curriculum to develop science capital. However, after a staff voice it became clear that not all staff have the same, deep understanding about science capital, therefore some opportunities, sometimes were missed.

**Scientists**

- Dr Ernest Madu (born 1960)**  
Dr Ernest Madu is a cardiologist. His work focuses on providing affordable healthcare in low-resource nations.
- Louis Pasteur (1822-1895)**  
French chemist and microbiologist: develop the first vaccine.
- John Loudon McAdam (1756-1836)**  
John Loudon McAdam was a Scottish engineer who modernised the way we build roads. He was the inventor of tarmac road surfacing – commonly called tarmac.
- Julie and Scott are one of the inventors of Solar Roadways.**  
Solar roadways use solar powered road panels to form a smart roadway.
- Dr Alexandra Harmon Threat**  
Entomologist and bee expert. Assistant Professor of Entomology at the University of Illinois. Urbana-Champaign. She focuses on identifying local landscape features that contribute to pollinator diversity and restoration.
- David Douglas (1799-1834)**  
David Douglas was a Scottish botanist best-known as the namesake of the Douglas-fir. He worked as a gardener, and explored the Scottish Highlands, North America, and Hawaii.

**Science Week 2023 at Egerton Primary School**

Science Week 2023 runs from Friday 10th March until Sunday 19th March. This year's theme is 'Connections' and we have launched the week with an assembly this morning, asking the children to think about the many different connections in science. Did you know that air has weight? In fact, a large amount of air can be very heavy. Mrs Rothwell demonstrated the weight of air during our assembly with a very interesting experiment – collapsing can.

Throughout the week, our focus, will be on how we can be inspired by connections with parents, who work in STEM, several parents have kindly offered to visit classes and talk to the children about their jobs and the connections they make every day in science. For example, we have parents visiting who work as a veterinary surgeon, in agricultural science and an analytical chemist.

We will be running a poster competition with one prize per year group. The top 5 posters from the school will be entered into a national competition run by the British Science Association. We will be encouraging the children to think of connections within science topics that they have been taught this year and also better connections that we, as humans, could make to help protect our planet.



**Evidence:** Scientists that the children learn about in Year 2 revisited to ensure diversity.

I really want to be a scientist when I'm older. I enjoy investigating things and mixing different liquids to find out what will happen. **Year 4 Pupil**



We will also run #ScienceSelfieCompetition. We want the children to recognise that science is all around us, every day. In order to get them to look for science around them, we are asking the children to take a Science Selfie. These are just a few suggestions: blowing bubbles, planting seeds, moving toy vehicles; looking at animal habitats; throwing and catching. The children will need to write a brief explanation of what Science their Selfie shows, e.g. kicking a ball shows how forces make an object move; taking your pulse shows how fast our heart rate is. You will find all the information on Seesaw.



Some teachers will be setting homework linked to science week and it will be exciting to see how creative the children can be! If you would

Building Science Capital  
Jo Moore and Stacey Reid  
jo.moore@pstt.org.uk  
stacey.reid@pstt.org.uk

**PSQM** Primary Science Quality Mark

**Activity L Ci – Science Capital**

Science learning is strengthened and developed through a shared understanding of the importance of, and strategies for, developing all children's science capital.

Outline of task

I love doing different experiments. It was so much fun doing them at home with my mum. **KS1 Pupil Voice**

**Action:** Science lead led staff INSET on Science capital to revisit this and embed understanding among staff

**Action:** SCIENCE WEEK to develop children's science capital 2023. Families involved in science activities.

**Evidence:** Cross curricular reading and writing activities incorporate finding out about famous scientists - display of Year 5 work.

Albino and Brown Experiment

I can see that the butter melts and turns into liquid when heated.



**In this experiment I tested two types of balls to see which was faster—a baseball or paper ball? During the experiment I discovered that the baseball travelled faster than the paper ball because of its aerodynamic structure. The baseball is smooth and heavier giving it a faster speed than the lighter paper ball.**



The light from planets doesn't twinkle because planets reflect light where stars produce light.

