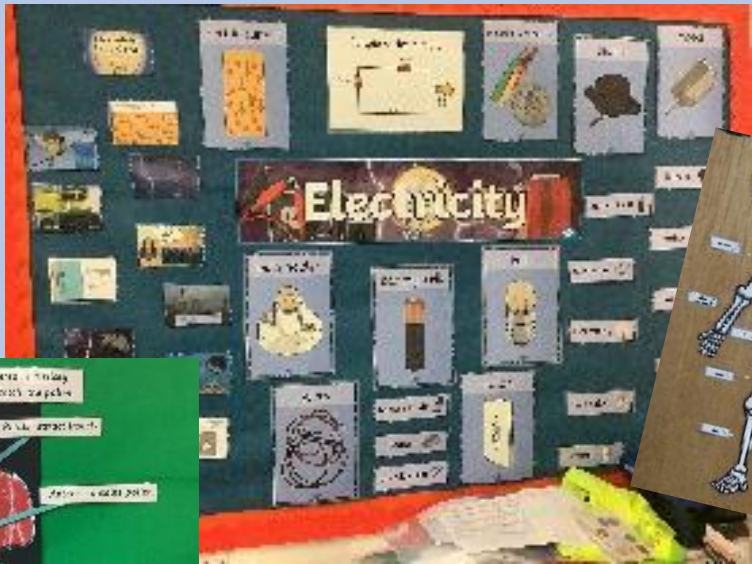


We are absolutely thrilled that Treloweth School has been awarded the Primary Science Quality Mark.

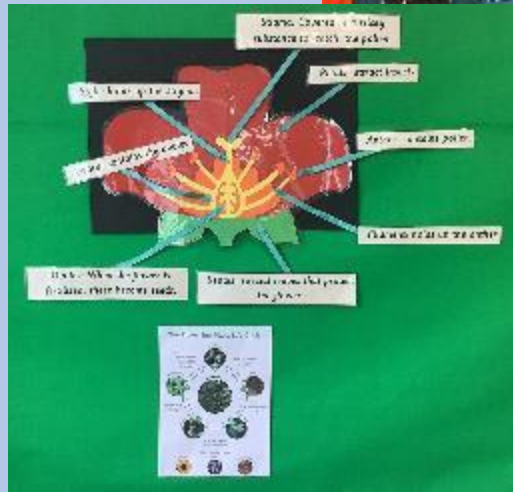
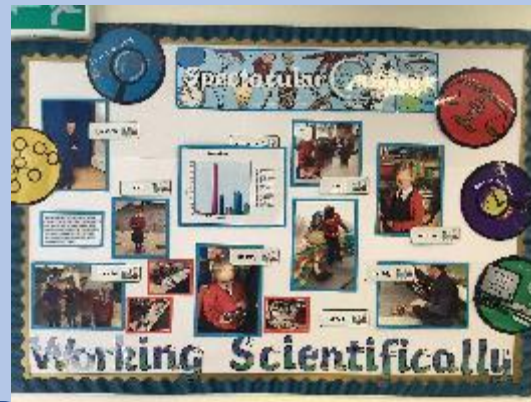
The Primary School Quality Mark programme enables schools to work together to share good practice and is supported by professional development led by local experts. It encourages teacher autonomy and innovation while at the same time offering a clear framework for development in science subject leadership, teaching and learning. Schools that achieve PSQM demonstrate commitment and expertise in science teaching and leadership.

The Primary Science Quality Mark is led by the University of Hertfordshire, School of Education in collaboration with the Primary Science Teaching Trust. Jane Turner, PSQM National Director said: "Gaining a Primary Science Quality Mark is a significant achievement for a school. The profile and quality of science teaching and learning in each awarded school is very high. Children are engaging with great science both in and outside the classroom, developing positive attitudes towards science as well as secure scientific understanding and skills. Science subject leaders, their colleagues, head teachers, children, parents and governors should be very proud."

Please explore this section of the website to see what science looks like at Treloweth School.



"If I get stuck, I use the 5 B's; brain, book, board, buddy, boss" Y2 child



Every class has a science working wall which has helped staff and children focus on vocabulary. Vocabulary is now spelt correctly in books.

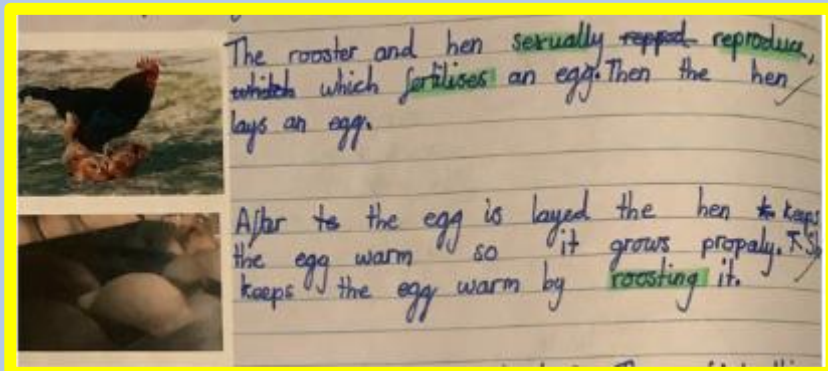
"I'm already noticing children approach questions with an idea of what enquiry we will use. In our skeletons lesson, the children were able to identify that they would need to carry out some research to find more living things with an exoskeleton" Mrs Hicks

"The displays help me spell the science words and remind us about things we have done already" Y5 child.

