

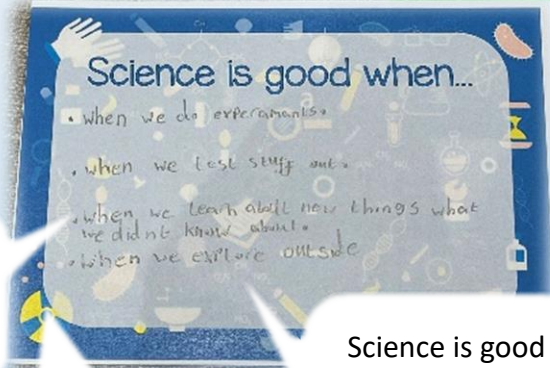
There is a clear vision for the teaching and learning of science SL A.

Before PSQM: There was no clear vision for science across school and staff and children had mixed ideas about what science looked like.

Impact: Children and staff voice were used to feed into the vision and principles.

Governors were made aware of the vision and principles during the science lead's report to governors.

Action: Science lead conducted whole school science voice- Science is good when...

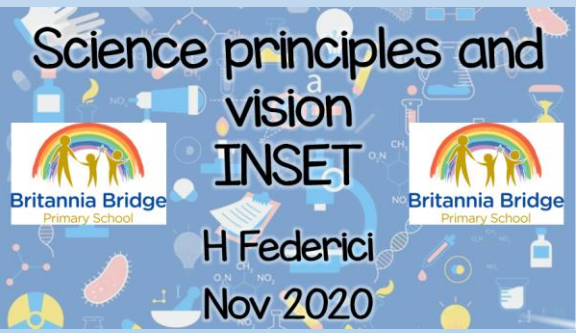


Science is good when we do experiments and test stuff out (Yr4 pupil)

Science is good when we explore outside (Yr5 pupil)

Science is good when children can be curious about the world around them. (Reception teacher)

Action: Science lead, lead INSET with staff and governors to develop and create the vision and principles for our school.



Impact: As the children worked collaboratively to create the vision they feel included in their learning and are more enthusiastic for science.

We said we wanted more practical activities and now we do lots more exciting things in science! (Yr3 pupil)

Science Vision and Principles

At Britannia Bridge, scientific enquiry sits at the heart of our science curriculum. We engage our children through stimulating, hands-on learning where pupils make links to the real world and develop a life long love of science.

- We are passionate and excited about science and are curious about the real world.
- We discuss our learning using accurate scientific vocabulary.
- We use lots of different resources inside and outside to enhance our learning through practical 'hands on' activities.
- We enjoy asking and answering questions and making decisions.
- We use a range of enquiry skills and can apply these in our learning.
- We link our experiences to the real world and where possible make cross curricular links.

It was good to work together as a staff to develop our vision and principles. (Year 2 teacher)



The vision and principles are displayed in every classroom and used to inform staff planning.

The vision and principles have been shared on our Facebook page and the website for parents and the wider community.



Next steps: Review principles, based on staff and pupil feedback and monitoring of planning.

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

Before PSQM: There was no clear vision for science across school and staff and children had mixed ideas about what science looked like.

Impact: Teaching reflects the principles. Children enjoy science lessons and are highly engaged.

We enjoy asking and answering questions and making decisions.

We are passionate and excited about science and are curious about the real world.

We use lots of different resources inside and outside to enhance our learning through practical 'hands on' activities.

We discuss our learning using accurate scientific vocabulary.

Dig Deeper
What do you know about vertebrates?

Dig deeper questions are now asked at the end of the lesson. They are based on Blooms taxonomy higher order questions.

What is the maximum size of a rock?
Where do rocks come from?
How deep does rock and soil go underground?
What do we want to find out about: Rocks + soils?
How were rocks made?
How is soil made?
Why are rocks bumpy?
Are rocks and soils important?
Are rocks water proof?
How strong is a rock?



Releasing the butterflies grown from eggs in Year 2



Year 1 craft activity relating to parts of a plant



Year 3 creating a fossil

Monday 28th February 2022
Key Knowledge: Describe the Sun, Earth and Moon as approximately spheroidal.
Working Scientifically: Identifying scientific evidence that has been used to support a scientific idea or argument.
VIV - Earth, Sun, Moon
Retrieval starter - What is cooperation?
Shape of the Earth
Flat Earth Theory
It was believed that the Earth was flat by ancient Greeks, Egyptians and Vikings. Some people think that ships and boats sail around the land and not the world. They say maps are wrong.
Spherical Earth Theory
There is more evidence the earth is spherical (ball shape) than flat. e.g. planes have flown all around the world, yet never seen the edge and there are observations of ships sailing across the horizon. It is clear from the evidence of ships sailing all over the world that the world is spherical.

Introduced VIV (very important vocabulary) to lessons. This enables children to use the correct vocabulary within their oral/written work. (Yr 5 example)

Vocabulary display in Nursery.



Reception class discussing the life cycle of a butterfly using correct vocabulary (floor book evidence)

Caterpillars start in eggs.
Lucas.
Caterpillars eat leaves.
Over.
They lay their eggs on leaves.
They grow into a big caterpillar.
Ovia.
The cocoon is outside in the bees.
Nelly.
They stay in the cocoon for two weeks.
Reenie.
A caterpillar! Kings!
Ovia.
They come out as a butterfly.
Lisa.

Each lesson starts with a big questions as a hook for the children. (Planning example)

Vocabulary: Record, tally, pictogram, total, popular, predict, result, data, colour, feet, measure, non standard.
Resources: net, unifix cubes, record sheet, name cards for children to use.
Big Question: No do you think will have bigger feet and why?

Key vocabulary for the lesson is evident in the planning and shared at the beginning of each lesson



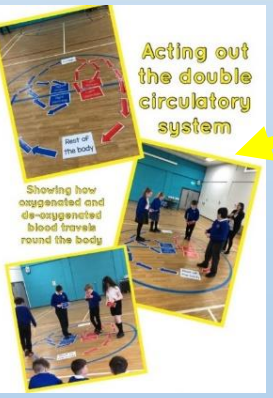
Year 3 acting out the process of pollination using correct vocabulary.



Nursery investigating magnets



Year 4 practical activity testing insulators and conductors



Acting out the double circulatory system

It was so much fun and it helped me understand the journey of blood around the circulatory system when we acted it out! (Yr 6 pupil)

Next steps: Review principles, based on staff and pupil feedback and monitoring of planning.

Year 6 acting out the journey of blood around the circulatory system



Year 5 investigating forces.

Science lead to engage with science professional development. SL B



Before PSQM: The Science Lead has not been involved in any recent CPD training and is not part of any local science networks. The development of science was not a priority and did not appear on the School Improvement Plan.

Science target on the SIP

OBJECTIVE 8 - Science Quality Mark: to ensure that our science curriculum offer is the very best that it can be for our children (to achieve standards in line/above national, through applying for the Quality Mark).						
ACTION	TIMESCALE	PERSON RESPONSIBLE	BUDGET/RESOURCE IMPLICATIONS	MONITORING (WHO BY AND HOW OFTEN)	SUCCESS CRITERIA	SEF REFERENCE
HF Apply for Award and attend INSET	TBC - cancelled due to COVID	HF	See Budget Info	SLT	Good/outstanding science curriculum and outcomes	

Impact: Science has been given a higher priority in school and the profile of science has been raised.

Science lead joined numerous online science groups. Receive newsletters sharing good practice/ resources/ events. Science lead disseminates to staff.

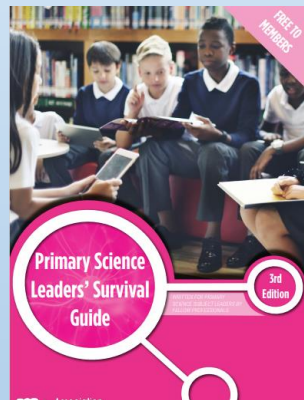
Science leader took part in various webinars/training on the PSQM repository

Action: Science leader has engaged with a huge array of professional development opportunities.