Also if you got a bath tub bigger enough full of water Saturn would float in it because its a gas giant.



**Careers in Science**

**Monika S. @monikasedg · 22/03/2023**  
Our children had a fantastic week celebrating STEM. #ScienceWeek @ExplorifySchool @ScienceWeekUK @pstt\_whyhow @WowScienceHQ @EgertonPrimary

**Impact:** The staff meeting on science capital was very beneficial and refreshed staff knowledge about cultural capital. They gained deeper understanding of the concept to further incorporate different strategies.

**newsround**

**Watch Newsround**

Emma-Louise has your Sunday Newsround. Pop star Ray Brit awards, Press-packer Annabel tells us why her wheel is important to her, and there's some inflatable art in Stran...

More on this

**Action:** Children watch Newsround each day. They stay informed about recent developments in the field of science





**L Aim:** Science teaching is strengthened and developed through:

**C.** The importance of, and strategies for, developing all children's science capital



**Action annual event:** EYFS pond dipping in Norton Priory. Promoting science for everyone

**WHAT IS A SCIENTIST?**  
They are people who...

- observe
- make guesses
- collect data
- measure
- ask questions
- invent things
- take notes
- wonder

**YOU are a scientist!**

"A scientist is someone who asks really cool questions and then tries to find the answers by doing experiments and investigations."  
**Year 3 Pupil Voice**

**Action:** Teachers incorporate "What is a scientist?" into the beginning and end of each new unit of work. Pupil voice shows the question and answers from Y5 children



**Action:** Year 6 programming and flying drones with Tom from STEM ambassador.

**Before:** STEM visitors were invited to school predominantly for STEM week. Moving forward, the SL to focus on inviting visitors throughout the year to continually enhance children's experiences in science. Also, there was not a consistent science focus in our school weekly newsletter.



Investigating the melting point of different foods.

During Science this week, Year 4 carried out an investigation into the different melting points of foods. We wanted to discover if all foods melted at the same temperature. Working as scientists, we used a thermometer to accurately read the temperature as soon as the food had melted and we shared our results in a line graph. We have been exploring how to create a line graph during our maths lessons.

**Action:** Science at home activity Y5

#MY SCIENCE EXPERIMENT

presenting the bouncy egg

**this is how it works**

if you put an egg (a brown egg, not a white egg) in vinegar for 48 hours, then the hard bit of the shell will dissolve. It will also turn the remaining bit of the egg into a bouncy substance.

- The following questions are about connecting scientific learning to the real world:
- If you were to invent something, what would it be?
  - Where does [e.g. electricity] come from?
  - How can science help people?

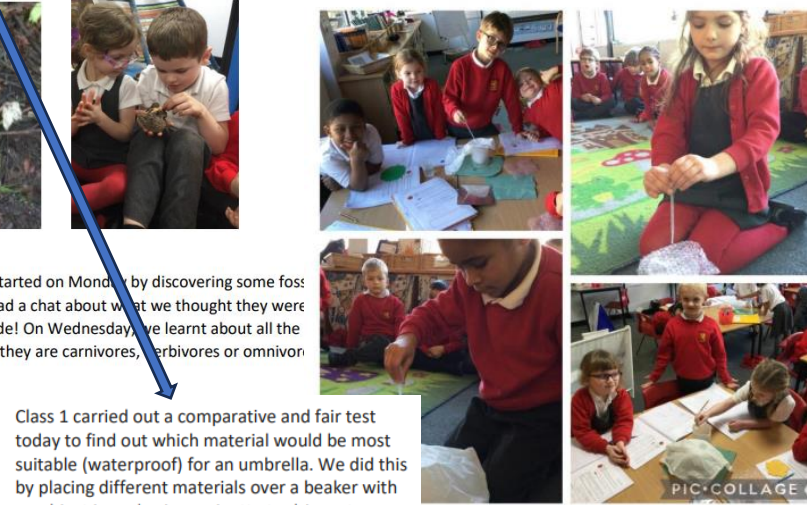
- Doctors – make medicines/injections.  
Archaeologist – animals, rocks, fossils  
Architects – building, measuring, materials  
Ecologists – environments, plants  
Gardener – plants  
Zoologist – need to have knowledge of life cycles.  
Vets – know about animals, medicines

