

I enjoyed science week because we got to try cool experiments.”

I loved watching mould grow on bread.

Group challenges help me to learn best because we can discuss our ideas.”

I enjoyed learning about what happens to our teeth if we drink too much coke or tea.”

# St Ignatius Catholic Primary School PSQM Outreach Portfolio 2023 – 2024

Key:

Impact quote

Impact

Next Step

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# Highlights of science at St Ignatius before the PSQM



Above: The science display was in an external corridor that every child saw. It displayed work from each year and had lots of practical resources that children enjoyed using. This included a dead lizard that had been found on the school grounds and dried out safely, under directions from CLEAPSS, for months. The children found this fascinating to look at.

There was a regular cycle of high quality workshops, carefully provided for each Year group by a variety of service providers.

## Locations



Above: An example of citizen science – the school took part in a funded air quality project in Year 5. Diffusion tubes were set up by children and then collected to be sent for analysis. The information above enthralled all children throughout the school when it was presented in an assembly.

School sleepover  
On Friday 17<sup>th</sup> May year 5 went back to school at 5:30pm so we could have a sleepover. ~~Firstly~~  
Firstly, my class went in a massive dome and inside was a projector. Most of us lay down on our backs and on the ceiling were lots of pictures in space. We talked about all the planets and what they were made of. Then I felt like we were actually in space. I was so surprised. Once we had finished, Kingfishers went in the dome and we went in an escape room. We were put in groups to do many challenges. My group was Charlotte, Ava and Olivia.



One year, the Year 5s had a science themed sleepover in the school. It was extremely popular.

## Mad Science write up

10.11.18

Today at Mad Science we learnt about light with Helen Helen. First we started by lighting one candle in the dark, then we all got rainbow glasses. When I put the rainbow glasses on the light from the window reflected off the candle which made rainbow lines around the candle. This happened because the light from the window is 'white light' and 'white light' is made up of all the colours of the rainbow. The candle can also be white light but it depends on what fuel it is burning off.

Secondly, we got UV torches which only worked on ~~just~~ fluorescent objects. We had <sup>to</sup> sort out ~~for~~ different types of pipecleaners into two piles (fluorescent and non fluorescent). Some were really fluorescent and some were not fluorescent at all. Next we got UV pens, which you had to write something that you had learnt at Mad Science. Then we shone a UV torch on top which revealed what you had written.

Thirdly we tried make light just with chemicals. We started with 250 ml of water in a flask and then we added luminol and sodium perborate. Last of all we added 'sawash' which made it glow in the dark.

Above: A write up of a club weekly club run by Mad Science.

During the Covid pandemic, the service provide went out of business. The enrichment opportunities stopped and needed replacing.

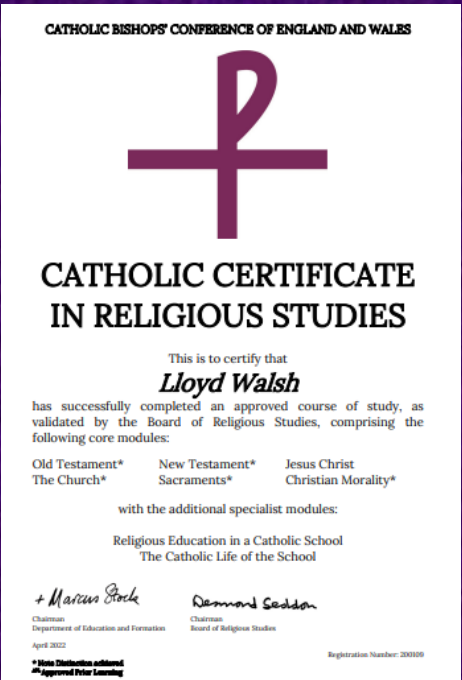
# The science Subject Leader's highlights before the PSQM



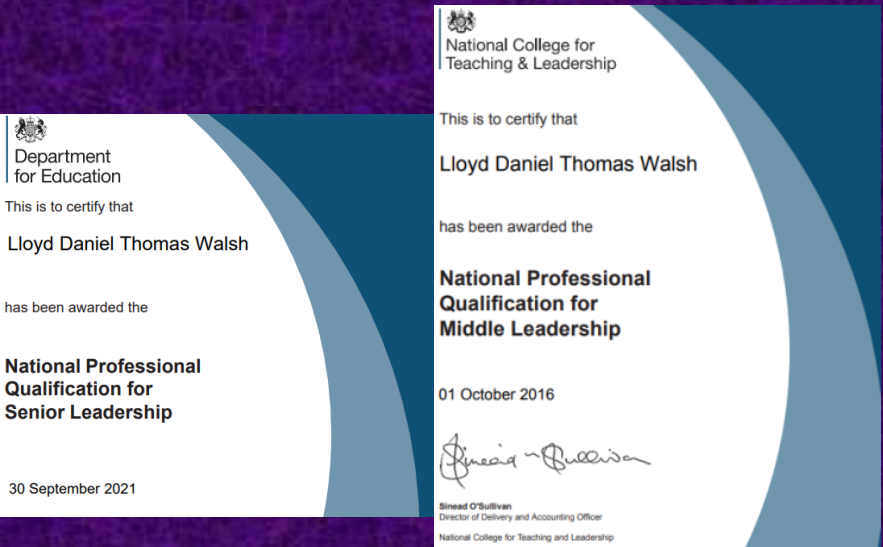
In 2022, Lloyd won a STEM Learning Award for Excellence in Primary STEM teaching. Left: Lloyd receiving a certificate at the regional award ceremony for the South of England. Right: Lloyd receiving a trophy at the national award ceremony in York. Following the award, Lloyd received training from education team at the national STEM Learning Centre in York and was invited to become a Professional Development Lead to support other teachers.

“Lloyd consistently shows a drive to improve and innovate STEM at St Ignatius and is never complacent, ensuring his own research around the subject continues outside of school. This has had a significant impact on attainment and progress within Science, but also in the motivation and engagement of the children... In addition, he supports less experienced colleagues at other schools in their leadership of Science, offering mentorship and practical support... I have been continually impressed with his commitment to helping others.

- The then headteacher's comments from the STEM Learning Award application form when they nominated Lloyd in 2022.



Through the CCRS, Lloyd was reminded of the importance of narratives in learning and worked with colleagues and children to create a list of high quality narratives that link meaningfully into the science curriculum.



# Science subject leadership

## A: creation and implementation of vision

Science learning in St Ignatius is going well when pupils are engaged and wanting to learn science. When they learn all subjects with a scientific mindset. When they apply the skills learned in other aspects of their learning.  
- Governor voice.

My child comes back excited about what they have learnt which shows engagement and hands on learning is great for young minds

The kids are engaged and interact with the activity

kids are learning science with a balance 20/80 rule. 20% of theoretical explanation of a subject followed by 80% of practical application activities.

Children are developing an interest in the world by looking more closely at the natural world, the environment, animals and humans and materials

Children are engaged in inquiry based learning and investigations.

There are science after school clubs offered, practical experiments to be done at home are offered, a break down of what science is taught at school so the parent can engage too at home.

A selection of responses from parents when asked to complete the sentence "Science learning in St Ignatius is going well when..."

children are curious and want to find out things for themselves.

the children are not only learning within the lesson but taking joy out of it also. Learning through experiments, exploration outside, understanding the further impact from their understanding.

