Pre PSQM

Reflection

IMPACT

Next steps

Aston Rowant C†E Primary School

Growing together we inspire each other to achieve our full potential as courageous lifelong learners.

School Science Curriculum Page:
https://www.aston-rowant.oxon.sch.uk/science-8/
Silver PSQM Award (achieved in 2018): https://www.aston-rowant.oxon.sch.uk/psqm-award/

Subject Leader: Georgina McCleary

PSQM Gilt Award Portfolio 2022

Science at our school

We are a small rural school of just over 70 children (4 classes – R, Y1&Y2, Y3&Y4, Y5&Y6) in Oxfordshire, with the luxury of outdoor space including a 'wild' area, allotments, large field, mud kitchen, willow dome, raised beds, sun bubble and pond. The children in our school love learning outside of the classroom in their mixed year groups classes.

Hedgehog Class (Reception)

Squirrel Class (Y1 & Y2)

Fox Class (Y3 & Y4)

Owl Class (Y5 & Y6)

Science at our school

During the PSQM process, staff have become even more reflective in their practice and used this to highlight areas for professional development. Enthusiasm for Science teaching and learning has risen across the whole school in both staff and children. Children have many more opportunities for outdoor and hands on learning to develop scientific enquiry. There is now a clear vision for Science teaching and learning at Aston Rowant School.

School vision:

Growing together we inspire each other to achieve our full potential as courageous lifelong learners.

Our Vision for Science Learning

The goal of Scientific education in Aston Rowant C†E Primary School is to enable our children to be curious in their approach to learning, to be courageous in their attitude to learning, to be empowered to work both independently and collaboratively, to understand the impact their learning has had on them so far and be inspired to keep learning.

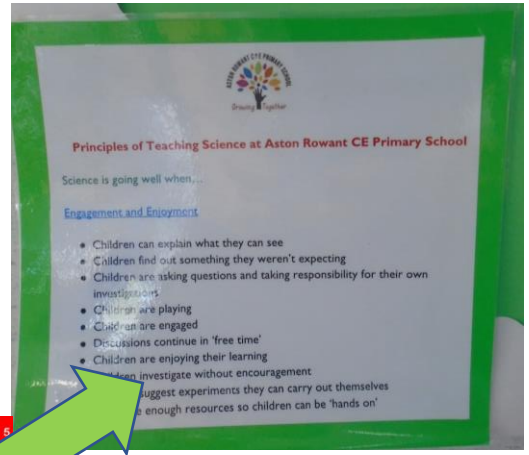
The link to our school vision has ensured cohesion across the school.

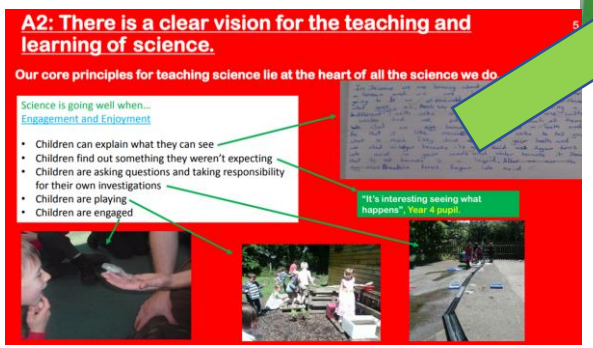
SL A: There is a clear vision for Science

We achieved the PSQM Silver Award in 2018

Our Vision and Key Principles are displayed on our website. (our shared key principles)