**Action:** Science work is shared with parents and the wider community in a weekly newsletter



This week the children have been learning about dinosaurs! We started on Monday by discovering some fossil dinosaur eggs under the trees on the big playground. When we had a chat about what we thought they were opened them up and found tiny fossilised dinosaur skeletons inside! On Wednesday, we learnt about all the different dinosaurs and spent some time thinking about whether they are carnivores, herbivores or omnivor looking at their distinguishing features.

**Next Step:** : To repeat science capital questionnaires to measure impact of activities. Incorporate more visits and visitors to develop science capital.



Class 1 carried out a comparative and fair test today to find out which material would be most suitable (waterproof) for an umbrella. We did this by placing different materials over a beaker with an object in and using a pipette to drip water on top. The best materials kept the object dry.

I really, really liked being in the big dome! And guess what? I know the names of all the planets! **KS1 Pupil Voice**



**Action:** EXPLORER DOME invited to deliver a workshop to each class. This took place in 2022 and again in summer term 2023.

**Impact:** The introduction of posters on "What is a Scientist?" and engagement in science projects and homework helped broaden children understanding of the diverse roles and opportunities in the field of science. They enthusiastically take part in projects at home and are very keen to involve family members. Parents get regular updates through weekly newsletter. This involvement not only enhanced communication between the school and families but also encourages families to support and reinforce scientific inquiry at home.

# Science Wider Opportunities: PSQM Gilt

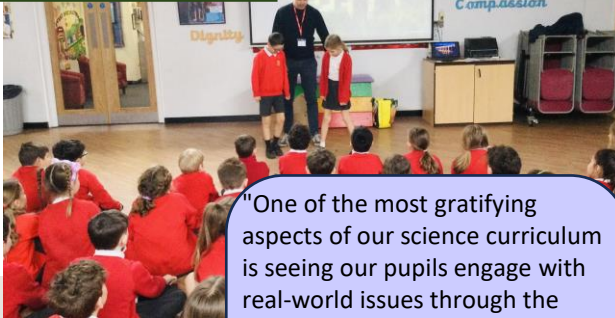
**WO Aim:** Science is enriched by:

**A:** Cross-curricular planning that links science to other areas of learning; development of SDGs through science lessons

**Before:** Our school has a comprehensive planning approach that integrates science with other subjects, identifying various potential activities across the curriculum. However, despite our status as a global learning school with a longstanding partnership with a school in Kenya spanning 15 years, we have not yet established robust connections between our science curriculum and the Sustainable Development Goals (SDGs). It was imperative for the Science Subject Leader to strengthen science education by aligning it with real-world global challenges, thus enriching our students' understanding of global issues and fostering a sense of responsibility towards sustainable development.

"Incorporating Sustainable Development Goals into our science curriculum has been transformative for my teaching practice. It has challenged me to think more deeply about the global impact of our lessons and has inspired me to explore innovative ways to engage children with real-world issues.  
**Teacher Voice**

**Action:** Parent visit - assembly; linked to SDG 15 Life on Land



"One of the most gratifying aspects of our science curriculum is seeing our pupils engage with real-world issues through the lens of Sustainable Development Goals. It's inspiring to witness their enthusiasm as they connect classroom learning to meaningful global challenges."  
**Headteacher**



**Action:** Parent Vet visit to Year 1; promoting science for everyone linked to SDG 15 Life on Land and careers

**Action: Incorporating SDGs into science planning and lessons**

I really like looking at SDGs and matching them with our science lessons and learning about real life problems.  
**KS2 Pupil Voice**

**Action: Science linked to SDGs in Year 6**

Mrs Hooper said: "We were extremely proud to accept Egerton's fifth International School Award, confirmed in June and representing 15 years of excellence in global learning.

