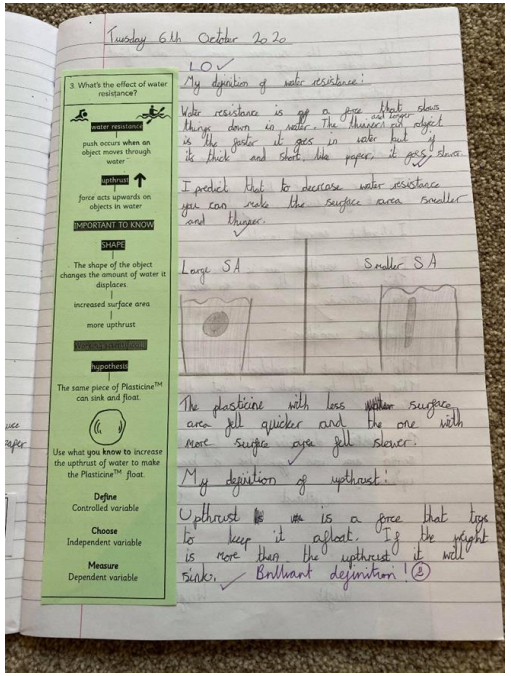
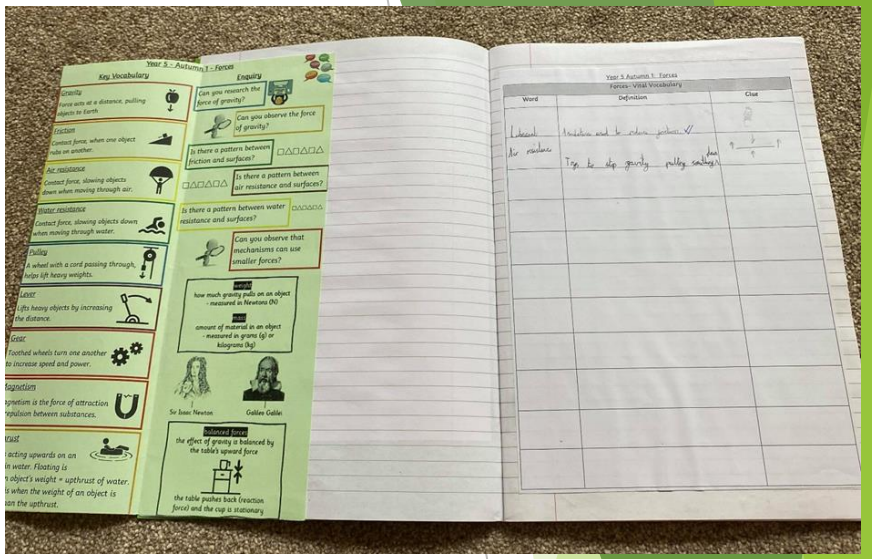
ABBOTS GREEN ACADEMY

Science

Intent


Tuesday 6th October 2020
LO
My definition of water resistance:
Water resistance is a force that slows things down in water. The thinner an object is the faster it goes in water but if it's thick and short like paper, it goes slower.
I predict that to decrease water resistance you can make the surface area smaller and thinner.
Large SA
Smaller SA
The plasticine with less surface area fell quicker and the one with more surface area fell slower.
My definition of upthrust:
Upthrust is a force that tries to keep it afloat. If the weight is more than the upthrust it will sink.
Brilliant definition!
3. What's the effect of water resistance?
water resistance
push occurs when an object moves through water
upthrust
force acts upwards on objects in water
IMPORTANT TO KNOW
SHAPE
The shape of the object changes the amount of water it displaces
increased surface area
more upthrust
VOCABULARY
hypothesis
The same piece of Plasticine™ can sink and float.
Use what you know to increase the upthrust of water to make the Plasticine™ float.
Define
Controlled variable
Choose
Independent variable
Measure
Dependent variable