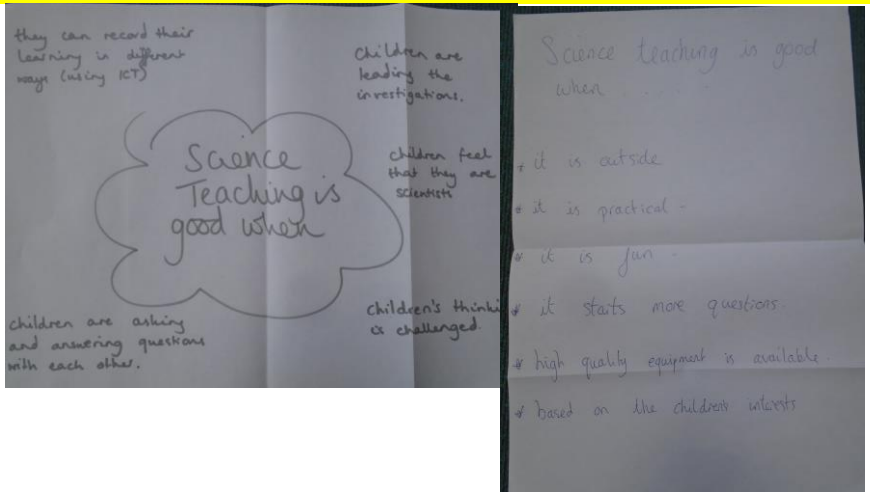
We reviewed our vision and principles for Science due a change in staffing, leadership and governance which had meant that very few stakeholders were aware of the current vision. This review highlighted that the original principles were still fit for purpose and we wrote a new Science vision based on this and our whole school vision and values together.





"She loves her Science lessons and talks about them at home" Y2

Parent Voice Survey



'Science is good when…' staff meeting.

Staff use our vision to take ownership of these principles and ensure that they teach in this way. The principles are shared with the wider school community via our website and displayed in every classroom. The whole community is aware of what Science will look like in our school.

We now use our vision as part of our monitoring process to ensure that the key teaching principles are part of this process for monitoring and evaluation.

SL B: There is strategic support for subject leadership.

CPD is valued and actively encouraged by current leadership, with the headteacher supporting release time for professional development over the last 2-3 years.

Examples of School CPD logs.

Aston Rowant C†E Primary School
Training Log 2019-20

Subject Knowledge	Skills Based
PSHEE 2020 (03.09)	New Ofsted Framework (03.09)
Assessment in Primary Science	Primary Site Website (08.01)
Difficulties in Literacy (04.10)	OTrack (01.07)
The Joy of Reading (24.02)	

Developing the role of subject leaders is a focus of the current SDP. SL meets with the headteacher regularly to inform her of monitoring within the subject and the impact of subject leadership is discussed at appraisal meetings. There is a sustained programme for professional development both delivered externally for the subject leader or internally by the subject leader.

Support in developing subject leadership has ensured continued confidence in leading the subject and supporting others to develop their skills and knowledge within Science.

To: Mrs McCleary

This is great, thank you so much!

really appreciated your feedback and guidenace yesterday,

To continue to monitor areas of need for CPD to support staff and therefore having a further impact on children in terms of hands on and enquiry based learning, especially with any potential changes in staff.

SL C: There is a rigorous monitoring and improvement cycle.

The monitoring and evaluating cycle is a live document created with subject leaders to include book looks, lesson observations, learning walks and pupil voice for each subject. The link governor for Science is also included in the monitoring process.

The current SDP outlines 'High Quality Inclusive Teaching' as a main focus. Subject leader takes responsibility and ownership for monitoring Science.

GM considered that pupils received sufficient time devoted to science, and that the quality of learning was good, with all staff having sufficient experience to teach at an appropriate level. She is keen that children get practical experience to get a feel for what science is and what scientists do – keen to have more input from people who have jobs with science backgrounds.

Learning in science has (like other disciplines) undoubtedly been difficult in the last 12-18 months, particularly during lockdown periods. Knowledge (science facts etc) has not been affected as much as was feared, possibly owing to the volume of sources of interesting factual information available to children; however, the acquisition of scientific 'skills' has fallen behind where pupils should be and particularly in KS2, there is significant emphasis being placed on the scientific method and 'how to do' science to recover this.

Link Governor Monitoring Report

"The girls (Year 3 and 4) love their Science lessons each week"

Parent Voice Survey.

Effective CPD and a well established monitoring cycle has ensured that subject leaders are confident to conduct monitoring exercises and support staff to improve the subject with relevant CPD and coaching. All stakeholders have opportunities to share their perspective of the effectiveness of Science at our school.

Parent voice has recently been introduced as part of the monitoring process for Science and should be continued as a valuable part of the monitoring process.

T A: There is a sustained programme of CPD.

CPD is highly valued and there are regular opportunities to develop through our Science Network of partnership schools.

