



Science Subject Leadership: PSQM GILT.

Science subject leadership is strengthened and developed through:
A.) The creation and implementation of a clear vision for science.

Identified Action:
Share vision and principles to ensure it is understood widely by all school stakeholders.

When children were asked about the school's vision for Science at Parish before the PQSM, most children were unable to articulate this clearly with a variety of albeit relevant, but different answers that varied in response. Many children in KS2 had good ideas relating to the already created curriculum intent statement but this needed to be more widely understood, particularly for our youngest learners (and newest members of staff).
Examples of initial, more generic, pupil responses about what Science means to them included:

"Science is all about experiments!"
(Year 2 child)

"Science is about our understanding of the world"
(Year 5 child).

"I like our Science lessons as we learn about animals."
(Year 3 child).

"Being new to the school, I understood what good Science teaching looked like from my training. However, being on placement in many different schools, I appreciated that the way this was taught varied and my personal vision for teaching Science may be different to what the school wanted." (Y4 ECT, September 2023).

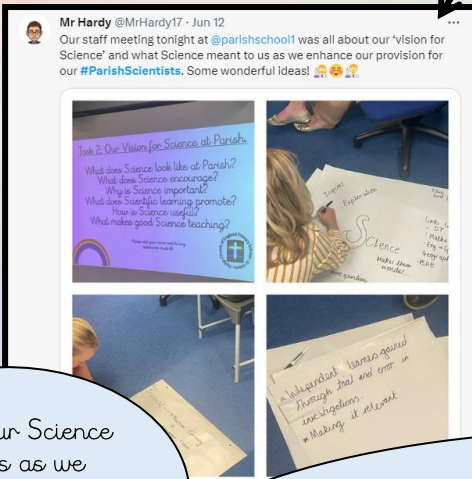
A staff meeting (involving all teaching staff, the Senior Leadership Team and two link Governors) was held on the 12th June 2023 to discuss and ultimately create our revised vision and principles.

This was poignant and ensured that the vision and principles were created collaboratively and universally understood, reflecting our school community and context.

Once the ideas for the vision were collated, a formalised version of the vision was created. This linked to our wider curriculum drivers (our Rainbow Curriculum) to ensure it was fully understood by all stakeholders and therefore compliment other subjects, including those with STEM links.

However, during the PQSM process, it was identified that the vision created was purposeful for adults but not necessarily child friendly. As a result of this feedback, both an adult version and child-friendly version of the vision were created.

This was displayed around school (on all class working walls for Science) and also shared with key stakeholders including all Governors in the Summer 23 meeting and with parents on the weekly newsletter.



Year 2

Year 1

Year 6

Submission: March 2024.



- Pre-PSQM
- During PSQM
- Impact



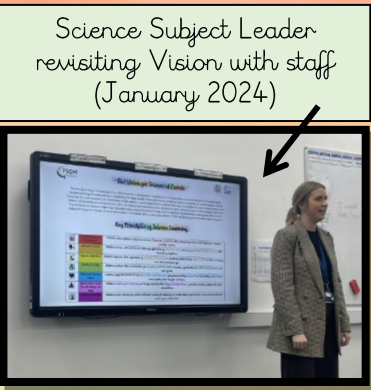
Science Subject Leadership: PSQM GILT.

Science subject leadership is strengthened and developed through:
A.) The creation and implementation of a clear vision for science.

All stakeholders are secure with the 'Vision and Principles' and this is now universally understood across the whole school community, including teaching staff where it is regularly revisited. This includes parents and carers who had the vision explained in more detail and saw this come to life at our Coffee Morning (January 2024).

Newly updated planning for September 2023 (using resources originally planned by secondary Science Subject Leader) showcases that within units of work, the learning sequence supported teachers to live out the wider vision for Science. This is exemplified by the 'Year 2, Unit 1 Medium-Term' planner below.

Within the termly Science update with teaching staff, the vision was continuously revisited to ensure that it is fully understood and remains at the forefront of all aspect of teaching and learning.



Identified Action:
Share vision and principles to ensure it is understood widely by all school stakeholders.

Overall Reporting as [RED / AMBER / GREEN]
Red relates to an area that has high impact and will show intended actions to green. Amber relates to an area that is cause for monitoring with the intended actions to show the pathway to green. Green relates to no current concern.

Area to report on:	Previous RAG	Current RAG	Next RAG	Update: If RED or AMBER RAG, please add pathway to GREEN - outlining Key actions required, activity and Timeline. Purple indicates update to previous comment
Curriculum	Previous RAG	Current RAG	Next RAG	<p>19/23: New English scheme of work has been implemented (Ready Steady Write). Inset Day has taken place to start the academic year and staff now fully understand key expectations. This has been implemented and has immediately led to consistency across school with clear adaptation from the English Leader. Early weeks of the year show immersion has been strong in our book-based curriculum.</p> <p>23/23: Continuing work from last academic year, our Science Subject Leader (Megan Dodd) continues to work towards the Primary Science Quality Mark GILT. After discussion of the Vision for Science in the Summer meeting, work now centres upon Curriculum development within Science. Areas of focus include: Science links across the curriculum, resources and relationships as exemplars.</p> <p>23/23: Our RAG curriculum has been updated in line with the revised Blackboard Decease updates. Staff are now fully informed of these changes and this is being delivered with great accuracy within the classroom. Despite planning to be created throughout the academic year to fully meet the needs of learners.</p> <p>23/23: Across this half term, further curriculum development has taken place within Design and Technology. A new scheme of work has been designed and implemented. The first unit has been delivered and the impact is beginning to be measured.</p>

Science now holds a high priority with governors and is a standing item on the minutes of every governors meeting (example provided above from Autumn 2 Headteacher Report provided to all governors) across this academic year. This ensures progress is constantly revisited and it provides a focus for challenging questions.

Opportunities to Build Upon Knowledge and Skills -
Building on Prior Learning and the Bigger Scientific Picture to start each unit of work.

Influence Aspirations -
Science Capital Links including the Bigger Scientific Picture.

Key Knowledge:

Progression of Learning - Prior Learning

- To identify and name a variety of common words and objects, including describing and comparing them.
- To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.

What are the differences between living and non-living things?

- To know what a living thing is called.
- To know that a living thing is called an organism.
- To know that a dead thing has been called.
- To know that a non-living thing does not have a life.

What is a habitat?

- To know that a habitat is a place that an animal or plant lives. To provide the animal with food, water and shelter.
- To know that living things live in environments to which they are particularly suited.
- To know that animals may live on land, from the hottest desert to the coldest ice, or in a habitat for some kinds of animals and plants.
- To know that most habitats include a community of animals and plants living with trees, insects, soil or water, and rocks.

What are different habitats and what lives there?

- To know the names of some specific habitats and what lives there, for example forest (for example: oak, pine, birch, maple, fern, hedgehog, rabbit, mole, mouse and snake) (for example: meadow, grassy area, pond, dragonfly, underground (for example: fungi, mole, earthworm, rabbit) (for example: desert, lizard, camel, cactus, snake, eagle, owl, fox, rabbit, squirrel).

What do habitats look like in the local area? What is a microhabitat?

- To know that a microhabitat is a very small, specific habitat for animals and plants, for example a pond or a rotting log. To identify the wider environment around it.

What do animals eat?

- To know that plants make their own food, but animals obtain food from eating plants or other living things.
- To know that a food chain is a way of showing the relationship between living things. To be able to diagram that animals eat their animals are linked to what they eat, for example: grass - rabbit - fox.
- To know that most food chains start with organisms that make their own food, such as plants. (Animals will then produce).

Progression of Learning - Future Learning

- To recognise that environments can change and that this can sometimes pose dangers to living things.
- To understand and interpret a variety of food chains, identifying producers, predators and prey.

Lesson Sequence:

Lesson 1: The Big Bang

Lesson 2: The Big Bang

Lesson 3: The Big Bang

Resilience and Perseverance -
Opportunities to 'Think Like a Scientist' in each lesson with evident progression in Scientific Enquiry.

Articulate Learners -
Vital vocabulary mapped out in each lesson.

Nurture Curiosity -
Practical activities throughout and one lesson of outdoor learning per unit of work.

"In Science, we learn lots about Biology and also Chemistry and Physics too." (Year 2 child).

"For me, Science is about the 'Bigger Scientific Picture and the importance of Science in the world around me." (Year 6 child).

"The session was excellent and well organised with an explanation of the school's vision for Science. I enjoyed seeing how this would help children in their learning." (Parent Coffee Morning Feedback)

5.00 Average Rating

3. How would you describe your understanding of the vision for Science at Parish?
1 star - Do not understand
5 star - Fully understand

More Details

Parents rated their understanding of our Science vision highlighting as 5/5 (in a post event survey) showing complete clarity.