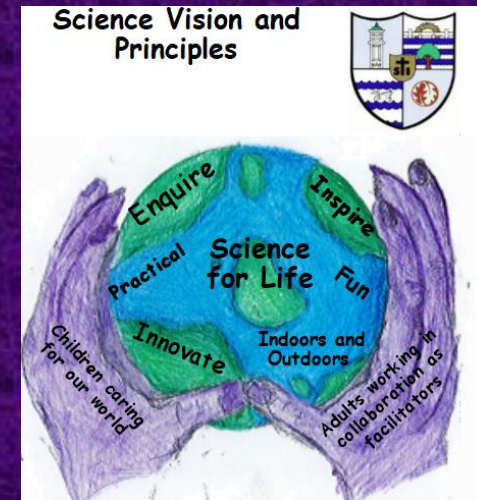
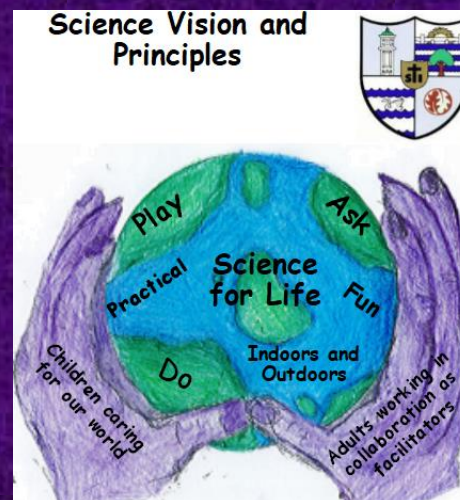
Lessons are practical and the children are active.

All the resources are easily accessible from the store cupboard for setting up practical elements - everything should be in designated boxes/shelving ready to find for the next time needed. Practical elements drive engagement in the subject so are key to a good lesson.

The children are doing lots of practical work, collaborating with their peers, making links between science and other areas of learning and having lots of fun!

A selection of responses from Teachers and TAs when asked to complete the sentence "Science learning in St Ignatius is going well when..."

Teachers and children have shown great enthusiasm for the vision and principles. The fact that they are taken from stakeholder feedback has been really important. Children have also mentioned how impressed they are that they were drawn by a child.



# Science subject leadership

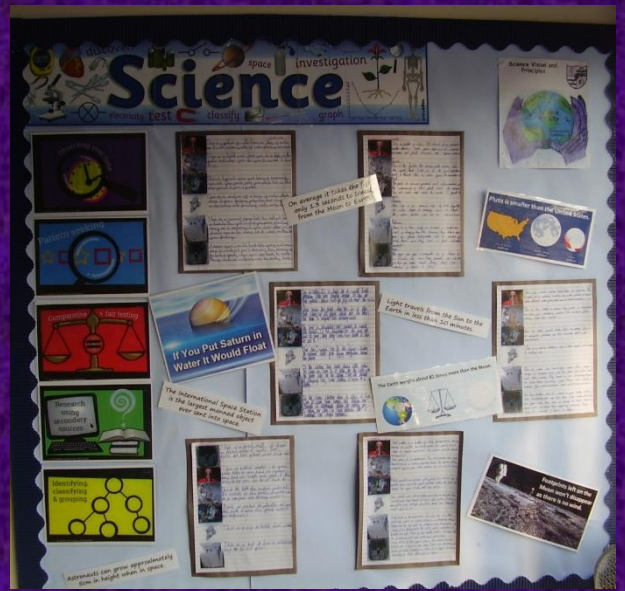
## B: strategic support

	Plants	Animals including humans	Living Things and their habitats	Evolution and inheritance	Seasonal Changes
EYFS	Draw information from a simple map. Explore the natural world around them. Describe what they see, hear and feel whilst outside. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them.	Talk about members of their immediate family and community. Name and describe people who are familiar to them. Recognise some environments that are different to the one in which they live.	Draw information from a simple map. Explore the natural world around them. Describe what they see, hear and feel whilst outside. Recognise some environments that are different to the one in which they live.	Recognise some environments that are different to the one in which they live.	Explore the natural world around them. Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them.
YEAR 1	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).	N/A	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.

Above: An excerpt from the new progression of skills document. All teachers contributed to this and it was created using the PLAN Progression information. This has been particularly impactful in showing teachers the importance of EYFS and also in helping teachers realise that themes such as plants are taught in all year groups.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	
RECEPTION	Understand the effect of autumn on the natural world around them. Describe what they see, hear and feel whilst outside. Talk about members of their immediate family and community. Name and describe people who are familiar to them.	Explore the natural world around them. Understand the effect of winter on the natural world around them.	Explore the natural world around them including living creature hunts in the outdoor learning environment. Recognise how the arctic environment is different to the one in which they live.	Recognise some environments that are different to the one in which they live. Understand the effect of Spring on the natural world around them. Draw information from a simple map.	Explore the natural world around them.	Recognise how marine and coastal environments are different to the one in which they live.	Understand the effect of Summer on the natural world around them.
YEAR 1	<b>Everyday Materials</b> Explore different types of materials, focusing on their everyday uses. Understand the properties of common materials, including their strength and water absorption. Choose effective materials for a superhero outfit.		<b>Animals including Humans</b> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals and classify them as carnivores, herbivores and omnivores. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.		<b>Plants</b> Name a variety of common wild and garden plants, including deciduous and evergreen trees. Learn the basic parts of a flowering plant and explore the differences between things that are living, non-living and dead.		
	<b>Seasonal Changes (throughout year)</b> Observe changes across the four seasons. Observe and describe weather associated with the four seasons and how day length varies.						

Above: This excerpt from the update school curriculum was contributed to by all teachers and has been updated to ensure that impactful and meaningful cross curricular links are made use of.



Staff have a clear view of what needs to be included on Science working walls in order to have the greatest impact on children's learning.

# Science subject leadership

## C: monitoring and improvement

How much progress - >	Ungraded (can't track)	Well below expected 4 or more units of assessment below expected	Well below expected -3 units of assessment below expected	Below expected -2 units of assessment below expected	Just below expected -1 units of assessment below expected	Expected	Just Above Expected 1 units of assessment above expected	Above Expected 2 units of assessment above expected	Above Expected 3 units of assessment above expected	Well Above Expected 4 or more units of assessment above expected
52 Year pupils NC (52 Science results)						30 57.7%	15 28.8%	7 13.5%		

Above: Progress is analysed by the Science Subject Leader each term. Children making less than expect progress are discussed with the class teacher and actions are decided on how to close the gap. This same process used to analyse the progress of SEN, EAL and Pupil Premium groups.

### St Ignatius Science data Autumn 2023 - 2024

Cohorts	NC Science	
	Attainment (Score)	Attainment (Share)
	Units of assessment	
<b>General</b>	<b>Whole school</b>	
All Pupils	411 85.1%	23.4%
Male	204 81.6%	25.3%
Female	207 88.6%	21.6%
Pupil Premium	61 73.7%	17.5%
Not Pupil Premium	350 87.4%	24.6%
Ever 6	61 73.7%	17.5%
Not Ever 6	350 87.4%	24.6%
Disadvantaged (Ever 6, FLAA or LAC)	61 73.7%	17.5%
Not Disadvantaged	350 87.4%	24.6%
FSM	61 73.7%	17.5%
Not FSM	350 87.4%	24.6%
Term Of Birth: Summer	175 79.2%	13.4%
<b>SEN</b>	<b>Whole school</b>	
Not SEN	364 89.8%	26.9%
Total SEN	47 53.3%	0%
SEN K	39 51.4%	0%

1. What is science?  
Science is everything. It makes up everything.

2. What activities help you to learn best in Science?  
I think that it helps us doing experiments helps us understand what we are doing.