Year 5 - Autumn 1 - Forces
Key Vocabulary
Enquiry
Can you research the force of gravity?
Can you observe the force of gravity?
Is there a pattern between friction and surfaces?
Is there a pattern between air resistance and surfaces?
Is there a pattern between water resistance and surfaces?
Can you observe that mechanisms can use smaller forces?
Sir Isaac Newton
Galileo Galilei
Balanced forces
the effect of gravity is balanced by the table's upward force
the table pushes back (reaction force) and the cup is stationary
Year 5 Autumn 1 - Forces
Forces - Vital Vocabulary
Word
Definition
Clue
Upthrust
Tips to stop gravity pulling

INTENT

At Abbots Green, we truly believe in developing our children as curious individuals. This is at the heart of our school's rainbow values, which filter through our science lessons. Children learn to become reflective, open-minded and independent as they develop their knowledge and skills to become inquisitive scientists. We consider that having a broad and balanced curriculum inspires and ignites children's curiosity but also contextualises learning, enabling children to develop an appetite for science. By providing hands-on experiences, our children develop as active learners, who are inspired to reach aspirational goals.

We believe in an enquiry-based teaching approach which inspires learners to question, hypothesise and test scientific concepts, thus engaging all children in the awe and wonder of science. Evidently, our learners develop the ability to pose scientific questions regarding the world around them – a crucial skill. At Abbots Green, science enriches and expands other areas of the curriculum, particularly, English, reading and maths. Whilst we understand that topical links and connections are key, we also recognise the need for depth and revisiting knowledge.

As Science is vital for the world's future prosperity and well-being, we understand the importance of it being a core subject. This is reflected in the National Curriculum 2014 and the Early Years Foundation Stage Early Learning Goals, which are used to plan our curriculum.

In the Early Years, scientific enquiry is taken outside where children are given scope to experiment and explore within a guided approach. In Year 1, science is blocked across a half-term, allowing these younger children to fully immerse themselves in their learning. From years 2-6, science is taught as a stand-alone lesson, but on a weekly basis with the theme changing every term. By teaching science weekly, it enables children to build upon their prior knowledge, vocabulary, understanding and enquiry skills. Each science lesson is articulately planned, to simultaneously cover knowledge content and ensure the prevalence of working scientifically across the school.

INTENT

Aims of teaching Science:

- develop children's scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop children's understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- equip children with the scientific knowledge required to understand the uses and implications of science, today and for the future

Three significant evidence-informed components underpin our ambition at Abbots Green: cognitive load theory, principles of instruction and tasks that support pupils to generate learning and make sense of the content. These are realised in the long-term teaching sequence, our teaching practice, and the tasks we set for children to think hard and thrive.

Early Years

In Early Years, children are encouraged to become scientists. Children's understanding of the world is developed by being encouraged to explore, investigate and manipulate objects. Children are encouraged to take their Science learning outside, with the title of 'Welly Wednesday'. With specific focuses, children are able to make sense of the world and community around them.

INTENT

Early years is all about exploring and investigating the world and Science combines these two key elements. It also connects all other areas of learning, for example language, describing what's happening in an experiment, learning new vocabulary. This is demonstrated through the EYFS curriculum coverage grids.

Science in Nursery and Reception is about raising questions and seeking answers. In Nursery, the outdoor environment is ideal for setting up imaginative and exciting provocations that will get children raising questions and looking for answers. For example, we have carried out ice experiments where items have been frozen, and the children wonder how this happened or it can be as simple as on a sunny day talking about shadows.

Early Years

INTENT

Children will:

- Show curiosity and interest in physical objects
- Talk about and describe what they see
- Show an awareness of change
- Ask appropriate questions
- Explain their understanding and share their own knowledge
- Investigate objects using all 5 senses
- Observe changes in the environment carefully
- Experiment with nature.