Science CPD is mostly delivered internally by SL and linked to specific areas of development, including 'Bright Ideas Time'. We have also had external CPD from Science Oxford through the partnership which took place virtually.

Time has been taken to support staff to develop planning to ensure enquiry based learning is consistent throughout the school. The impact has been that they are confident to plan for more hands on and open ended learning.

Dear Thame Partnership Science Network leaders,

Please save the CPD date **15th of February, 4pm (STC).**

As part of the partnership, we run an annual CPD. This year we have chosen to go with Science Oxford's Thinking, Doing, Talking Science Taster 3 which is about focused recording.

Course Outcomes

- Practical ideas to help you focus recording on learning objectives.
- Sharing of best practice and a chance to "have a go"

More info can be found here Thinking, Doing, Talking Science Taster 3 (scienceoxford.com)

Subject monitoring to continue to include staff audits so that they receive up to date, personalised and purposeful CPD.

The Year 3/4 teacher planned for children to investigate the relationship between bones and muscles by creating working models.

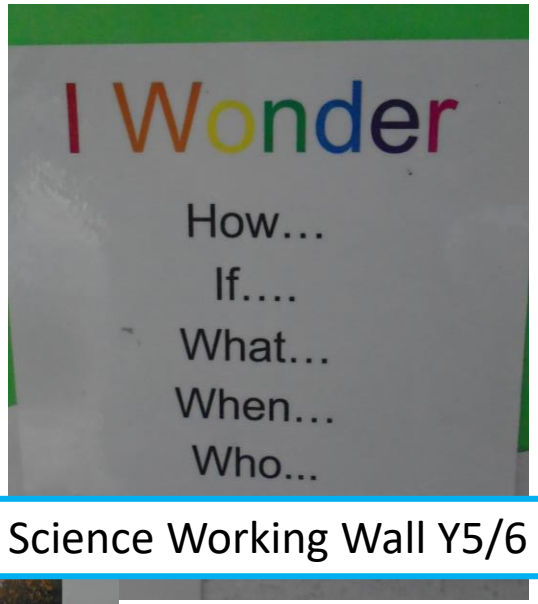
The Year 1/2 teacher planned for children to experience for themselves how materials can be changed.

Reception teachers planned for children to explore magnets to find 'treasure'.

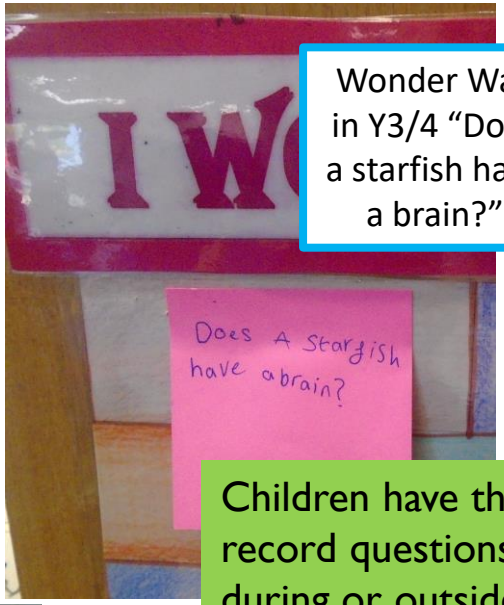
T B: teaching strategies – I Wonder statements

I wonder statements were introduced in Science to encourage curiosity in learning and the beginning of each topic and also to frame feedback.

The impact of this is that children are consistently encouraged to question and be curious. Framing our written feedback in this way helps to model this further.