Impact: Science lead is up to date with new science developments/resources/guidance-and disseminates this to the rest of the school which in turn has led staff to have better subject knowledge and feel more confident in teaching science.



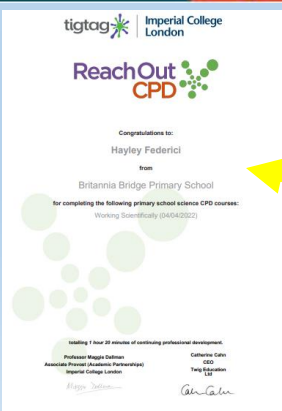
Science Lead joined ASE- reads monthly magazine- shares ideas/resources to staff in school. Staff have opportunity to read the magazine in staff room.



Science Lead uses the ASE primary science leaders survival guide as a support tool and to move science forward.



Science Lead involved in Reach out CPD to improve subject knowledge and to support teachers.



Science lead attended An inspector calls webinar- great ideas/preparation for a science deep dive.

Science lead attended online webinar-A Response to OFSTED research review- fed back main points to staff at INSET and gave out handout.



By signing up to lots of different groups allows me to keep up to date with science updates and take advantage of all the free training opportunities.
(Science Lead)

Next steps: To join/create a local science network cluster groups for science leads. To attend STEM training at the STEM centre in York.

Children are given opportunities to talk about their science teaching and learning. SL C

Before PSQM: There was no consistent regular monitoring of science with little or no pupil voice meetings/surveys/questionnaires.

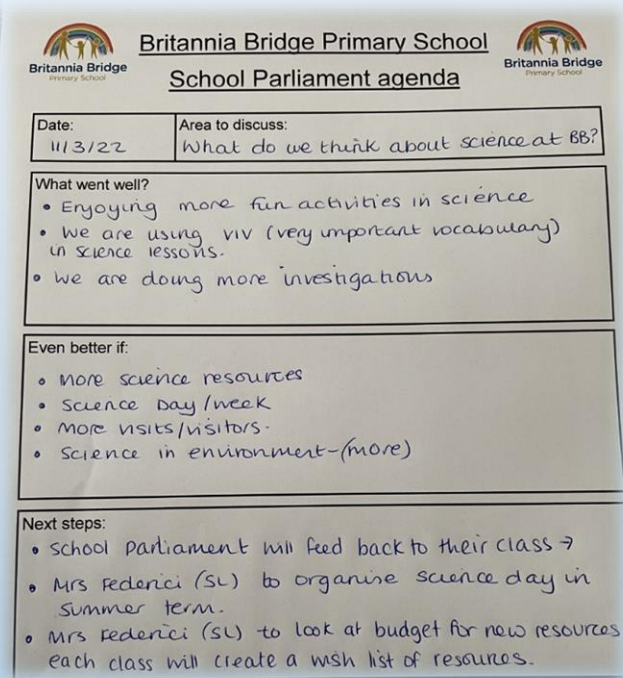
Action: Science lead incorporated children's science views and opinions into school parliament meetings.

Action: Science lead arranged regular pupil voice meetings/questionnaires through the year for reception to year 6.

Science is my favourite lesson.
I can't wait till Wednesdays!
(Yr 2 pupil)

It was great to incorporate science into the school parliament agenda. This has raised the profile of science. The children enjoyed talking about their science learning.
(School Parliament lead)

Impact: Science lead has a good understanding of children's views and opinions of science. Which has enabled several changes to be implemented based on pupil voice data.



Britannia Bridge Primary School
School Parliament agenda

Date: 11/3/22 Area to discuss: What do we think about science at BB?

What went well?

- Enjoying more fun activities in science
- We are using VIV (very important vocabulary) in science lessons.
- We are doing more investigations

Even better if:

- more science resources
- science day/week
- more visits/visitors.
- science in environment-(more)

Next steps:

- school parliament will feed back to their class →
- Mrs Federici (SL) to organise science day in summer term.
- Mrs Federici (SL) to look at budget for new resources each class will create a wish list of resources.

Questions	Pupil responses
What class are you in?	Year 4/dragonflies.
How often do you have a science lesson?	Once a week on Wednesday.
What is science/a scientist?	Someone who discovers things, and works on things to sort things out.
What do you like about science?	Working with scientific things to make things and discover things.
What's been your favourite part of science this year?	Learning all about electricity because I liked making the circuit.
How could your teacher/school improve science?	By doing more scientific things outside.
Do you work on your own or in groups in science?	It mainly depends on what your doing because we don't always have enough equipment.
What do you find hardest in science?	When we were doing electrical stuff because I was afraid I would be electrified.
Is there anything about science you do not like?	When we have to do alot of work to describe what we did.

I would like to go outside more for science.
(Yr 6 pupil)

My favourite science lesson was when we learned about fossils and made a model!
(Yr 3 pupil)

Science is amazing when we investigate things!
(Yr 4 pupil)

I love it when we go outside and look for plants and how they have changed over the year.
(Yr 1 pupil)

I don't like it when we do lots of writing in science. I prefer practical activities.
(Yr 5 pupil)

Pupil interview- children talked about what they had learnt in science and what they liked/disliked.

It was really good to talk about our science learning in the meeting. We had some great ideas for next steps.
(School Parliament member)

Impact: It is evident that children are enjoying their science lessons.



Impact: The science lead was able to see which sticky knowledge had been retained and whether children had gaps in their knowledge.

Next steps: Schedule pupil voice interviews on a half termly basis with SL, where children can discuss what they have learnt in science and bring forward any suggestions to improve science.

There is an effective monitoring and improvement cycle that informs development in science SL C.

Before PSQM: There was no regular timetabled monitoring session for science in place.

The science lead is now fully aware of strengths and weaknesses in science due to an improved monitoring cycle and completes a termly subject leader report for governors which is shared at curriculum meetings.

(Chair of Governors)

Termly science report to governors

Britannia Bridge Primary
Subject Leader Report to Governors
 Subject: Science
 Subject Leader: Hayley Federici
 Link Governor: Adele Farrell
 Date: 8th December 2021



What is working well:

- EYES**
 - Understanding of the World is incorporated in different areas of continuous provision throughout N3, N2 and reception as well as specific topics being covered in adult guided tasks.
 - There is evidence in floor books of children's work for Understanding of the World.
- Key Stage 1 and 2**
 - Science is being taught very week for the full afternoon. All teachers in Year 1-6 are using the new updated planning format with the different science skills and enquiry types to be highlighted.
 - Retrieval starters are incorporated into the beginning of each lesson.
 - Knowledge organisers are being used within lessons and are being utilised at the end of the unit for sticky knowledge quizzes.
 - Evidence of VIV being used in science books.

