KEY

Action Box | Impact Box

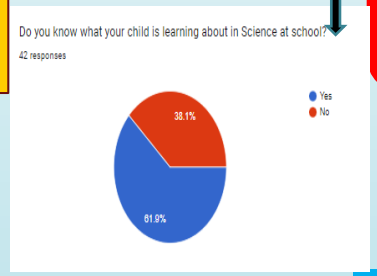
Commentary Box | Next Steps

SL A There is a clear vision for Science, created and implemented by teachers and children, through principles for teaching and learning.

Starting Point

Prior to starting our PSQM journey there was little direction for Science with teachers who taught either in isolation or only across their own Key Stage. They followed LT plans that had been in place for a number of years with little thought to why those topics were being taught.

Parents were unsure as to what Science was happening across school.



A series of Staff Meetings were attended by all staff to develop our own Visions & Principles which were unique to St Bernadette's.

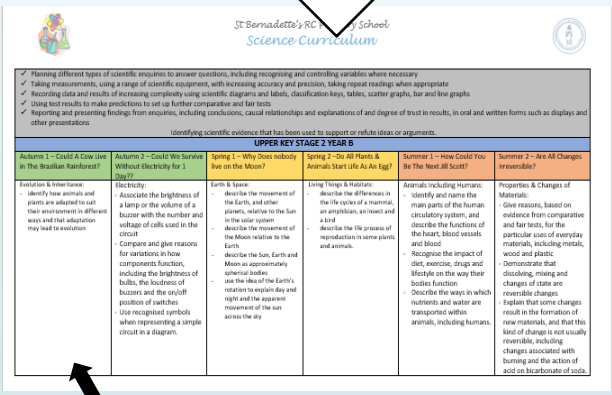
Visions & Principle's document written after consultation with children and staff.

Staff now have a clear understanding of the purpose behind our teaching of Science & are invested in these. They share these with the children regularly.

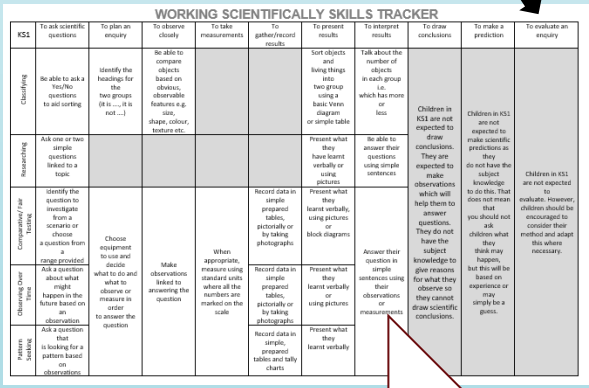
One of our Science Principles "Science is relevant & has real-life purpose" is shared by all staff .

Children are able to refer to our principles of Science as they are referred to regularly.

Where We Are Now



Progression of key skills & curriculum maps were developed across all 4 Key Stages.

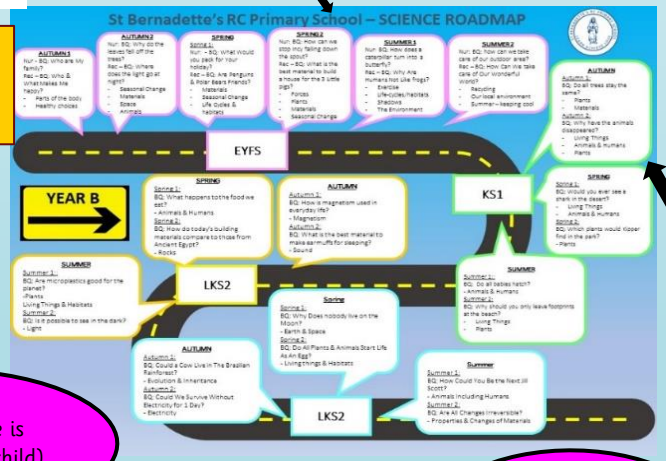


Clear roadmaps were developed & published on our Science webpage as a "window" into our Science curriculum.to inform parents of what was being taught in Science.

Parents are now able to see at a glance what their child is learning in Science at any given point during the year resulting in more parental engagement.

Children now see a real purpose for Science.

This is the Year B roadmap of our 2-year rolling programme.



Children did not know the significance of Science in our curriculum & the world that we live in.

Q: Why are you taught Science?
A: To help our brain grow! (Y6 child)

Reception children learning about the importance of good, personal hygiene with our school nurses.

One of our principles in action – Science is relevant & has a real-life purpose. Staff now look for explicit links to real-life in their lessons.

Why do our wellies need to be waterproof?

Because Science is everywhere! (Y2 child)

It is helping us to save the planet!! (Y6 child)

Why are we taught Science in school? (Lab Technician)

Lots of jobs need Science! (Y4 child)

- ✓ Ensure our "Principles of Science" maintain high status around school.
- ✓ Complete a 2nd parental questionnaire to see impact upon the of perceptions of Science at home.

Slide 1

KEY

Action Box | Impact Box

Commentary Box | Next Steps

SL B Strategic support for subject leadership is provided and includes: focused CPD for subject leader; regular release time; resources to facilitate development in Science.

Starting Point

A limited budget meant that it was difficult to afford external training..

Science Lead was new to the role & subject specific release time was adhoc.

Science had not been identified as an "Improvement Focus" on the School Improvement Plan .

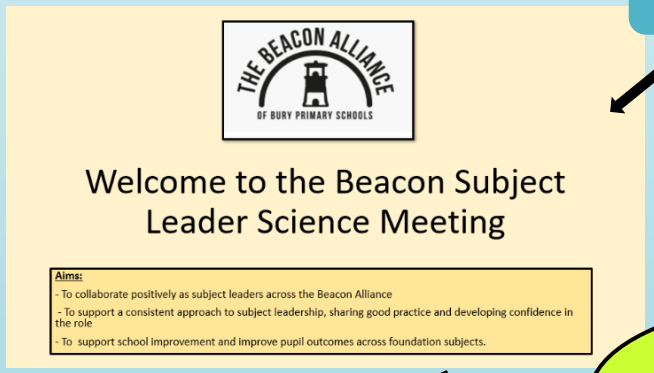
Quality of Education

Improvement Focus	How are we going to do it?/Key Actions	Person Responsible	Timescale	Funding	Resources/Impact
To ensure the Science curriculum at St Bernadette's is coherently planned and sequenced and is ambitious and accessible for all children.	• Ensure a Progression of Skills map is in place for Science demonstrating clear milestones for each Key Stage. • Ensure Progression of Skills map shows clear sequencing in learning and progression across and within phases/key stages. • Create a 2-year Science Curriculum document that ensures all NC objectives are covered within the correct ages & stages of primary Science development • Create roadmaps for Year A & Year B as a clear overview of Science for parents & other interested partners • Provide quality CPD for all teaching staff in Science. • Complete the PSQM quality mark to raise standards & provision within Science.	T Stevenson	End of Summer term 2022/2023	£2000	Skills, knowledge and understanding are mapped out, with a clear sequence that shows progression. Science has a much higher profile across all Key Stages.

School Improvement plan has now been adapted to include "Key Actions" for developing Science across the school.

The profile of Science has been raised across the school .

Science Lead/ASL attend termly Subject Leader meetings.



Strong links with the Beacon Alliance network has meant that the SL & ASL have gained ideas for opportunities to support staff across the school with teaching and learning e.g. REACHOUT

Science is much more visible around school and is much higher on the agenda of staff, children, parents & governors.

I can tell what both of my children learning about in Science even though they normally say "nothing" when I ask them! (patent)

The diet of "Science" across the school is evident to see through your Twitter page. (Parent)

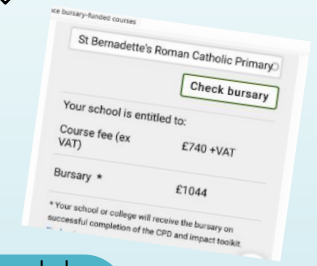
Following the STEM training, I now have a new toolkit with which to address misconceptions e.g. concept cartoons, chalk-talk & interactive investigations. (Y4 teacher)

SL – used a variety of pocket CPD Spotlight videos for personal development.