Early Years

INTENT

Jolly Journeys

Science **Welly Wednesday** Autumn 1	Scavenger Hunt	Introduce / model magnifying glasses and bug pots with bug finder sheets. What can you find? Where would be a good place to look? Why?	Natural Crowns What did you use? Catwalk of crowns.	Read the stickman story. Create a family of stick man using natural materials. Rat wasn't very kind. Create a game to play using natural resources	Play charades with creatures you may find in the WW area. Make a home for one of them.

Jolly Journeys

Science **Welly Wednesday** Autumn 2	What can you see in Autumn? What happens to the environment? Scavenger hunt.	Create a bonfire and fireworks using natural resources.	What does nocturnal mean? Which animals are nocturnal? Why? Make a nocturnal animal.	Can you make a woodland potion? Find a stirring stick and make a wish.	What does hibernate mean? Read 'One Snowy Night' Talk about hedgehogs make one a home.	Ice experiment.

Early Years

INTENT

Traditional Tales

Science **Welly Wednesday** Spring 1	Rubbings – what can you find to take a rubbing of? Can your friend guess what object it is?	Carrot Experiment. What do plants need to grow? Big and small scavenger hunt. Set up a display. Who can find the smallest / largest object?	Cooking – make bread. Look at pictures of a hen. Talk about its features. Using salt dough create a hen using natural materials.	Create the Chinese alphabet using natural materials and or an animal from the story.	Floating and sinking. Look at pictures of nests. What have birds used to build them? Build a nest for the duckling. Look for signs of birds whilst outside.	Make a story strip. Collect 1 item to represent each character from the story. Use strip to retell the sequence of events.

Traditional Tales / Spring

Science **Welly Wednesday** Spring 2	The signs of Spring. Read the text 'Seasons'. Go for a walk to look for signs of Spring. Record on a clipboard.	What is a Fairy / Elf? Do you know any stories about them? Create Fairy /Elf doors and or set up a miniature tea party for a Fairy / Elf. Swapped with week 4	Talk about 'trails' what is a trail? Who makes a trail? Who has followed a trail? Use natural resources and work in pairs to leave each other a trail.	Faces in trees. On a walk around the school how many different faces can be found in the trees?	What is a nest? Who builds a nest? What are they for? Using a range of natural materials build a nest. What bird/animal is your nest for?	Go on an Easter Egg hunt. Follow clues to find the treasure.

Early Years

Each half-term in early years has an over-arching theme, in Summer term these are both science based.

INTENT

From a Little Seed (Minibeasts)

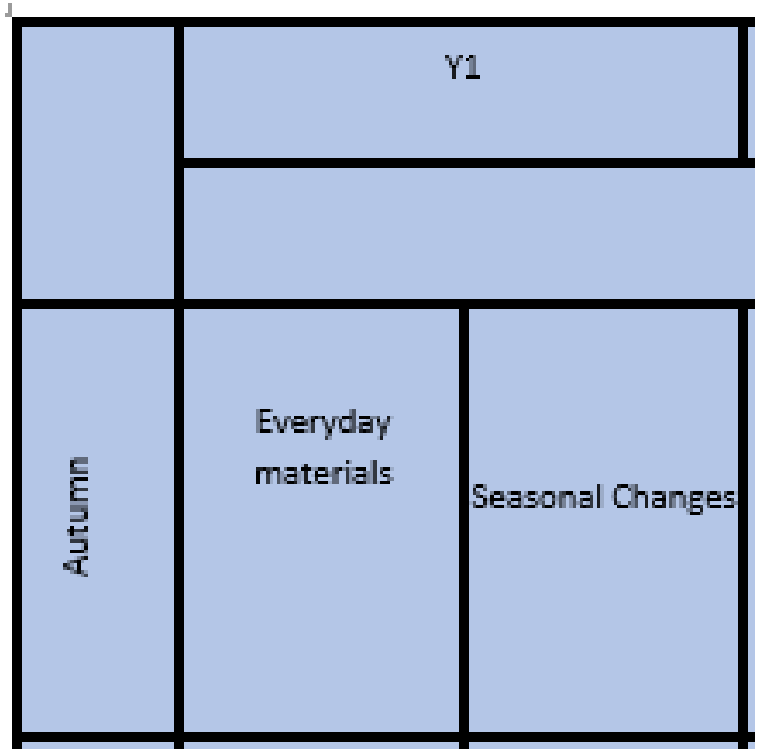
Science **Welly Wednesday** Summer 1	Watch a clip on you tube how to set up a wormery then go on a hunt for some worms to put in it. Observe over the next few weeks.	Watch a video about ladybirds. Go on a mini beast hunt then build a home for a ladybird using natural resources.	What is special about butterflies? Create a butterfly with a symmetrical pattern on its wings using natural materials. Order caterpillars?	Watch a clip about spiders. Find out about their webs. Using sticks and wool create a spiders web.	Go on a bug hunt using minibeast detective sheet. Practise laying a white sheet under a branch and gently shaking to find bugs. Practise carefully rolling logs.	Collect natural resources and create their own representation of the phases of the moon or create a star from sticks and wool.