Even Better If:

- Incorporate more outdoor learning into science lessons
- More enrichment days/events - Science week march of 2022
- Have a science after-school club
- CPD for teaching staff - subject knowledge - see reach out cpd (online free)

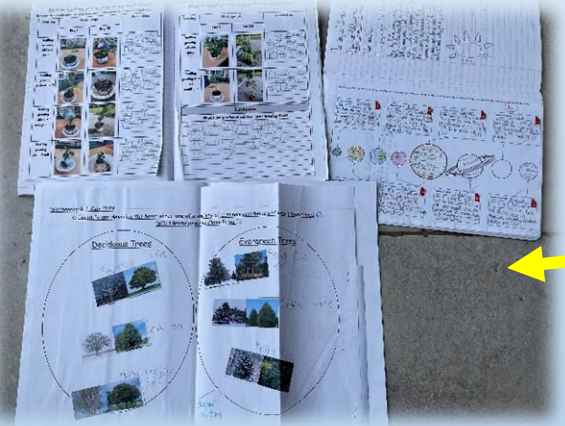
Questions	Staff responses
Which areas of science do you work on?	KS2
What is science for?	Learning about how things work / natural processes / learning about organisms / being able to understand why things happen
Why do we teach science in school?	To equip children with practical knowledge about why things happen
How often is science taught in your class?	Once a week
Do you teach science at other times?	occasional talks by other classes / in the playground / assemblies / during PE
How confident (out of 10) do you feel of teaching science?	9
What are your strengths when teaching science?	Using lots of hands on / using lots of resources / using lots of practicals
What are your areas for development when teaching science?	More time for each of the different topics / more time for the others / more resources
What CPD would you like to help address this area?	More resources / more time for each of the different topics / more time for the others / more resources
How could science be improved at school?	More resources / more time for each of the different topics / more time for the others / more resources
Is there anything you would like to do more or less of?	More resources / more time for each of the different topics / more time for the others / more resources

Science lead introduced staff voice as well as pupil voice.

Impact: Staff feel they have a voice and ownership of teaching and learning and feel more empowered to make improvements.

Science action plan reviewed regularly and updated

SUBJECT LEADERSHIP NEEDS ANALYSIS AND ASSOCIATED ACTIONS				Progress Review		
Key identified development need: (Based on self-assessment and the PSQM criteria. Add rows as required)	Action(s) to address this specific need: (You may add further actions as the year progresses)	Who? (not just the SL)	When? (month or half term)	Intended impact of actions (on children, staff, SL/governors, SL or parents/carers) and likely sources of evidence (e.g. Vision and Principles statement, Science Development Log, monitoring data, teacher planning and evaluation, pupil outcomes)	RAG rating after training 5	FINAL RAG rating
1. To establish a clear vision for science.	<ul style="list-style-type: none"> Send out 'Science is good when...' cards to all staff: TA's, Teachers, SLT, Governors. To fill in before INSET. All Reception-Year 6 fill in 'Science is good when...' (Reception, Y1 and Y2 fill in as whole class-teacher scribe response), Y3-6 individual response cards ✓ SL take all suggestions collate ready to share with staff in INSET ✓ Staff INSET - develop vision and principles as a whole school ✓ SL take all suggestions from INSET and create vision and principles - share with staff ✓ Staff share the vision and principles with their classes ✓ 	SL & all staff Teachers & pupils SL SL & staff Teacher and pupils	Aut 2 Aut 2 Aut 2 Aut 2	<ul style="list-style-type: none"> SL will have a clear understanding of staff and children's opinion on what they think is good science. Children and staff feel valued and can give their opinion of science. SL will establish what children and staff think/like/dislike about science and how this can feed into science principles and vision. Staff have ownership and a shared and common understanding of the vision and principles of science. Children are aware of the vision and principles and feel included in their learning as they worked collaboratively to create them 	<ul style="list-style-type: none"> SL has completed the vision and principles statement ✓ SL has shared the vision and principles statement with staff ✓ SL has shared the vision and principles statement with children ✓ SL has shared the vision and principles statement with governors ✓ 	



Through book monitoring- science leader realised that some children were missing science lessons due to interventions and had gaps in their learning.

Action: SL ensured that no interventions take place when it is science. All children have a full afternoon of science teaching and learning with a teacher and a teaching assistant.

Impact: All children have access to the full science curriculum with fewer gaps in their learning. There is greater emphasis on science teaching and learning and more children especially the SEN children are making more rapid progress with support from the teaching assistant.

Action: Improved long term plan with sequenced topics that build on previous knowledge.

Britannia Bridge Science Long Term Plan 2021/22

Class	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1 Bumblebees	Plants	Animals (humans)	Animals	Materials	Materials	Plants
Seasonal change and plant school locality study ongoing throughout the year						
Year 2 Seahorses	Animals inc humans	Animals inc humans	Uses of everyday materials	Living things and their habitats	Living things and their habitats	Plants
Living things and their habitat and plants ongoing throughout the year						
Year 3 Hummingbirds	Animals inc humans	Light	Forces and magnets	Rocks	Plants	Plants
Plants throughout the year						
Year 4 DragonFlies	Electricity	States of matter	States of matter	Sound	Animals inc humans	Living things and their habitats
Living things and their habitats throughout the year - naming and identifying in local environment						
Year 5 Owls	Properties and changes of material (testing)	Living things and their habitats (life cycle and reproduction of animals)	Forces	Earth and Space	Properties of changes in material (reversible/ irreversible changes)	Living things - life cycle and reproduction (plants)
Year 6 Sharks	Living things and their habitats	Electricity	Animals inc humans circulatory systems	Animals inc humans- Healthy diet and lifestyle	Evolution and inheritance	Light

Feedback to staff from learning walk

Subject Specific Deep Dive Summary
 Whole School Feedback: Following Deep Dive Monitoring

Date/s	Leader/ Subject Lead	Lead	Staff Meeting date	Feedback offered	Year Group
5/5/21	Mrs Hayley Federici	Mrs Hayley Federici			3, 4 and 6
Focus of Deep Dive (pupil group)	To get a picture of what science looks like in KS2				
Focus	Key- Action Question to ask/line of enquiry				
Planning - long/medium term	Strengths in best practice: <ul style="list-style-type: none"> The long term plan is being followed with continuity and progression between topics and year groups. Scientific vocabulary being taught is evident on the short term plans. There is a science Knowledge objective and working scientifically objective for each lesson evident on planning. 		Areas for Development/ Lines of Enquiry <ul style="list-style-type: none"> There was not enough evidence of Fair testing/Investigations in planning or children's books. Subject leader to work alongside teachers to plot the different scientific enquiry strands eg Fair testing investigations into each unit for appropriate coverage. 		
Lesson visit/ Learning walk	<ul style="list-style-type: none"> Pupils were involved in hands on activities that fostered curiosity with a mixture of independent, paired and group work seen. In some classrooms there was evidence of enrichment of learning. Use of varied scientific resources was evident. Science boards are in each classroom- with relevant vocabulary for the science unit being covered. Support staff were used effectively to support the children's learning. 		<ul style="list-style-type: none"> How can the science boards be utilised more effectively- how many children look at the board for assistance? Could the boards be more interactive and scientific vocabulary be shared each lesson on the boards? Link with Knowledge organisers? Could there be more links to working scientifically? Subject leader to discuss with teachers 		

Next steps: Continue with regular monitoring activities feeding back to staff and governors and moving science forward.

There is external and internal professional development and support for teaching staff. T A.

Before PSQM: Teaching staff had not been involved in any recent internal CPD training. There had been no external CPD for teaching staff.

Action: Science lead provided internal CPD and external CPD opportunities for teaching staff. To develop subject knowledge and teaching in science.

STEM remote lessons- support for remote learning and support to develop subject knowledge.



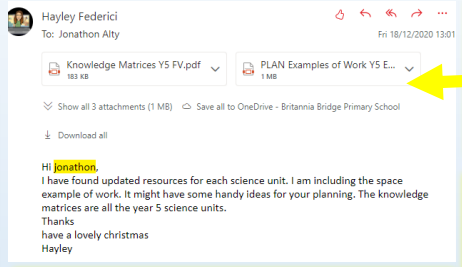
Teaching staff had training via Great Science Skills linked to science skills.