Training provided has ensured that SL is up-to-date with own subject knowledge & pedagogy ensuring that she can support staff across the school.

Science Lead has been in role for just over 12 months & dedicated half termly subject release time is ensured.

Where We Are Now



A bursary was awarded to enable one member of staff to attend a STEM 3 day course, in June 2022, to support staff in progressing children's ideas and skills in biology.

Through INSET training, all staff were provided with a wide range of practical ideas to teach biology across school. In addition to this, they were also provided with the tools to explore how children's ideas and skills progress through Biology, & how they could tackle common misconceptions using a new interactive approach.

Science leader to keep up-to-date with current CPD events & to inspire others in school.

Slide 2

KEY

Action Box | Impact Box

Commentary Box | Next Steps

SL C There is a monitoring cycle, including pupil voice, that informs actions taken and the development of Science.

Starting Point

Monitoring of Science had become adhoc due to the absence of our SL & priorities being given to other core subjects in the post-COVID recovery.

Neither staff nor pupil voices had been gained to support improvements within the Science curriculum.

Regular learning walks show how Science has developed across the school – it's "visibility".

Working walls – mark expectations for Science and promote learning consistently in school.

It is clear, through learning walks how Science now has a higher status across the school & a real "buzz".

Where We Are Now

Science is now included in our termly monitoring cycle.

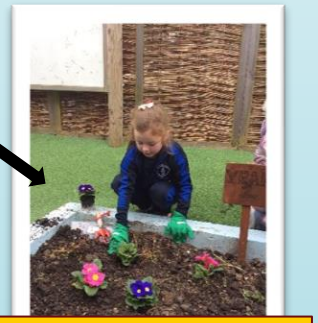
St Bernadette's RC Primary school
Monitoring Timetable Spring 2022/23

Date	Monitoring	Focus	Who?
w/b 16th Jan	Writing Moderation	A sample of pieces of writing are to be brought to the staff meeting. Staff will be checking books that are EXP & also those on the cusp of EXP in order to check. We will be in cross key stage teams.	DP/KM/GM
w/b 23rd Jan	RE book check	A sample of RE books collected this week. Areas for dev / strength identified in order to map out progression and development of the subject. Using the 'Checking In / Checking Out' Process	KM / HOD
w/b 30th Jan	n/a		
w/b 6th Feb	External Moderation at Beacon Schools	Class teachers are meeting at Whitefield Primary School to moderate writing across year groups with other schools in the Beacon	Externally
w/b 13th Feb	Pupil Voice	Pupils asked to give their thoughts on aspects of school life. Do they feel safe at school? Does bullying happen and how is it dealt with? Mental wellbeing and physical wellbeing.	DP/KM/GM/HOD/CG/TS
Half Term			
w/b 27th Feb	Maths Books	A sample of Maths books collected this week. Areas of strength and areas for development identified.	DP /KM /CG
w/b 6th Mar	Phonics Drop Ins	SLT to drop in to classrooms to check on the teaching of Phonics	DP/KM /EC
w/b 13th Mar	Guided reading Books	Ensure GR is effective and the model is being followed. Drop in sessions this week – Support provided and opportunity for staff to raise issues/concerns etc.	DP /KM/GM
[illegible] Mar	Science – Learning Walk/Drop-ins	SLT to drop in to classrooms to check on the teaching & learning of Science & learning environments.	TS / AD / KM
w/b 27th Mar	RE book check	A sample of RE books collected this week. Areas for dev / strength identified in order to map out progression and development of the subject. Using the 'Checking In / Checking Out' Process	DP/HO'D/KM

Pupil Voice is now gathered through interviews with individual children and through visits to each class from our Lab Technicians.

Pupil voice was gathered to find out what the children thought would make Science better.

What would make science even better at school?	playing with things to find out things. (Y1 child)
What would make science even better at school?	To invesgate and explor more [illegible] (Y3 child)
What would make science even better at school?	Making discoverys discoverys outside more often. (Y4 child)
What would make science even better at school?	if we dow even more projets in/out of School. (Y6 child)



Investigating & exploring.

Working in our outdoor areas.

Work scrutinies are carried out & feedback given on our strengths & how we can continue to improve.

Science Work Scrutiny 30/11/22

Strengths	Areas for Development
• Science is happening regularly across the school. • Practical, interactive lessons are the "norm". • Science is engaging & fun with "enhancements" seen across school. • Both long term plans & Big Questions in place across all Key Stages. • Coverage of topics/objectives now in correct Key Stages. • A variety of ways of recording • Some evidence of concept maps being used as a "pre-assessment" tool in some classes (Check-in) & some used as an assessment tool at end of topic. (Not yet consistent) • Working scientifically evident across all Key Stages • Objectives taken directly from the curriculum. • Topics have been re-jigged to be covered at the most appropriate time of year now. • Recording has moved on & Big Books are being used more effectively - remember we do not need to put lots of the same thing in BBs.	• Differentiation • All work must be dated, including work in BBs. • More "pupil voice" needed in BBs/Floor books & child identified (generic quotes given in BBs but not individual or group voices identified) - not an explanation of the task (this is actually teacher's/adult's voice). • Worksheets still very evident in books. Are we using these effectively? • Working Scientifically - need to look at progression across the school. What key skills need to be taught & in which Key Stage. • Work in individual books - 3/4 pieces should be evident in individual books dependent upon Key Stage. • Pic collages - not needed in individual books. Are they even needed in BBs? Purpose? Duplication of work put into BBs & individual books.
Things To Think About: • Include "Working Scientifically" on planning - are we now doing this? • Knowledge mats - need a decision as to whether or not we use these as a school/what is their purpose? • Planning - adapt as necessary. Include Objectives - copied & pasted directly from PoS & then they are there for reference. • Ensure which element of Working Scientifically is also identified on your planning. • Label your lesson biology/chemistry/physics & ensure children which "arm" of the Science curriculum they are covering. • Assessment • Progression • Differentiation	

There is now much more consistency in the approach to the teaching & learning of Science across all Key Stages, as we have collectively developed a set of agreed principles that constitutes good science across our school. This facilitated the Science progression map for staff and road map for children & parents.

Staff have listened to children & started to use our own outdoor area more to enhance teaching & learning in Science, as well as making lessons more practical

- ✓ Continue to use Lab technicians to gather pupil voice.
- ✓ Ensure that Science maintains it's status on the monitoring programme/SDP.

KEY

Action Box | Impact Box

Commentary Box | Next Steps

T A. There is provision and signposting of relevant internal or external professional development and support with which staff engage.

Starting Point

Science CPD which had been booked for 2020 was significantly delayed due to COVID 19.

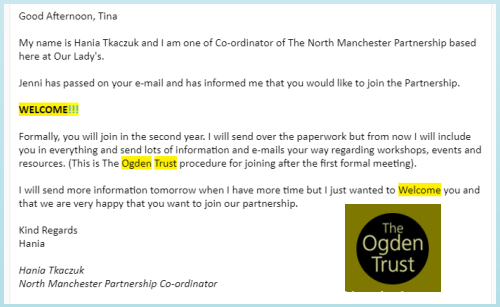
Science Lead was new to the role.

Lessons are very much teacher led & knowledge based – relying upon videos & PowerPoints (teacher)

Staff lacked confidence in teaching certain aspects of Science and in the area of Working Scientifically.

I have become more confident & adventurous in my Science teaching this year. (teacher)

SL – used a variety of pocket CPD Spotlight videos for with all teaching staff.



Training provided has ensured that teachers are up-to-date with current Science initiatives & have become more reflective on their current teaching strategies in Science.