5. What have you learned that really excited you in Science? Why?  
When we were learning about bodies as they are very interesting.

1-36 Outdoor activity //  
↳ children able to explain 10-15 mins later.  
Could easily be made //  
(lear diff since Jan //  
could be enjoyed.  
T.A. using plant knowledge to bring learning forward.  
!! child enjoyed //

TEACHING	
1. Set high expectations which inspire, motivate and challenge pupils	
• establish a safe and stimulating environment for pupils, rooted in mutual respect	✓
• set goals that stretch and challenge pupils of all backgrounds, abilities and dispositions	✓
• demonstrate consistently the positive attitudes, values and behaviour which are expected of pupils.	✓
2. Promote good progress and outcomes by pupils	
• be accountable for pupils' attainment, progress and outcomes	✓
• be aware of pupils' capabilities and their prior knowledge, and plan teaching to build on these	✓
• guide pupils to reflect on the progress they have made and their emerging needs	✓
• demonstrate knowledge and understanding of how pupils learn and how this impacts on teaching	✓

Excerpts from the annual pupil voice survey. Representatives from each year are spoken to. Trends are fed back to staff to improve our provision.

Above: Excerpts from a science observation. Feedback is given to staff in person and actions and support are agreed where needed.

Above: An example of termly data analysis. Like progression, attainment is analysed based on many factors including EAL, PP, SEN and summer born. Class data is also analysed and carefully cross referenced with the other core subjects. Data analysis is shared with teachers and support is given if required.

# Wider Community Activity: Expertise is shared

## Science narratives list



Welcome to our curated collection of narrative books meticulously selected to enrich the teaching of science topics within the UK primary science curriculum. This document serves as a valuable resource for educators seeking to infuse captivating storytelling into their science lessons, fostering deeper engagement and understanding among children. Each book in this list has been thoughtfully chosen for its ability to seamlessly integrate with specific science topics while captivating young minds.

### About the Document

This document compiles a range of high-quality narrative books that have been carefully vetted to align with key science topics outlined in the UK primary curriculum. Designed for teachers and science leaders, it provides clear references to the curriculum areas each book complements, allowing for easy integration into lesson planning. Moreover, the selection process involved focus groups of children to ensure that the texts are not only educational but also short, engaging, and age-appropriate.

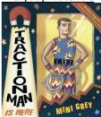



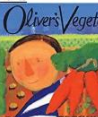

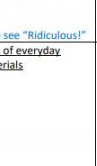

### Benefits for Educators:

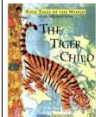




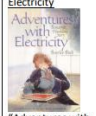

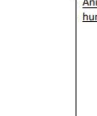
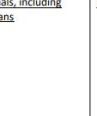
- **Enhance Learning Experiences:** By incorporating narrative books into STEM lessons, educators can create dynamic learning experiences that appeal to diverse learning styles and foster a deeper understanding of scientific concepts.
- **Increase Engagement:** Engaging storytelling can captivate children's attention and spark their curiosity, leading to increased engagement and participation in science lessons.
- **Strengthen Literacy Skills:** Integrating narrative texts into science education not only enhances STEM learning but also supports the development of literacy skills such as reading comprehension, critical thinking, and vocabulary expansion.

"Great list, I will use for our science in literacy competition 2024/25! Thank you!" – Public comment from a STEM Community member.

"A great resource, Lloyd - thank you!" - Public comment from a STEM Community member.

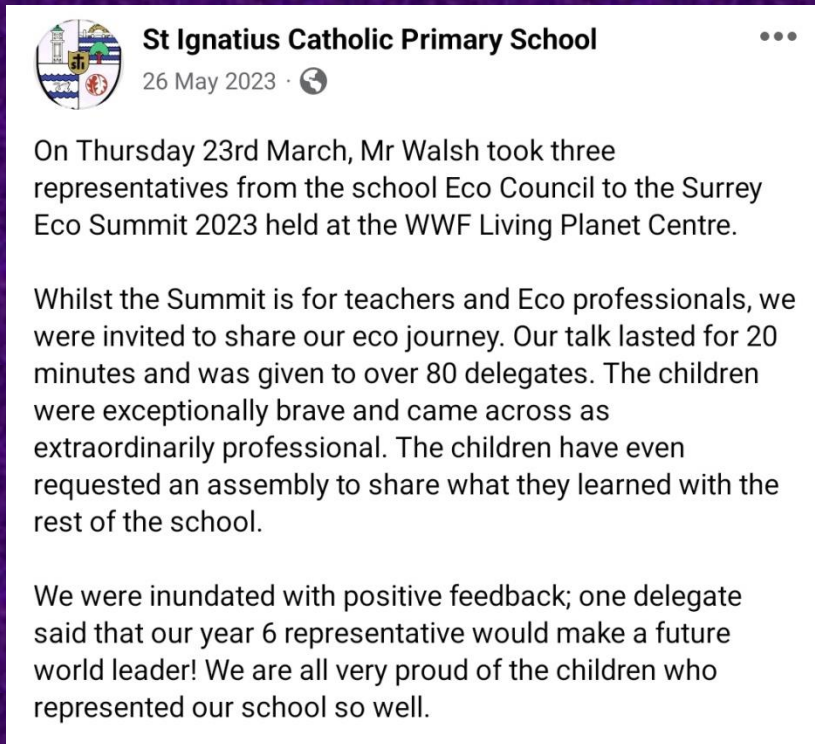
The resource was highlighted to all members of STEM Community as part of their daily and weekly consolidated digests. Within two weeks the resource had 50 views and 28 downloads.

Year Group	Topics (in no particular order)				
1	<b>Everyday materials</b>  "Traction Man is here!" by Mini Grey (Already owned and used by school)	<b>Humans</b>  "Funny Bones" by Janet and Allan Ahlberg	<b>Seasonal Changes</b>  "Winnie in the Winter" by Valerie Thomas and Korky Paul  [also see "Ridiculous!"]	<b>Plants</b>  Oliver's Vegetables by Vivian French (illustrated by Alison Bartlett)	<b>Animals, including humans</b>  "Ridiculous!" by Michael Coleman
2	<b>Living Things and their habitats</b>  "One day on our blue planet in the Savannah" by Ella Bailey (already owned and used by school)	<b>Uses of everyday materials</b>	<b>Animals, including humans</b>  Handa's Surprise by Eilene Browne	<b>Plants</b>  Jasper's Beanstalk by Nick Butterworth and Mick Inkpen	

3	<b>Animals, including humans</b>  "The Tiger Child" by Joanna Troughton	<b>Light</b>  "What makes a shadow?" by Clyde Robert Bulla	<b>Forces and Magnets</b>  "Magnet Max" by Monica Lozano Hughes	<b>Rocks</b>  "Pebble in my Pocket" by Meredith Hopper	<b>Plants</b>  "The story of Frog Belly Rat Bone" by Timothy Basil Ering
4	<b>Electricity</b>  "Adventures with Electricity: Benjamin Franklin's story" by Beverley Birch	<b>Sound</b>	<b>Animals, including humans</b>  "New Life Stories" by David Attenborough Chapter 9 Identities	<b>Living things and their habitats</b>  "Peter's Railway: A bit of energy" by Christopher Vine  (Water cycle):	<b>States of matter</b> 

# Wider Community Activity: Expertise is shared and further reciprocal links

## Surrey Primary Eco Conference 2023



**St Ignatius Catholic Primary School**  
26 May 2023 · 🌐

On Thursday 23rd March, Mr Walsh took three representatives from the school Eco Council to the Surrey Eco Summit 2023 held at the WWF Living Planet Centre.