From a Little Seed (Plants, Growing, Healthy Eating)

Science **Welly Wednesday** Summer 2	Rainbow flower experiment. Make a rainbow using natural items collected on a walk. Colour walk	Life cycle of a plant	Keeping healthy: exercise and balanced diet. Healthy teeth?	Sounds – what do you think you will hear outside? Lay outside and listen for sounds? What would it be like not to be able to hear?	Using a scavenger hunt list how many natural items can children find.	Build a habitat for a chosen animal.

Transition from Early Years to KS1

INTENT



Each half-term in early years has an over-arching theme, in Summer term these are both science based.

Summer 1 **From a Little Seed (Minibeasts)**

Summer 2 **From a Little Seed (Plants, Growing, Healthy Eating)**

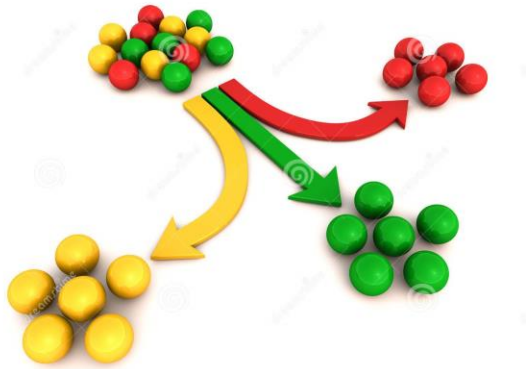
INTENT

This document shows our Abbots Green long term plan for Science, across the years 1-6. Science is taught weekly from years 2-6.

	Y1		Y2		Y3		Y4		Y5		Y6	
	Working Scientifically											
Autumn	Everyday materials	Seasonal Changes	Everyday Materials		Rocks	Animals including humans	Sound		Earth and Space	Forces	Electricity	Light
Spring	Plants	Seasonal Changes	Animals including humans		Forces and Magnets		Animals, including humans	Living things and their habitats	Properties and changes of materials		Animals, including humans	
Summer	Animals including Humans	Seasonal Changes	Plants	Living things and habitats	Plants	Light	Electricity	States of Matter	Living things and their habitats	Animals including humans	Living things and their habitats	Evolution and inheritance

INTENT

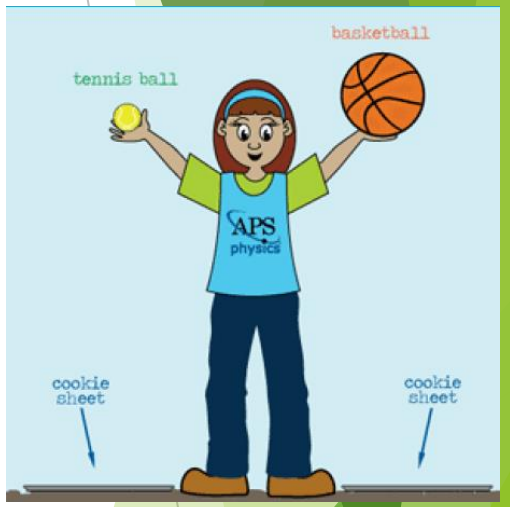
As the children progress through key stage one and key stage two, it is crucial they develop a range of enquiry skills: identifying and classifying, fair test, observing over time, pattern seeking and research. These enquiry skills underpin our Science teaching across the school. Children are able to recognise and name these.