SL joined the Ogden Trust which provides free CPD & resources for all staff in a wide range of Science topics.

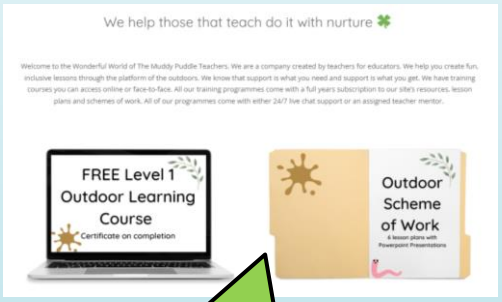
School joined ASE professional body to develop teaching and learning.

The Association for Science Education

The lesson plans & resources around sound, provided by the Ogden Trust, have really enhanced the T&L in my class (teacher)

As a primary member of the Ogden Trust staff are now being given regular opportunities to engage in purposeful science CPD throughout the year.

Teachers are actively engaged with external training & support & sourcing it for themselves.



I think this can help us with our 'getting outside more' target & I would be happy to complete this training. (teacher)

Where We Are Now

SL completed a survey of training needs across all Key Stages.

Staff now inform me of training they would like to take part in for their own professional development.

Teachers take an active part in internal professional development sessions..

Staff now take an active part in the development of our Science curriculum rather than being directed.

To continue to encourage use of Explorify, Reach Out and STEM. & other supportive agencies.

KEY

Action Box | Impact Box

Commentary Box | Next Steps

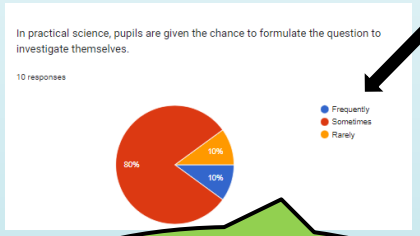
T B Teachers are supported to use a range of effective strategies for teaching science which challenge and support the learning needs of all children.

Starting Point

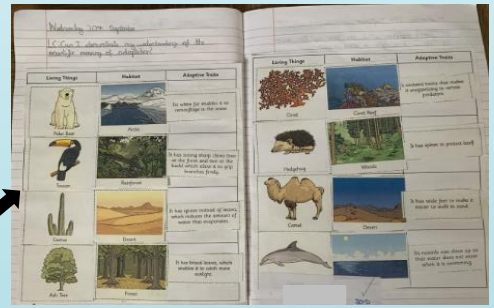
Science boards were for "display" purposes & did not support children's learning. Working Scientifically was not evident..

I don't like it when we have to do lots of writing. (Y4 child)

In a staff survey staff acknowledged that they rarely gave pupils the chance to formulate the question to investigate.



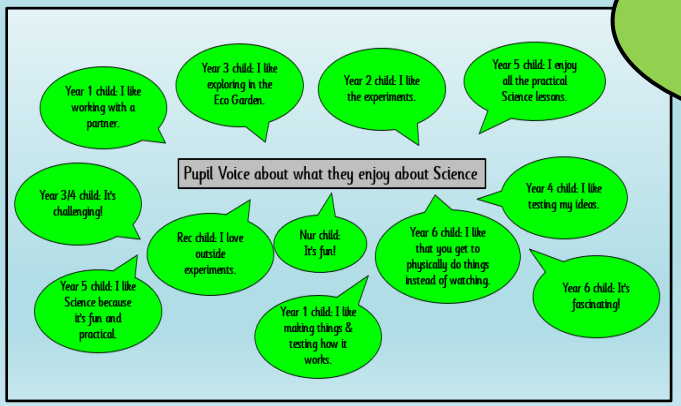
I would tell the children the questions that we would be finding the answers to and lead the teaching & learning. (teacher)



Science was very much classroom - based & teacher led.

Could you send home ideas of experiments that we can complete at home linked to what the children are learning about in school? (Parent)

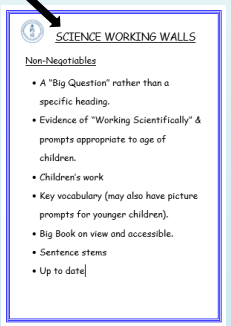
Children's engagement & excitement is clear to see.



I am now more confident to let the children take an active part in their own learning. (teacher)

Where We Are Now

Science Working Walls were developed with "non-negotiables" established in collaboration with all teaching staff.


SCIENCE WORKING WALLS

Non-Negotiables

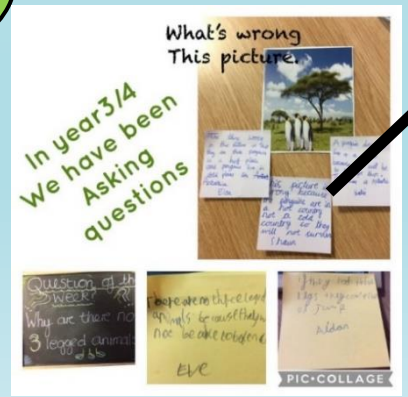
- A "Big Question" rather than a specific heading.
- Evidence of "Working Scientifically" & prompts appropriate to age of children.
- Children's work
- Key vocabulary (may also have picture prompts for younger children).
- Big Book on view and accessible.
- Sentence stems
- Up to date

Big Books are being used to record group work.

Could you send home ideas What about a Science day/week? (Parent)

Parental support & ideas to enhance the teaching of Science were sought.

Science working walls now support the children's independence, highlights key knowledge and supports AFL enabling teachres to plan for next steps knowledge.



Approaches like this help class discussions and supports a variety of learning styles, along with retention of information because it maintains and engages children's attention. This is an example from a Year 3/4 unit on animals.

To continue to encourage staff to use a range of strategies in their teaching to engage children and the wonder of Science.

KEY

Action Box | Impact Box

Commentary Box | Next Steps

T B Teachers are supported to use a range of effective strategies for teaching science which challenge and support the learning needs of all children (continued)

Starting Point

Our outdoor area was not being utilized to support children's learning.

We now take our learning outside whenever we can & link it to other areas of the curriculum.

Year 6 children investigating shadows.

Staff were unaware of the wealth of resources available to enhance & engage learners of all types. .

Teachers have started to incorporate things such as drama, poetry & stories into their science lessons as alternative teaching & learning strategies.

Year 3/4 children investigating bugs in our Eco Garden..

Children who were less engaged in "paper-based" Science lessons are showing much higher engagement due to the varied teaching strategies being used.

Y3 using drama to act out different types of acting out seed dispersal.

One of our SEND children, who would often spend time outside of the classroom, is now a proud Lab Technician who goes into lots of pother classes to support Science!

Y5/6 used the story of "The Great Kapok Tree" to understand how all trees serve an important role and that everyone should think more carefully about cutting them down or destroying them

Lab Technicians work across the school supporting Science.

Online resources are now being used regularly to enhance their teaching & the learning needs of all children.

Staff were introduced to digital resources such as Explorify to facilitate the wonder of Science..

Year 1 completing a stem activity about parts of plants & their function.

What a wonderful environment you are creating for our little ones (Parent)

Parents are noticing the changes in Science across the school & how this is impacting their child's learning.

Where We Are Now

SEND children are thriving through their love of Science & the new, varied teaching approaches being used.

To continue to encourage staff to use a range of strategies in their teaching to engage children and the wonder of Science.