Teachers highlight the learning and vocabulary in green to reinforce the learning and to help children recap in subsequent lessons. Our focus on vocabulary has created outcomes that also provide evidence for assessment.

Our working walls now provide the models, images and vocabulary that the children are expected to use in lessons.

Impact: Adding expected vocabulary to the planning for teachers has helped to ensure vocabulary progresses through the school. The impact of this focus is now clear in lesson slides and evident in children's books.



In the main corridor, we have a display that shows the result of the school's focus on enquiries and actions towards our vision. Children, governors and visitors can see the value we place in our principles and see work and photos that reflect this.

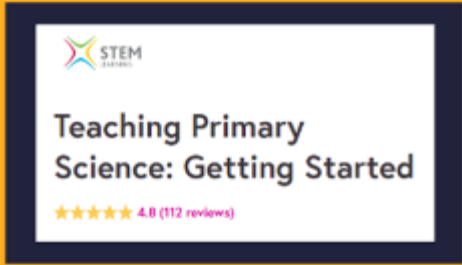
Seek focused CPD ,activities for the subject lead.



Being a part of communities online, and joining local support groups like Cornwall Primary Science Share, has opened up further opportunities for CPD. Such as the STEM learning subject leader course and CPD for our ECT's through Plymouth Science.

“Before the new curriculum was in place, we weren’t sure if we were pitching the work at the right level for Year 4. Having the CPD and the curriculum in place helps us focus the planning on what needs to be taught” Mr Humberstone Y4

CPD and support



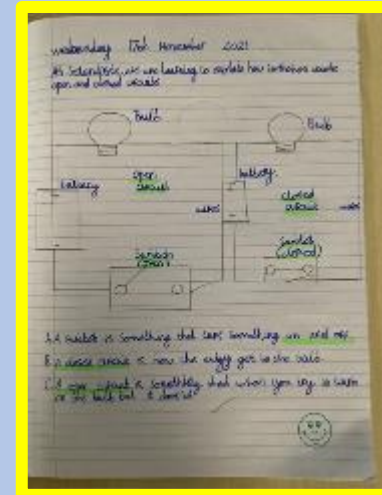
Developing pupil led investigations – embedding working scientifically in the primary classroom
PM298 Starting with enquiry
1st March 2022
Michael Kimber @kimberteaches

Impact: Carrying out an intensive programme of CPD has meant that the subject lead has been able to write the school’s curriculum and upskill other teachers subject knowledge through regular staff meetings. Seeking CPD through high quality sources has helped shape the actions needed to meet the needs identified in the school’s action plan.

Reading quality resources such as ‘It’s Not Fair’ and PLAN resources has helped shape our curriculum and given the science lead a better understanding of the progression of working scientifically skills.

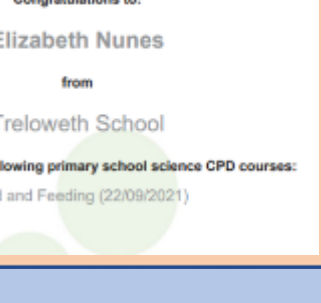
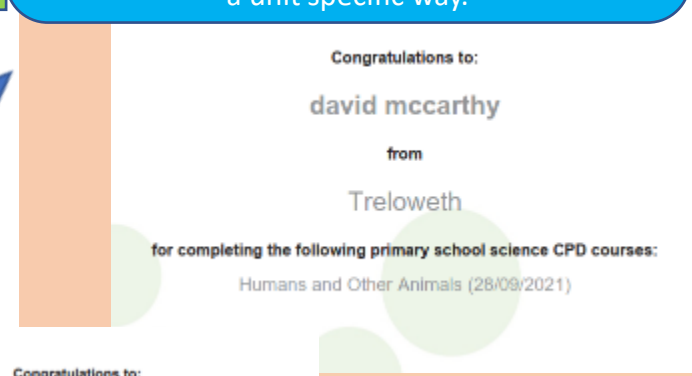


To ensure classes have regular opportunities to ‘observe over time’ the science lead implemented ideas from PLAN and ‘It’s not Fair’ directly into the curriculum . E.g. observing bacteria growing on bread.



Ensure teachers use a range of effective strategies for teaching science which challenge and support the learning needs of all children.

Staff feedback showed that the teachers are confident in their own subject knowledge but needed support to identify what their children needed to know and what vocabulary to use. Reachout CPD was chosen to upskill teachers in a unit specific way.