Whilst the Summit is for teachers and Eco professionals, we were invited to share our eco journey. Our talk lasted for 20 minutes and was given to over 80 delegates. The children were exceptionally brave and came across as extraordinarily professional. The children have even requested an assembly to share what they learned with the rest of the school.

We were inundated with positive feedback; one delegate said that our year 6 representative would make a future world leader! We are all very proud of the children who represented our school so well.

Left: A write up of the school's representation at the Surrey Eco Summit in March 2023 on the school's social media page.



The Eco Council shared how we use and benefit from WasteBusters. A delegate mentioned this to WasteBusters and we received a video thank you (screenshot above) from one of the directors whilst she was at an Eco Summit at the UN Headquarters in New York!

# Wider Community Activity: Reciprocal links are established

I have been a Science Subject Leader for 8 years and I have received Science CPD from a variety of providers. STEM Learning offer a wide range of CPD opportunities and gives the most breadth of any Science CPD provider that I have come across.

STEM Learning embraces partnerships with other organisations and this gives me the impression that STEM Learning is genuinely dedicated to raising awareness and STEM and not making a profit.

As a primary school teacher, STEM Learning is the only CPD provider that I know that is known in the wider STEM community. This gives the qualifications that it provides a real sense of credibility. The CPD that STEM Learning provides is the most varied provision that I have come across. It gives opportunities for STEM Learning has National Links and, in the days of virtual CPD, this means that STEM Learning has the ability to provide many varied provisions throughout the school year.

STEM Learning's provision is flexible. There are many types of courses including free Network meetings after school. In lockdown, their provision allowed me to stay on top of high quality science trends and ensure that teaching and learning was Covid secure whilst still remaining high quality provision.

The children in my school have benefitted from free opportunities from STEM Ambassadors and many other opportunities that I have come across through CPD including the annual Science conference for my local area. This year bit put me in touch with STEM Innovation who my school have since trailed and have booked to provide since week workshops for all 14 of our classes. I have struggled to find high quality practical providers since Covid and so this connection has been really important and beneficial. From what I have seen all staff at STEM Learning and their associates are friendly, supportive and passionate about raising awareness of CPD.

The fact that STEM Learning provides for many subjects over many phases of education gives very broad and rich networking opportunities and allows people like me who are passionate about making links between parts of Education (e.g. between Primary and Secondary) to do so.

Personally, I am extremely grateful for the support offered to me by STEM Learning. Within the past 4 years or so I have undertaken around 30 of their CPD opportunities. I am extremely grateful to have won a STEM Learning Award for Outstanding Primary STEM Teaching. This led to more outreach opportunities. For example, I have acted as a Science Primary Advisor to a TV production company. STEM learning have also provided me with CPD Mark Associate and Lead qualifications allowing me to pursue outreach opportunities and to give back.

I see STEM Learning as a quality mark in STEM CPD and I whole heartedly support their bid to continue to provide CPD to Educationalists.

Thank you for your continued support.

Left: An expert from a letter, written by the Science Subject Leader, in support of STEM Learning's bid to continue delivery of quality science CPD. An important aspect of the bid was letters of **support**, provided by senior leaders, schools and formal and informal partners, which reinforce the DfE's confidence that STEM Learning is the right organisation for driving the CPD agenda forward.

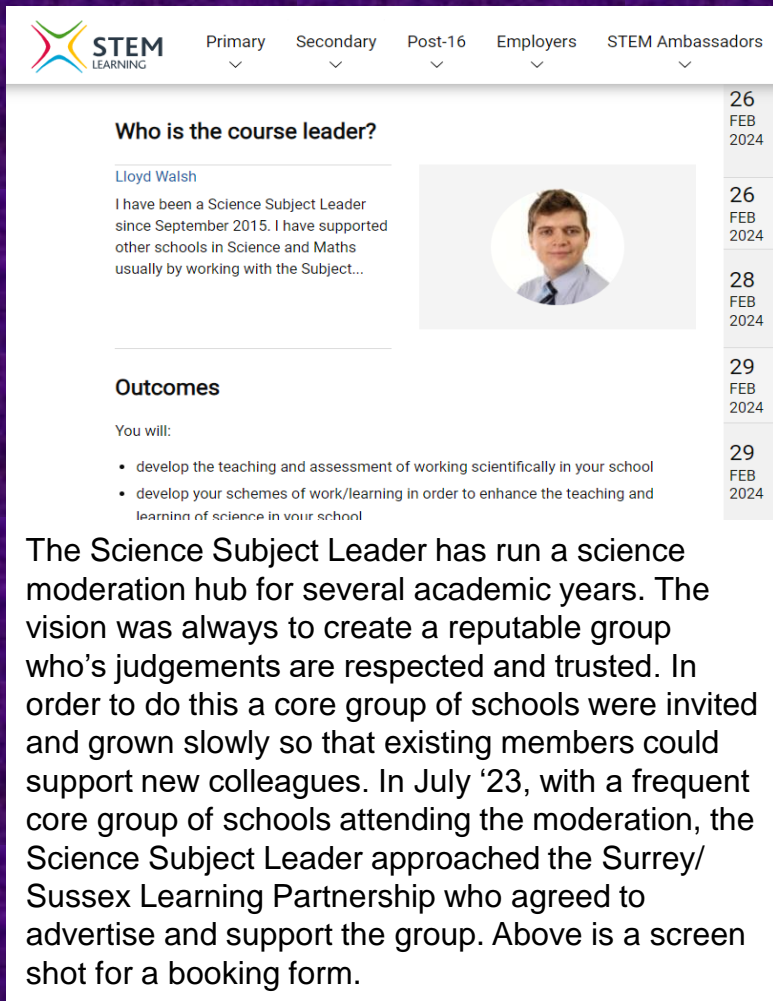
"Incredible letter...and from the heart too." Part of a reply from STEM Learning's Regional Network Lead for the South East of England.

STEM Learning successfully won the CPD bid.

STEM Learning CPD has had a huge impact on the school. It is through such CPD that we have found inspiration, and resources, for British Science Week for several years. This CPD has also provided connections such as STEM Ambassadors, particularly a Bee Keeper, and introduced us to STEM Innovation who will be providing our Science Week workshops moving forwards

# Professional development in other schools: Mentoring colleagues in other schools

## Science Moderation Part 1



The screenshot shows a booking form on the STEM Learning website. At the top, there are navigation tabs for Primary, Secondary, Post-16, Employers, and STEM Ambassadors. The main content area is titled "Who is the course leader?" and features a profile for Lloyd Walsh, a Science Subject Leader since September 2015. Below this, there is a section for "Outcomes" with two bullet points: "develop the teaching and assessment of working scientifically in your school" and "develop your schemes of work/learning in order to enhance the teaching and learning of science in your school". On the right side of the form, there are four booking slots with dates: 26 FEB 2024, 26 FEB 2024, 28 FEB 2024, and 29 FEB 2024.

The Science Subject Leader has run a science moderation hub for several academic years. The vision was always to create a reputable group who's judgements are respected and trusted. In order to do this a core group of schools were invited and grown slowly so that existing members could support new colleagues. In July '23, with a frequent core group of schools attending the moderation, the Science Subject Leader approached the Surrey/ Sussex Learning Partnership who agreed to advertise and support the group. Above is a screen shot for a booking form.

Growing the group and increasing the support offered to other teachers remains a priority.

The booking links from the STEM Learning website have made easier to share the session details with colleagues. The sessions are also advertised to all Surrey schools on the Surrey/ Sussex SLP mailing list and are on the STEM Learning website.