Great Science Skills Starters

Asking Questions

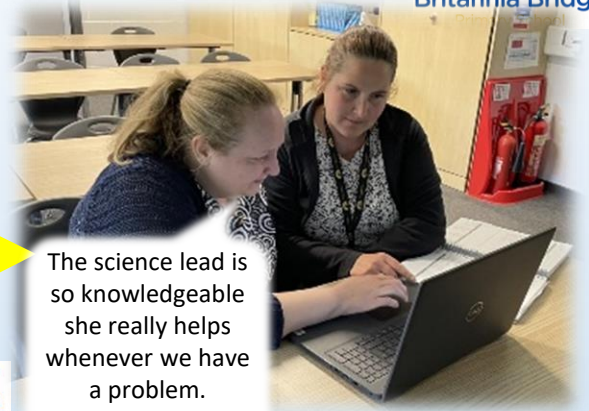
Age 5-7

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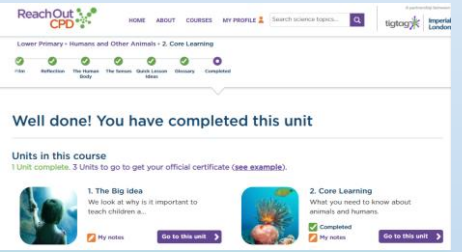
Science lead sends teachers e-mails with documents and resources that support teachers planning and assessment.

Science lead meets with teachers when needed to offer support with planning/assessment



The science lead is so knowledgeable she really helps whenever we have a problem. (Yr1 Teacher)

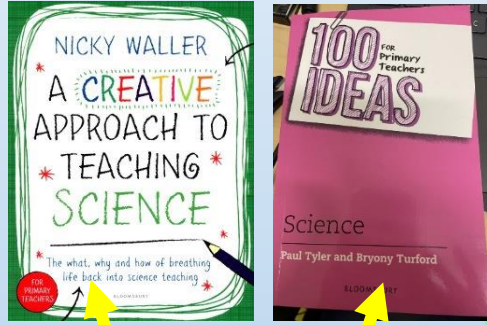
All teaching staff attended Reach Out CPD units online to support subject knowledge and ideas for planning.



Impact: Teachers feel more confident at planning and teaching science. They enjoy it more now.

Science lead found the remote learning lesson plans to support teachers during COVID.

I loved the ASE remote learning hub resources- they enabled me to plan and deliver amazing practical science lessons to children who were accessing work via remote learning. (Yr5 Teacher)



After attending online webinars- The science lead feeds back to teachers and then purchased resource books to support subject knowledge and planning ideas. Teachers to trial using an activity from each book.



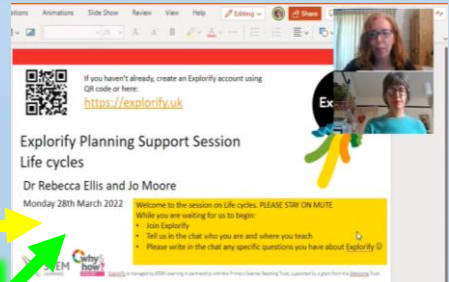
Science lead created knowledge organisers for each science unit for each year group.



Various online magazines/journals are shared with teaching staff to keep them up to date with science issues/updates.

Impact: Teachers know exactly what knowledge needs to be taught and the key vocabulary to be covered. This has enabled planning to be more detailed and correct ensuring children are being taught exactly what they should be.

All teaching staff had training via Explorify planning support session webinars.

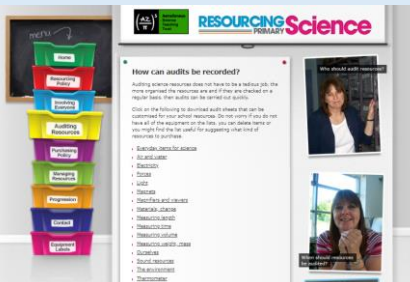


Impact: Teachers are beginning to implement Explorify resources into their teaching, ensuring practical, hands on activities which underpins our principles and values.

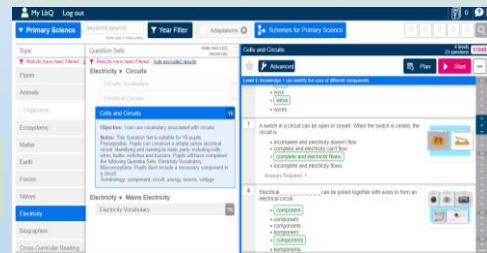
Next steps: Continue to find CPD opportunities for staff to further support and develop teaching and learning.

There are sufficient science resources which are used effectively, regularly audited, maintained and replenished T C.

Before PSQM: The science resource area has not been audited in the past 5 years. It was not well organised and some resources were outdated/needed replenishing. Teachers were not aware of what resources were available to enhance and support topics.



KS 2 teachers have access to LBQ (learning by questions) a great interactive resource for in class teaching or home learning.



Science lead took attended online PSTT CPD on auditing resources.

Before PSQM: The science resource area



Action: Science lead sorted all resources into new labelled boxes with items in and suggestions for extra/ supplementary resources to enhance learning.



15 new magnifying glasses were purchased which enables each class to have a magnifying glass per 2 people.

Impact: Teachers are aware of the resources available to them which enables them to plan and deliver high quality practical and fun lessons.



Year 3 using the new magnets as part of their investigation.



I loved using the new magnets to investigate if things were magnetic. (Yr3 pupil)

I used to dread going into the science cupboard to find resources, now it is so easy to find the resources you need. This has enabled me to spend more time planning and teaching science instead of searching for resources. (Yr 4 teacher)

Year 6 teacher used the CLEAPSS safety guidance when dissecting lambs hearts.



Impact: children are highly engaged using the resources to support their learning.

Next steps: Continue to monitor and order new resources. Ask school parliament for ideas for any new resources that they feel would benefit school.

CLEAPSS Supporting practical science, D&T and art - In schools and colleges

Looking at (dissecting) animal organs in primary schools: Health and safety aspects

This guide supports activities in which pupils make their first observations of animal organs. It is an element of cutting into the organ, which is commonly described as "dissection". The term "dissection" is therefore used in this document, but the activities do not require specialist equipment or skills.

Why do this?

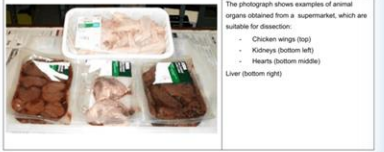
- To help pupils learn about the structure of real organs, through watching their teacher carry out a dissection.
- To help pupils develop observational skills, through investigating the dissected organ.

Context

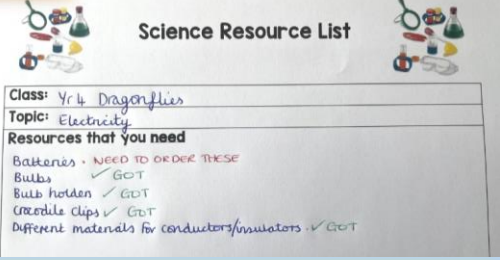
The educational value of dissections
The National Curriculum in primary schools has long included the concept of organs and organ systems. It is often difficult for pupils to relate the simplified drawings and/or simulations that are used in teaching about organs to the structures in their own bodies. Dissection gives pupils an opportunity to use their understanding to try to work out the structure and action of the real organ. The pupil's observations allow them to practice their "Working Scientifically" skills.

What can be dissected?

Any animal materials that can be bought from a butcher or supermarket can be used in school systems. It is often difficult for pupils to relate the simplified drawings and/or simulations that are used in teaching about organs to the structures in their own bodies. Dissection gives pupils an opportunity to use their understanding to try to work out the structure and action of the real organ. The pupil's observations allow them to practice their "Working Scientifically" skills.



DMITT Primary Guide to dissection. © CLEAPSS. The Gardner Building, Brunel Science Park, Kingston Lane, Uxbridge UB8 3PH Page 1 of 4 Tel: 01895 814362, Fax: 01895 814372, E-mail: science@cleapss.org.uk, Web site: www.cleapss.org.uk



Action: teachers now complete a resource list they need for their next science topic ensuring children have the correct resources to support their learning.

Children across school have opportunities to be taught science outdoors.



T C. Before PSQM: There was limited science being taught outside. There were lots of missed opportunities for outdoor science learning.