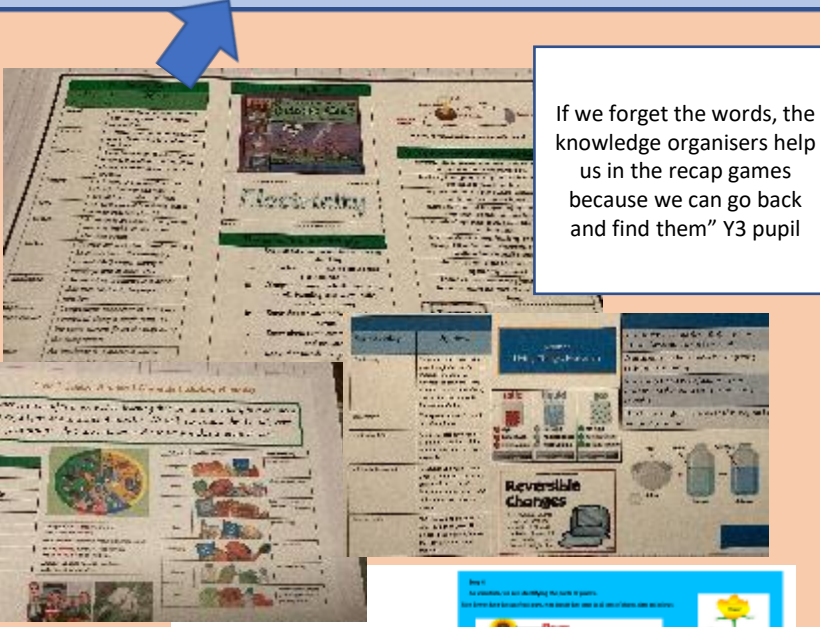


First the subject leader identified a good source for CPD: Teachers are now given time in staff meetings to complete Reachout CPD units to prepare for upcoming teaching.

"I like that the CPD is focused on what we have to teach for that year and gives us practical ideas for lessons"
Mrs Nunes Y3

"Having vocabulary in the planning document has helped me understand what to have in the lesson plans and the science display. I feel like there is less to teach now, but what we are teaching is becoming more impactful."
Mr Nedeljko Y5

Impact: Lessons are now focused on key vocabulary and the teachers understand the specific vocabulary to teach. This is now evident in all year groups and teachers are now responding to the use of this vocabulary using a green highlighter.

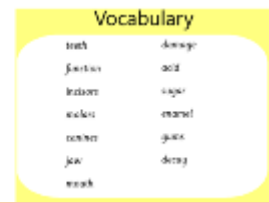


If we forget the words, the knowledge organisers help us in the recap games because we can go back and find them" Y3 pupil

Vocabulary is signposted in the curriculum, units and individual lessons to help teachers plan their lessons.

Unit Vocabulary	nutrition, protein, carbohydrate, minerals, vitamins, fats, sugars, balanced, diet, skeleton, skull, spine, ribcage, pelvis, femur, calcium, muscle, contract, relax, reflex, brain, heart, lungs, stomach, kidneys.	light, dark, reflected, shadow, transparent, opaque, direction, light travels, translucent, shortest, longest, highest, object, material, light source, sun, night, day, absence of light, opaque, shiny, matt, surface, mirror, sunlight, dangerous, SPF stands for Sun Protection Factor, UVA and UVB radiation	fossil, rock, soil, igneous, sedimentary, metamorphic, layers, natural, artefacts, preserved, fossil, erosion, organic matter, stone, pebble, boulder, grain, crystals, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil	air, nutrients, soil, transported, life cycle, pollination, seed formation, seed dispersal, fertiliser/food, structure.	air, nutrients, soil, transported, life cycle, formation, seed dispersal, fertiliser/food, structure.	magnetic materials. push, pull, twist, force, fast, slow, slows down, material, surface, magnet, attracts, repels, magnetic material, magnetism, non-magnetic material, metal, non-metal, strength, north pole, south pole, repel, bar magnet, ring magnet, button magnet, horseshoe magnet, metal, iron, steel, poles, north pole, south pole
Developable	Some children may think:	Some children may think:	Some children may think:	Some children may think:	Some children may think:	Some children may think:

Staff now use the vocabulary for display, lessons starters and for knowledge organisers. These slides are taken directly from teacher's lessons slides.



Create opportunities, such as fieldwork, for children to work outside of the classroom.

To provide our year 2 class with a better understanding of microhabitats, we planned a lesson where the children took things from the school's local environment to be able to show them that micro habitats are on their doorstep! After introducing woodlice, they were able to observe what habitats the woodlice preferred.

Taking saltwater, rocks and sand from our local beach, the children chose ways to separate materials. We wanted to show the children that when we talk about 'materials', this doesn't just mean manmade materials. Materials are all around us. Here the children are using our new microscopes to view the salt that was left after the water evaporated in the window of the classroom.



"My favourite lesson was looking at the salt crystals through the microscope"
Where did the salt come from?
"We left the saltwater in the window and the water evaporated" Y5 pupil



By downloading a datalogging app onto the school iPads, we were able to plan a lesson from Y3 which involved them exploring the whole school to take light readings. Using the equipment and investigating different areas helps the children understand that there are a variety of light sources around us.



Using the school grounds to take soil samples brings to life a topic that was typically done through diagrams and videos. It was powerful for children to see all of the components of soil samples taken from under the ground they tread on every day.

Providing more outdoor lessons has provided so many benefits: Children have been engaged, they have seen the whole school environment as a place of enquiry, and it has been essential for wellbeing during a time in which children have been confined to one classroom for much of the day.