As of March '24, 8 sessions have taken place with over 16 teachers being supported from 9 schools.

Two members of SLT of a local school have had their views of floor books challenged and changed after exploring examples of how they can be used to show clear learning journeys for individual children.

In the July '23 session, we were joined by secondary science colleagues from different secondary schools. One was head of KS3 science, the other was a teacher who had never had any experience of external moderation. Both found the session very beneficial, particularly in seeing how energy is not a discreet subject in the primary national curriculum. The experience was mutually beneficial as primary colleagues found it interesting to see where certain terms and concepts appeared in the KS3 curriculum. Collaborative links across phases were also explored by teachers including outreach support between primary and secondary colleagues.



# Professional development in other schools: Science Moderation Part 2

Looking at Year 5 & 6 Science Books.  
Having the opportunity to <sup>have</sup> discussions with Primary colleagues.

Seeing how different schools deliver topics, getting ideas/sharing ideas. Comparing Y5 & Y6.

Examples of delegates responses to the feedback question, "What part(s) of the CPD did you find most useful and why?"

Useful to see good practice + floor books.

Moderation of books, chance to discuss different ways of working.

evaluating and looking through books - examples of how to apply + evidence learning

All delegates have at rated the quality of the CPD received at the moderation sessions to be "good" or "very good."

"It's been so lovely to be apart of the moderation hub. Thank you so much for all of your support and kind words along the way as well. I have really appreciated everything." An expert from an email from a local Science Subject Leader who had attended all moderations hub meetings until she was no longer Science Lead.

The moderation is frequently changing to suits the needs of its members. In July 2023, it was requested that we moderate each Key stage at a time which we started from our September meeting with Key Stage 1 moderated in Autumn '23, Upper KS2 in Spring '24 and Lower KS2 will be the focus in Summer '24.

In the Autumn '23 session, a member of SLT of a school in attendance, who was acting as Science Lead during a maternity leave, was very impressed by the quality of the CPD opportunity and requested that non-science leads could attend. This was implemented and used in the spring session which included a Year 5 class teacher, an Early Career Teacher and a computing Leader.

Since March '23, the group has grown with eight new teachers, attending. More schools and individuals have booked on for the Summer meeting. One teacher who will be science lead in September has already requested a place for the Autumn '24 meeting!

Opening up the sessions beyond Science Subject Leaders means that some members will have more interest in the books than the networking. In order to suit the needs of everyone who attends, networking and sharing ideas will be encouraged at allotted times so that individuals can review and benefit from seeing more books.

# Science teaching A: professional development

## Things you need to know

1. It is good to give people feedback correctly, but feedback, if given wrong, can do more harm than good.
2. Avoid talking about someone's ability, the more you discuss and compliment them the more it is likely to drop and they could become big headed.

## Here is some advice for when you peer review in class

Always comment on how they could do the task better

Praising effort occasionally can help but praising effort all of the time can stop people from trying at all.



ASK ME HOW  
TO IMPROVE MY  
SCIENCE

Above: Children have been wearing "Ask me about" stickers to promote science discussions around the school.

Right: excerpts from the metacognition group's assembly on how to give effective feedback. They explored research on this area and shared it with the whole school. Many members of staff and children said how helpful it was. Delivering CPD using the children worked well and meant that children, staff and teachers benefitted from it. Follow-ups were given by children in classes.

The idea behind the science ambassador and meta cognition groups will be combined into one group who help the subject leader to deliver training across the whole school with all stakeholders present.

EYFS have added word aware to their action plan and started to introduce high quality vocabulary teaching. KS2 have introduced science words of the week, used word raps, sent messages home to parents and used "Ask me about stickers" to enthuse children regarding Science vocabulary.

"It helps me to teach science. It's good that it has videos for practical ideas and helps to refresh my knowledge. It's easy to access. My Master's Degree is in science. Simplifying my knowledge to a primary level can be hard without changing the information into a misconception." – An Upper KS2 teacher on why they find Reach Out CPD so helpful.

Word aware – Word aware books have been ordered so that teachers will have a resource to use for supporting children with vocabulary development. As a school, we will establish whole school expectations for the science vocabulary taught in each year and broken down into science topics including the working scientifically skills where needed.



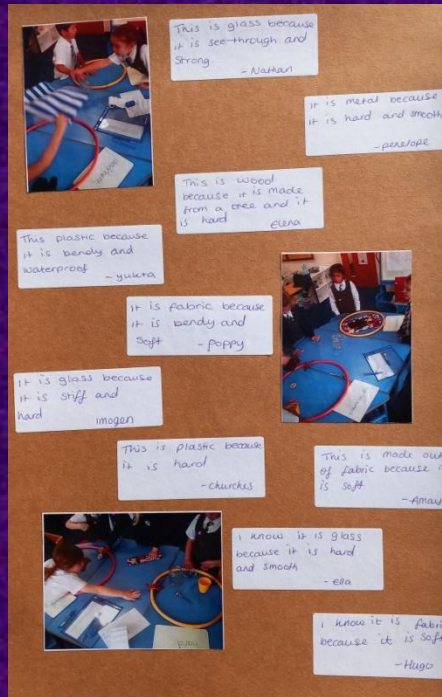
# Science teaching B: effective teaching and learning strategies

“The Year 6 planning for adaptation is great; it is engaging and carefully sequenced. The children really enjoyed it and had clearly understood the sequence of lessons before.” – PPA teacher after covering a one off lesson

The Metacognition Group researched and shared how to give effective feedback. This was shared in an assembly and in classes.



Left: Engaging practical experiences are used to ensure that children are engaged and able to access the learning.



Playfoam is used to support children to create their understanding. This has been particularly useful in supporting children to then record their ideas.

**Science**  
In Science this term, we started our topic on living things by dissecting different flowers. We identified and labelled the different parts and classified the male and female components. We have been learning about how flowers reproduce and are now moving on to animals and their habitats.

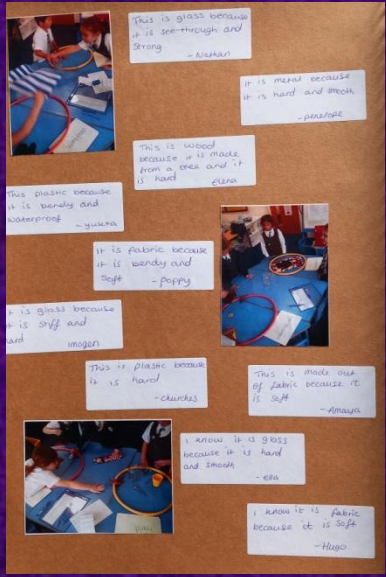


Year 5 Newsletter  
Practical lessons learning about plants

Above: Group challenges and quotes rare used to keep lessons active and well paced.

# Science teaching C: regular and safe use of up-to-date quality resources

We have a selection of high-quality resources available to each phase. New resources used this year have included, periscopes in year 6 lesson on how light travels in straight lines and pulleys used in year 5 as part of their forces work.