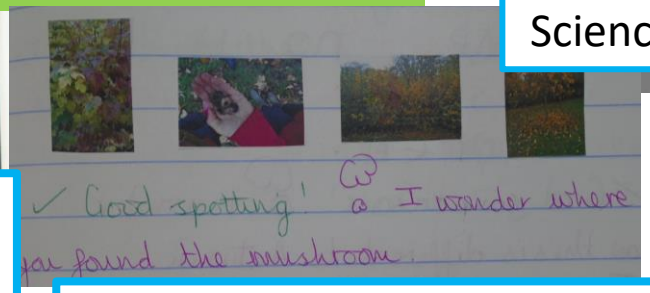
Science Working Wall Y5/6



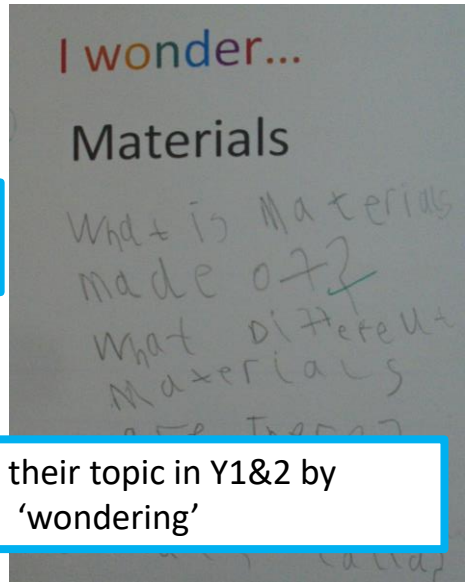
Wonder Wall in Y3/4 "Does a starfish have a brain?"

Children have the opportunity to record questions they think of during or outside of Science lessons. They (or their class mates) then have access to research materials to find out their answers.

Wonder Wall on playground with blackboard for writing questions.



'I wonder' statements modelled in written feedback in Y1&2



Starting their topic in Y1&2 by 'wondering'

I wonder statements are now an established practice in Science learning and also now used across the school in History, Geography and RE. These are shown on displays, in books and through written feedback.

Subject leads and leadership have considered how this could develop in our outdoor spaces. Work is in place to make sure this is becoming more established.

T B: Teaching strategies – remote learning

Children experienced a range of teaching strategies in school.

This was forced online during the school closures. Scientific enquiry was supported during the school lockdown period by providing quality resources, lessons and tasks for home learning and supporting other teachers to do this.

Year 5/6 had weekly Science lessons as well as an ongoing project for the term.

Year 1 /2 made rubbery soap in a remote lesson linked to materials and healthy habits.

The whole school was provided with ideas for hands on learning using resources you can find at home. 50 Simple Science Experiments with Supplies You Already Have (handsonaswegrow.com)

All pupils had the opportunity for Science learning at home. When children returned to school their Science knowledge had not suffered as much as expected.

We have a good insight into Science engagement at home and can use this for future planning.

T C: Resources

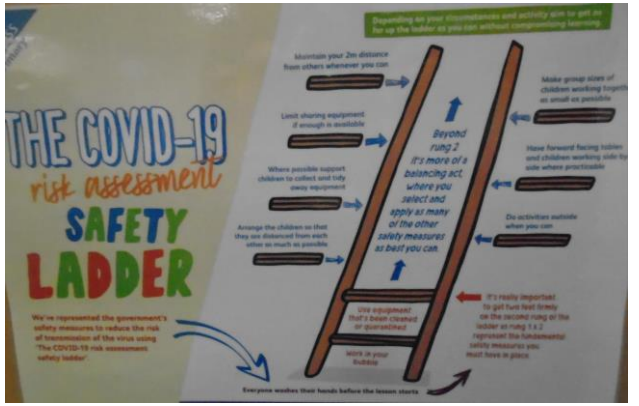
There is a central store of resources and staff are aware of how to request and order resources where necessary. There is a 'safe science' culture at school.

We have developed good links with local Secondary schools to provide further resources and advice about how to use them safely.

"They loved the microscopes and are already talking about doing Science at Secondary School"

Parent Voice Survey

The CLEAPSS COVID Safety Ladder was shared with staff to support with practical work during periods of COVID restrictions.



COVID Safety Ladder Displayed next to Science resources

The Safety Ladder empowered staff to return to practical work by using smaller groups and working outside.

Year 5/6 working outside to investigate forces during COVID restrictions

The children have had access to resources they may not otherwise be able to. Children have developed their curiosity and developed enthusiasm for Science beyond the Primary Curriculum.