Through our curriculum, we now have planned opportunities for field work across the year. Alongside this, year groups are given regular opportunities to use scientific equipment such as microscopes and data loggers.

Ensure children have opportunities to use different enquiry types that help them understand the world around them.

The 'Crofty small steps documents' map the order and knowledge that should be taught in sequence to reach the national curriculum end point.

Year 2 Plants					
Steps to knowing...			Working scientifically	End Point – NC statement	
What is a seed/ bulb?	What does a seed/bulb need to start growing (germinate)?	Which parts of the plant grow first?	Is this process different for different plants (seeds/ bulbs)?	How does a plant change as it grows?	
I know that plants make seeds to grow into new plants.			Observe and record with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb.	Observe similar plants at different stages of growth.	Observe and describe how seeds and bulbs grow into mature plants

"I look forward to planning and teaching science as the planning is all there for us and the lessons are engaging for the children" Year 1 teacher Mrs Ishmael

'The science lead has been thoughtful and diligent in his approach to developing science teaching and learning in the school. Having conducted an audit and benchmarking activity he has reviewed the curriculum to ensure not only national curriculum compliance but also judiciously sequenced small steps. Documentation has been produced to support staff in not only developing their subject expertise and planning but also to help with workload in the long run. Staff CPD has been high on the agenda'

Justine Hocking- Ofsted Consultant



Year 1
Year 1 have really enjoyed campfire cooking. This week we have cooked our own popcorn. They loved hearing the corn pop on the campfire and it tasted even better than bought popcorn. Then we went on a bug hunt in the wildlife garden, they loved identifying all the different minibeasts. Children's wellbeing is so important!

As scientists, we are identifying the male and female reproductive parts of flowers.

Evidence
(Identify and Classify)

Plant dissection using a microscope and magnifying glass. Children name pollen as male sex cells and eggs. Pollen lands on this bit and fertilises the eggs.

Children label diagram and answer the question 'How can a plant reproduce?'

Children can refer to both asexual and sexual reproduction to demonstrate knowledge towards the end point statement. EP2

Living Things	Animals including Humans	Properties and changes of materials
Reactivate Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)	Reactivate Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)	Reactivate Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)

Possible misconceptions	Some children may think:
	<ul style="list-style-type: none"> all plants start out as seeds all plants have flowers plants that grow from bulbs do not have seeds only birds lay eggs.

Lessons have been planned ensuring teachers are giving opportunities for all enquiry types. Guidance is given to teachers regarding resources and evidence.

'Reactivate' signposts teachers to the previous learning the children would have encountered in previous years, this helps teachers focus their recap starters.

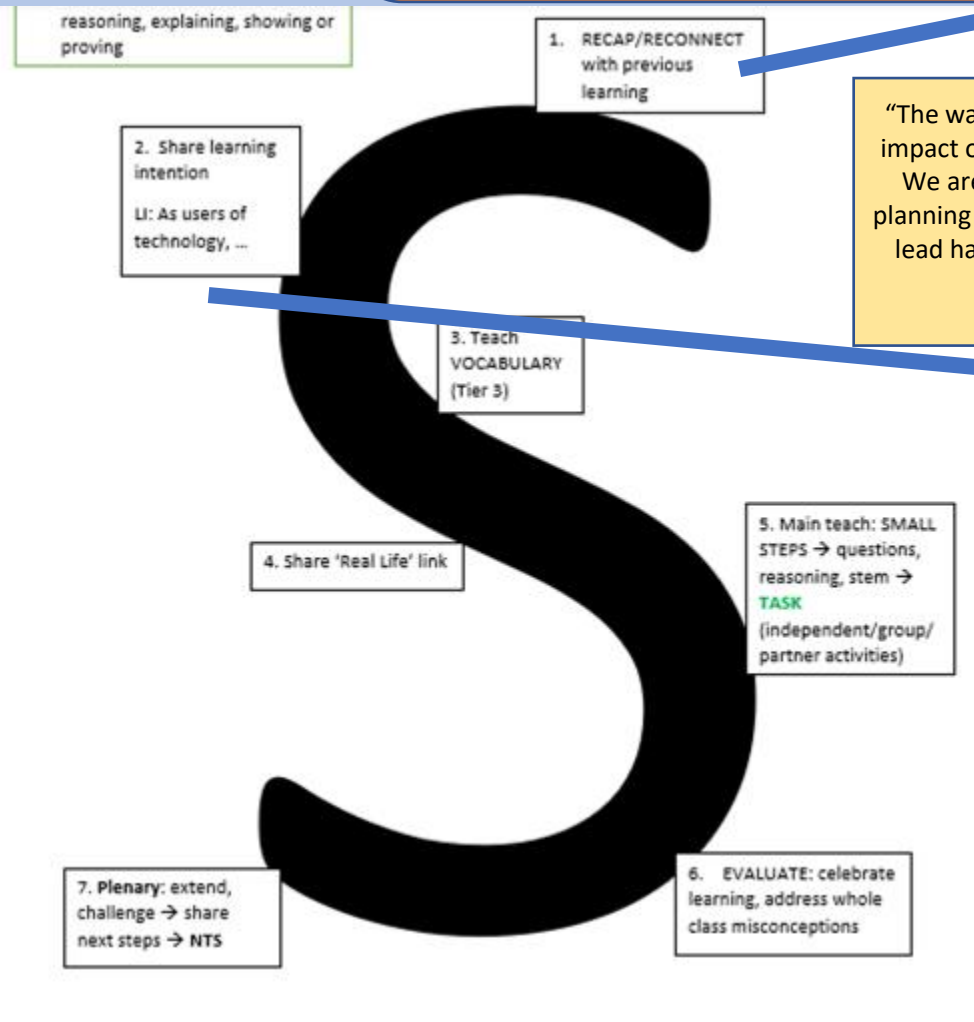
We have used the PLAN misconceptions in our curriculum for staff to reference and use when planning and teaching.