I like playing outside in the water (nursery pupil)



Nursery children investigating floating and sinking

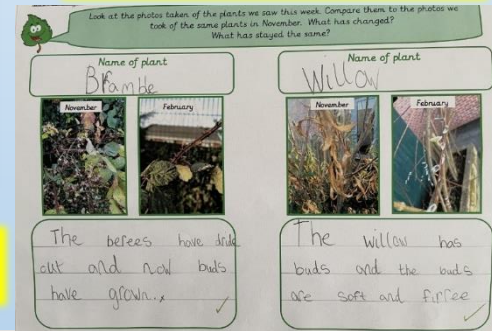


Reception investigating forces and friction.



Year 1 observation over time looking at plants throughout the year in the school environment

Example of children's science observation work (Year 1)



Year 5 investigating properties of materials.

Woodland schools leader- with plans for outdoor area.



School Parliament involved in the development of the outside learning area

Year 4 investigating states of matter with toast and the fire pit

Impact: children are being immersed in more interesting and hands on science activities outdoors- underpinning our principles and values. There are high levels of enjoyment and standards are improving.

Teachers use the book for planning ideas where outdoor learning can be incorporated ins science lessons.



It is so much more fun when we take science learning outside. (Yr5 pupil)

Teaching Primary Science Outdoors

Helen Spring
www.SpringLearning.co.uk
helen@springlearning.co.uk
@SpringLeans

#PSQM_HQ #PSQMFestival21

University of Hertfordshire UH

Science lead took part in science outdoors CPD – fed back to class teachers plotted where outdoor learning can be done in science.

Primary science enquiry outdoors

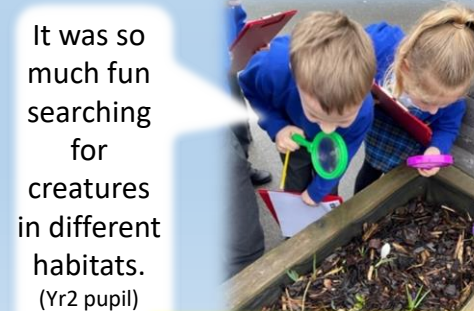
Learning outdoors: is a key part of primary science. The Teacher Assessment in Primary Science (TAPS) project has created a wide range of activities to support Working Scientifically. Many of these can take place outside and examples are listed below, with hyperlinks directly to the TAPS plan.

Age	Possible skills focus	Examples of science learning which can be done outdoors	Examples of science learning about the outdoors
Age 4-7	<ul style="list-style-type: none"> Ask questions Perform simple tests Observe closely Gather and record data to answer Qs Identify and classify 	<ul style="list-style-type: none"> How could we make the best shelter? Topic: Shelter # What happens to the car? Topic: Batteries # Which materials can we see light through? Topic: Light # Which objects do we think will float? Topic: Float & Sink # Which material made the best boat? Topic: Boats # How do we get the character out of the ice? Topic: Ice # How do we find out the best conditions for growing? Topic: We # How do we test which material is the most waterproof? Topic: Waterproof # 	<ul style="list-style-type: none"> How can we sort the things we have found? Topic: Sorting # Do all leaves look the same? Topic: Leaves # What parts does this plant have? Topic: Plants # What colours/shades can we find? Topic: Colours # What makes a plant need to keep healthy? Topic: Plants # What living things can we find nearby? Topic: Living # Is this alive? Has this ever been alive? Topic: Living # How many daisies are in each area? Topic: Daisies # Where do woodlice live? Topic: Woodlice #
Age 7-11	<ul style="list-style-type: none"> Plan different types of enquiry to answer Q Take measurements Gather, record and classify data Report findings Use results to draw simple conclusions Evaluate degree of trust in results 	<ul style="list-style-type: none"> Which kind of materials make shadows? Topic: Shadows # Which rock is the most hard-wearing? Topic: Rocks # How can we pack the egg? Topic: Eggs # Which area is hottest/coolest? Topic: Temperature # How do we find out the best conditions for growing? Topic: We # Which is the best material for the job? Topic: Champion # How can we compare our plans? Topic: Plans # How far can we make a spinner travel? Topic: Spinners # 	<ul style="list-style-type: none"> How much water do plants need? Topic: Plants # How can we help our local environment? Topic: Local # What living things can we find? Topic: Living # Making a classification key for our area. Topic: Key # <p>Plus:</p> <ul style="list-style-type: none"> Woodland Trust topic: plants and animals Growing plants topic: guide for each month of the year Dr Katherine Foray's detailed plans for ponds/bank/woodland/pond/good/pond

The full set of enquiry lesson plans can be found under the 'Focused Assessment plans' tab: <https://taps.ox.ac.uk/resources/curriculum-materials/assessment>
The majority of plans can be adapted for any age group or situation, so the above are only suggestions.

Science lead used the Primary science enquiry outdoors document from PSTT to help implement outdoor opportunities.

Next steps: To develop a science area with pond, wildlife area in to further enhance outdoor science.



Year 2 investigating animal habitats



Year 3 involved in the city of trees project

Ensure that the full range of enquiry types are embedded into all science lessons. L A.

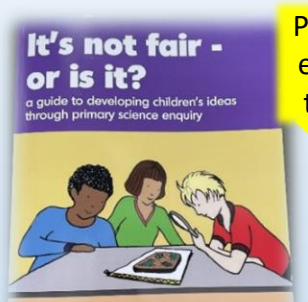
Before PSQM: Staff were not confident about teaching the 5 enquiry types and they were not embedded in all science lessons. Children were not aware of the enquiry types.

The grid has really supported me when thinking about the different enquiry types as I sometimes struggle with pattern seeking. (Yr1 teacher)

Science lead created a grid with suggested opportunities for where different enquiry types could be taught in each year group.



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



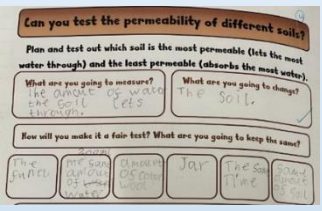
Progression skills for each enquiry type shared with teachers from the book.

Enquiry Type	Plan	Do	Review
Observation	Identify what to observe and what to change.	Look at the object/phenomenon.	Look at what has changed since you started to observe.
Pattern seeking	Look for a pattern in the data.	Record the data.	Look for a pattern in the data.
Comparison	Identify what to compare and what to change.	Compare the two things.	Look for differences between the two things.
Fair testing	Identify what to change and what to keep the same.	Change one thing and keep the others the same.	Look for differences between the two things.

Teachers use this book to support their subject knowledge of the 5 types of enquiry.



Ogden trust resources shared with big question ideas for each year group for each enquiry type.



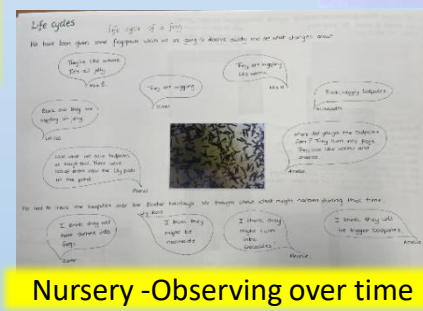
Year 3 comparison and fair testing

Enquiry Type	Living things and their habitats	Plants	Animals inc humans	Use of everyday materials
Observing over time	Yes	Yes	Yes	Yes
Pattern seeking	Yes	Yes	Yes	Yes
Comparison	Yes	Yes	Yes	Yes
Fair testing	Yes	Yes	Yes	Yes

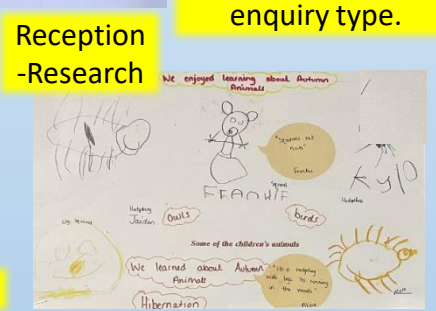
Short term planning format has the enquiry types on so teachers are aware of which enquiry they are focusing on.