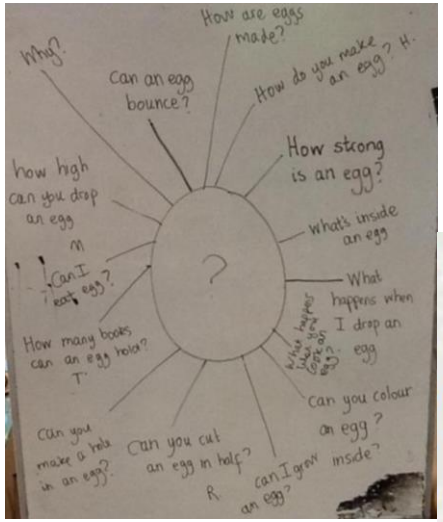
SL to maintain links with other settings to share resources to enhance day to day to teaching as well as enrichment opportunities.

L A: Independent Enquiry

Enquiry based learning is well established and is evident in the GROWTH document for Science. This was also highlighted in our PSQM Silver Award. (Our document on Growth)

Learning objectives are phrased as questions. When reviewed this was not always consistent so we have had a strong focus on highlighting these on planning and to the children.

Consistent use of questions, and opportunities to develop their own, ensure children know that they are 'finding out' in every lesson.



Children in Reception ask questions about eggs before conducting their own investigations.

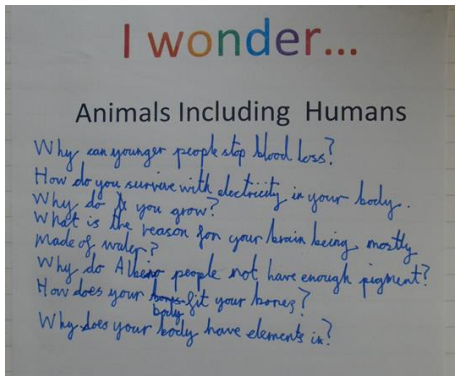
We dropped them from 1 metre high!

Children understand the value and purpose of enquiry.

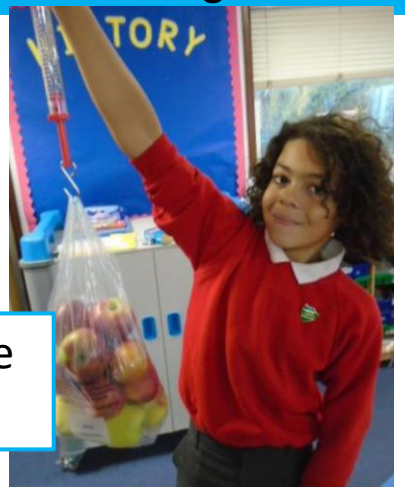
"I like finding out how things work and why things happen" (Year 2)

Pupil Voice Survey

Children will now be given further opportunities to reflect on their questions and further their enquiry as a result of their findings.



Y3&4 generating questions to guide their enquiry.



Y5&6 investigating the effects of gravity.

L A: Independent Enquiry

Annual Participation in Science Oxford's 'The Big Science Event'. We have previously had teams in the final. This year our team came second out of Oxfordshire schools.

As this is well established, staff are confident to allow children to follow their own lines of enquiry outside of the competition.

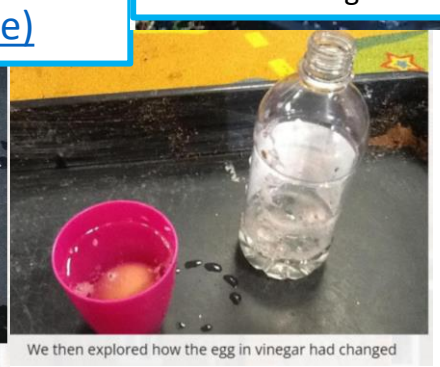
Y3&4 investigate durability and permeability of rocks

Children in Reception investigated ways they could make an egg bounce, how strong eggs are and how they might protect them from a fall. (Reception Science Week Blog Page)

Reception investigating ice that had formed over night.

Y5&6 use their knowledge of evaporation to make salt crystal Christmas decorations

The egg in vinegar bounced!



We then explored how the egg in vinegar had changed

Children take full ownership of their enquiry by planning, resourcing and carrying out their investigations independently.

Y3&4 use their knowledge of light to investigate rainbows.