Impact of this process is evident in all facets of our monitoring. Books now feature all enquiry types, the newsletter in consistently referring to the ambitious lessons that teachers are implementing and our curriculum has been praised externally through the school's Ofsted consultant.

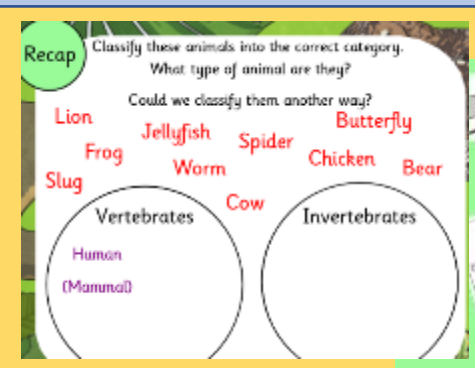
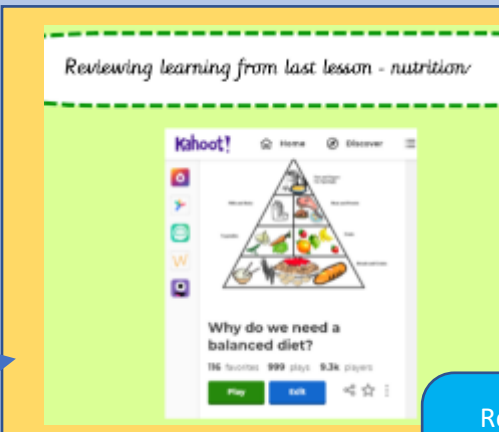


Ensure children have opportunities to use different enquiry types that help them understand the world around them.

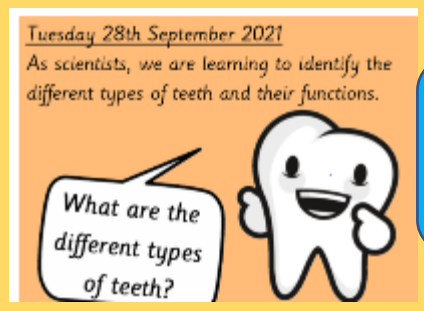
To help staff use the new curriculum plans and to implement our shared vision, we have created an 'S plan' to aid planning and the delivery of lessons. This has now been implemented in all curriculum subjects.



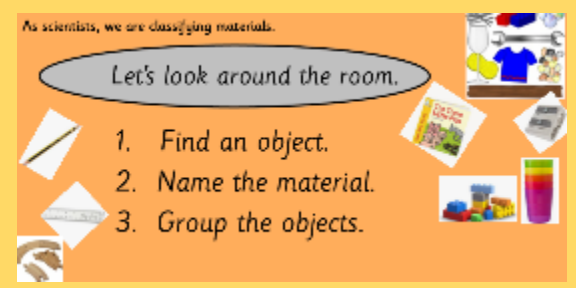
"The way science is planned has had an impact on all of our curriculum subjects. We are now implementing the same planning across each subject. Our science lead has given CPD to staff to support them in this"
Kim Rogers (Deputy Head)



Reactivate slides are planned in all lessons to cover prior knowledge. This is done through activities such as sorting, classifying and Kahoot quizzes.



We have planned learning intentions that begin with 'As scientists' to help children see themselves as scientists and pick out the skills they need to use. The learning objectives and introductions refer to both the substantive and disciplinary knowledge of the lessons.



Ensure children have opportunities to use different enquiry types that help them understand the world around them.



Year 6

This week, in Science, year 6 were studying Charles Darwin's theory of natural selection and evolution. We carried out an investigation where each child was given a different tool to represent the beak of a bird (like the finches that Darwin studied). If the 'bird' could not get enough food, they would die; if they did manage to feed, they would pass this characteristic on to their offspring.

Year 3

This week in Science, Year 3 were learning to observe and identify the contents of soil. We learned that soil is made up of tiny particles of rock, dead and decaying plants and animals, air and water. So that we could observe soil closely, we dug a sample and placed it in a clear container. We looked at it using magnifying glasses and described what we could see. We then added water and observed the changes before drawing and labelling a diagram of the layers.

The main activities and evidence have been planned for staff to ensure working scientifically skills are integrated with key knowledge. There is a focus on group work and working outdoors.

Year 2

This week, we have been looking at the habitat boxes and writing conclusions from our findings. Unbelievably, all the minibeasts chose the mud. Why do you think that?