"This is in recognition of the school's commitment to ensuring the children are supported in developing skills such as critical thinking and problem solving when learning about their world."



Alison Hooper, former head teacher of Egerton Primary School with the award and some of the children's international work (Image: Egerton Primary School)

The school has formed a unique partnership with teachers and children in Africa.

**Next Step:** Staff and pupil voice in summer term focusing on SDGs. Continue to develop stronger links between Geography and Science. Field Trips and Outdoor Activities: Organise field trips to eco-friendly facilities, research centres, or places where sustainability initiatives are in practice, providing pupils with practical examples of SDGs in action.

**Evidence: June 2023 Fifth International School Award**

**Action: Science linked to SDGs in Year 1**

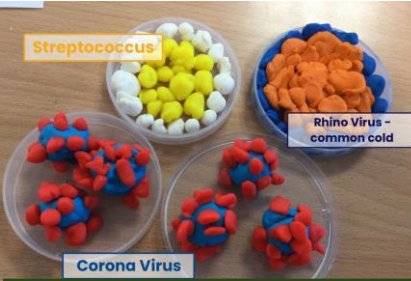
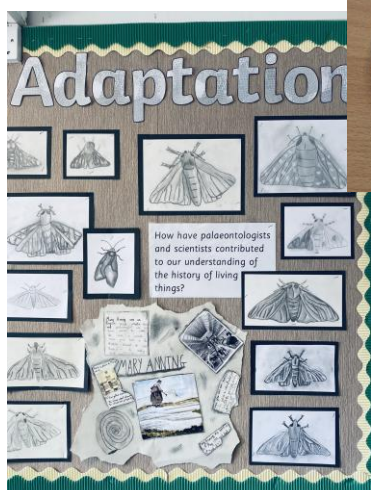
**Impact:** Through collaborative Professional Development Meetings, teachers have been empowered to align science topics with Sustainable Development Goals, fostering ownership and commitment. This integration has expanded pedagogical approaches, deepened pupil's understanding of global issues, and nurtured a sense of global citizenship and responsibility among young scientists – evident through pupil and staff voice.

# Science Wider Opportunities: PSQM Gilt

**WO Aim:** Science is enriched by:

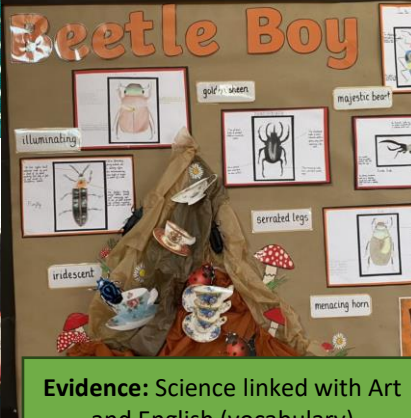
**A:** Cross-curricular planning that links science to other areas of learning;

**Evidence pre PSQM:** Science linked with Art: Sketching moths in Y6; planets in Y5



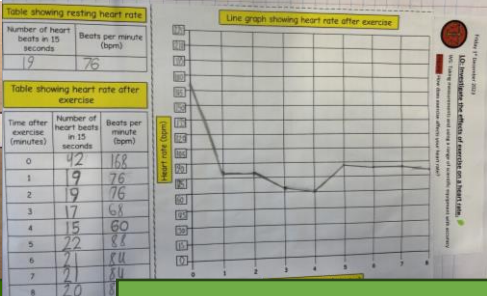
**Evidence pre PSQM:** Year 6 learn about micro-organisms; they used playdough to represent it..