Identifying and classifying

Observing over time

Research



Fair test

Pattern seeking

INTENT

Below is a document showing the progression within these enquiry skills throughout our school.

Enquiry skill: Observing over time.

	Enquiry skill: observing over time		
	Plan	**Do**	**Review**
Early Years	• Curious • With help, ask questions • Talk about ideas for finding out	• Use all senses to observe changes • Look closely at how things change • Make simple records of how things change with help • Use simple equipment to observe and record changes	• Talk about what has been done and noticed
Years 1 & 2	• Ask questions about how and why things change • With help, identify changes to observe and measure and suggest how to do it	• Use non-standard units and simple equipment • Record in words or pictures, or in prepared formats such as tables and charts	• Identify simple changes and talk about them • Sequence the changes • Begin to use scientific language • Talk about the change was what was expected
Years 3 & 4	• Talk about things changing and recognise when questions can be answered by observing over time • Decide what observations to make, how often and what equipment to use	• Use a range of equipment to collect data using standard measures • Make records using tables and bar charts • Begin to use and interpret graphs produced by data loggers	• Draw simple conclusions from changes observed • Use some scientific language • Suggest improvements
Years 5 & 6	• Decide when observing will help answer questions • Decide how detailed observations need to be and what equipment to use to make measurements as accurate as possible	• Use equipment accurately without support • Record data appropriately • Present data in line graphs • Interpret changes in data • Recognise the effect of changing the time and number of observations	• Draw valid conclusions from data • Recognise significance • Talk about and explain changes using scientific knowledge and understanding • Evaluate

INTENT

Below is a document showing the progression within these enquiry skills throughout our school.

Enquiry skill: Research.

	Enquiry skill: research		
	Plan	Do	Review
Early Years	• Curious • With help, can ask questions • Talk about ideas	• Listen carefully • Know that information in books / online can be used to answer questions • Find pictures of things • Talk to people about what they do and how things work	• Talk about has been found out
Years 1 & 2	• Ask questions about how things are and the way things work • With help, make suggestions about how to find things out	• Use simple books / online to find things out • Ask questions to find out what people do and how things work • Record in words and pictures	• Talk about whether the information source was useful • Begin to use scientific language • Give an opinion
Years 3 & 4	• Talk about how things are and the way they work and recognise when questions can be answered by research using secondary sources	• Use information sources to find the information needed • Use someone else's data • Record what has been found out in own words • Present information in different ways	• Draw simple conclusions about patterns between 2 sets of data • Use some scientific language • Suggest improvements
Years 5 & 6	• Decide when research will help answer question • Decide which sources of information might answer my questions	• Use relevant information and data from range of secondary sources • Recognise how data has been obtained • Start to notice when information and data is biased or based on opinion rather than facts • Present findings in suitable formats	• Draw valid conclusions • Talk about and explain using scientific knowledge and understanding • Evaluate • Recognise that some scientific questions may not have been answered definitively

INTENT

Below is a document showing the progression within these enquiry skills throughout our school.

Enquiry skill: Pattern seeking.