Year 1

Year 1 have explored natural and man-made materials in Science this week. We went on a nature walk around the school grounds to collect natural materials, then the children created their own art collages.

Red question: Draw a Venn diagram to compare the life cycles of a butterfly and a mouse.

Butterfly
Lays eggs but it is still a larva. Crawls into a cocoon. Lives in a cocoon. They produce with both legs on land. They both eat both things in the egg.

Mouse
Lays nest. Cat gets into a bird. Sometimes they don't produce with both legs on land. They both eat both things in the egg.

"Science is a tricky lesson but fun! I like red questions because I like a challenge" Y3 Child

What's going on?

Red Question: It's what you see from the moon. Half is dark and half is light because the sun is shining on one side.

Extensions and challenges are given in the form of 'red questions' which are focused on the learning but challenge the children to apply their science knowledge to a problem-solving question. Often these questions have a real-life context.

Red question: In some parts of the world, people are even using... Why do you think that?

Red question: How do you think...?



Bringing living things into the classroom has raised the profile of the subject and exposes the children to things they wouldn't otherwise experience. E.g. spider crabs, tadpoles, chicks hatching.



"My favourite lesson is when we made the digestion system and made the food go down the oesophagus"
Y4 pupil



Left: Millie's brainstorm on the learning she has remembered from the unit on lifecycles.
Below: Year 2's class display to present their learning about minibeasts.

We believe, through our vision and principles, that we need to provide children with opportunities to talk and explain their science in meaningful ways. We try to do this by bringing science into the classroom.



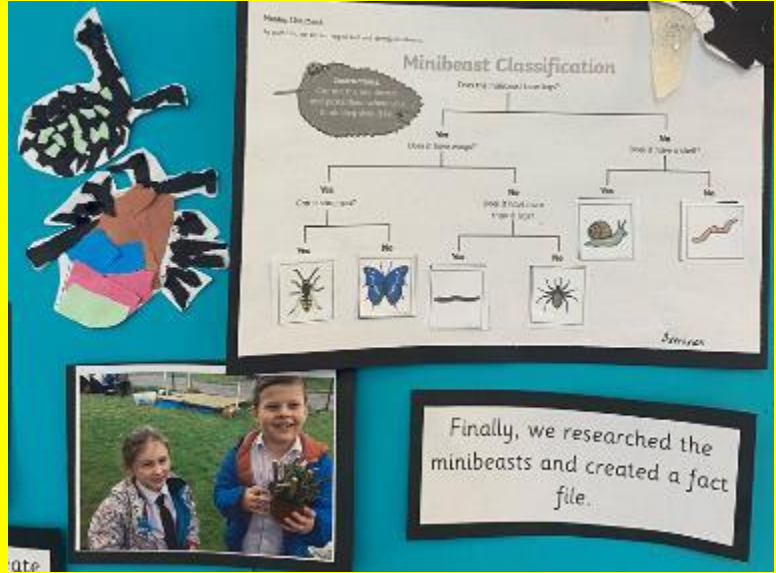
"We had to see which chamber the woodlice would go in, I thought it would go in with the sticks and leaves and I was right"
Y2 pupil



Children regularly stop the science lead in the corridor to update him on the caterpillars or tadpoles. It features on Class Dojo and in the newsletter; providing lots of opportunities to reinforce the learning of lifecycles!



Using coloured water in year 3 to show the transportation of water in a 'change over time' enquiry.



Impact: Children are producing work that feedback the learning intentions. In pupil conferencing children often recall these 'wow' moments.

CREATING APPROPRIATE EXPERIENCES TO INITIATE LEARNING

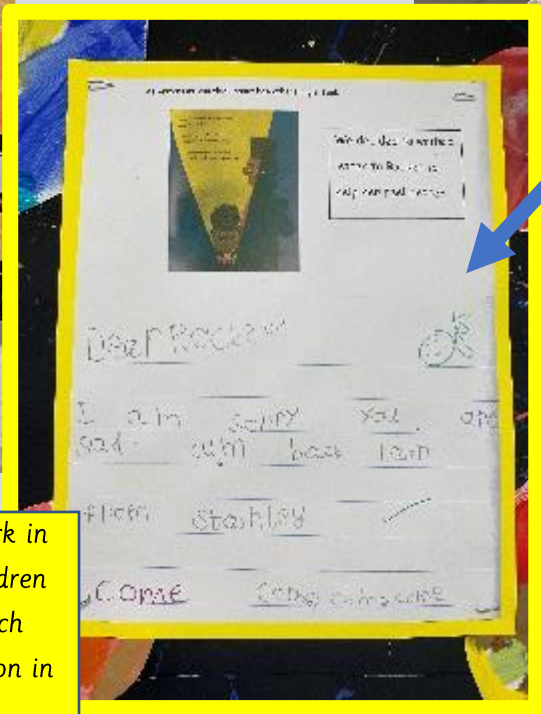
What adults might provide

- Opportunities to learn about the Earth, Sun, Moon, planets and stars**
- Observing that the Sun appears to move across the sky
 - Observing that it is warmer and brighter when the Sun is shining than when it is behind the clouds
 - Observing that they can see the Moon at night and sometimes in the day
 - Observing that they can only see the stars at night
 - Making model planets e.g. with papier-mâché or Modroc and balloons
 - Modelling a cratered moon landscape with papier-mâché or Modroc
 - Observing distant objects, including the Moon, with binoculars or a small telescope
 - Sharing books and video clips about the Earth, Sun, Moon, planets and stars
 - Talking about what happens and what they can see and hear in the daytime and at night