## Year 5



**Evidence:** Science linked with Art and English (vocabulary)

**Next Step: Project-Based Learning:** Design interdisciplinary projects that incorporate scientific concepts along with other subject areas. For example, children could work on a project that combines science, technology, engineering, and mathematics (STEM) principles with elements of history, geography, or art. This approach encourages critical thinking, collaboration, and problem-solving skills while reinforcing learning across multiple disciplines.



**Action:** Science linked to maths in Year 6 and Y1

Is there a pattern in the materials used for objects in school?

Material	Tally	Total
Wood		5
Plastic		5
Metal		5
Glass		5
Paper/card		5
Fabric		5

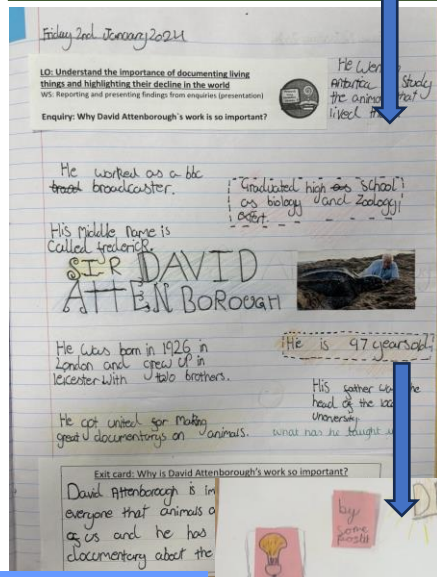
Conclusion: Which was the most popular? Why do you think this is?  
Plastic is mostly used  
 I think because it is strong, colourful and Water Proof.

**Impact:** Professional Growth: Collaboration between different subject leaders provided opportunities for professional growth as educators share expertise, exchange ideas, and learn from one another's teaching practices. This shows more cohesive approach to curriculum delivery and more meaningful connections. **Staff Voice.**

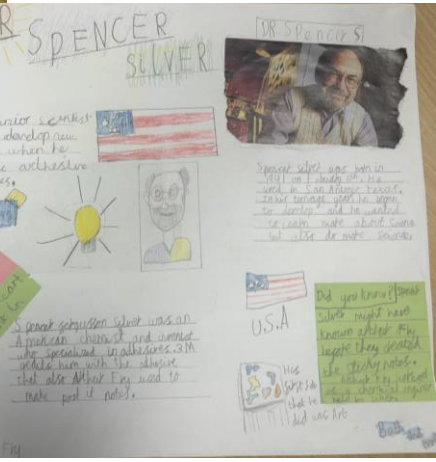
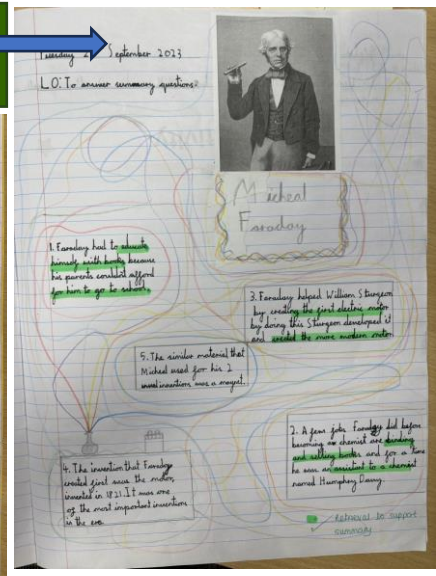


**Action:** Maths and Science in Y1

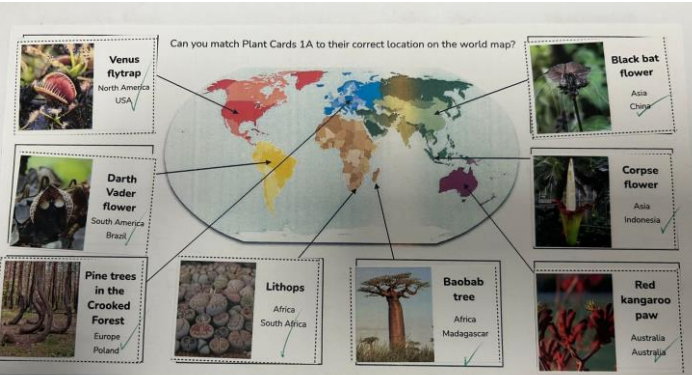
## Evidence pre PSQM: Children research information about scientists that they study