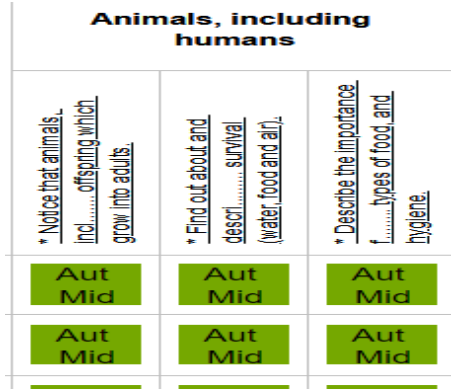
Y5&6 independently explore the way light travels and refraction.

Children will be given further opportunities to follow their own lines of enquiry during normal lesson as much as possible as well as through competitions.

L B: Assessment

A review of assessment highlighted that the current system was not valuable to teaching and learning.

Teachers can update children's attainment again skills and knowledge against each objective taught via the tracker. The impact of this has been that current and subsequent teachers of the class, as well as SL can quickly identify any gaps in learning.



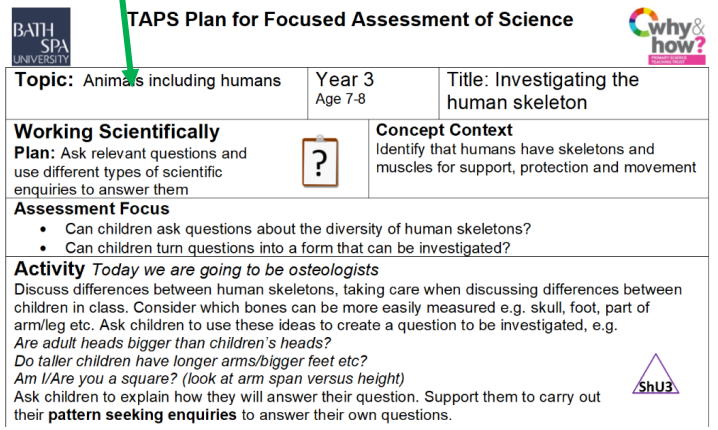
There is however, a lack of long term data due to the newness of the tracker and the remote learning period. This means that although attainment is simple to track, it has been challenging to track progress this year.

SL will support teachers in uploading data and monitor how the tracker shows progress.

We wanted to ensure that assessment was more effective. Online tracking system was purchased for whole school assessment. Our partnership schools were looking into an alternative assessment specifically for Science.

As a partnership. we are beginning to roll out TAPS assessment plans in order to assess knowledge and skills and inform future planning alongside the online tracker.

Teachers can assess working scientifically skills alongside knowledge towards the end of the topic and address any misconceptions and gaps within the unit rather than at other times (closing the gap more effectively).



TAPS Plan for Focused Assessment of Science

Topic: Animals including humans	Year 3 Age 7-8	Title: Investigating the human skeleton

Working Scientifically
Plan: Ask relevant questions and use different types of scientific enquiries to answer them

Concept Context
Identify that humans have skeletons and muscles for support, protection and movement

Assessment Focus
- Can children ask questions about the diversity of human skeletons?
- Can children turn questions into a form that can be investigated?

Activity *Today we are going to be osteologists*
Discuss differences between human skeletons, taking care when discussing differences between children in class. Consider which bones can be more easily measured e.g. skull, foot, part of arm/leg etc. Ask children to use these ideas to create a question to be investigated, e.g.
Are adult heads bigger than children's heads?
Do taller children have longer arms/bigger feet etc?
Am I/Are you a square? (look at arm span versus height)
Ask children to explain how they will answer their question. Support them to carry out their **pattern seeking enquiries** to answer their own questions.

ShU3

L C: Raising Science Capital

Ambitious plans were in place to invite Scientists into school to talk about their work. We are lucky to have lots of parents with Scientific backgrounds.

We were able to 'invite' some parents remotely during COVID restrictions. As soon as these were relaxed we have recruited passionate parents to support our creative curriculum.

Children were able to ask questions. They were inspired by the places and opportunities that these parents jobs had given them. Mostly they were inspired by people they knew and see at the school gate are 'actual Scientists!'

A parent who is a research Scientist at the Natural History museum in London, came to launch our Science week with a whole school assembly. The children asked lots of questions and were wowed by the elephant bird egg.

A parent came to talk to Reception about raising chicks and left an incubator of eggs for them to take care of.

Y5/6 had a virtual visit from a parent who is an expert in cardiology.