What adults might do

- Encourage children to safely observe changes in the sky at different times of the day.
- Support children to link changes in the sky to other observations e.g. changes in temperature and brightness.
- Encourage children to observe the evening/night sky with their family.
- Model asking questions about space and space travel.
- Encourage children to ask questions about space and space travel.
- Encourage children to move as if they were in space or on the Moon.
- Encourage children to use observations from books and video clips when painting their model planets.
- Encourage children to talk about how binoculars or a telescope make distant objects appear larger and closer.
- Encourage children to sort animals by when they are active.
- Encourage children to use criteria for the 'best' rocket.

In EYFS the science lead has provided guidance from PLAN to help plan activities that initiate learning and science talk. Science is weaved into 'Understanding the World' and every week the EYFS class ensures a science focused afternoon.



EYFS



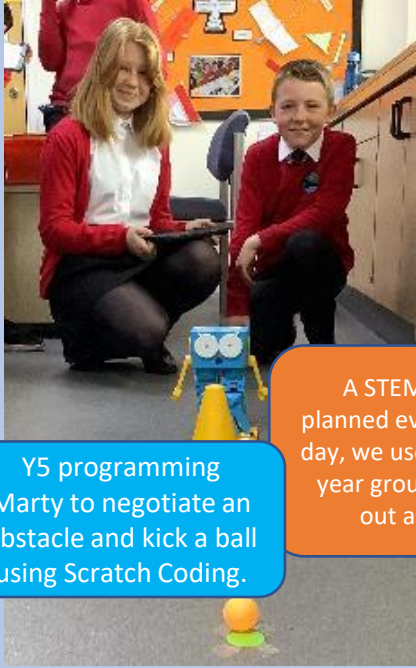
In the EYFS/KS1 area, we now have a range of plants growing to support the unit taught in Y1 and Y2.

Through small world provision, children in EYFS are provided with opportunities to explore scientific contexts, such as plants and habitats.



Impact: Displays and children's work in EYFS feature science work and children are now exposed to language much earlier which they will re-visit later on in the school.

Create initiatives that promote science and science capital which engage and enthuse children and adults.



A STEM challenge day is now planned every year. In our last STEM day, we used 'Marty the Robot' in all year groups to program and carry out a range of challenges.

Y5 programming Marty to negotiate an obstacle and kick a ball using Scratch Coding.



Y4 programming Marty to dance. This was highly engaging and was an opportunity to talk to the class about careers in robotics.



Y4 planting trees in the school grounds. We wanted to create a project that would support the learning about habitats and create a project that pupils could return to again and again; an ongoing change over time enquiry!



Y1 designing and testing boats to learn about materials. This lesson was then included in our permanent curriculum for the following year.



In a challenge taken from '15-minute STEM activities', classes were challenged to create the highest spaghetti tower. They had to plan and work collaboratively with a partner to achieve their goal.



Our Science Week in 2021 was a chance to provide opportunities for our staff to work on enquiries that linked with their current unit. A 'home science challenge' was provided to raise the profile of science and raise science capital.



Home challenges included making crystals and lava lamps. These were set up to promote science at home and improve chances for science capital. PSTT resources were used.



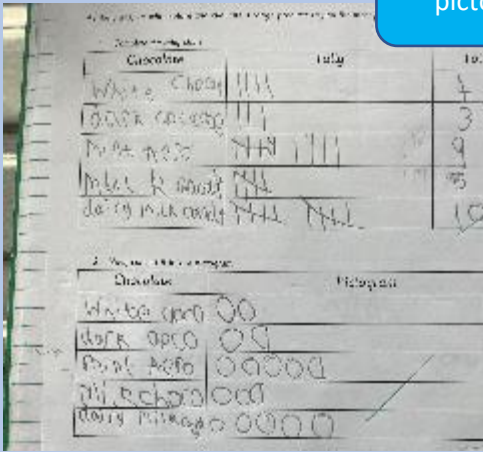
Embed literacy and numeracy skills into science lessons.

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Maths	<ul style="list-style-type: none"> -Create Venn diagrams to classify materials. -Using metre stick to measure animal lengths. -Use ruler to measure plant growth. -Record weather data throughout the year. 	<ul style="list-style-type: none"> -Use block diagrams to show frequency of mini beasts. -Tally charts to show frequency of living things on a nature walk. -Measuring heights and hand size. - Pictograms to show frequency of materials in the classroom. 	<ul style="list-style-type: none"> -Measuring lengths of shadows. -Bar charts to present data from light comparative test. -Pictograms to show and interpret the number of children bringing in healthy snacks/lunch every day. 	<ul style="list-style-type: none"> -Modelled line graph created as class to interpret results of evaporation fair test. 	<ul style="list-style-type: none"> -Measuring using trundle wheel and presenting data using line graph. -Bar graphs to show gestation periods of different animals. - Venn and Carroll diagrams to show the properties of different materials. 	<ul style="list-style-type: none"> - Use line graphs to show change in pulse rates. -Scatter graphs to show effects of more cells in a circuit. -Interpret pie charts to see increased amounts of children walking to school. -Using mean averages to show progress in fitness challenge.