KEY

Action Box | Impact Box

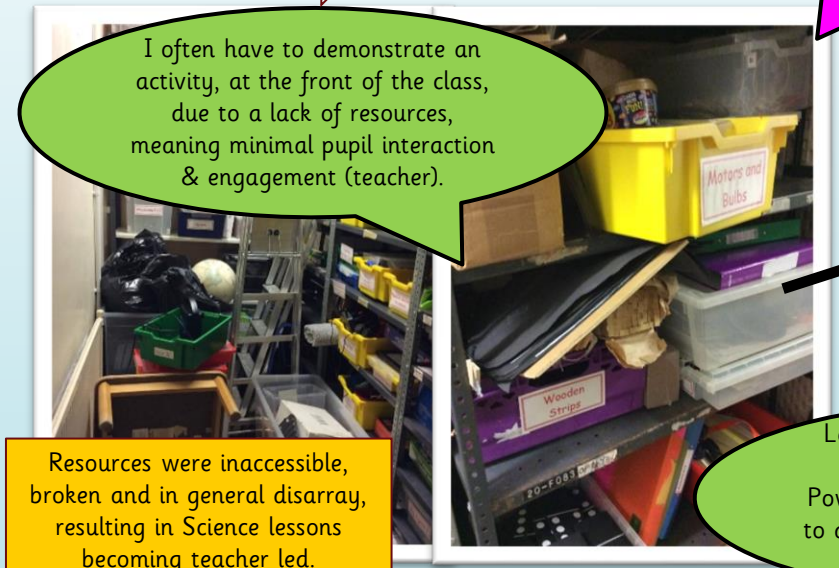
Commentary Box | Next Steps

T C. Resources are audited annually, well-organised and accessible, so that children can regularly and safely use appropriate practical and digital resources, information texts and the outdoor environment.

Starting Point

Lessons are boring with lots of writing to do! (Y4 child)

I often have to demonstrate an activity, at the front of the class, due to a lack of resources, meaning minimal pupil interaction & engagement (teacher).



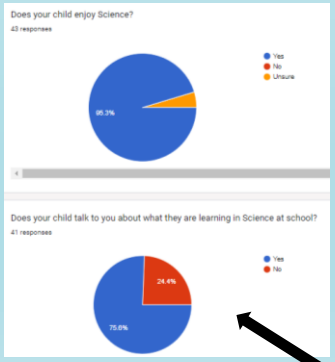
Resources were inaccessible, broken and in general disarray, resulting in Science lessons becoming teacher led.

Lessons were often teacher-led with a heavy reliance on PowerPoints/video clips which led to a passive learning environment. (teacher)

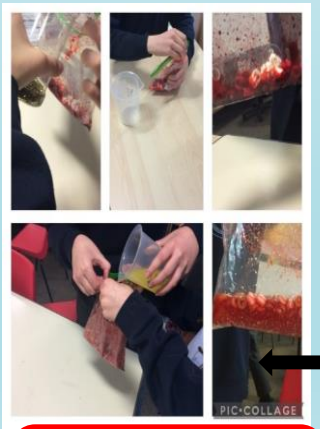
SCIENCE PLANNING: ELECTRICITY

LOWER KEY STAGE 2		AUTUMN TERM 2020		
	Learning Intentions	Outline/Reminder Of Activity	Challenge/ Differentiation	Key Vocab & Or resources	Success/Assessment Pupil Voice / Questions
Lesson 3	Can I make a simple Circuit and name the parts? Can I recognise a complete/ incomplete loop (circuit)?	Share L.C. & S.C. What is electricity? Recap and discuss different types of electricity, power sources etc. www.switchedonkids.com/electricity Update KWL: What have we learned? Capture any new questions. Watch demo – how to make a circuit: https://youtu.be/INBYuA6KoLA Experiment: Can a circuit be made with tinfoil, battery & bulb. What is the tinfoil replacing? Draw the circuit & label parts. Introduce complete/ incomplete circuit. What/ why? Predict which circuit diagrams will work/ not work - will the bulb will light up? Recap L.C. & S.C.	HA: What do you think will happen if we use 2 batteries/ 2 bulbs? Challenge cards: Answer the challenge questions. Use the electricity display light bulb questions. LA: Teacher support - differentiated questions and prompts.	Vocab: Power station Solar power Water power Wind turbine electricity Power Mains Batteries/ cell Wires bulb Switch Pylon Circuit Complete Incomplete static	Success Criteria: • Cbn light a bulb with their circuit • Cbn label parts of their circuit • Cbn predict if the bulb will light in a complete/ incomplete circuit. Will this circuit work? Why? What did we use/do to make the bulb light up? What is this part called? What happened when we used 2 batteries/ 2 bulbs?

Planning reflected a heavy reliance upon video clips/PowerPoints/teacher –led demonstrations.



Parents report that their child enjoys Science & are able to talk about it at home.

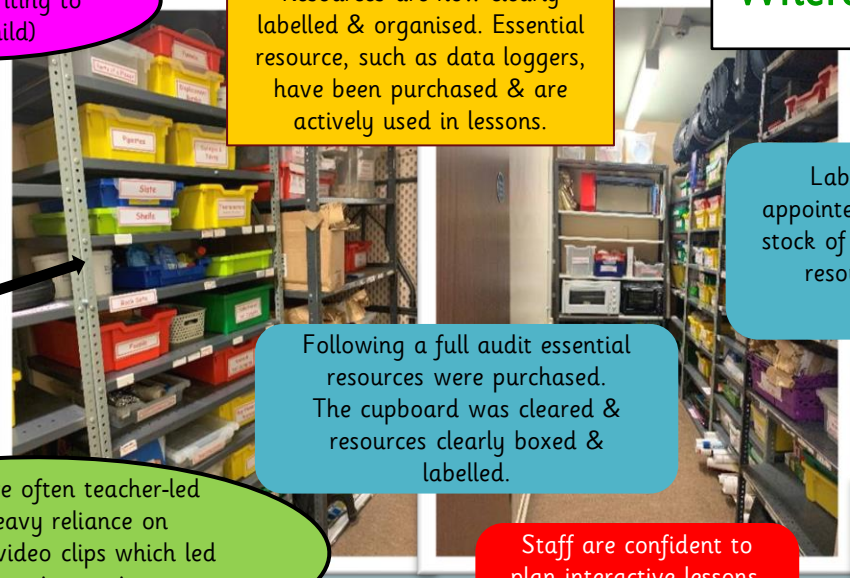


In lessons there is good use of new resources. There is an increase in the amount of practical work being carried out, developing greater understanding and independence. Resources are easily accessible.

Child engagement & interaction has increased. Children are allowed to follow their own lines of enquiry.

Starting Point

Resources are now clearly labelled & organised. Essential resource, such as data loggers, have been purchased & are actively used in lessons.

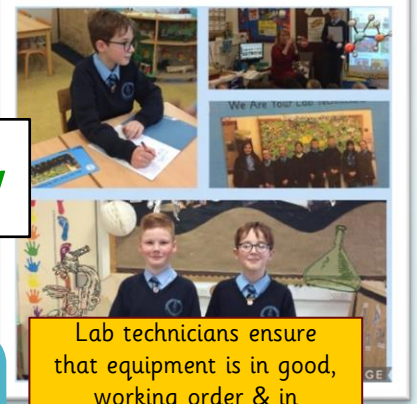


Following a full audit essential resources were purchased. The cupboard was cleared & resources clearly boxed & labelled.

Staff are confident to plan interactive lessons, knowing that the resources will be available.

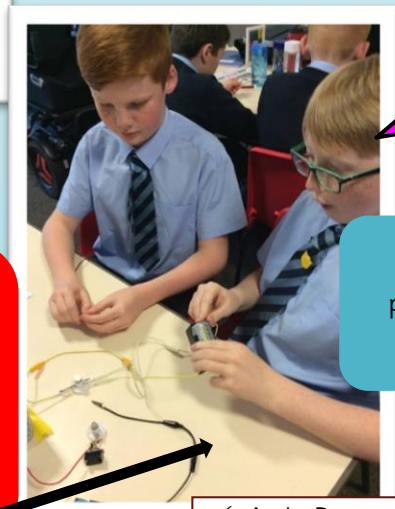
Where We Are Now

Lab Technicians were appointed and trained to keep stock of resources & to deliver resources to individual classrooms.



Lab technicians ensure that equipment is in good, working order & in amounts needed for whole class/KS lessons.