During curriculum monitoring and from pupil surveys (collated in December 2023 and January 2024), pupils are now able to talk more confidently about the vision and principles for Science. Having a shared vision enables pupils to provide clearer responses to what Science means to them. Examples of recent responses include:

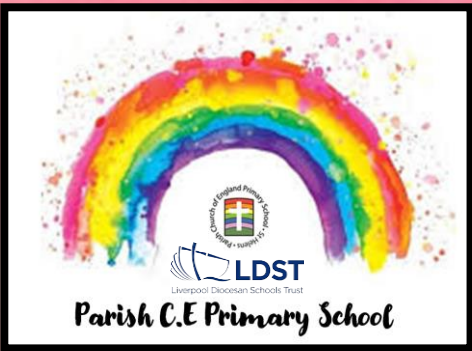
Submission: March 2024.

PSQM
Primary Science Quality Mark
Valid 2017-2025
PSQM GILT

Pre-PSQM

During PSQM

Impact



Science Subject Leadership: PSQM GILT.

- Science subject leadership is strengthened and developed through:*
- B.) Strategic support enabling improvement to take place.
 - C.) An effective monitoring and improvement cycle that informs development in science.

Examples of explicit Science links from 22/23 School Development Plan, supporting whole-school strategic planning..

Key Priority Link:	Responsibility:	SLT	SLT	IV/MH	IV/MH
Build on the success of the Forest School to support outdoor learning in developing emotional well-being, self-esteem, confidence and perseverance across the Science curriculum.	Spring 1	SLT	SLT	IV/MH	IV/MH
3					
PARISH C. OF E. PRIMARY SCHOOL DEVELOPMENT PLAN SEP 2022 – SEP 2023					
Key Priority Link: 1, 2, 3	Responsibility:	IV/BA	MV/BA	IV/MH/MH	HM
Nurture Curiosity					
OFSTED/SIAMS Framework Link: Quality of Education					
Detailed Action/Objectives		Milestones to Success Resources, Time, Cost Person Responsible, Person Monitoring		Measurable Outcomes	RAG JAN RAG JUNE
To review and enhance teaching and learning practices in Science to ensure they allow pupils to 'know and remember more'.		Teaching and learning practices in Science to ensure they allow pupils to 'know and remember more'.		18% Targeted improvement in Science capital	Monitoring cycle provides clear evidence that new policy is being 'lived out' in classrooms across the Science curriculum
Key Priority Link: 1, 2, 3	Responsibility:	IV/MH/MH	SLT	IV/SG	SLT

Identified Action:
Ensure monitoring is communicated to staff and leaders to ensure sustained improvements.

Science has always been on the School Development Plan (SDP) and had a high profile to allow for strategic support. With the work of the Trust to provide high-quality CPD, the subject leader has always been provided with clear strategic support to enable improvement to take place. One example being the termly subject briefings (see below, referred within Science Development Log) as part of subject leader development day.

Despite monitoring showcasing that standards across all classes were high (with particular strengths linked to retrieval, innovative teaching strategies, reading and the development of Science Capital), it became evident that impact was minimised through a lack of strategic thought on how to address areas for development - noticeably, assessment processes and use of age-appropriate scaffolds.

Previously, monitoring was taking place, however, the follow up and support was not specific or strategic enough to ensure that teaching and learning was improved. For instance, in July 2023, the monitoring opportunities were arguably conducted too late in the year with no follow-up CPD time allocated in the monitoring overview to address the areas for development. Monitoring was also a process completed away from teachers and they were not a part of the monitoring process (usually, a book look).

Parish Church of England Primary School Curriculum Monitoring		
Subject: Science (Summer 2)	Date: July 2023	Subject Leader/Champion: Mr Hardy/Miss Dodd
Monitoring Focus: Environment, Teaching, Progress and Learning, Attitudes, Accessibility/Scaffolding/Challenge.		Monitoring Methods: Book Look, Teacher Interview, Pupil Interview, Lesson Observation, Learning Walk, Environment Walk, Lesson Drop In, Coaching, ALL.
Whole School Feedback		
Areas of Strength:		Areas for Development:
<ul style="list-style-type: none">Unit 3 has been finished (or almost finished) in all classes - well done for this in such a busy half-term. Keep this momentum going across the year.Teaching sequence has been consistently followed across all classes enabling children to 'know more and remember more.'Lot of innovation in teaching and learning across most classes- including Explorify, variety of retrieval tasks, recording using concept cartoons and use of QR codes to record 'Thinking like a Scientist.' Please see email for ideas and continue to adapt.Links to reading are strong in some classes and is best with links to reading spines and whole class reads made clear.The 'Bigger Scientific Picture' is completed well in all classes and children are really understanding the why to develop Science Capital.Assessment procedures are accurate and continuing to develop.		<ul style="list-style-type: none">Cursive handwriting is the expectation - please ensure this happens in Science books and all other subjects. Ensure children complete spellings.Continue to minimise scaffolds (in an age-appropriate manner) with adaptive teaching strategies used appropriately.After CPD, use practical methods of recording for pre-learning.After CPD, from Unit 4, start to use consistent assessment task for Science to assess substantive knowledge.
Science Monitoring feedback from July 2023		

Since the Science Subject Leader has attended the PSQM CPD sessions and had the opportunity to reflect on key pitfalls, they have worked with SLT to further refine and develop the monitoring overview for Science. Following recommendations from PSQM mentors, the focus of monitoring is now much more varied with a broader range of monitoring activities taking place at key points throughout the academic year (with one piece of monitoring per term) also supported by instructional coaching. During the PSQM process, Science monitoring (including the book look) was and will now be completed with staff to ensure this is supportive and collaborative rather than purely judging their final outcomes. Monitoring also identified that investment in resources was required (see slides 7 and 8 for evidence of how newly allocated resource budget was spent).

Date for Science Monitoring	Focus	Follow Up Activity
December 2023	Science Survey/Pupil Book Look	Staff Meeting with CPD building on instructional coaching/
February 2024	Science Learning Walk	Action plan review and review STEM three-year plan
May 2024	Science Lesson Observations	Bespoke follow up coaching

"Reflecting on our Science monitoring processes as a result of the PSQM has had a profound impact on our wider monitoring across all subject areas."
(Headteacher).

Purposeful follow-up activities are now planned throughout the year after each monitoring activity has taken place, ensuring that staff receive strategic support and school development/Science specific priorities can be addressed. One example being the strategically planned Science Staff Meeting in January 2023 after curriculum monitoring and our 'Multi Academy Trust Science Subject Network' which was attended by the Subject Leader.

Submission: March 2024.



Pre-PSQM

During PSQM

Impact



School Improvement Liverpool
Finding the optimum: Ofsted science subject report 2nd February 2023
LDST Science Subject Leader Meeting
Thursday 23rd September 2023



Science Teaching: PSQM GILT.

Science teaching is strengthened and developed through:
 A.) Engagement with professional development.
 B.) Use of a range of effective teaching and learning strategies.

The Science Development Log showcases extensive engagement with professional development at all levels impacting the subject leader and staff alike. This was taking place before the PSQM and during its completion to inform our internal approaches. This has been driven with our session from All About STEM (28th September 2022, see Science Development Log), beginning our drive for authentic STEM links and professional development around Science Capital.

Identified Action:
 Implement new instructional coaching cycle in Science using WalkThrus approach.

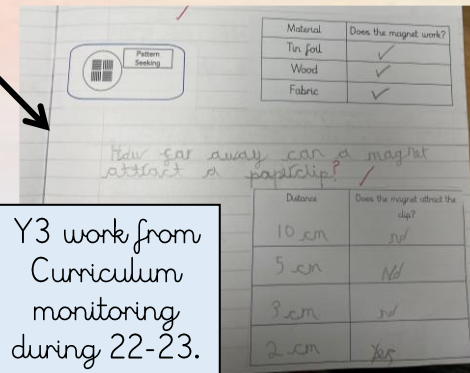
WalkThrus Instructional Coaching Cycles
Coaching Conversations to happen at least once in each cycle.

WalkThrus Coaching Cycle	Session 1 Review - Intent	Unseen Observations	Session 2 Reflect and Refine - Implementation	Session 3 Repeat and Sustain - Impact
Cycle 1: Establish expectations (All lessons)	W/C 4 th September 2023	Supported by MH. (W/C 11 th September).	W/C 18 th September 2023	W/C 9 th October 2023
Cycle 2: Live Modelling (Science Focus)	W/C 13 th November 2023	Supported by MH and MD. Peer supported coaching with same school key-stage partners. (W/C 20 th November).	W/C 27 th November 2023	11 th December 2023



Before the PSQM, although quality of work was high, monitoring identified that it was common place for tables to be stuck into books and pupil outcomes to be very similar in nature due to over scaffolding and a lack of teacher modelling.