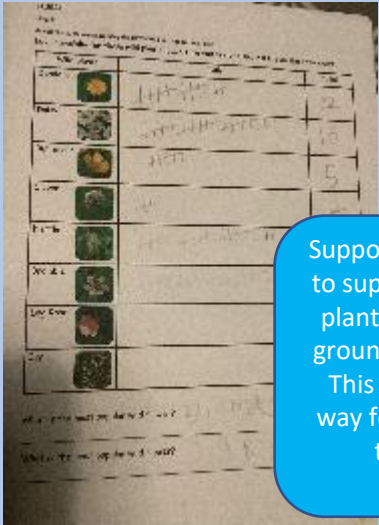
The science lead has created a cross-curricular links document to track how other subjects are implemented through science. Initially this was important to track the way statistics were used in science and to ensure children were taught how to use these representations in maths, before being expected to present these in science.

Impact: There is now clear progression in representing data. The quality of the work is high and children are more independent due to their prior knowledge in maths.

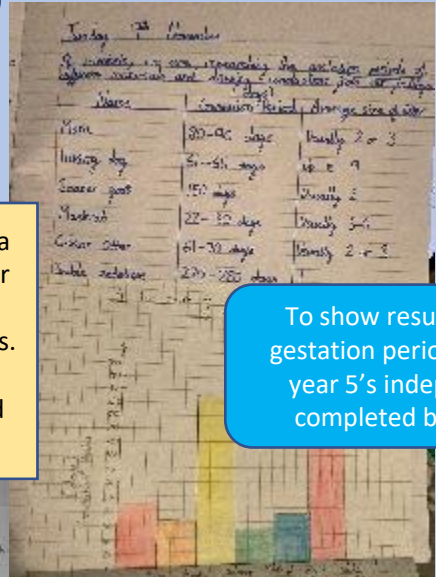
Tally chart and pictograms in Y2.



The application of maths skills was a target following our last Ofsted. Our science curriculum now provides a meaningful way to apply maths skills. The skills progress clearly year on year. Kim Rogers (Deputy head and Maths Lead)

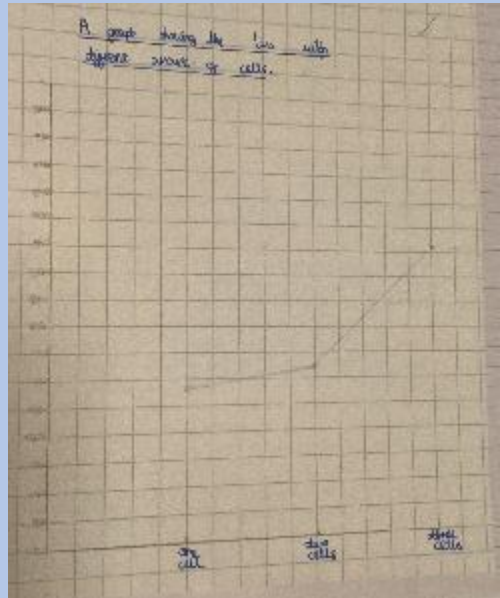


Supported Tally chart in Y1 to support the counting of plants around the school grounds on a nature walk. This was an easy, visual way for year one children to make simple observations.



To show results of their gestation period research, year 5's independently completed bar charts.

To show how adding cells makes light readings increase, Year 6 were able to apply their knowledge of line graphs to present their data.

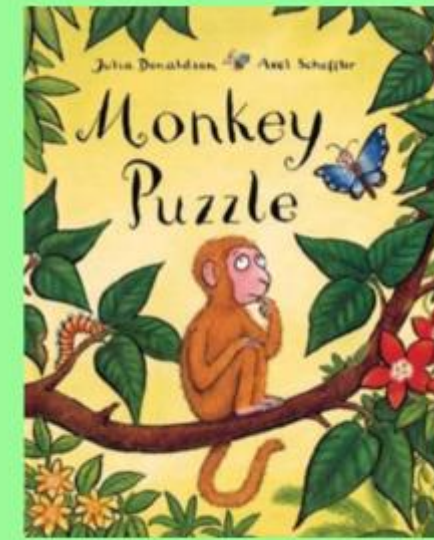


Following their light investigation, Year 3 children were shown how bar charts can be used to present their data. They had previously seen bar charts in their maths lessons.





With help from the Literary Curriculum, we have begun implementing texts into the writing curriculum that have a science focus. We have books in our curriculum that are focused on space, rocks and life-cycles.



As well as embedding literacy and numeracy skills in our curriculum, we also try to apply skills from other subjects such as art. We believe making meaningful cross-curricular links helps to embed learning.



Through science, we have now begun a process in which we make links across subjects in a way that enhances the knowledge and skill application in each discipline. Subject content is not lost through tenuous links; it is enhanced through the contextualisation created through meaningful links.