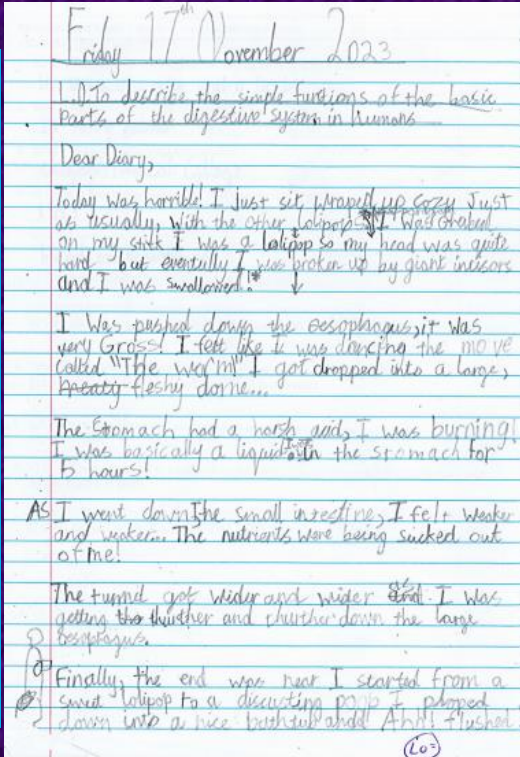


Above: A practical activity recorded in KS 1 floor book using photographic evidence and quotes.

Use of the Woodland Trust resources has helped staff and children feel more confident with identifying trees in the grounds. Many children and staff can now explain how they know we have an oak tree on site. Staff have now realised how much biodiversity we have in the school grounds and this will give them reason to take the children out more when learning about habitats and plants.



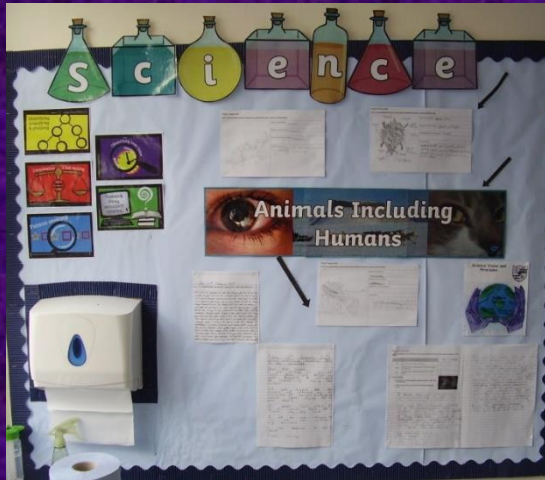
Above and right: After a practical lesson where the children went outside and used household items and a slice of bread to represent the journey of food through the digestive (e.g. using a fork to represent teeth and tights to represent the large intestines), the children wrote diary entries as a piece of food travelling through the digestive system.



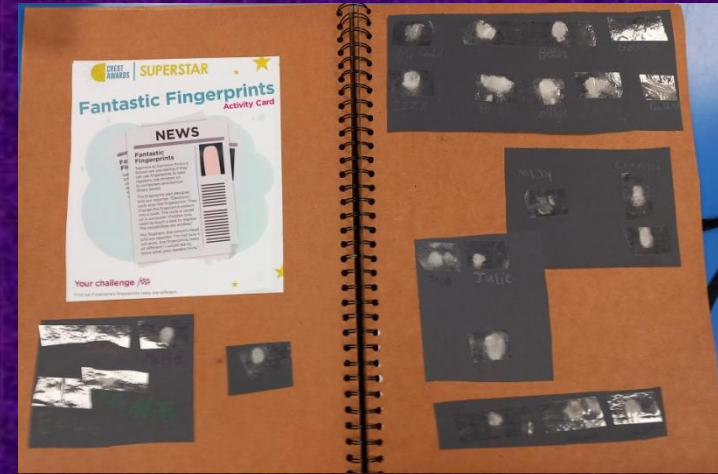
Use of the Woodland Trust plant checklists will be stranded out across the school to ensure that children leave with a love of and ability to identify trees.

To ensure that all writing opportunities are suitably scaffolded so that all children can demonstrate their understanding of science regardless of their writing skills.

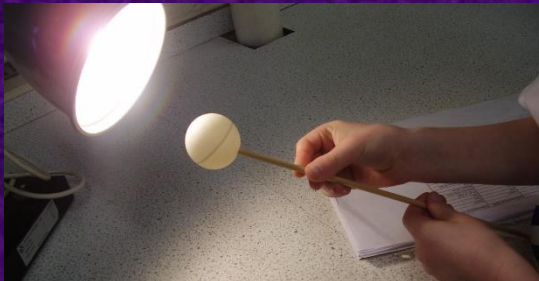
# Science learning A: science enquiry.



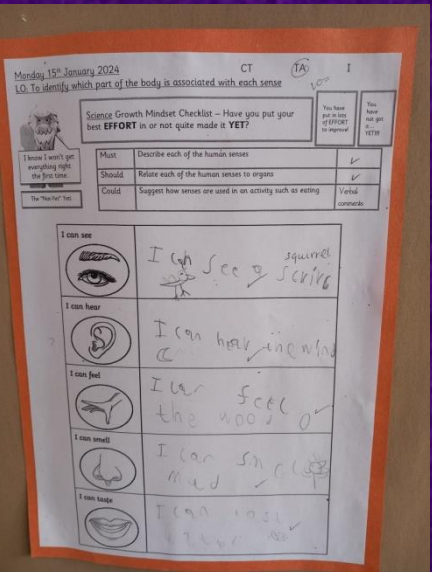
Every class has a Science working wall and this includes the 5 strands of working scientifically skills which children and adults can refer back to in each lesson. This has helped to remind staff and pupils of the importance of the process of investigating.



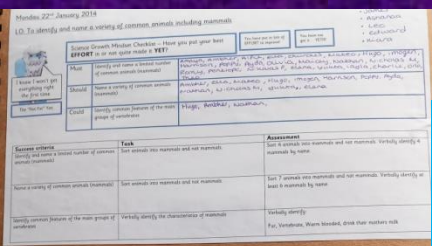
Floorbook example of a fingerprint challenge. In September 2023, all Year 3 children completed the CREST Awards before formal lessons began. This introduction to Key Stage 2 developed their independence, team work, investigative skills and working scientifically skills. The children all found it to be an enjoyable start to Key Stage 2 and are very proud of their achievements.



# Science learning B: assessment



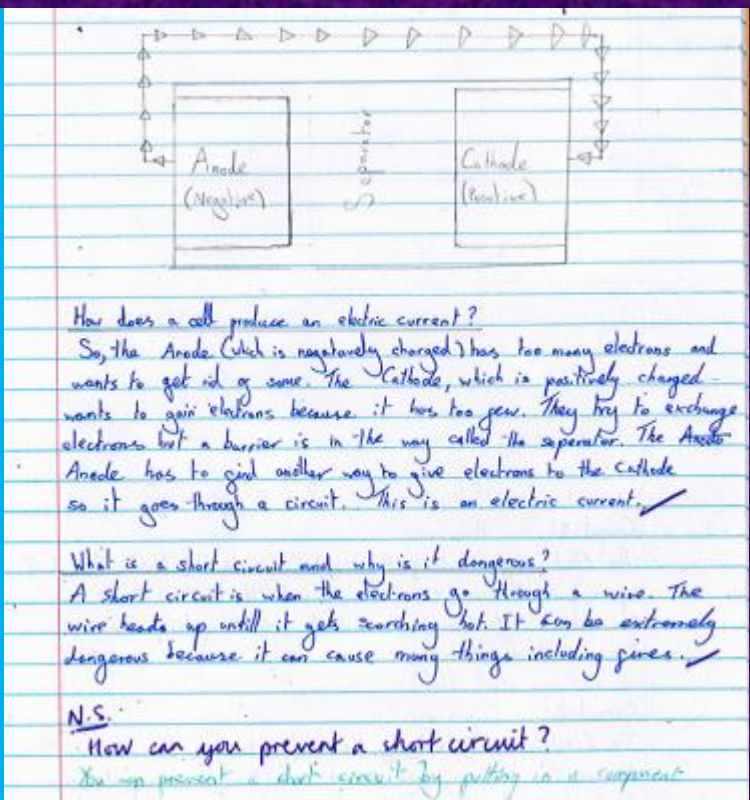
We use differentiated tasks to ensure that learning is carefully scaffolded. This also allows children to have a clear understanding of how to improve. Children assess their own learning in addition to their teacher.