We have previously held bespoke coaching cycles in Science. However, there has been significant staff turnover with four ECTs currently in school meaning that further professional development was needed. As a core subject, use of Science to launch our new whole-school approach to 'Instructional Coaching' highlights the subject profile.



Y3 work from Curriculum monitoring during 22-23.

As an ECT, I knew what to deliver but due to time, would use templates that I thought were helping. However, once we started coaching I reflected on my own practice and really focussed on children's independence. (1st year ECT. Feedback from mentoring session).

Illustrated above, our Teaching and Learning leader, designed a bespoke programme for continued professional development encompassing 7 week cycles of instructional coaching. Responsive to curriculum monitoring and CPD (including the Science Leader's NPQLT, LDST networks and PSQM learning evidenced in the Science Development Log) the second coaching cycle was a focus upon 'Live Modelling' within Science.

This is one example of a previous coaching cycle (from 2022) that although implemented is not as focussed as our current approach.

Science Coaching Dates:

Tuesday 11th Jan 2022 - PM Y1/Y2.

Tuesday 18th Jan 2022 - PM Y3/Y4.

Tuesday 25th Feb 2022 - PM Y5/Y6.

Figure 5: 'Live' coaching cycle

- Coaching cycle arrangements agreed
- Pre-lesson coaching meeting
- Lesson taught and evidence of practice collected
- Post-lesson coaching meeting

Figure 6: Progress of coaching identified in this research project including most common evidence practices

Sharing classroom practice with a colleague	Working towards a school or department development priority	Supporting the development of a specific learning skill
Adding the quality of practice to existing practice	Supporting the learning of a specific group of pupils	Supporting a development course or scheme of work
Supporting individual or small group learning	Trying out coaching and modelling	Working towards a performance management target

Mr Hardy @MrHardy17

We have been working really hard at @parishschool1 to develop our Scientific recording and pupil independence. It was fantastic to see this put into practice today with pupils from Y1 upwards drawing tables and recording their own ideas. #ParishPride #ParishScientists

3/4 full	Low
1/2 full	Medium
1/4 full	High
Hand empty	Highly

During the coaching cycle, the Science Subject Leader and Curriculum lead explored the 'Live Modelling WalkThru' and modelled teaching and learning strategies to staff to create clarity and precision in approaches. Once fully understood, the cycle then involved all teaching staff with lesson drop ins, 1-1 reflective conversations and peer supported coaching all taking place to lead to sustained impact over time.

Submission: March 2024.



Pre-PSQM
 During PSQM
 Impact



Science Teaching: PSQM GILT.

Science teaching is strengthened and developed through:

- A.) Engagement with professional development.
- B.) Use of a range of effective teaching and learning strategies.

"Staff have really been motivated to develop their modelling with progression in mind and this has improved the recording of Science across school."
(Curriculum Leader).

Identified Action:
Implement new instructional coaching cycle in Science using WalkThrus approach.

In just a seven week period, monitoring from December 2023 illustrated that there was a clear impact of pupil independence and progression in Working Scientifically across school as a result of live modelling and using fewer, unnecessary scaffolds.

While staff explain how they feel empowered to adapt existing planning to the needs of their class ensuring high-quality pupil outcomes, SLT have also commented on the consistent use of strategies across school when visiting Science lessons. This has had the impact of developing progression in Working Scientifically, building on the work from the Science Subject Leader on slide 9 to slide 10.

Page 6.

Y3 teacher quote about the impact of coaching cycle.

Throughout the instructional coaching cycle, the focus was on effective modelling that created clear progression in 'Working Scientifically'. As a school in a partnership, we worked closely across our partner school to also develop their strategies as part of an outreach support. This ensured that our own teaching and learning pedagogy was always up-to-date and in line with current expectations.

Names: D. Molyneux
Date: November 2023
Focus: Science (Live Modelling)

Speed Coaching:

LDST

Model each stage step by step
Model how you organise messy thinking
Review the success or quality of your model
Model alternatives and further examples
Set tasks to emulate the model

Session 1: Review - Intent

Thinking about the learning goal, which practice will have the most leverage for your learners? Where are you now?
Children often struggle to complete tasks independently and templates are often used to save time. This includes drawing tables, diagrams and planning/recording for tests.

Planning stage - next steps
Build in opportunities for independent preparation from children. This will take longer but is key in order for children to 'Think Like a Scientist'. Build into Forces unit of work, lesson 2 and lesson 3.

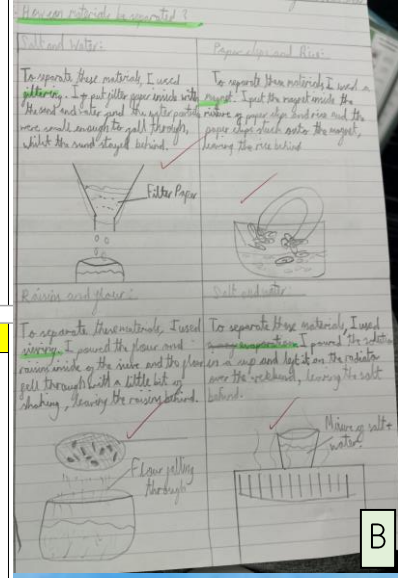
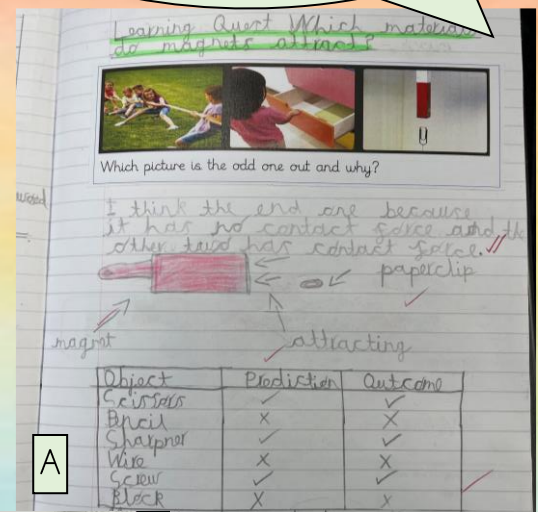
Session 2: Reflect and Refine - Implementation (Including feedback).		
Attempt	How did the WalkThru work initially?	At first, the WalkThru lacked impact as pupils were not used to drawing tables and diagrams. However, with use of scaffolds (that can eventually be removed) this got easier.
Develop	How have you developed the WalkThru?	Focus on stage 1, use of visualiser to model each stage step by step. This leads to improved outcomes and clarity.
Adapt	Is further adaptation required? Consider adaptive teaching.	Success criteria needed for step 3. This supported children to use metacognitive strategies during their preparation stage.
Practise	Which steps needs to be focussed upon further in your practice?	Narrate thinking to organise messy thinking. Will support EAL learners.
Test	How can you test the effectiveness of the strategy? What are you looking for?	Independent recording of Scientific thoughts. Clear differences in recording from different children. Fulfil progression in Working Scientifically statements.

Session 3: Repeat and Sustain - Impact

What has been the impact? How can you sustain and build on this progress?

- Children are growing in independence and are independently developing their own thoughts and ideas before recording these with less adult support. This will be my expectation moving forward.
- As the Y3 teacher, this has clearly built on the work from KS1 with clear progression when reviewing planning as part of coaching cycle. Professional development has supported my teaching practice as an ECT to deliver Science more effectively in line with our school vision for Science.

Y3 work (A) and Y5 work (B) from November 23 highlights the growing independence of learners and progression across school using Vital Vocabulary meeting Learning Quest stated above.



Submission: March 2024.

PSQM
Primary Science Quality Mark
Valid 2017-20
PSQM GILT

Pre-PSQM

During PSQM

Impact



Science teaching is strengthened and developed through:

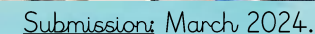
C.) Regular and safe use of up-to-date quality resources.

Once resources were ordered in the correct quantities, staff were provided with time to review medium term planning with the Science Subject Leader, ensuring that resources were accurately used to support progressive scientific enquiry across all year groups.

We have since empowered our Pupil Science Leaders to regularly review and tidy the resources. We keep a list of the resources inside the cupboard, where the Science Subject Leader can audit them three times per year.

Resources are generally not looked after or signposted clearly, making it much more difficult for teachers and children to access.
(Science Subject Leader)

£272 was spent on resources before the start of Autumn Term. A further £200 was allocated for depletion of resources throughout the year.



During PSQM

Impact

Resources had been audited in the last two years and were generally organised. Although they were still extensive, they had depleted over time and targeted investment was very much needed.



Science Teaching: PSQM GILT.