Time is saved and the role of the Lab Technicians has become an integral , valued part of lesson preparation.



I enjoy all the practical Science lessons. (Y5 child)

Resources were purchased in plentiful supply to allow small group/paired practical work.

- ✓ Audit Resources annually
- ✓ Secure an annual Science budget
- ✓ Use lab techs to maintain organisation, accessibility & quantity of resources.

Slide 7

KEY

Action Box | Impact Box | Commentary Box | Next Steps

T C. Resources are audited annually, well-organised and accessible, so that children can regularly and safely use appropriate practical and digital resources, information texts and the outdoor environment.

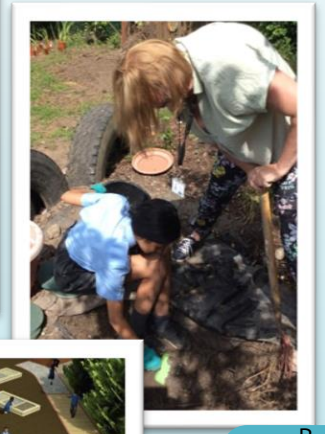
Starting Point

Although we had a designated Eco area it had become unloved & inaccessible.

There wasn't a member of staff in charge of the space to maintain it & involve children in the upkeep.

The area was seldom used or utilized.

A member of staff was very interested in developing this are and utilising it for all children across the school.



A new sensory pathway has been installed in our Eco garden to support SEND children.

The Eco garden is now a thriving part of our outdoor space and utilised by children from Nur - Y6

Year 3/4 children exploring the question; Who lives in a habitat like this?

Artist's impression of the finished Eco garden.

Both an Eco Club and Gardening club were formed and they began to transform the Eco garden & other outdoor areas around school.

1st-hand experiences of outdoor science mean that the children see "Science-in-action" on a regular basis & understand the impact they can have upon th eowrld we live in.

Nursery children recycling pumpkins form Halloween to feed the creatures that live in our Eco garden.

Frogs being released into our new wildlife pond.

Year 1 children exploring & planting bulbs.

New solar powered pond with fish and other forms of pond-life

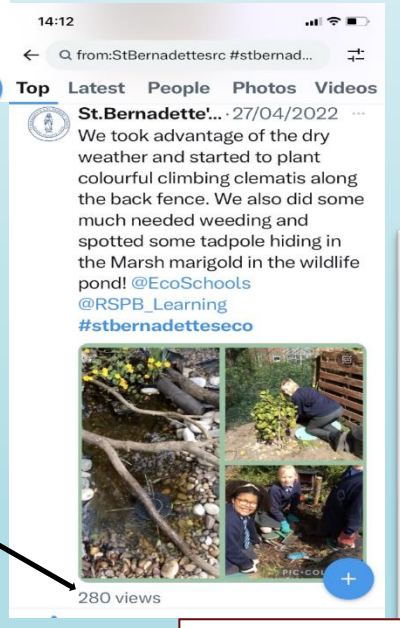
I like Science because it is fun and practical (Y5 child)

Our @stbernadetteseco TWITTER page regularly has over 200 views meaning that parents & groups, such as @RSPB-Learning & @EcoSchools, are following the progress of our Outdoor area.

Where We Are Now

An Eco Council was formed.

Children have an invested interest as they have taken an active part in the transformation.



✓ Ensure that the outdoor area continues to be utilised to enhance the experiences of children across the school.

Slide 8

KEY

Action Box | Impact Box

Commentary Box | Next Steps

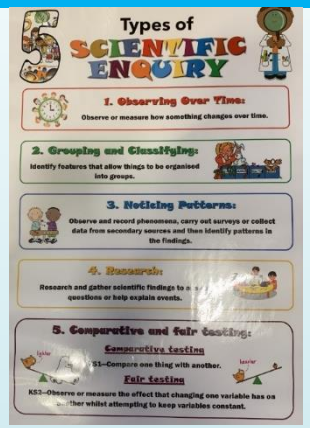
L A. Children are taught to use different enquiry types to answer scientific questions about the world around them, through the use of scientific enquiry skills.

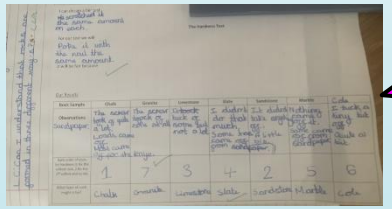
Starting Point

Working Scientifically was not explicitly incorporated into the planning across the school.

The 5 different enquiry types were not explicitly taught in our curriculum. The word 'investigation' was frequently used for all enquiry types by staff & children.

The 5 types of working scientifically have been made into a child-friendly poster to be displayed in each classroom on/near science displays.





An investigation is when you do a fair test and only change 1 thing (Y4 child)

Both of my children find science exciting and interesting (Parent)

When asked about working scientifically, most children talked about fair testing – they were unable to verbalise using the other enquiry types.

Both teachers & children alike are more confident in the 5 enquiry types & there is now a strong ethos for working scientifically throughout school.

Parents have commented upon their child's engagement since children have been encouraged to find answers to their own questions.

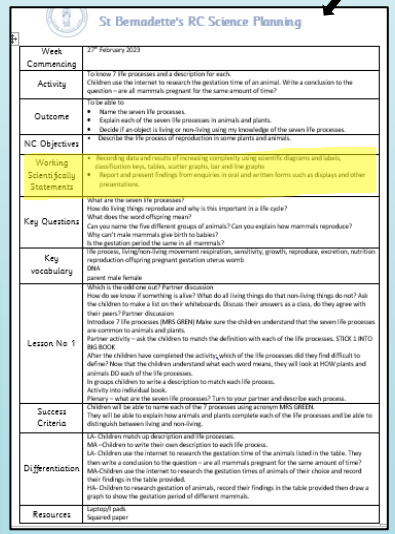
In-house staff training was provided in the 5 different enquiry types & a Working Scientifically progression of skills grid has been adopted. SLT were also involved in these sessions.

Where We Are Now

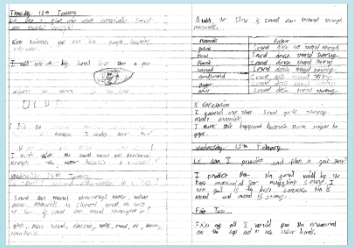
Science planning format has changed to include working Scientifically & is planned for 2/3 sessions, to enable assessment of progress towards objectives (AFL) instead of a whole half term.

Ways of Working Scientifically is now planned for in each Science session and has helped to bring science alive for the children and to make real life links.

Biology lesson plan post INSET training, using new planning format.


St Bernadette's RC Science Planning

Week Commencing	27th February 2023
Activity	To know 7 life processes and a description for each. Children use the internet to research the gestation time of an animal. Write a conclusion to the question – are all mammals pregnant for the same amount of time?
Outcome	To be able to • Name the seven life processes. • Explain each of the seven life processes in animals and plants. • Decide if an object is living or non-living using my knowledge of the seven life processes. • Describe the life process of reproduction in some plants and animals.
NC Objectives	
Working Scientifically Statements	• Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Report and present findings from enquiries in oral and written forms such as displays and other presentations.
Key Questions	What are the seven life processes? How do living things reproduce and why is this important in a life cycle? What does the word offspring mean? Can you name the five different groups of animals? Can you explain how mammals reproduce? Why can't male mammals give birth to babies? Is the gestation period the same in all mammals?
Key vocabulary	life process, living/non-living movement respiration, sensitivity, growth, reproduce, excretion, nutrition reproduction offspring pregnant gestation uterus womb DNA parent male female
Lesson No 1	Which is the odd one out? Partner discussion How do we know if something is alive? What do all living things do that non-living things do not? Ask the children to make a list on their whiteboards. Discuss their answers as a class, do they agree with their peers? Partner discussion Introduce 7 life processes (MRS GREN) Make sure the children understand that the seven life processes are common to animals and plants. Partner activity – ask the children to match the definition with each of the life processes. STICK 1 INTO BIG BOOK After the children have completed the activity, which of the life processes did they find difficult to define? How that the children understand what each word means, they will look at HOW plants and animals DO each of the life processes. In groups children to write a description to match each life process. Activity into individual book. Plenary – what are the seven life processes? Turn to your partner and describe each process.
Success Criteria	Children will be able to name each of the 7 processes using acronym MRS GREEN. They will be able to explain how animals and plants complete each of the life processes and be able to distinguish between living and non-living.
Differentiation	LA- Children match up description and life processes. MA –Children to write their own description to each life process. LA- Children use the internet to research the gestation time of the animals listed in the table. They then write a conclusion to the question – are all mammals pregnant for the same amount of time? MA-Children use the internet to research the gestation times of animals of their choice and record their findings in the table provided. HA- Children to research gestation of animals, record their findings in the table provided then draw a graph to show the gestation period of different mammals.
Resources	Lapbook pads Squared paper