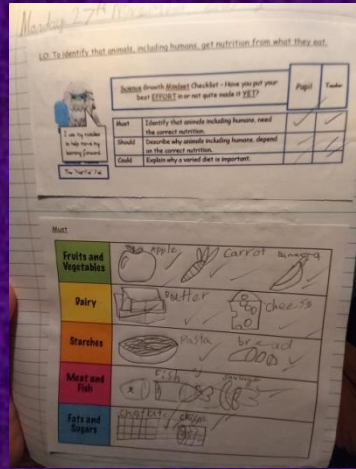
Floorbooks have been used to show individual children's learning with out doubling up pictures. Teachers have found that they can focus on activities and high quality discussions without having to worry about what he children are recording.



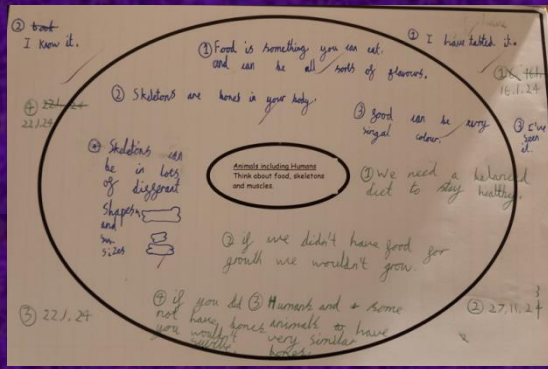
An example of next step marking. This is used to ensure that children are challenged suitably and can be assessed at the attainment that they have been targeted at.



Left: Our "Not Yet Yeti" grids embed growth mindset whilst use of self marking in green provides the children with instant feedback which is inline with good learning theory.



# Science learning B: assessment



This thinking map has been trialled in KS2. All years from Years 2 – 6 use KWL grids to establish what children Know before starting the topic, what they would like to learn. Once the topic has finished, they then include what they have learned. This simple template also allows children to share how they know . This helps the to address misconceptions in their learning.



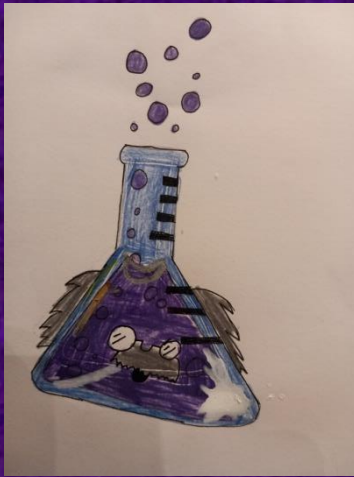
Using the Plan assessment documents has helped teachers to assess tasks such as the investigation to the left.

Around 50% of SEN are still not meeting end of year expectations in science. The classes and children that require support have been identified and support in helping these children meet will be put in place. Floorbooks and increased practical activities with fewer long written tasks will help.

Cohorts	Attainment (Greens)		Attainment (Blues)	
		(units of assessment)		(units of assessment)
<b>General</b>				
<b>Whole school</b>				
All Pupils	411	85.1%		23.4%
Male	204	81.6%		25.3%
Female	207	88.6%		21.6%
Pupil Premium	61	73.7%		17.5%
Not Pupil Premium	350	87.4%		24.6%
Ever 6	61	73.7%		17.5%
Not Ever 6	350	87.4%		24.6%
Disadvantaged (Ever6, PLAA or LAC)	61	73.7%		17.5%
Not Disadvantaged	350	87.4%		24.6%
FSM	61	73.7%		17.5%
Not FSM	350	87.4%		24.6%
Term Of Birth: Summer	175	79.2%		13.4%
<b>SEN</b>				
<b>Whole school</b>				
Not SEN	364	89.8%		26.9%
Total SEN	47	53.3%		0%
SEN K	39	51.4%		0%

An excerpt from the Autumn '23 science attainment data using Pupil Asset. Data is collected every term. SEN and EAL, and classes are analysed among other criteria. The data is also compared to the other core subjects to looks for themes and to identify action points.

# Science learning C: science capital



This picture drawn by a child and given voluntarily to the Science Subject Leader by a child depicts a test tube personified as an old male with grey hair. This view that the child had of what a scientist looked like in Summer 2023 needed challenging and improving.



Above: The new science wall art. Children are delighted by the 'wow factor'. Children new to the school from KS1 and KS2 are very impressed that the scientists were selected by children. Views of what science is and who counts as a scientist have been successfully challenged and changed (astronauts and oceanographers were not originally included). It has resulted in different views. A greater understanding has been gained as a school on the people who use applied science and or scientific skills in their job. The oceanography after school club was originally viewed as not linking into science but views on this have changed.



# Wider opportunities A: cross-curricular links

## Topic

In topic, we further consolidated our understanding of space through learning about The Space Race. We enjoyed learning about the early days of space exploration and the first humans to go into space. We also learnt about the competition between The USSR and USA, and created posters celebrating the scientific successes of these rival nations during The Space Race.



An excerpt from the December '23 newsletter explaining how Year 5 link Science topic to their history topic of the space race. This shows off children's work to parents and carers.

Right: Our Mental Health Day linked PSHE learning objectives to applications on the science curriculum on how to look after our bodies. The workshops were enjoyable and provided excellent spacing to help children retrieve previously taught information.



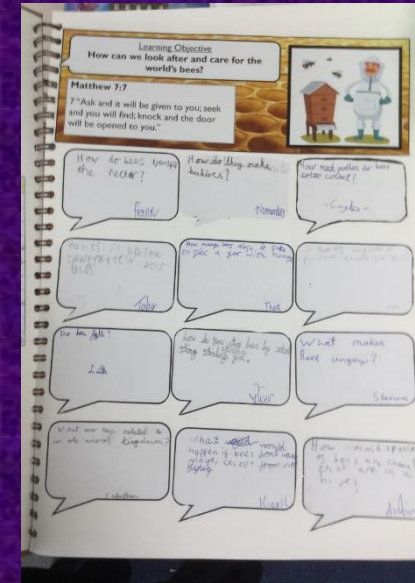
Teaching science topic of "Space" at the same time as our history topic of Space Race" allowed good cross curricular links and the children seemed more engaged. They had more questions ready for the planetarium visit" – Year 5 class teacher.



A Key Stage two reading comprehension from a stay and learn.

High quality reading books including those linked into the science topics have been bought by the Reading Subject Leader and introduced into the reading scheme. This helps parents and children understand our science topics at home.

Right: Children in Year 4 spoke to a Bee Keeper through The STEM Ambassador programme. They prepared questions before the conversations and then applied what they learned to our school grounds to help attract bees. This linked our Eco work with our Science curriculum.



# Wider opportunities A: cross-curricular links

Awesome because we got see a volcanic eruption in action!" – Year 3 child.



Mind-blowing! – Year 3 child.

Interesting because I didn't know coke and mints would do that! – Year 3 child

Revising when we teach topics has led to improved cross curricular links. E.g. Rocks in Year 3 is now taught alongside the Stone Age history topic. Learning about skeletons comes next so it links in with learning about how bones are useful in archaeology. A history topic on the Romans, taught in spring, which includes Mount Vesuvius and geography lessons about volcanoes topic offers meaningful spacing and revision of rocks.