Science teaching is strengthened and developed through:
C.) Regular and safe use of up-to-date quality resources.

A key learning point from the PQSM is the sustainability of this and how it needs to be continually revisited year on year as part of the subject action plan.



Identified Action: To order new Science resources and organise for staff.

During the PQSM, staff were provided with CPD for use of resources as a component of bespoke coaching cycles (complimenting Working Scientifically Training illustrated on page 9). This was also supported by use of 'CLEAPPS' online video tutorials, which also enabled staff to develop their own confidence and Reach Out CPD (recommended as part of the PQSM process).



Photos show that resources are now well organised and easy to access.



Between the pre-teacher survey (conducted in May 2023) and the post-teacher survey (completed in December 2023), responses highlight that all teachers are now likely to use resources to supplement their teaching.

Staff also explain how they feel empowered to now want to use resources more freely as not only are they easy to access but they know that they are in working order and will support high-quality teaching and learning.

Staff explained how investment in resources has been beneficial. However, in the end of the year survey the CPD in how to use the resources was identified as the most important factor. This was particularly the case for the 4 ECTs, highlighted by the following quote below:

"Resources are clearly labelled and well-organised. Having worked alongside the Science Subject Leader, I have been able to map out exactly which resources I need for each unit of work throughout the year. Specific resources are now included on my Medium Term Planning, which makes it a great reference point"

(Year 4 Class Teacher)

During curriculum monitoring in December 23, the Science subject leader observed that the use of up-to-date quality resources led to:

- Progressive Scientific enquiry across all year groups.
- Improved teacher modelling
 - Developing pupil independence,

Please visit slide 10 for examples of monitoring.

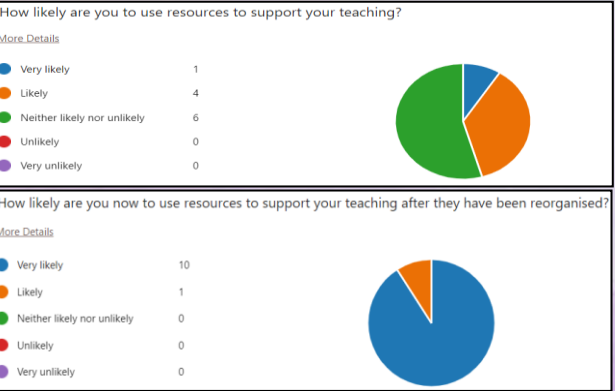
Mrs Flanders
@MrsEFlanders

We have really enjoyed completing lots of experiments in Science this half term! Can you guess what our topic was? #ParishScience @parishschool1 @MissDoddY2 @MrHardy17

Submission: March 2024.



- Pre-PSQM
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- Impact





Science Learning: PSQM GILT.

Science learning is strengthened and developed through a shared understanding of:
A.) the purposes and process of science enquiry.

Identified Action: To review progression in Scientific Enquiry across all year groups

Previously, Scientific Enquiry was not securely embedded in all year groups, which arguably stemmed from a lack of quality resources and Working Scientifically statements not being mapped out on Medium Term Planning. Due to Substantive Knowledge being an area for development in other subjects, it became clear during Science subject monitoring that staff were prioritising this; as opposed to providing children with opportunities to engage in practical Scientific Enquiry.



Subject Leader - Young Scientists Working Scientifically Training (January 2024)

Since attending the training, assessment principles have been refined (see pages 11 and 12) with a focus on 'active pupils', promoting progression in Scientific Enquiry. This has been beneficial in supporting teachers to understand the purposes and processes involved and ensure that they have a shared understanding.

By meeting with teachers to update Medium-Term Planning and ensure that Working Scientifically statements were clearly mapped out, this meant that each statement was matched to the appropriate 'Learning Question' for each lesson and that activities were progressive across year groups, providing children with the opportunity to revisit, practice and apply a wide range of Working Scientifically Skills.



Substantive Knowledge

Key 'sticky' knowledge that the children need to know



Balance

Disciplinary Knowledge

Opportunities for scientific enquiry and working scientifically.

Since attending the PSQM training sessions, the Subject Leader has reviewed all of the Science Progression documentation, with a particular focus on progression in Maths skills (please refer to slide 15). This was further supported by the recommended TAPS 'Science Skills Flower', which incorporated key strands such as prediction, observation and questioning into a quantifiable framework.

During the PSQM, the Science Subject Leader held a Staff CPD Session, which made direct links to the 'Finding the Optimum: Science Subject Report' (2023) and to define the difference between 'Substantive Knowledge' and 'Disciplinary Knowledge'. Staff were reminded about the importance of incorporating a balance within their lessons.

What is the best material for the job?

- Complete unit pre-assessment questions and glossary.
- Retrieval Activity (Brain dump of Y1 learning to review prior knowledge).
- Teaching (Introduce and explain the different key terminology and allow children to explore different objects around the classroom. Review prior learning from year 1 by showing pupils a range of objects and asking them what materials they are made of. Further the discussion by asking pupils why certain materials are used for different purposes. Encourage the use of scientific vocabulary and introduce terms they may not have met in year 1 such as reflective, transparent, opaque etc).
- Vocabulary (material, property, flexible, hard, transparent, translucent).
- Activity (Pupils to sort objects into the materials in which they are used for, considering their properties as further challenge).
- Scientific Enquiry (identifying/classifying/grouping).
- Working Scientifically (Sc2/1.4: identifying and classifying. Sc2/1.5: using their observations and ideas to suggest answers to questions).

How do you focus on the 'Working Scientifically' aspect?

Submission: March 2024.



Pre-PSQM

During PSQM

Impact



Science Learning: PSQM GILT.

Science learning is strengthened and developed through a shared understanding of:
A.) the purposes and process of science enquiry.

Identified Action: To review progression in Scientific Enquiry across all year groups

"Through meeting with the Science Subject Leader it is evident that a considerable amount of time has been spent upskilling staff knowledge of Scientific Enquiry."
(Science Link Governor)

The overall impact of staff understanding the purpose and process of Scientific Enquiry (with a secure progression across all year groups) has been a significant improvement in teaching and learning. Monitoring in the form of a book look in December 23 highlighted that children could:

- 1.) Talk more confidently about the strands of scientific enquiry.
- 2.) Use equipment/resources (organised on slide 8) with increasing independence.
- 3.) Speak positively about their enjoyment of Science learning.

With a clear progression of Scientific Enquiry in place, working walls were also now a celebration of the children's learning across the unit of work. Previously, working walls were ineffective, however, they now accentuate the process of Scientific Enquiry and provide tangible scaffolds for children to 'Think like a Scientist'. Working walls, including use of tuff trays (shown below) are also evidence of improved teacher understanding around Scientific Enquiry and how this is progressive across year groups.

Evidence of this can be seen from Teacher Tweets in May 2023 with Science Enquiry at the core of learning and staff able to justify the decisions they have made to develop science enquiry.

Parish Church of England Primary School Curriculum Monitoring		
Subject: Science	Date: December 2023	Subject Leader/Chairperson: M. Dobbie M. Hodge
Monitoring Focus: Environment, Teaching, Progress and Learning, Attitudes, Accessibility/Scaffolding/Challenges	Monitoring Methods: Book Look, Teacher Interviews, Pupil Interviews, Lesson Observations, Learning Walk, Environment Walk, Lesson Drop In, Coaching, ALL...	
Year Groups	Strengths	Developments
EYF5	The Wider Natural World - Habitat - Children could talk confidently about the learning which will clearly prepare them for future learning in KS1. Provision was engaging with purposeful use of sentence stems for adults within areas to promote age appropriate Scientific enquiry.	
Year 1	Season and Weather - Use of Posters allowed for clear links to Maths curriculum to be made. Good balance between observation and disciplinary knowledge.	
Year 2	Animals and their Needs - Working Scientifically progression accurately followed from medium term planning. Monitoring of data allowed for clear links to Maths curriculum to be made.	Share good practice of recording.
Year 3	Structure and Function of Plants - Use of observations to ensure progression in Working Scientifically strands was excellent. Effective use of teacher questioning.	Increase independence when drawing.
Year 4	Digestion Systems - use of models for observation and questioning. New resources being utilized.	Support for ECT around development of disciplinary knowledge.
Year 5	Plant Cell - Working Scientifically progression accurately followed from medium term planning. Clear progression from Y3 in recording and understanding of plant adaptation knowledge.	
Year 6	Evolution and Inheritance - Working Scientifically progression accurately followed from medium term planning with use of classification keys. Progression from exemplar of classification keys recorded in Y4 from Autumn Term.	Continue to build independence when recording - minimise use of scaffolds.