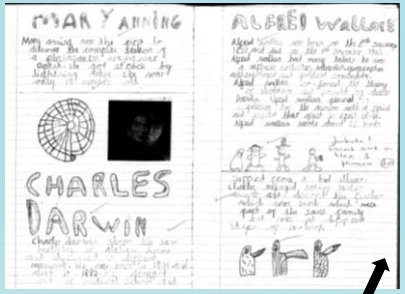


Use of enquiry types is now more consistent across school.

Y3/4 devising their own sound experiment to find out if sound gets fainter the further away you are.

HT & DHT are aware of the importance of ensuring that there is a good balance of both Science knowledge & Working Scientifically being taught across school.

Child-led enquiry in Reception – testing which materials make the best kite..



Research in Year 5– looking at some "Giants" of Science.

Pupils are becoming more confident in planning and carrying out investigations.

✓ Ensure that children's own questions lead enquiry more consistently across school.

Slide 9

KEY

Action Box | Impact Box

Commentary Box | Next Steps

L A. Children are taught to use different enquiry types to answer scientific questions about the world around them, through the use of scientific enquiry skills.

Starting Point

Children couldn't talk confidently about the types of enquiry or the skills they would need to be successful.

Children rarely came up with their own questions to investigate.

The 5 types of working scientifically are now explicitly taught & the language reinforced across school..

Observations over time in Reception – mould investigation.

I no longer provide the questions for every line of enquiry & now allow individual/pairs/small group research. (teacher)

Sorting and Classifying in Year 3.

Children have a better understanding and more experience of different types of enquiry.

I know that there are 5 different parts to an enquiry – they are on our class poster in case you forget. (Y6 child)

Secondary research taking place in pairs.

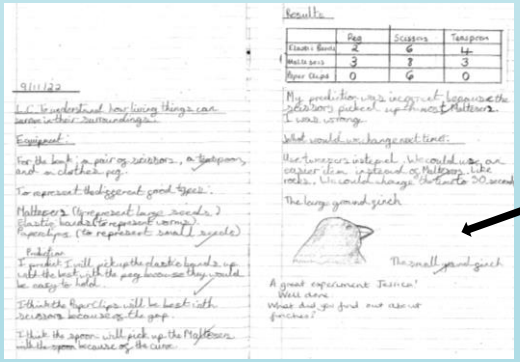
Staff were actively encouraged to "let go of the reins" in their Science lessons and enable more child-initiated enquiries.

Pattern Seeking in Year 4 – Can the tallest child always jump the furthest?

Children are now encouraged to follow their own lines of enquiry.

Where We Are Now

Problem Solving in Year 6 – Where does the sun go at night?



Fair Testing and Pattern Seeking in Year 5/6 – Which beak is best for picking up different types of seeds?

✓ Monitor working scientifically across school to ensure this area of the science curriculum continues to develop.

KEY

Action Box | Impact Box

Commentary Box | Next Steps

L B. A range of strategies and processes for formative, summative and statutory assessment are used, which reflect a shared understanding of the purposes of assessment in science and current best practice.

Where We Are Now

Starting Point

Pre-PSQM, assessment, across school was very much arbitrary with different approaches being used across & within Key Stages

AFL was not embedded with little "pre-assessment taking place.

Science Lead researched TAPs assessment pyramid online and, as part of the monitoring cycle, investigated current assessment practises across school.

Science leader trialed the TAPs focused assessments with own class – Mixing Materials.


TAPS
Plan for Focused Assessment

Science & Technology topic: Materials, outdoor learning | Reception Age 4-6 | Title: Mixing materials

Being curious focus: I can explore the environment and make observations

Concept context: I can explore the properties of materials

Assessment focus
- Can children explore the properties of materials?
- Can children describe their observations of the materials and mixtures?

Activity *Today we will be materials scientists.*
Provide an area and a range of materials for playful exploration, e.g. one of the following could be set up:
- 'Mud kitchen' with natural materials and water.
- 'Potions' station with kitchen ingredients like flour, salt, water.
- Powder paints for colour mixing.
- Colour mixing jars containing half water, half oil, dyed with water and oil based food colouring respectively. E.g. primary colour combinations of red/blue; red/yellow and blue/yellow, which can be shaken to mix and then left to settle. (see pic)

NB. If using oil and water jars, the oil needs to be disposed of according to local regulations e.g. in food waste if possible.
As appropriate, join in the activity to support use of vocabulary and description of the material properties. Collect vocabulary on labels, post its or in a floorbook.

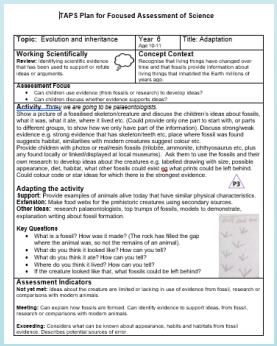
Adapting the activity
Support: Return to the activity frequently to support use of vocabulary.
Extension: Provide labels to list features of potions.
Other ideas: Write 'recipe' instructions for their potions.

Questions to support discussion
- What can you see? What does it feel/smell like?
- What did you add? How does it look/feel now?
- Will it look different if we leave it here for a while?
- What has happened to it?

Assessment Indicators
Not yet met: May mix materials, but does not observe closely or verbalise their observations.
Meeting: Describes their observations of materials and the mixtures they create.
Possible ways of going further: Uses a wide range of vocabulary and/or applies knowledge from other experiences to predict what will happen to the mixtures.

The TAPS assessment documents are supporting a much more practical approach to AFL in Science. (SL)

From Science leader training - Staff are starting to use TAPs ideas to support assessment.


TAPS Plan for Focused Assessment of Science

Topic: Evolution and inheritance | Year: 6 Age 10-11 | Title: Adaptation

Working Scientifically
Review: Identifying scientific evidence that has been used to support or refute ideas or arguments.

Concept Context
Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

Assessment Focus
- Can children use evidence (from fossils or research) to develop ideas?
- Can children discuss whether evidence supports ideas?

Activity *Today we are going to be palaeontologists.*
Show a picture of a fossilised skeleton/creature and discuss the children's ideas about fossils, what it was, what it ate, where it lived etc. (Could provide only one part to start with, or parts to different groups, to show how we only have part of the information). Discuss strong/weak evidence e.g. strong evidence that has skeleton/teeth etc, place where fossil was found suggests habitat, similarities with modern creatures suggest colour etc.
Provide children with photos or real/resin fossils (trilobite, ammonite, ichthyosaurus etc, plus any found locally or linked/displayed in local museums). Ask them to use the fossils and their own research to develop ideas about the creatures e.g. labelled drawing with size, possible appearance, diet, habitat, what other fossils could exist eg what prints could be left behind. Could colour code or star ideas for which there is the strongest evidence.

Adapting the activity
Support: Provide examples of animals alive today that have similar physical characteristics.
Extension: Make food webs for the prehistoric creatures using secondary sources.
Other ideas: research palaeontologists, top trumps of fossils, models to demonstrate, explanation writing about fossil formation.