	Enquiry skill: pattern seeking		
	Plan	Do	Review
Early Years	• Curious • With help, can ask questions • Talk about ideas	• Use senses to look for patterns • Observe more than 1 thing at a time • Make simple records of what is noticed • Use simple equipment to observe and record patterns	• Talk about what has been done
Years 1 & 2	• Ask questions about how and why things are linked • With help, decide what patterns to observe and measure and suggest how to do it	• Use non-standard units and simple equipment to record events that might be related • Record in words, pictures or simple prepared formats – tables, tally charts and maps	• Identify simple patterns about talk about them • Make links between 2 sets of observations • Begin to use scientific language • Talk about whether pattern was what was expected
Years 3 & 4	• Talk about where patterns might be found and recognise when questions can be investigated by pattern seeking • Decide on which sets of data to collect, what observations to make and what equipment to use	• Use a range of equipment to collect data using standard measures • Make records using tables, bar charts or simple scatter graphs • Begin to use and interpret data collected through data loggers	• Draw simple conclusions about patterns between 2 sets of data • Use some scientific language • Suggest improvements
Years 5 & 6	• Decide when variables cannot be controlled and decide when pattern seeking will help answer question • Decide how detailed data needs to be, which equipment to use to make measurements as accurate as possible	• Use equipment accurately to collect observations • Record data appropriately and accurately • Present data in scatter graphs and frequency charts • Recognise patterns in results • Recognise the effect of sample size on reliability	• Draw valid conclusions • Recognise significance • Talk about and explain using scientific knowledge and understanding • Evaluate

INTENT

Below is a document showing the progression within these enquiry skills throughout our school.

Enquiry skill: Identify and classify.

	Enquiry skill: identify & classify		
	Plan	**Do**	**Review**
Early Years	• Curious • With help, can ask questions • Talk about ideas	• Use senses to sort and match things • Match things that are the same • Find things that are similar or different • Sort or group things in my own way • Use simple equipment to help sort things (boxes / hoops)	• Talk about how sorted or matched things
Years 1 & 2	• Ask questions about how and why things are similar or different • Decide what to observe to identify or sort things	• Make comparisons between simple features of objects, materials or living things • Record observations in words, pictures or simple tables • Sort objects by observable and behavioural features • Record sorting in sorting tables or circles	• Identify similarities and differences and talk about them • Begin to use simple scientific language • Try to use records to help sort or identify other things
Years 3 & 4	• Talk about what criteria to use to sort and classify things • Decide what equipment to use to identify and classify • Talk about how things that can be grouped and recognise when questions can be answered by sorting and classifying	• Carry out simple tests to sort and classify according to behaviour or properties • Use Carroll / Venn diagrams and more complex tables to sort things • Use simple keys and branching databases to identify things • Make simple branching keys for things that have clear differences	• Draw simple conclusions • Use some scientific language • Suggest improvements
Years 5 & 6	• Decide when identify & classify will help answer questions • Decide what equipment, tests and secondary sources of information to use to identify and classify things	• Use series of tests to sort and classify • Use secondary sources • Make own keys and branching data bases with four or more items • Use more than 1 piece of evidence	• Draw valid conclusions • Recognise significance • Talk about and explain using scientific knowledge and understanding • Evaluate

INTENT

Below is a document showing the progression within these enquiry skills throughout our school.

Enquiry skill: Fair test.

	Enquiry skill: fair test		
	Plan	**Do**	**Review**
Early Years	• Curious about how things behave • With help, can ask questions about things they can test • Talk about ideas for testing	• Use senses to look closely at how things behave • Carry out simple tests • Make simple records of what they notice (help when necessary) • Use simple equipment to observe and record	• Talk about what they have done or noticed • Talk about whether something makes a difference
Years 1 & 2	• Ask why and how questions • Make comparisons about how things behave • With help, notice links between cause and effect • With help, identify simple variables to change and measure • Plan simple comparative tests	• Use non-standard units and simple equipment to record data • Record in words, pictures or in simple prepared formats such as tables and tally charts	• Talk about their data • Use comparative data to rank materials or objects • Use simple scientific language to describe simple causal relationships • With help, can say if test was fair test • Say if the relationship was what they expected
Years 3 & 4	• Talk about links between cause and effect and with help pose a fair test question • Help to plan a fair test • Decide what data to collect • Decide what equipment to use and how to make observations	• Use a range of equipment to collect data using standard measures • Make records using tables and bar charts • Begin to use and interpret data collected through data loggers	• Draw simple conclusions from fair tests • Talk about and explain simple causal relationships using some scientific language • Suggest ways that fair tests can be improved
Years 5 & 6	• Recognise when variables need to be controlled and decide when a fair test is the best way to answer a question • Plan a fair test selecting variables to measure, change and keep the same • Decide what equipment to use to make measurements as accurate as possible	• Use equipment accurately to collect observations • Record data appropriately and accurately • Present data in line graphs • Identify causal relationships	• Draw valid conclusions based on the data • Recognise the significance of the results • Talk about and explain causal relationships using scientific knowledge and understanding • Evaluate the effectiveness of fair testing, recognising variables that were difficult to control.