Mrs Flanders @MrsEFlanders
We have cloned plants in Science using our knowledge of asexual plant reproduction. We hope that our cuttings will produce roots, which will make a clone of the parent plant #parishschool1 #ParishScience



Mrs Atherton @MrsAtherton
The funnest and most disgusting Science activity ever! Today, our #ParishScientists were making models of the digestive system to better understand how it works #ParishPride #NurturingCuriosity



Submission: March 2024.



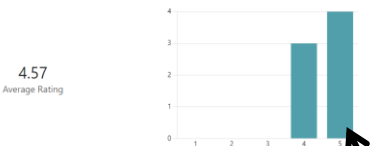
Pre-PSQM

During PSQM

Impact

2. Rate your understanding of Scientific Enquiry and how to plan it effectively into a sequence of learning.

More Details



On average, teachers now rate their understanding of Scientific Enquiry as 4.7/5, highlighting confidence in all staff around the purpose and process of Scientific Enquiry.





Science Learning: PSQM GILT.

Science learning is strengthened and developed through a shared understanding of:
B.) The purposes of science assessment and current best practice.



Identified Actions: Review assessment procedures in Science including exploration of TAPS and ensure moderation of judgements take place to ensure accuracy of assessment in Science.

Monitoring identified that the purpose of Science assessment across school was not always clear and current best practise was not always fully understood by staff. Prior to completion of the PSQM, assessment was primarily summative in nature and was purely assessing substantive knowledge. Although processes were consistent, this form of assessment meant that the purpose of assessment was purely a judgment (WT, EXP, GD) that often lacked consistency and did not impact what was being taught. A key area for improvement was also how this did not assess each child's ability to work scientifically. Finally, assessment was also not appropriate for all children - specifically some children with SEND or with English as an Additional Language, who struggled in written recording.

During PQSM, key learning was around understanding the best practice of assessment in Science by the subject leader prior to dissemination to staff. Key learning included an in-depth understanding of the TAPS framework. The two key principles of our assessment approach, underpinned by whole school processes and a secure understanding became "active pupils informing responsive teaching".

The Science Subject Leader also completed their National Professional Qualification in Leading Teaching (NPQLT) supporting the successful implementation of our assessment principles.



From in depth understanding of the TAPS framework, pre-learning tasks were redefined in all units of work in order for staff to assess children's prior knowledge at the start of a unit and subsequently inform the teaching sequence. Using resources from the 'Primary Science Teaching Trust' this was well received amongst staff and has been instrumental in making links in schema between previous units of work. With practical tasks/resource, this form of assessment has also been powerful in engaging all learners.

As a result of a deeper understanding of the TAPS framework, (see Subject Development Log 18/01/2024) clear assessment principles and guidance were created and defined in our Science curriculum handbook giving layers of guidance for teachers with examples of good practice. These were shared with staff alongside practical ideas for implementation to create consistency across school.

What are assessment procedures in science?

Across our science curriculum, a range of robust assessment procedures are in place. Informed by the TAPS Science Pyramid tool (see below), robust processes for assessment are based around the principle of 'active pupils and responsive teachers' throughout the learning sequence.

Extract taken from Science Curriculum Handbook 23/24

Consistent across all year groups (through moderation of judgements), assessment procedures support accurate recording of the Teacher Assessment Framework (TAF) in Y2 and Y6 and aim to record progress in both substantive and working scientifically statements. Our assessment procedures include:

- Practical pre-learning activities and 'Vital Vocabulary Assessment'.
- Retrieval based learning techniques every lesson with three formally evidenced per topics
- Exit tasks at the end of the unit which are practical and allow for evidence of scientific enquiry.
- Final judgement as emerging, expected or exceeding per topic, using bespoke assessment statements created from TAF.
- Assessment sheet for books and completion on assessment snapshot by class teacher
- A report generated termly by subject leader with moderation of judgements.

An example of pre-learning activity alongside the whole-class feedback sheet to ensure clear-actionable next steps for teachers.

Science Pre-Learning Whole Class Feedback Sheet

Parish Church of England Primary School

What I did & what I learned about this topic:

What Children Would Like to Know:

What Children Would Like to Know:

What Children Would Like to Know:

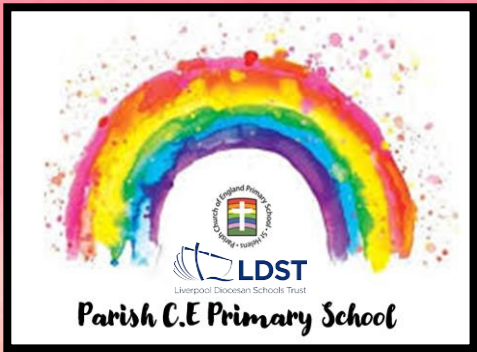
Submission: March 2024.



Pre-PSQM

During PSQM

Impact



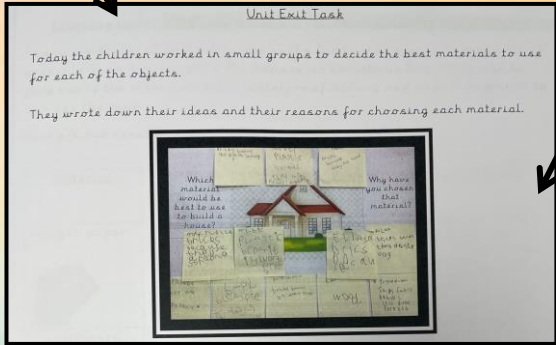
Science Learning: PSQM GILT.

Science learning is strengthened and developed through a shared understanding of:
B.) The purposes of science assessment and current best practice.

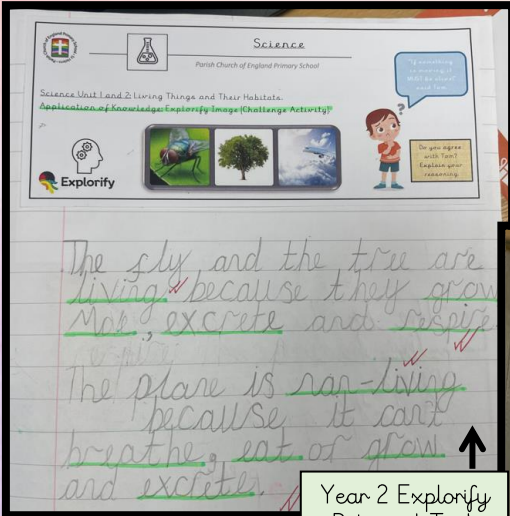
Identified Actions: Review assessment procedures in Science including exploration of TAPS and ensure moderation of judgements take place to ensure accuracy of assessment in Science.

A significant development in reviewing assessment procedures has been the quality of retrieval tasks set by teachers (previously closed activities that were purely assessing substantive knowledge). With the expectation that a retrieval task takes place each lesson, learning from the subject leader during their NPQLT allowed for successful implementation across school. Through a universal understanding of assessment principles and information provided to staff around use of resources such as Explorify (as per guidance as part of the PQSM process) retrieval activities now promote deeper Scientific understanding and are used as ongoing assessment. This ensures that pupils are active (providing pupils with opportunities to use vocabulary, observe and reason with links to other areas of learning) while teachers can then use this in depth knowledge of pupil understanding to inform the future teaching sequence.

An example of an 'Exit Task' from Y1 assessing both disciplinary and substantive knowledge.



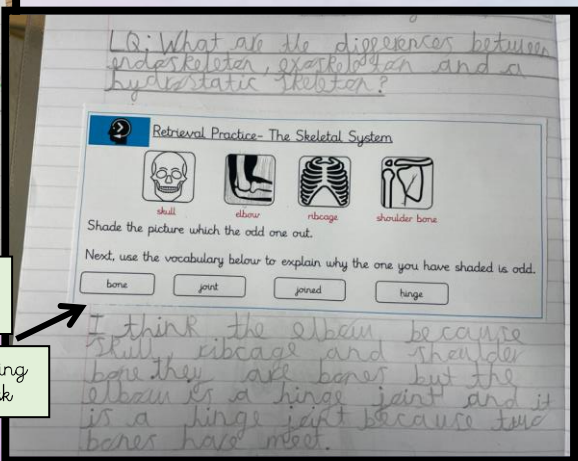
During carefully created exit tasks, teachers have been trained to observe and record discussions to formulate an accurate judgement of learning.



Year 2 Explorify Retrieval Task

Two examples here can be seen from Year 2 and Year 3 highlighting depth in pupil responses.

Teacher knowledge of a wide range of strategies to assess the ongoing development of disciplinary knowledge in addition to use of practical exit task as the end of the unit has been a significant area of impact during the PQSM. Use of poignant exit tasks (defined as a key process within our Science assessment principles) allow for application of both knowledge and skills throughout the learning journey.