**Impact:** Deepened Understanding: Integrating science with other subjects allowed children to see how scientific concepts relate to real-world contexts and other areas of study. This deeper understanding enhances their grasp of scientific principles and fosters connections between different fields of knowledge as showed during pupil voice.



**Action:** Science and Geography linked in Y3 when learning about plants and biomes

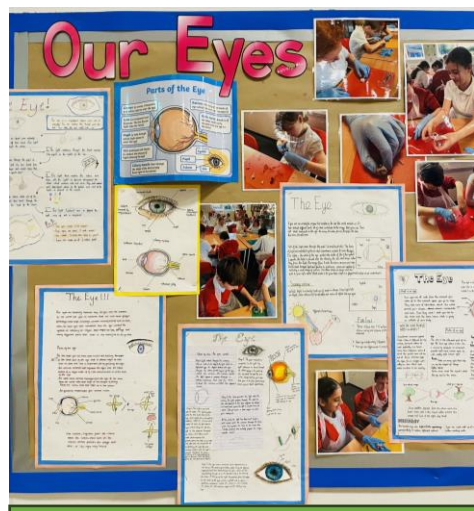


# Science Wider Opportunities: PSQM Gilt

**WO Aim:** Science is enriched by:

**B:** Develop after school club links. Children have opportunities to enhance their science learning through enrichment activities.

**Before:** There was no after school club linked to Science. Gardening club was introduced last spring term. Eco Ambassadors started in September 2022. We wanted to increase the number of visitors to school and add new after school clubs.



I really enjoy coming to our science club. We do different things each week. Last week we learnt about electricity and this week we were investigating forces.  
**Pupil Voice**

**Impact:** The Science club collaboration with Mad Science proved highly successful. Enthusiastic participation from attending children was evident, with each session met with great enthusiasm and excitement. The children thoroughly enjoyed their experiences and expressed a keen desire to continue attending the club into the next term.

Thank you for introducing few different after school clubs. My children love attending Mad science and Coding clubs. They can not stop talking about it.  
**Parent Voice**

**Action:** Eye dissection in Year 6 with a Science teacher. Year 6 were able to write a detailed explanation about how the eye works after the session, including scientific, accurate vocabulary

**Evidence pre PSQM:** Eco ambassadors across the school established couple of years ago. Meetings every 3<sup>rd</sup> week.

PrimeVR Booking <booking@primevr.co.uk>  
To: Monika Sedgwick  
Cc: Egerton Primary Admin  
Hi Monika,  
Thank you for choosing PrimeVR for your VR experience day.  
Your booking is now confirmed for Tuesday 12th March 2024 with Duncan.

**Action:** VR experience booked for KS2



**Evidence pre PSQM:** Gardening Club focus is biodiversity, encouraging insects to visit our school grounds



**Action:** Coding Club, led by a parent started in Spring Term

This half term in Coding Club the children have had an introduction to LEDs and electronics; made name badges, virtual dice and games with the Microbit; tried their hand at Scratch and Python; sent each other short messages using radio waves; and submitted code to entertain the astronauts on the International Space Station.  
**Coding Club Lead (Parent)**

**Next Step:** Conduct pupil voice to gain better understanding around pupils interest and continue to further develop the after school provision linked to STEM.

**Impact:** Working together in the garden fostered teamwork and cooperation among our children. It provides supportive and inclusive environment. Children that do not have large gardens at home, enjoyed being part of the gardening club at school.



**Evidence pre PSQM:** Eco Ambassadors involved in different projects – bird feeders