Science

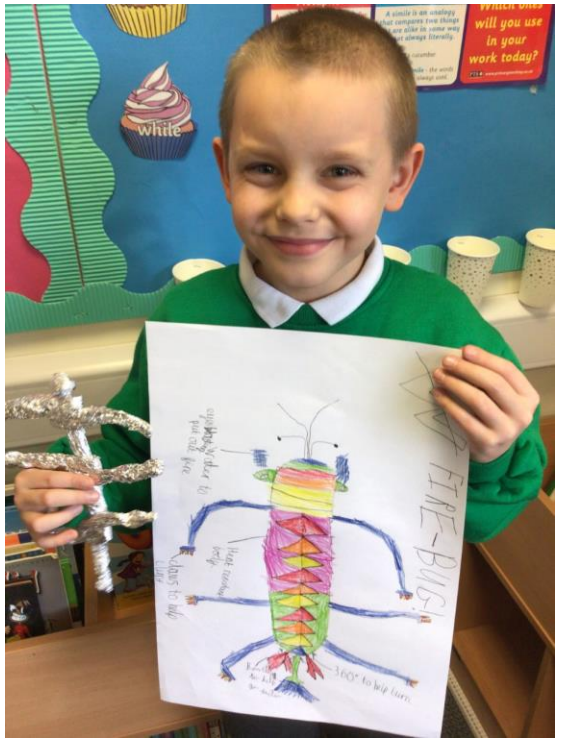
Implementation

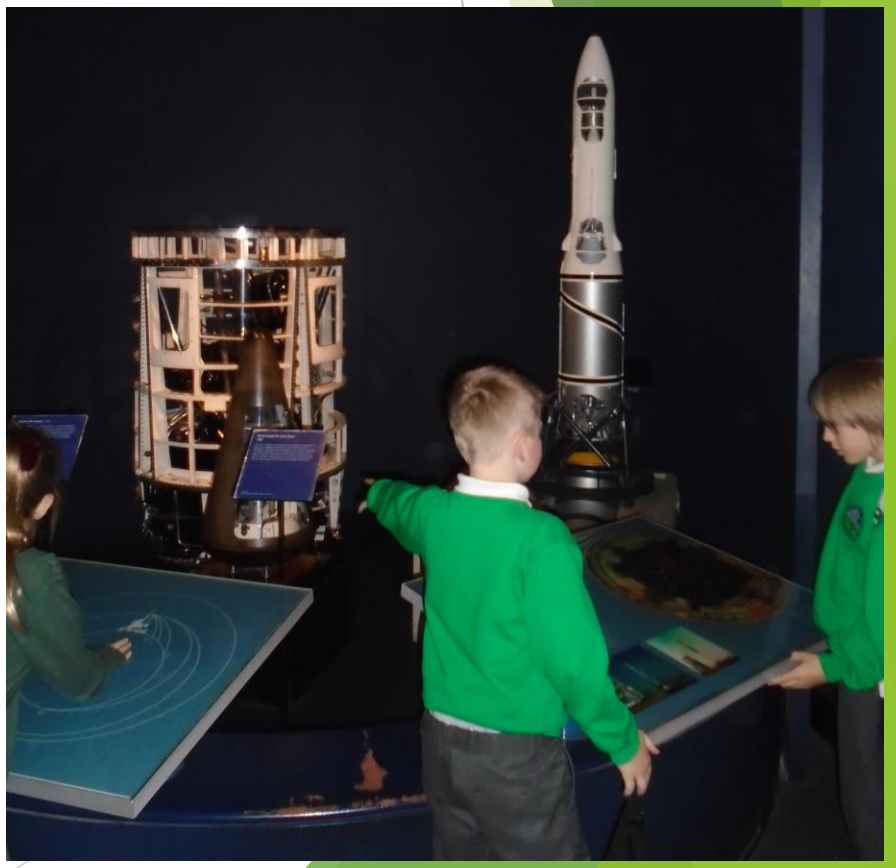
ABBOTS GREEN ACADEMY

BIG GARDEN BIRDWATCH!

Have fun!

ABBOTS GREEN ACADEMY





IMPLEMENTATION

Abbots Green Science Vitals

To teach effective Science lessons at Abbots Green, each Science lesson should include all of these learning/teaching approaches.

Vital Vocabulary

Children should be adding one/two words to their vital vocabulary sheet each lesson to build a bank of vocabulary.

Knowledge Strips

Each lesson should include a knowledge strip. Children to tick off the words they use. Words on knowledge strip should be spelt correctly in books.

Retrieval Question

Children should complete their quiz question based on their learning from the previous lesson at the start of each lesson. Children should date this.

Learning/Teaching Approaches

Children should be exposed to a range of teaching and learning approaches drawing on the different enquiry skills.

Enquiry-skills

Enquiry-skill images to be referred to in lessons. As children progress, can they identify the skill we need to use in our investigation?

Knowledge Organisers

A knowledge organiser used for each unit. This should include enquiry questions and key vocabulary / information.

IMPLEMENTATION

Abbots Green Science Menu

To teach effective Science lessons at Abbots Green, each Science lesson should include a range of learning/teaching approaches from this menu. One lesson would not have all these elements. Although, throughout a half-term, all elements should be evident in planning and children's books.

Outdoor/Practical Learning

Once per half-term, a Science lesson can be purely outdoor/practical.

Evidence in books to be a picture of children engaged in activity. Children to annotate and write what they have learnt using words from knowledge strip.