Year 3 Reasoning Retrieval Task

Finally, moderation of judgements also now routinely take place at the end of each learning cycle ensuring increased accuracy of summative teacher assessment. This ensures validity and reliability of judgements as a key component of the shared understanding. This is a continued area for development post PQSM.

As an overall impact, redefining Science assessment principles and processes has informed teaching and learning and truly meant that teaching is now responsive to children's needs.

"Science is leading the way for a reactive assessment process across school and in adapting teaching through ongoing processes to meet learner's needs."
(Curriculum Leader, 2024).

Submission: March 2024.



Pre-PSQM
During PSQM
Impact



Science Learning: PSQM GILT.

Science learning is strengthened and developed through a shared understanding of:

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

During the PSQM process, many regular opportunities for parents to be involved in Science learning were created to fulfil our Vision for Science at Parish (with a "rich variety of experiences and observations" that "promoted positive attitudes to STEM.")

Specific initiatives included:

- 1.) An increased range of extra-curricular Science opportunities in school that empowered pupils to go home and discuss their learning.
- 2.) Increasing the opportunities for pupils to continue their Science learning at home.
- 3.) Inviting parents into school to take part in Science learning.

Identified Action: To further engage parents as a key stakeholder to developing all children's science capital.

Example of understanding the 'Bigger Scientific Picture' from Medium-Term planning.

Lesson 18: The Bigger Scientific Picture

Explore the name of the unit, considering the questions: 'why are we studying this unit?' and 'what are the big scientific ideas?' Explore the disciplines of Chemistry, Physics and Biology making extensive links to all areas of prior learning through retrieval opportunities, mind map creation, research and discussion.

For many years, training on staff understanding of 'Science Capital' had been very powerful and supported our delivery of the 'Bigger Scientific Picture' at the start of each unit of work. In monitoring, this was identified as a strength of teaching and allowed authentic retrieval across units of work to be made.

However, with five new teachers in the last 18 months, the subject leader believed this had become diluted and was not universally understood by all staff. This part of the unit was identified as an area that was impactful for pupils, but did not necessarily engage parents in the process of developing Science Capital.



In Science Club, we have been looking at states of matter and how liquids can sometimes be denser. We also used food colouring and fizzing tablets to understand how reactions can release gas. Our scientist of the week was Stephen Hawking. 🌈🧪 #ParishScientists @parishschool1



Our first initiative was the termly Science club. Centered upon experiments, the club explored a different diverse Scientist each week and was offered to a different age group each half-term

The club had the impact of nurturing curiosity in Science learning with links to reading. Work around stereotypes of Scientist was very poignant.

A further example of how parents were engaged was in the setting of home learning tasks. With the remit of simple experiments that utilised existing materials and object at home, these were linked to taught units of work and sent each week.

Parental feedback from the challenges was very positive with an extremely high-participation rates across school. Teachers reported improved understanding in pupil learning during lessons and pupils learning that Science is for everyone.



Lauren Aspinall @LaurenAspinall19 · Jul 6
Atticus enjoyed completing a couple of the challenges including 'scared pepper' and the 'dancing raisins' @MrsMooreParish @parishschool1



Jess Walker @JessWalker0x · Jul 4
Noah's excited to see what happens to the coins overnight! He also really enjoyed the mini tornado in a bottle. Definitely some engaging tasks for homework! @MissDoddY2 @parishschool1 #STEM #stemeducation #science



Submission: March 2024.



Pre-PSQM

During PSQM

Impact

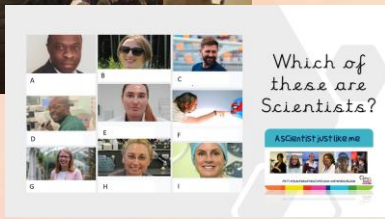


Science Learning: PSQM GILT.

Science learning is strengthened and developed through a shared understanding of:

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

Identified Action: To further engage parents as a key stakeholder to developing all children's science capital.



The final strategy for developing parental engagement was by holding a Science Coffee Morning. This was well attended with over 100 parents coming to the session which saw the vision for Science discussed alongside visiting lessons to see the learning come to life. When visiting classes, resources from a 'Scientist Just Like Me' (learning from the PQSM process) were used with a real focus on the 'Bigger Scientific Picture' as previously mentioned.

Learning from the PQSM around diversity of Scientists and eradicating stereotypes was very powerful. This was an example of the learning that took place during the Year 2 parent session.

After the session, a post event survey was provided to parents. This was really powerful in analysing the impact of the event with many parents referring to "inclusion, eradicating stereotypes and minority groups."

Miss Dodd
@MissDoddY2

Thank you to all parents/carers who attended our @parishschool1 Science Coffee Morning yesterday.

After hearing about our Science Curriculum Vision and the meaning of Science Capital, parents were able to see this in action and explore the 'Bigger Scientific Picture'.



Examples of responses to the question "What did you learn from our Science Coffee Morning?"

1	anonymous	I saw the importance of breaking down stereotypes and that Science truly is for everyone. This was done in an age appropriate way and was very informatively
2	anonymous	About the different strands of science the children will be completing
3	anonymous	How the school approaches teaching the science in 3 different sections biology, chemistry and physics.
	anonymous	I like how the school is encouraging a love of science across harder to reach demographics such as females and certain minorities
	anonymous	The link between other subjects; the focus on certain learning points; the inclusiveness "a scientist like you and me"

4. How would you describe your child's attitude to learning about Science? Do they enjoy their learning Science in school?

ID	Name	Responses
1	anonymous	My child loves Science!
2	anonymous	He loves science and often tells me about his biology lessons
3	anonymous	Very enthusiastic
4	anonymous	My child is naturally inquisitive and enjoys most science topics
5	anonymous	Absolutely she enjoys to learn science
6	anonymous	He absolutely loves science

Anecdotal parent quotes were also positive around their children's love for Science and enthusiasm to learn at home.

In order to measure the cumulative impact of the programme of events and measuring the impact upon both parents and pupils, a pupil Science Capital Survey was sent out on the 10/12/23.

Seen below, the results highlighted that 90% of children not only enjoyed their Science learning but pupils now had a better understanding of Science Capital and the importance of this to their lives. A clear impact was that 96% of children were now aware that Science is for everyone illustrating the significant impact that work around diversity and stereotypes was having across the school community.

Although extremely positive, the results highlighted that work is still to be done in reference to future careers in STEM and this has become a focus area in development of the three year working plan for Science learning and STEM links.

Science at Parish Church of England Primary School Pupil Survey Results 2023/2024			
How much do you enjoy Science at Parish?			
I enjoy my learning in Science...	A lot	Not Much	A little
Percentage of responses %	90%	5%	5%
My Learning in Science			
Science	Yes	No	Not Sure
...I know the meaning of Science Capital.	98%	10%	2%
...I think that Science is for everyone.	98%	2%	0%
...I think that Science helps me in my life.	96%	4%	0%
...I can make links to my Science learning in my everyday life.	88%	12%	0%
Our Rainbow Promises			
Does Science:	Yes	No	Not Sure
R...help you to show resilience and perseverance?	82%	5%	13%
A...develop your speaking skills?	83%	10%	7%
L...help me to decide what I want to do in the future.	85%	11%	4%
N...help me to know more and be curious?	93%	3%	4%
B...help me to be a better person/citizen?	87%	10%	3%
O...help me to know more and remember more?	92%	3%	5%
W...help me to feel healthier and safer?	80%	11%	9%

Submission: March 2024.



Pre-PSQM

During PSQM

Impact

"Previously, my choice of diagram was left to chance. Now, I fully understand what has come in the year group before me and know how to plan for this with independence in mind." (Year 1 ECT).



Science Wider Opportunities: PSQM GILT.

Science is enriched by:

A.) cross-curricular planning that links science to other areas of learning.

Identified Action: Create map of cross-curricular links throughout the Science curriculum with other subjects, including outdoor learning.

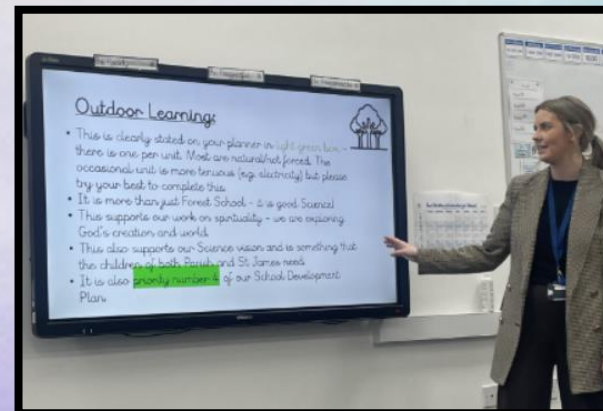
As a school community and from the revised progression in Working Scientifically, we have identified the importance of outdoor learning. This is particularly important as 82% of children in our school community stated that they have no green space at their home address.