Key Questions
- What is a fossil? How was it made? (The rock has filled the gap where the animal was, so not the remains of an animal).
- What do you think it looked like? How can you tell?
- What do you think it ate? How can you tell?
- Where do you think it lived? How can you tell?
- If the creature looked like that, what fossils could be left behind?

Assessment Indicators
Not yet met: Ideas about the creature are limited or lacking in use of evidence from fossil, research or comparisons with modern animals.
Meeting: Can explain how fossils are formed. Can identify evidence to support ideas, from fossil, research or comparisons with modern animals.
Exceeding: Considers what can be known about appearance, habits and habitats from fossil evidence. Describes potential sources of error.

TAPS Assessment

Can children:
- Explain how fossils are formed?
- Identify evidence to support ideas

Staff confidence is increasing in the TAPS approach & this is feeding through into their summative assessments which SLT are now confident with.

SL provided training on using the TAPs assessments & a "check-in" & "check-out" approach to AFL. All teaching staff & SLT attended

Science Lead became confident in the TAPs approach & how to deliver training following the trial in her own class.

TAPS assessment - assessing children's ability to use secondary resources to identify how animals and plants are adapted to suit their environment in different ways

Following training strong AFL now informs planning and provision of appropriate support.

✓ SL & SLT to monitor AFL across school as part of the monitoring process.

KEY

Action Box | Impact Box

Commentary Box | Next Steps

L B. A range of strategies and processes for formative, summative and statutory assessment are used, which reflect a shared understanding of the purposes of assessment in science and current best practice.

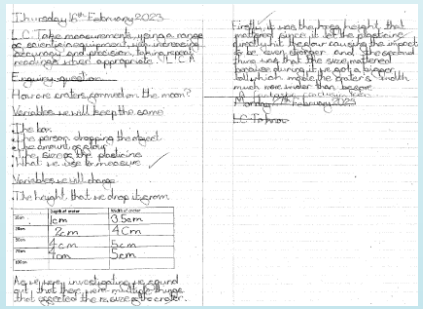
Starting Point

Assessment for Science was heavily "knowledge-based" and working scientifically was not specifically assessed..

Prior to our training, my assessment of Science would be very much based upon subject knowledge. (teacher)

Working Scientifically is now assessed alongside subject knowledge.

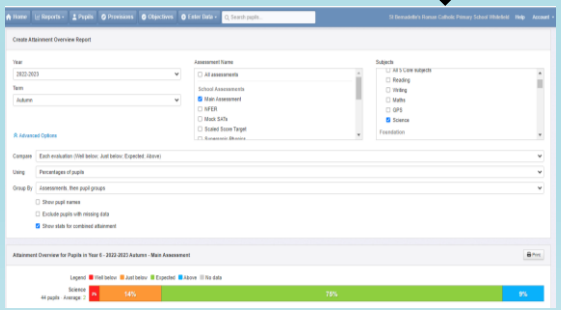
Working Scientifically is now very much as integral a aprt of our AFL approach as subject knowledge & staff are now using this to improve this area of the science curriculum.



SLT & SL are now confident in the types of assessments taking place in Science & the role they play in the summative assessments uploaded to INSIGHT which they are using to track progress.

The new assessment system is proving informative for teaching and next steps in learning.

Staff are now using their concept maps & TAPs AFL assessments to provide valuable information for our new, whole school assessment system - INSIGHT.

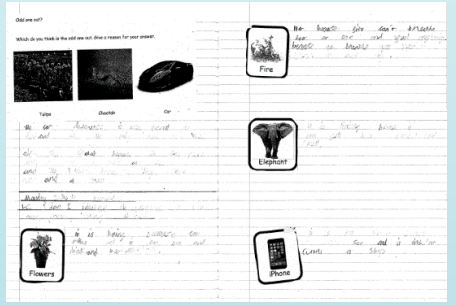


I now use TAPs assessment activities to support assessment in my class.. (teacher)

Where We Are Now

A range of assessments are now being used to inform teaching and learning.

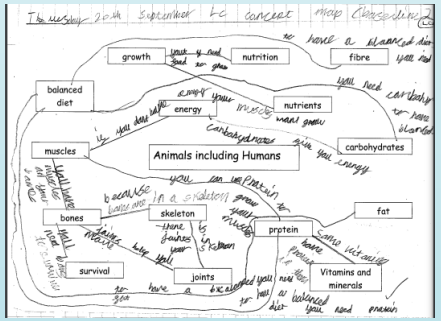
"Check-in Assessment: Year 6 children complete a quiz-trade activity to assess knowledge of Earth & Space.



Y4 TAPS "Odd One Out" activity

TAPS assessment to assess children's working scientifically skills, as well as knowledge. Example - Year 5/6 record data in a table when investigating the formation of 'craters'

Pre-teaching & post-teaching concept map completed in Year 4.



Concept maps are used across all Key Stages to establish initial starting points. These are re-visited towards the end of a topic as a "check-out" assessment.

AFL activities show a clear starting point and an end point for learning.

- ✓ SL & SLT to monitor AFL across school as part of the monitoring process.

Slide12

KEY

Action Box | Impact Box

Commentary Box | Next Steps

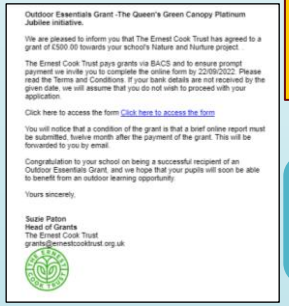
L C. Initiatives that encourage all children to think that science is relevant and important to their lives, now and in the future, are supported and promoted.

Starting Point

Staff, children & parents were unfamiliar with the term "Science Capital & it's relevance to Science teaching within school.

Parents' with a "science skill-set" were not being utilised to promote the relevance of Science in our day-to-day lives.

Children understand the importance of Science & how it affects tehri daily lives.


Outdoor Essentials Grant -The Queen's Green Canopy Platinum Jubilee initiative.

We are pleased to inform you that The Ernest Cook Trust has agreed to a grant of £500.00 towards your school's Nature and Nurture project.

The Ernest Cook Trust pays grants via BACS and to ensure prompt payment we invite you to complete the online form by 22/09/2022. Please read the Terms and Conditions. If your bank details are not received by the given date, we will assume that you do not wish to proceed with your application.

Click here to access the form Click here to access the form

You will notice that a condition of the grant is that a brief online report must be submitted, twelve month after the payment of the grant. This will be forwarded to you by email.

Congratulation to your school on being a successful recipient of an Outdoor Essentials Grant, and we hope that your pupils will soon be able to benefit from an outdoor learning opportunity.

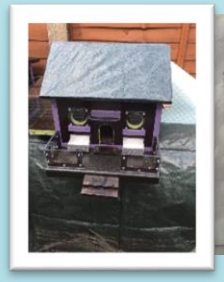
Yours sincerely,

Suzie Paton
Head of Grants
The Ernest Cook Trust
grants@ernestcooktrust.org.uk

The Eco Team won a £500 grant from The Ernest Cook Trust towards our nature & Nurture project.

Staff & children are now encouraged to enter various Science Competitions/initiatives.

School "House for a Mouse" competition which saw children design houses for mice in our Eco area. The winning entry was built & placed inn the garden.



A visit from our parents who specialise in cardiology.

I work in waste treatment.

I work with gas and carbon monoxide within my job

SL completed an on-line survey of parents to find out about their personal professional skills/hobbies & sent out an open invitation to come into school to promote their work.

I'm a diagnostic radiographer, my daughter asks about different bones, body systems etc

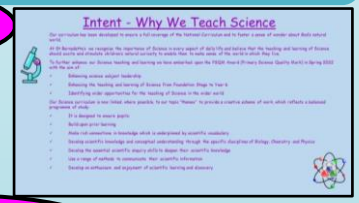
I have an interest in Astro Physics

I am a Pharmacist.