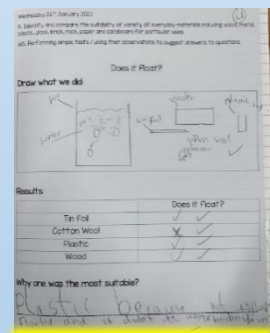
Year 1 science board with enquiry symbols on.



Nursery - Observing over time



Year 4 comparison over time



Year 2-comparison and fair testing

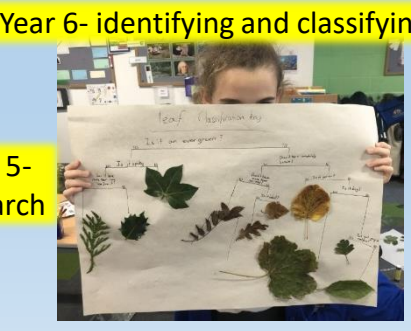
Unit:	Electricity
Date:	15/11/2021
Lesson number:	3
Teacher:	[Name]
Class:	Year 2
Topic:	Electricity

The new planning format really helps me think about which enquiry skill I will be concentrating on. (Yr4 teacher)

Impact: Teachers are more confident about the types of enquiry. Each class has a science display and the 5 enquiry skills are displayed. Teachers share with the children which enquiry skill they are concentrating on in the lesson.



Year 5- Research



Year 6- identifying and classifying

Next steps: Plan staff meetings to further support teachers subject knowledge of the enquiry types. Science lead to go on STEM training – Develop the children independently deciding their own enquiry types within investigations.

There is a shared understanding of the purpose of assessment. L B.

Before PSQM: Teachers filled a tracking sheet that the Science lead had created using assessment data at the end of each unit.

Tracking example – The tracking moves up the school with the children allowing teachers to see previous learning and fill any gaps. Teacher RAG rate the children.

Impact: Teachers are more confident at making accurate judgements of children's attainment and progress.

Year	2	Topic	Living things and their habitat
PLAN			
		Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including microhabitats. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	
		Prior learning	Future learning
		Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (Y1 - Plants). Identify and describe the basic structure of a variety of common flowering plants, including trees (Y1 - Plants). Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans). Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans). Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pigs). (Y1 - Animals, including humans). Observe changes across the four seasons. (Y1 - Seasonal changes)	Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats). Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats). Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats). Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans).

The plan Matrices are used to support planning and teaching and also used as a moderation document.

Using the plan and TAPs documents has really supported me making accurate judgements on children's attainment. (Yr2teacher)

Retrieval Starter

27th September 2021

1. Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (Y1)

Can you remember the names of these wild plants? Put a tick next to the correct name.

	Dandelion	<input type="checkbox"/>
	Bramble	<input type="checkbox"/>
	Daisy	<input type="checkbox"/>
	Bramble	<input type="checkbox"/>
	Buttercup	<input type="checkbox"/>
	Nettle	<input type="checkbox"/>
	Nettle	<input type="checkbox"/>
	Buttercup	<input type="checkbox"/>
	Clover	<input type="checkbox"/>
	Daisy	<input type="checkbox"/>
	Dandelion	<input type="checkbox"/>
	Bramble	<input type="checkbox"/>
	Dandelion	<input type="checkbox"/>
	Clover	<input type="checkbox"/>
	Buttercup	<input type="checkbox"/>

Retrieval starters have been introduced that recap on previous learning which could be from last week, last month, last year. This helps ensure sticky knowledge has been embedded. (Yr1 example)

BATH SPA

Focused Assessment of Science

Topic: Animals including humans. Year 2: April 17. Title: Ordering animal life cycles

Working Scientifically Link

Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (Y1 - Plants). Identify and describe the basic structure of a variety of common flowering plants, including trees (Y1 - Plants). Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans). Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans). Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pigs). (Y1 - Animals, including humans). Observe changes across the four seasons. (Y1 - Seasonal changes)

Conceptual Knowledge Focus

Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats). Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats). Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats). Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans).

Example

Children were asked to sort and sequence pictures for the cycles of a butterfly, tadpole, spider, human and frog. An adult sorted comments on post-it. A selection of ordering and post-its is presented below (from a mix of children - pictures do not match comments).

4 weeks
25 years
4 to 7 years

How one with black spots I have baby frog instead have frog first
Every child has a baby a spider
big frog at the end because it grows up
4 to 7 years

Children meeting the objective would be able to match the offspring and explain why they had ordered in this way e.g. "Because you eat off your runway & history so it's a baby frog, the babies come out of the eggs then they grow bigger". "Is it how they grow up and get bigger".

Example from St Mary's Primary School, Axminster

Teachers use the TAPS Focused assessment plans and resources to help make judgements on working scientifically.

Teachers use the progression sheets to see previous and future knowledge. Teachers use this for their planning and assessment.

The working scientifically progression document also shows which scientific skill is being covered to which helps teachers plan and assess.

Overview of progression in scientific knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
Plants	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (Y1 - Plants). Identify and describe the basic structure of a variety of common flowering plants, including trees (Y1 - Plants). Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans). Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans). Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pigs). (Y1 - Animals, including humans). Observe changes across the four seasons. (Y1 - Seasonal changes)	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (Y1 - Plants). Identify and describe the basic structure of a variety of common flowering plants, including trees (Y1 - Plants). 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Living things and their habitats	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (Y1 - Plants). Identify and describe the basic structure of a variety of common flowering plants, including trees (Y1 - Plants). Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans). Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans). Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pigs). (Y1 - Animals, including humans). Observe changes across the four seasons. (Y1 - Seasonal changes)	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (Y1 - Plants). Identify and describe the basic structure of a variety of common flowering plants, including trees (Y1 - Plants). 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Overview of progression in Working Scientifically Skills

Science skills icons	Asking scientific questions	Presenting results
	Asking scientific questions	Presenting results
	Planning an enquiry	Interpreting results
	Observing closely	Drawing conclusions (KS2 only)
	Taking measurements	Making predictions (KS2 only)
	Gathering and recording results	Evaluating an enquiry (KS2 only)

Impact: Children with gaps in their learning or requiring support can have intervention provided to ensure they catch up. Thus ensuring more children achieve ARE in science.

Britannia Bridge Science Assessment Summary
Whole school FSU Year 6 2020-21

Children who are meeting or above ARE	Number of children	% of children
Rec (whole class 30)	13	43%
Year 1 (whole class 29)	26	89%
Year 2 (whole class 30)	19	63%
Year 3 (whole class 30)	18	60%
Year 4 (whole class 28)	20	71%
Year 5 (whole class 31)	25	81%
Boys (50% 2021 - 50% of whole school)	25	86%
Girls (50% 2021 - 50% of whole school)	146	70%

Children who are meeting or below ARE	Number of children	% of children
Whole school (207)	146	70%
SEN (19/207 - 8% of whole school)	38	48%
FSM (83/207 - 40% of whole school)	63	68%
Boys (50% 2021 - 50% of whole school)	79	76%
Girls (103/207 - 50% of whole school)	68	66%

Children who are meeting BELOW ARE	Number of children	% of children
Rec (whole class 30)	17	57%
Year 1 (whole class 29)	3	11%
Year 2 (whole class 30)	11	37%
Year 3 (whole class 30)	12	40%
Year 4 (whole class 28)	8	29%
Year 5 (whole class 31)	6	19%
Year 6 (whole class 29)	4	14%
Whole school (207)	61	30%

Children who are meeting BELOW ARE	Number of children	% of children
Whole school (207)	61	30%
SEN (19/207 - 8% of whole school)	41	52%
FSM (83/207 - 40% of whole school)	30	34%
Boys (50% 2021 - 50% of whole school)	25	24%
Girls (103/207 - 50% of whole school)	35	34%

End of unit quizzes for each class have been produced to ensure knowledge for the unit has been retained and help make summative judgements to inform the tracking. (Yr5 example)

My Earth and Space Quiz

- 1) What is the 4th planet away from the Sun?
- 2) Why does the Sun look like it's moving across the sky during the day?
- 3) Roughly what shape are the Earth, Sun and Moon?
- 4) What is the Sun a planet?
- 5) What is a satellite?
- 6) What is the idea of the heliocentric model?
- 7) How long does it take the Earth to spin once on its axis?
- 8) How long does it take the Earth to go round the Sun once?
- 9) Describe how Earth and the other planets in our Solar System move around.
- 10) Describe where the UK is in relation to the Sun when it is night time.