Previously, outdoor learning was not mapped progressively across the Science curriculum. It may have taken place but was left to chance if teachers chose to do this. EYFS also used to take part in regular opportunities for outdoor learning. However, again this was not as progressive as it could have been and did not necessarily link Science to other areas of learning within 'Understanding the World.'

As a school, our commitment to cross-curricular planning that links science to other areas of learning was shown by being a priority on our school development plan for the 23/24 academic year



This was then able to be built into our vision for Science education at Parish and clearly shared with staff.

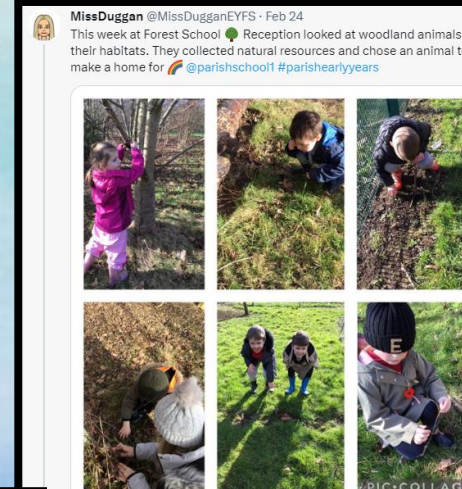


Staff meeting discussing expectations of 'Outdoor Learning' with staff (January 2024).

To ensure clear progression across the curriculum, all Science medium-term planning was updated to include one focus lesson of outdoor learning per unit of work. Created by the subject leader and curriculum leader, this truly ensured that Science linked to other areas of learning and was progressive to support children to work Scientifically. An example seen below from the Y2 Medium Term planning unit

- What do different habitats look like?
- Retrieval Activity (vocabulary game to test knowledge of vocabulary from last lesson).
 - Teaching (Review previous lessons. Explain how they are different types of habitats, explaining their features).
 - Vocabulary (habitat, environment).
 - Activity (Drawing different habitats and classifying animals that live there through fact files in addition to research themselves).
 - Scientific Enquiry (researching using secondary sources).
 - Working Scientifically (Sc2/1.4: identifying and classifying).

- What do habitats look like in the local area? What is a microhabitat? [Outdoor Learning]
- Retrieval Activity (sorting and matching activities from knowledge from lesson 1-3)
 - Teaching (Explain key concept of something that is 'micro' is on a small-scale and is different to the wider external environment).
 - Vocabulary (microhabitat).
 - Activity (Conduct an investigation into exploring some of the microhabitats on the school field. Labelling, sketching and explaining the differences).
 - Scientific Enquiry (identifying, classifying and grouping).
 - Working Scientifically (Sc2/1.2: observing closely, using simple equipment). (Sc2/1.4: identifying and classifying).



Staff training also took place for Early Years staff including one member of staff (a Level 3 LSA) being an accredited Forest School teacher.

This ensured that activities in EYFS (such as the example shown) were truly linked to Scientific learning and prepared children for the next stage of education.

Submission: March 2024.



Pre-PSQM

During PSQM

Impact



Science Wider Opportunities: PSQM GILT.

Science is enriched by:

A.) cross-curricular planning that links science to other areas of learning.

Identified Action: Create map of cross-curricular links throughout the Science curriculum with other subjects, including outdoor learning.

A final area of focus was to create authentic opportunities for Spiritual Development throughout the curriculum particularly through opportunities for outdoor learning. As a collective whole-school team, we defined spirituality in Science and provided tangible examples of how this could be lived out.

The impact of Spiritual development across the Science curriculum has been a renewed appreciation of the world around them. Much of this involved looking out in the world and ensuring as a school further links to Science could be made throughout the curriculum.

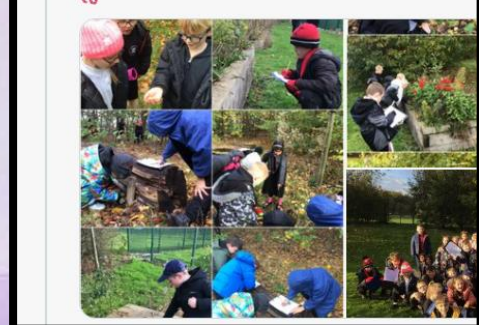
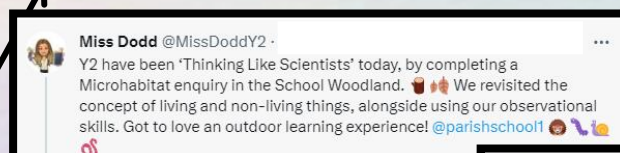
Sciences	
Mirrors (Reflection on thoughts and feelings):	<ul style="list-style-type: none"> Asking deeper questions about the meaning and purpose of life around Science. Children going on a 'QUEST' for meaning and asking relevant questions about the world around them to make sense of Scientific concepts. Thinking about life in its deepest form and making sense of this alongside Spiritual beliefs.
Windows (Looking out):	<ul style="list-style-type: none"> Delivery of the Science curriculum creating a sense of 'awe and wonder' and real curiosity about the world around us including evolution. STEM links throughout the wider curriculum providing opportunities for the 'WOWS' and 'OWS.' Outdoor Science Lessons mapped across the curriculum including use of Forest School to explore God's world.
Doors (Stepping out into the world):	<ul style="list-style-type: none"> Science being for everyone and anyone - use of a 'A Scientist Just Like Me' as part of the 'Bigger Scientific Picture' to build Science Capital. Programme of annual STEM events with a focus on conversation to be 'Agents of Change' including caring for the environment. Opportunities for purposeful 'Speak Its' across the Science curriculum for children to voice their opinions and ideas.

In a recent pupil survey around enjoyment of Science learning, one pupil stated that:

"Outdoor learning really helps me to understand the importance of Biology all around me and make sense of the world. I love outdoor learning, especially visiting the school woodland where we can get muddy!" (Year 2 pupil).



"Since the focus has taken place on outdoor learning in Science and this has been mapped out across the curriculum, students are now more routinely thinking like a Scientist and considering environmental factors to apply their learning from the classroom Undoubtedly, this is improving outcomes in Science. (Year 6 Teacher).



Example of purposeful outdoor learning taking place leaving to development of Scientific knowledge.

A clear impact of outdoor learning being mapped across the curriculum is that Science teaching is now contextualised and enables children to engage with the environment around them; something which cannot always be achieved in a classroom. This has been widely recognised by staff who have described a greater understanding in Scientific learning and diagonal connections across the curriculum.

Submission: March 2024.



Pre-PSQM

During PSQM

Impact



Science Wider Opportunities: PSQM GILT.

Science is enriched by:

B.) provision of a variety of opportunities that deepen and extend learning.

Identified Action:

Create a sustainable provision for a variety of STEM activities year-on-year in Science.

Before we undertook our programme of learning on the PQSM, we regularly celebrated one-off days such as 'World Science Day' that had the well-intentioned aim of developing Science Capital. These were very successful and in the short-term inevitably created positive attitudes to STEM subjects.

However, as a school we were uncertain of the long-term impact due to the nature of these one-off events. Nearly all of these events involved external agencies creating 'awe and wonder' which enthused pupils but did not always translate to a tangible impact past enjoyment. In the post impact report of the event, misconceptions around stereotypes continued to persist from students' responses (seen below).

"A scientist usually wears a lab coat and makes things like potions."

Year 2 pupil.

"I loved our workshop on gases! I enjoyed the different reactions we could make using the equipment and making the different bangs."

Year 4 Pupil.



Y4 and Y5 'World Science Day Workshops' from 22-23 creating a sense of awe and wonder about Science learning.



From our learning during the PQSM process, it was pivotal that our Vision for Science (now universally understood by all stakeholders throughout school) informed our sustainable provision of STEM activities and these were considered over a three-year period to develop Science capital incrementally. A significant deficit was also how parents were often not previously involved in events (thus supporting our identified action outlines on page 13 and 14).

The three key areas of deficit included activities that developed understanding of:

- The impact of Science upon the world around them.
- The 'Bigger Scientific Picture'
- Employment in Scientific Industries

There was a distinct need for this to be more sustained and purposeful to complement a wider ranging programme of events that supported retrieval of knowledge and specifically had a different intended impact per event. These regular events also seemed stagnant as they were repetitive and similar in outcomes year on year. Reflecting as a subject leader, all of the events were similar in nature and not truly authentic examples of real-life Science.