Owl Class

We have had a Zoom meeting this week in Owl Class, to finish off our Science topic on the human body. We were joined by Dr Barakat, who kindly offered to answer all the burning medical questions we had, however unusual! We found out lots about eyes, the heart, the liver and even where the idea of royals having blue blood came from. Dr Barakat gave us advice on how to lead a healthy lifestyle (ask your children how much sugar there is an orange vs a carton of orange juice and prepare to be surprised). We are extremely grateful for his time and expertise and we would like to say a big 'thank you'!

Two parents led a session on exploring plant and animal cells in KS2.

"He absolutely loved the visit and came home telling us all the new facts he had learned!" Y5&6

Parent voice survey

We will continue to invite a wider variety of Scientists into school for children to meet and extend our provision to trips now that restrictions have relaxed.

WO A: Whole-school planning links science to other areas of learning.

As a whole school we work within termly whole school topics.

There was concern that the Science curriculum was not be covered adequately so, with the support of leadership, Science is remaining as a stand alone topic for now. There is a cohesive whole school long term plan and progression map for the two year cycle where all of the required Scientific skills and knowledge objectives are covered.

All objectives are covered and linked to the whole school topic where links to other subjects can be made.

SL to continue monitoring that curriculum objectives are covered. Staff meeting time to be allocated to see how topics could be interwoven creatively to strengthen cross curricular links.

SPRING		SUMMER	
God ~ Son		God ~ Holy Spirit	
TRUST	OUTREACH	HARMONY	RESILIENCE
A SENSE OF PLACE LOCATION, LOCATION, LOCATION HOME IS WHERE THE HEART IS		WHERE IN THE WORLD WHAT A WONDERFUL WORLD ALL OVER THE WORLD	
Squirrel Everyday Materials Seasonal Changes (Spring and Summer)		**Squirrel** Plants (Year 1 NC) Scientists and Inventors	
Fox Light Animals including humans (Year 3 NC)		**Fox** Animals Including humans (Year 4 NC) Scientists and Inventors	
Owl Light Evolution and Inheritance		**Owl** Electricity Animals including humans (Year 5 NC)	
STORY TELLERS OPEN THE BOOK ONCE UPON A TIME		AS S SI	
Squirrel Animals Including Humans (Year 1 NC) Living Things and their habitatats		**Squirrel** Plants (Year 2 NC) The Environment (link t	
Fox Forces and Magnets States of Matter		**Fox** Living Things and their H Plants	
Owl Earth and Space Living things and their habitats (Year 5 NC)		**Owl** Living things and their h Scientists and Inventors	

SL created a COVID recovery plan to highlight areas of learning which may have been lost due to lockdowns.

Evolution and Inheritance (National Curriculum Statements in red are linked from other science topics)

Early Learning Goals	Understand some important processes and changes in the natural world around them.
Year 1	
Year 2	• Identify that most living things live in habitats to which they are suited and describe how different habitats provide for t animals and plants, and how they depend on each other. (Y2 - Living things and their habitats) • Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)
Year 3	• Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dis
Year 4	• Recog
Year 5	• Descr
Year 6	• Recog • Recog • Identif
KS3	• Hered • A simp DNA m • The va selectio • Chang which ir

Teachers are aware of potential gaps from lockdown through the year groups and can use this document to make links to other areas of the science curriculum to help close the gap. We ARE closing the gap.

Y5/6 tree identification during Forest School.

Y1/2 studied desert animals as part of their English and Geography

WO B: Enrichment

We redesigned our programme to be virtual and school based to adhere to COVID restrictions.

We have an established culture of enrichment since working towards the PSQM Silver Award.

"Big Science – I want more Big Science! " Y3&4

Pupil Voice Survey

'Winter Wonderland' virtual interactive workshop from Science Oxford (whole school)

Year 4 pupil sharing a plant she had grown in nutritious gel at a weekend Science fair.

"More trips, perhaps to the Science Museum"

Parent Voice Survey

These opportunities continue to increase our children's love of Science.

SL to strengthen and pursue further enrichment opportunities.

Children are inspired to share enrichment opportunities that they have had outside of school with their classes so that we may all be inspired.

Children in Year 3 created their own rock museum to share with their peers.