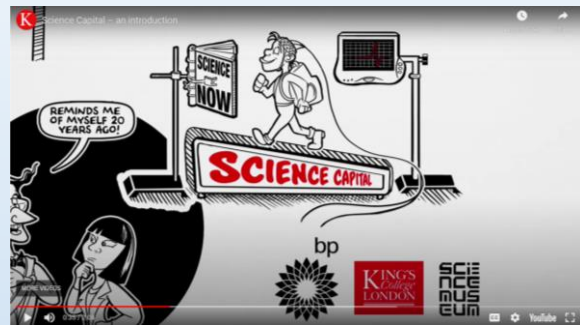
Impact: Using the data the science lead can identify areas for development/support for specific groups/classes to improve progress and attainment in science.

Next steps: To continue to develop the assessment procedure further by incorporating more formative/child led assessments.

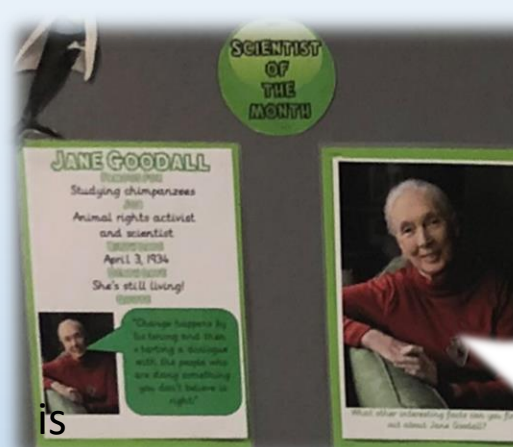
All children engage in activities in school to develop their science capital

L.C. Before PSQM: Staff and children were not familiar with the term 'science capital'. The children had low aspirations and children and parents didn't see how science was relevant to them.

Action: Science lead led staff INSET on Science capital. All staff are now aware of this and plan opportunities to enhance science capital within lessons.



I had never really thought about all the everyday jobs that use science!
(Yr2 Teacher)



Part of the whole school science display- children are set a home challenge to research and find out about a famous scientist each month.

I enjoy working with my mum at home to find out about different famous scientists and what they have done for the world.
(Yr 5 pupil)

Questions	Responses
Do you think science is important in your life now?	I think it's quite important because I learn something new everytime we do Science.
Do you think science will be important in your life in the future?	Yes, because if I got in high school I could tell people the things I have learnt.
Do you know any adults whose work or study is science related?	No not really because no body I know really enjoy Science.
Do you have any science related hobbies?	Yes, I like creating things out of science related objects.
Do you have any books like to read about science related topics at home?	Not really if I'm 100% honest.
Do you watch any science programmes on TV/Internet at home?	Yes, I watch how to make Science related explosions.
Do you visit any science centres in the holidays on the weekends?	Yes, I went to a place where you can make tiny explosions.

Science lead conducted science capital questionnaires – review these in July to measure impact of activities.

What is a SCIENTIST?
A scientist is a person who...

- discovers
- sorts
- measures
- wonders
- records
- collects
- asks questions
- experiments
- records
- invents
- observes
- classifies

A scientist is **YOU!**

I used to think scientists wore lab coats and had chemicals bubbling in test tubes. But people such as hairdressers use science in their jobs everyday!!
(Yr6 pupil)



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

Due to children having low aspirations teachers were using opportunities within science lessons to discuss what everyday jobs use science.

The Incredible Charles Darwin!

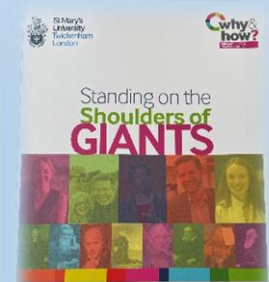
How likely you've heard of Charles Darwin? Perhaps he's been mentioned during one of your science lessons but didn't seem hugely important at the time! Well, in fact, he was an incredibly important person, whose discoveries led to the theory of evolution by natural selection and would change the world. They are still highly relevant in the modern world!

Early life and childhood
Darwin's childhood and even parents probably missed the medical man that he became. Born on the 12th February 1809, Darwin grew up in a privileged and well-connected family. They were known for their authoritarian attitudes, thus high expectations extended to Darwin and all of his siblings. His family home was located in Shrewsbury, Shropshire, where his love for nature would be ignited. His younger years were filled with exploratory walks, where he hunted for insects, plants and minerals to study in more detail and developed his interest even further.

Being nearly the youngest sibling in the family – he was 23th out of six children – he attended the Shrewsbury School for boys. At the age of thirteen, Charles demonstrated his early passion for science, he built a science laboratory in his garden shed. Initially, this pleased his father – a doctor – and Darwin was soon enrolled in a school in Edinburgh to pursue a medical career. However, a distant sibling for blood held any further advancement in this profession, he was not going to follow in his father's 'profession' or brother's footsteps. Instead, his father wanted him at Cambridge, where he studied to become a cleric – a rather different profession to a doctor, don't you think? Having successfully passed his studies, he got again changed course and decided to eventually pursue his dream of becoming a naturalist. Despite support from friends and teachers, his biggest chance was soon to be realised – an offer which stood above the rest and would catapult him into the history books!

Cross curricular reading and writing activities incorporate finding out about famous scientists which develops science capital.

Teachers use the activities within the book to plan lessons either linked to their unit of work or a stand alone lesson to find out about famous scientists



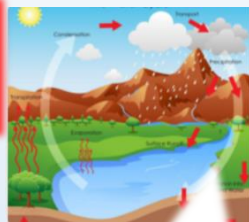
Teachers incorporate "What is a scientist?" into the beginning of each new unit of work.

An aspirations week was planned where parents and community members were going to visit school and talk about their jobs but due to COVID restrictions was postponed.

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

Ensure science is contextualised within other subjects. WO A.

Before PSQM: There were very few cross curricular links for science in other subjects. Science was seen and taught as a stand a lone subject.



Lesson 5: The water cycle in French

Through a practical activity that explains the water cycle, children use cognates and near cognates to describe the process in French, then demonstrate their understanding by drawing and labelling a diagram of the water cycle.

Impact: Children are beginning to make links between science and other subjects and link this to real life.

I could use all the things I had learnt in my science lesson about circuits to easily create a moving fairground in DT. (Yr6 pupil)

Year 2 cross curricular writing in English based on science topic.

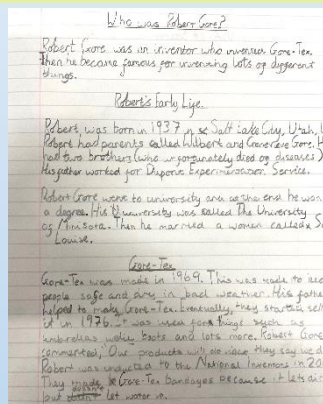
By making cross curricular links with science and other subjects enables the children to continually refer to their science learning and ensure they have sticky knowledge.