Right and above: pictures from Art Day including Andy Goldsworthy inspired art from nature. Children from KS1 and KS2 enjoyed these outdoor activities.



"(my daughter) loved the Art Day activity with making pictures with natural materials. It is great that the school is so dedicated to outdoor learning." Parent of a KS2 child.

## Wider opportunities A: cross-curricular links

They are always really cool. I always find them really intriguing. - Year 4 child.



The First round of clubs (50 places) sold out in a few days). 25 children from KS1 and KS2 experienced 10 hours of science enrichment per term. The next wave inspired 45 and Mad Science is a popular enrichment activity.



Our termly Mad Science assemblies provide meaningful cross curricular links to topics; for example, this fire assembly made meaningful links to the Great Fire of London topic and served as great consolidation for older year groups who had learned about it in Year 2. Another focused on flight, linking into the topic of 'Flying High' looking at Amelia Earhart.

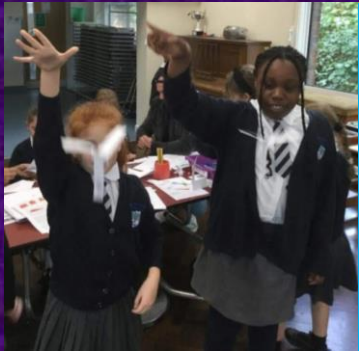
We learned how to make fire I found it really interesting and I will be able to use this in my scout group"- Year 4 child.

I loved it when they made the ball float with a leaf blower. Blowing toilet paper over us was really funny. It was interesting to learn about how things can float in the air. - Year 6 child

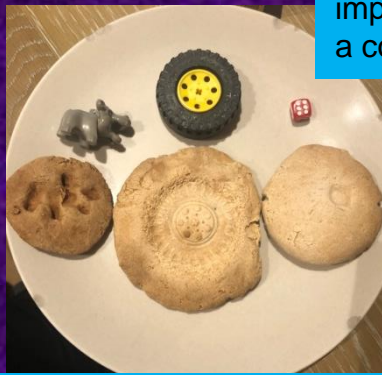
They are really good. They use resources in creative ways. I learned how oxygen, heat and fuel make fire. – Year 6 child

I've always wanted to know how to make fire, and, until today, people have never gone into enough detail.

## Wider opportunities B: provision of a variety of opportunities that deepen and extend learning



Practical investigations taking place in stay and learns help children and parents' understanding of the working scientifically skills. It also gives parents ideas for how to support and challenge their children at home whilst promoting the importance of science as a core subject.

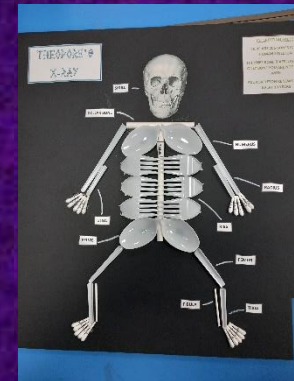


An example of homework. This shows a Year 3 child's understanding of how fossils are an imprint in a soft material that hardens. Unlike the fossils made in class this one uses easy to find household materials e.g. flour, salt and water and was completed with the parent. These homeworks are optional and show how much children enjoy deepening their learning at home.

We have been learning about farm animals and food that is grown on farms. This week the farm animals came to our school. We got to meet sheep, goats, donkeys and pigs. We learnt lots of interesting facts about the animals and got to stroke them too. We also learnt about wool and how it is collected, cleaned and used to make products. It was such a special day for us!



A write up of Reception enrichment from the newsletter



Year 3  
Homework

# Wider opportunities B: provision of a variety of opportunities that deepen and extend learning

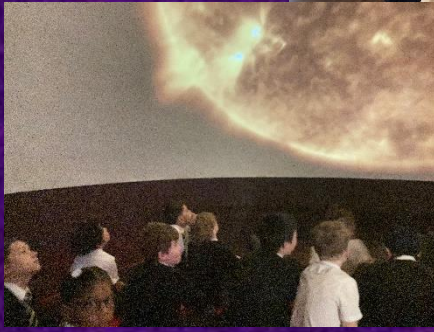
“The Wonder Lab was incredible. It links to multiple topics. The children really enjoyed it. They experienced friction by sliding down different slides with different surfaces. Every child in the school should go” – A Year 5 class teacher describing the trip to the British Science museum.

We have a sensor in the school grounds to monitor air quality. It is simple and allows the Eco Council, and anyone walking by, to check the air quality in a simple way (green is good). This shows our commitment to maintaining meaningful reciprocal links and to citizen science



The sensor funding is due to end in Spring 2024 so the Science Subject Leader will look for new Citizen Science opportunities to inspire the children and enhance their learning.

Below: All year 5 children benefitted from and enjoyed a travelling planetarium workshop which provided a high quality link to their space topic.



“It was great to read that the Environmental Review helped your young people build a clear and comprehensive picture of the eco-work that your school does, while highlighting the excellent work you have already done to promote biodiversity... You have embedded environmental topics into your curriculum with great enthusiasm and these issues are being used to enrich learning in your school whilst engaging your pupils with topical environmental concepts, such as recycling and the importance of bees. Looking after caterpillars and creating seed bombs are great examples of how these topics provide opportunities to engage your young people with the natural world. Terrific work! ... it gives us great pleasure to award you an Eco-Schools Green Flag with Merit – congratulations!”

Eco Schools feedback explaining why we were awarded a Green Flag with Merit in July 2024.


Teachers and SLT will continue to create a yearly cycle of high quality workshops and trips that support science skills and provide children with memorable experiences that will enhance their learning.

# Wider opportunities B: provision of a variety of opportunities that deepen and extend learning

**Year 5 science at saint paul's**

When at Saint Paul's, me and my group of ten went through a series of experiments, which were not only educational but enjoyable too! Personally, one of my favourite experiments was the firefly experiment.

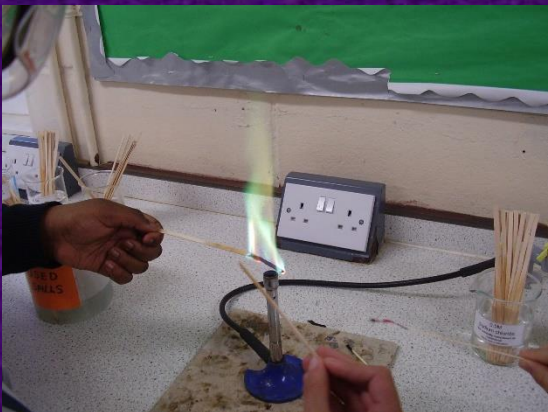

To achieve the firefly effect the atmosphere oxygen oxidises the acetone vapour on the heated copper surface leading it to wander off in a blizzard of fireflies.



In this experiment we saw the adults of the group pour heated up ammonium into the flask and watched the magic begin!

Another one of my favourites were the sound experiments. I personally like learning about the vibrations and the unique sound waves that can result in different tones and volumes.

When learning about sounds, we were shown how the frequency and vibrations affected were the salt were the salt moved and where it did not move.



Above: As part of British Science week, a selection of Year 5 children went to our local secondary school for some inspiring enrichment. Several children were so enthused that they voluntarily wrote about their experiences.

Left: As part of British Science week, all children had workshops provided by STEM Innovation. Activities included exploring Tesla coils, making circuits from copper and coding robots from popular cultural including Optimus Prime and Iron Man's helmet. Children and adults were equally impressed.