I didn't know that gardening and seasonal walks counted as science (though it seems obvious now I write it) (parent).

The Wild Roadshow linked well with our Habitats topic and added excitement to a normal school day. (teacher)

Our newly adapted INTENT statement is at the heart of our Science curriculum.


Intent - Why We Teach Science

Lots of different things in the world are linked to Science. (Y1 child)

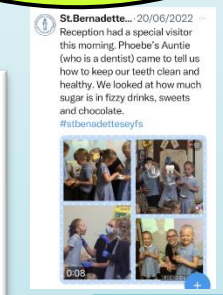
Lots of jobs require Science. (Y6 child)

Why is Science Important?

Science is everywhere! (Y2 child)

It helps us to get a job & learn (Rec child). (Y6 child)

The "Wild Roadshow" came into school..


St.Bernadette... · 20/06/2022
Reception had a special visitor this morning. Phoebe's Auntie (who is a dentist) came to tell us how to keep our teeth clean and healthy. We looked at how much sugar is in fizzy drinks, sweets and chocolate.
#stbenadetteseyfs

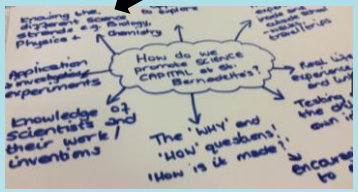

St.Bernadette's... · 11/07/2022
Reception turned Eco Warriors this morning! Following our incredible Summer Fair we picked up all the litter from the playground and the field. We even found some treasure!
#ecowarrior #litterpickers #godswonderfulworld

We need to look after God's wonderful world. (Rec child)

SL encouraged staff to promote Science Capital by utilising parents & through visits from external companies

Y3 children learning about electricity whilst building a fairground ride through a Lego Robotics Workshop.

Staff, children & even parents are now familiar with the term "Science Capital".



KS1 learning all about irreversible changes with the help of the local fire service.

- ✓ To extend involvement of parents now knowing the wealth of expertise we have.
- ✓ Plan trips/visits which will enhance our science curriculum further.

Children understand the importance of science in our curriculum.

Why is oral hygiene so important?


Life Caravan Workshop.

Where We Are Now

Slide13

KEY

Action Box | Impact Box

Commentary Box | Next Steps

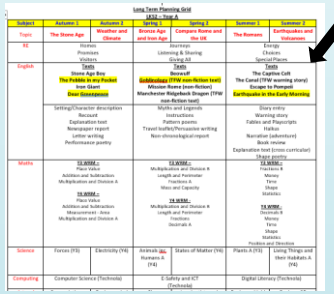
WO A. Curriculum planning links science to other areas of learning.

Starting Point

Opportunities for linking Science to other areas of the curriculum were not being fully utilised.

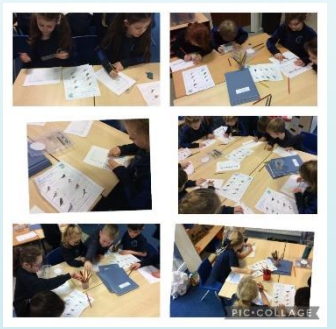
Science was seen very much as a "Stand-alone" subject area.

Links between Science & other areas of the curriculum were not high-lighted on our Long-Term planning grids.



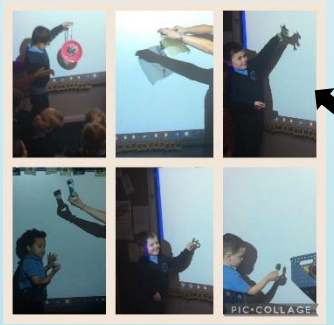
As part of our re-mapping of the curriculum, staff have now identified possible links between science & other subjects .

Where We Are Now



Using tally charts in Science

Aspects of Science in History lessons in KS1, as children learn about the Great Fire of London & link this to work on materials.



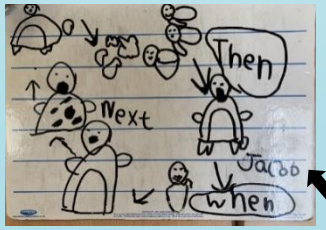
Children investigating shadows, on the interactive whiteboard, as part of child-led learning in Reception.

It is now clear in children's books & in classroom environments that Science is being embedded in other subject areas.

Teachers then started to incorporate Science into other subject areas & other subject areas into Science lessons.

By linking Science to other curriculum areas, children can see how Science is relevant in the wider world.

Art & Science – Y2 used Art to show what they had learnt about cacti & how they've adapted to their habitat.

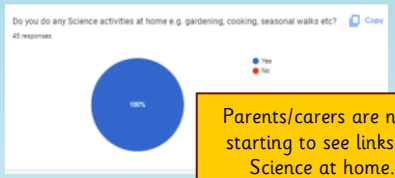


Linking English & Science – Y1/2 looked at a letter from Polly the Polar Bear asking Sir David Attenborough for help as her home is melting away.

Writing & Science – Reception children writing about the life cycle of a penguin in their Literacy lessons.

Staff now actively look for possible links to other subject areas, ensuring that Science permeates lots of our curriculum.

Life-cycles – butterflies released into our Eco garden.



Parents/carers are now starting to see links to Science at home.

- ✓ To continue to look for and use relevant cross curricular links to enhance and make connections in learning, making it relevant for the children.

KEY

Action Box | Impact Box

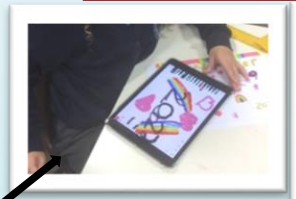
Commentary Box | Next Steps

WO B. There is participation in some external initiatives, topical science events and family learning.

Starting Point

Although the school has engaged with external initiatives in the past, these were not always linked to science even when possible links were available.

Family learning in Science was not actively promoted with a much heavier reliance on Reading & Maths activities being sent home.



A variety of clubs were offered to children, such as a computer club & sports clubs, but none with a specific Science background.

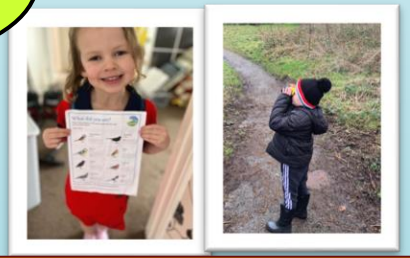
Gardening Club making Christmas wreaths.

New Science Club - coming Spring 2 2023

The whole school took part in the "Big Battery Hunt" competition.

The British Science Week "take-home activities were sent home to enhance family engagement.

There is a rain gauge at our front door, that my children made and check regularly! (parent)



Family involvement is increasing & parents/carers are recognising the importance of Science in their children's lives..

We both did the experiment to show how even mum and daughter have different finger prints and patterns - mum has Arch and Izzy has Whirl and Arch! Thank you for sharing, we had fun! (parent)

EYFS & KS1 children took part in the "Big Garden Birdwatch with their families.

Y3/4 finding out about the mummification process at Bolton Museum.

Parents and children have been actively encouraged to get involved with Science through newsletters & involvement in external events.

The phases of the moon is the big thing at the moment and I am supporting my child in finding out about this by keeping a diary. (parent)

Learning started at school is now being followed up at home!.

Reception taking their learning home & creating life cycles.

A variety of new clubs have been established with specific Scientific links.

Eco Club making recycling pumpkins to feed the wildlife in our Eco garden.

Nursery children taking part in the "Brush Bus" campaign.

Where We Are Now

The Eco garden has been a Godsend to me (parent of 2 SEND children)

All families are benefitting form our initiatives.

A Science after school club has been set up.

Children's interest in Science is growing across the school with our newly stated Science club being over-subscribed!

- ✓ To further develop links with our families
- ✓ To look for other initiatives, such as British Science Week, to promote Science across school.