(Yr 2 teacher)

It's really cool that we can use what we have learnt in science and find out the French words as well!

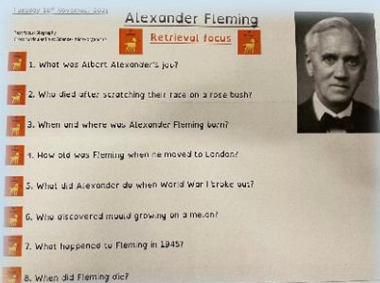
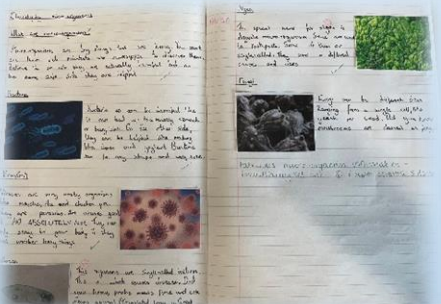
(Yr4 pupil)

Year 5 cross curricular writing – Robert Gore- linked to properties of materials.



Year 6 used the knowledge and skills gained through their science unit 'electricity' to then make a working fairground ride using electricity in DT.

Year 6 cross curricular writing on micro-organisms

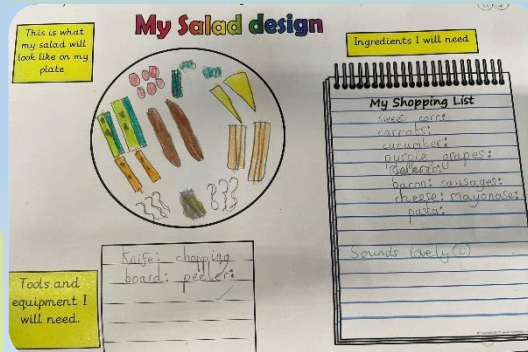


Year 6 – Reading domain work linked to Living things and their habitats unit

Year 6 creating power points within computing about famous scientists they have studied in science.



Year 3 DT topic- designing a healthy salad- linked with nutrition and healthy eating within science.



Year 3 PE lesson – Magnets-gymnastic lesson children perform repel and attract sequences.



Nursery class moving like frogs in PE linked to their Understanding of the World topic of frogs.



Year 1 creating pictograms with leaves to answer the question- What is the most popular leaf colour in our playground? Linked to science outdoor learning on seasons.



Next steps: Continue to review and incorporate cross curricular links with science.

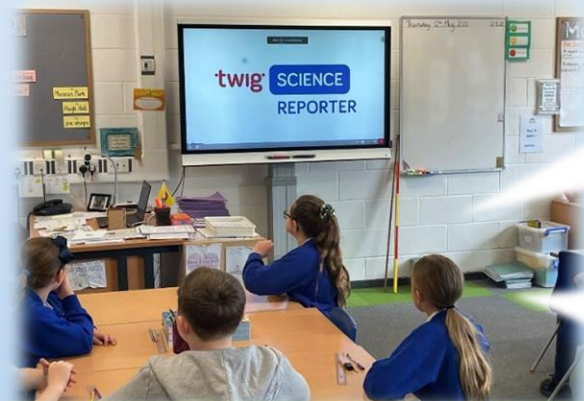
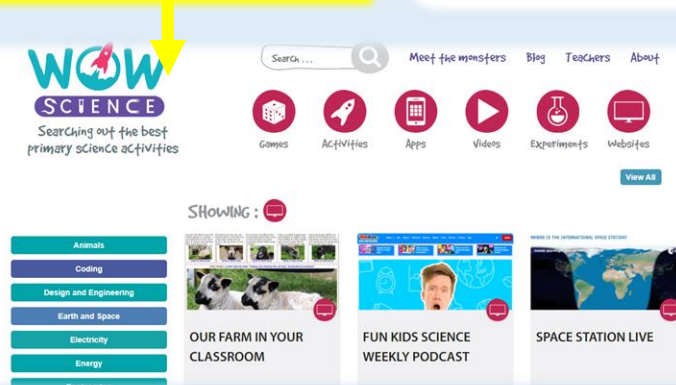
Children are aware of current issues and science in the news and link science to real life. WO B.

Before PSQM: Children were not aware of science in the news/current issues. Children did not link science to the real world.

Action: Science leader introduced Twig Reporter as part of science lessons- Teachers now start their science lesson's with the weekly Twig Reporter videos.

Science lead shares websites that children can access in school or at home with science issues/news/activities.

I can't wait to find out the next set of strange but true facts about science!
(Yr4 pupil)



I enjoy finding out about science news. I have learnt some fascinating things.
(Yr5 pupil)

My favorite part of the week is watching Twig Reporter.
(Yr4 pupil)

Year 5 watching Twig Reporter video in the weekly science lesson .

Impact: Children are much more aware of science issues and are beginning to see where science fits in the real world. Children discuss science issues they have seen on Twig Reporter within science lessons and at other times.



Parts of the whole school display. Children found out about science in the news and strange but true science facts about the world! Updated every month.



Year 4 child reading First News



Year 6 watching News



Science lead receives newsletters from various websites- disseminates/shares relevant news/issues with teachers to share with their classes.

Next steps: To continue making links with the real world and science- link with science capital.

Children have opportunities to enhance their science learning through enrichment activities. WO B.



Before PSQM: There were limited enrichment opportunities for science in school.

Dissecting hearts in Year 6- linked with the circulatory system work.

I was a bit nervous at first but it was so exciting to see all the parts of the hearts in real life!!
(Yr6 pupil)



Year 2 trip- pond dipping

We found so many creatures it was amazing!
(Yr2 pupil)

Curious Critters after school club
Years 3 & 4



Year 3 Class trip- visiting a rare breeds farm



It was amazing every week we met new creatures and got to hold them and find out about them.
(Yr3 pupil)

Hayley Federici ▶ Britannia Bridge Primary School
9 Mar · 📷

As part of our Primary Science Quality Mark (PSQM) journey I would like to build in more enrichment opportunities for children to develop their love of science. Every fortnight I will be sharing a fun activity that your child can take part in at home related to science. If you do any of the activities i would love to see photogra... See more

SCIENCE FUN AT HOME

Have some fun at home with these science activities from Science Sparks and the Primary Science Teaching Trust

TRIAL THIS INDOORS... MAKE A SPINNER

TRIAL THIS OUTDOORS...

WHAT DO YOU NOTICE?

WHAT IS THE SCIENCE?

MORE ACTIVITIES YOU COULD TRY

Science at home activity shared on school Facebook

Hayley Federici ▶ Britannia Bridge Primary School
9 Mar · 📷

Adele Farrell

Leah and Wesley have both done the activity this morning we used paper, card, tissue paper, made difference sizes of spinners and used the target inside and outside 😊 both have loved doing the activity xxx

Year 2 & 3 Parent comment on Facebook about home science activity

Year 1 Science Home Challenge

In Science, Bumblebee class have been looking at plants and trees this half term. With a grown up, find some trees and see if you can work out the name of the tree by using the leaf i.d. sheet to help. (I've enclosed green and autumn leaves) There is also a really good free app that you can ask your grown up to download from the woodland trust that helps with tree identification. Collect your leaves and see if you can write a label for the tree that they belong to. Either stick the leaves onto the piece of paper or get your grown up to take a photo of your leaves with your labels and email it to me at - hayley.federici@britanniabridge.co.uk

Enjoy! Happy leaf hunting!

Year 1 home challenge over the holidays to complete with parents



Year 1 children have magazines to read at lunch times

Impact: Due to COVID restrictions there has been very limited enrichment activities within school. Now restrictions have been lifted more enrichment activities have been planned. Where activities have taken place, children have showed great enjoyment and curiosity for science.

Next steps: To plan more enrichment activities for all year groups- Whole school Science day planned for Summer term and science club postponed to Autumn term.