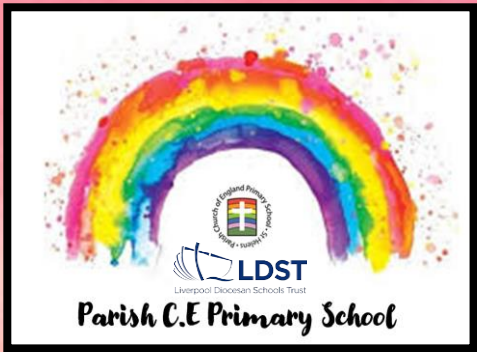
Submission: March 2024.



Pre-PSQM

During PSQM

Impact



Science Wider Opportunities: PSQM GILT.

Science is enriched by:

B.) provision of a variety of opportunities that deepen and extend learning.

Identified Action: Create a sustainable provision for a variety of STEM activities year-on-year in Science.

A significant milestone during the PQSM process was in the creation of a three-year STEM programme of events involving one event per half term. Created alongside the Curriculum Subject leader, each event was booked to fulfil one key element of our Science Vision statement and significantly had no cost implications to ensure full sustainability in times of whole school budgetary pressures..

The plan contains a wider range of more purposeful activities including their individual, actual or intended impact (as pupil and parent voice is now always obtained after each of the events).

The activities planned involve all year groups with several activities that involve parent participation and significant links to reading are regular.

STEM - Three Year Programme of Events:			
Parish Church of England Primary School			
2022/2023:			
Half-Term	Date	Event	Event Impact
Autumn 1	20 th September 2022	Most Science Assembly - Whole School for Y1-Y6.	Vision for our Science curriculum promoted with a focus on 'nurturing curiosity' as a curriculum driver and redefining of STEM learning.
Autumn 2	10 th November 2022	World Science Day 2022 - Class Workshops from the Catalyst Museum.	Workshops took place with a core focus on 'healthy eating' (as a priority on our SDP). Science capital was also developed throughout school through practical workshops creating awe and wonder that used high-quality resources.
Spring 1	Across the half-term	STEM Ambassador Visits across the half-term (including the Most the STEM Superstars).	Development of 'Science Capital' throughout school with impact of addressing stereotypes around the definition of a Scientist. Also defining Chemistry, Physics and Biology in line with our vision for a high-quality Science education.
Spring 2	10-14 th March 2023	British Science Week - Growth 2022 (Whole School events).	Science Capital development with activities to deepen and extend learning linked to current units of work.
Summer 1	W/C 15 th May 2023.	Workshops from Warrington STEM Centre with links to Computing in KS2.	Through use of high-quality resources, CPD took place for staff alongside inspiring pupils in individual workshops.
Summer 2	W/C 3 rd July 2023	Whole School STEM Week - Engineering Focus.	Throughout the week, there was a focus on Scientific enquiry in all sessions. Science Capital was also well developed with parents, reading projects, home activities and outdoor learning all part of the week. This week had a significant impact on the profile of Science at Parish. (Pre/post event whole-school survey conducted).

2023/2024:			
Half-Term	Date	Event	Intended Event Impact
Autumn 1	16 th October 2023	STEM Reading Challenge.	To provide staff with strategies that will develop all children's Science Capital through high-quality literature. Sustained impact of how to utilise existing Reading Spine texts.
Autumn 2	Across the half-term	Road to RIAT STEM Challenges - Small Piece Triads.	To continue to develop Science Capital (with relevant hands-on experiences) through activities to deepen and extend learning linked to current units of work.
Spring 1	19 th January 2024.	Parent Coffee Morning - Science Vision and Science Capital.	To ensure the school curriculum vision for Science is universally understood and to develop positive learning habits at home. Science capital to also be developed with parents being able to see the 'Bigger Scientific Picture' part of the lesson.
Spring 2	8-17 th March 2024	British Science Week 2024 - Theme of Time.	To plan cross-curricular activities that link to other areas of the curriculum retaining knowledge in the long-term memory.
Summer 1	W/C 17 th June 2024	Whole School Careers Week - STEM Focus.	To build on last year's work of addressing stereotypes and provide pupil knowledge of a wider range of STEM careers.
Summer 2	W/C 1 st July 2024.	Whole School STEM Week - Conservation Theme.	Throughout the week, a focus on Scientific enquiry in all sessions. Science Capital to be developed with more activities involving parents, reading projects (that provide opportunities to courageous advocacy), and outdoor learning (from the SDP) all part of the week. This will build on the work conducted last academic year with pre/post event whole-school survey conducted.

Learning during the PSQM course introduced the wider variety of authentic and fully funded STEM opportunities available. These included: All About STEM, STEM Centre Warrington and Reading is STEMSational. All of these programmes were free of charge and meant that money previously allocated to one-off Science events was able to be used in the investment of Science resources (seen on slide 6) to develop teaching and learning.

Mr Hardy @MrHardy17 ·
 Year 5 (soon to be Year 6) absolutely loved their #STEM week at @parishschool1 learning all about structures. 🧱

They particularly loved their visits from people in STEM Careers who explained the importance of Science Capital and their jobs!
[#ParishScientists](#) @allaboutstem

Photo 1 and Photo 2 illustrate visits from real-life Science Ambassadors breaking down community stereotypes and developing authentic Science Capital.

Mrs Flanders @MrsEFlanders
 We loved meeting the STEM superstars and learning all about their careers such as digital manufacturing manager, squadron leader and flight lieutenant in the RAF! Very inspiring for the children to learn about future jobs [#STEM](#) [#ParishScientists](#) @parishschool1

Submission: March 2024.



- Pre-PSQM
- During PSQM
- Impact



Science Wider Opportunities: PSQM GILT.

Science is enriched by:

B.) provision of a variety of opportunities that deepen and extend learning.

Identified Action: Create a sustainable provision for a variety of STEM activities year-on-year in Science.

Planning the intended impact of each event prior to its completion means that there is a provision of a variety of opportunities that truly deepen and extend learning. From pupil voice, the greatest impact has been around “employment in Scientific industries.” A commitment to using authentic real-life Scientists and ambassadors has created a real buzz within our school community and forged sustainable links in the local area. This is a further focus area post PQSM.

In our end of year Science subject survey, children were asked to answer yes or no whether they would likely to continue to STEM subjects once they left Parish. This was compared between June 2022 and July 2023

June 2022	July 2023
52%	76%

“I know now there are many jobs around here linked to STEM especially about glass production in St Helens.” (Year 2 pupil)

“The wide range of events that have taken place have really supported our learning in the classroom and raised the profile of STEM across school. Significantly, children now know much more about this and understand its importance.” (Y3 Teacher quote).

Clear links to STEM have now been made with children able to widely explain the meaning of STEM.

The vision of our Science Curriculum is for all our children to develop an age-appropriate understanding of the knowledge, methods, processes and uses of Science, through the specific disciplines of **Biology, Chemistry and Physics**. Understanding **‘The Bigger Scientific Picture’** of their learning will allow our children to develop their own understanding of the impact of Science upon the world around them and to answer deeper scientific questions - comprehending that this has implications both today and in the future. Our bespoke curriculum design promotes children’s natural curiosity and excitement of Science with a rich variety of experiences and observations, tailored to the meet the needs of our learners. As children progress through school, they will become more proficient in different types of scientific enquiry, applying their growing knowledge to work scientifically through our knowledge-enabled approach. With rich links to reading and employment in Scientific industries, Science Capital can be developed, whilst promoting positive attitudes to STEM, thus influencing aspirations for future study and employment.

Elements of the Parish ‘Vision for Science Education’ highlighted when an event each academic year has been planned to develop component.

Miss Dodd @MissDoddY2 ·
@MissODEll1 and I have had a wonderful day with the soon to be Year 2 Class. ✨ A fantastic start to our STEM week with links to engineering, architecture and buildings around the world. 🏗️🔧🏠
#ParishScientists @parishschool1 @allaboutstem

STEM Week 2023 example in the Year 2 class. Impact of:

- Rich links to Reading
- Employment in Scientific Industries.
- Attitudes for future study and employment

Miss Dodd @MissDoddY2
As part of STEM Week, Y2 had a wonderful day out to The World of Glass. 🏗️🔧 They enjoyed thinking like Engineers and took part in various workshops, including: Glass Blowing demonstrations, tunnel walks and exploring the galleries. @parishschool1 🤖 #ParishScientists 🔧

Submission: March 2024.



- Pre-PSQM
- During PSQM
- Impact

Mr Hardy @MrHardy17 · Jul 4
Our artist in residence @parishschool1 - Mr Corcoran aka @warringtonart - has been working with our 'Creation Champions' throughout the day to create our STEM-related masterpiece for display! 🏗️🔧🏠
#ParishScientists #ParishArtists

Mr Hardy @MrHardy17 · Jul 3
This morning, we launched our @parishschool1 'STEM Week' exploring what STEM means and how it links to so many different careers. 🏗️🔧
Look out for our special 'STEM Home Study tasks' coming your way this week!
#ParishHome #ParishScientists