Assigning Roles

In any enquiry-based, practical lesson, use the lab roles with the children to ensure children all children have an active role in the investigation.

Pupil Premium children to always be lab technicians. This will allow us to develop 'Technician Time' where pupil premium children will be pre-taught Science weekly.

Vocabulary Tasks

Children to complete stand-alone short vocabulary tasks from the unity vocabulary units.

Children should complete a range of different tasks throughout the half-term: link two words, vocabulary matrix etc.

SATS Questions

UKS2 only

Children should be exposed to a range of SATS questions.

This will support their understanding of vocabulary used in test questions in preparation for KS3.

End of Unit Challenge

At the end of each unit, children will be set a challenge to show their understanding. One lesson will need to be set aside for this.

This may include an age-appropriate case study, explanation, debate, experiment or presentation.

Next Steps

Marking should often include next steps to extend and consolidate children's scientific understanding.

This could be a vocabulary task or a challenge question.

Let's challenge and set high expectations for our learners.

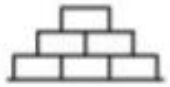
Technician Time

To support our pupil premium children, these children will have weekly 'Technician Time'.

This should entail a 20 minute slot in which a TA or preferably a teacher, pre-teaches them key vocabulary in preparation for the next lesson.

IMPLEMENTATION

Science is taught in modules across each year group. Each module is articulately planned to build on prior knowledge, developing children's understanding and improving retention. Modules are also revisited as part of spaced retrieval practise to ensure learning is embedded and retained.



Previous learning – curriculum narrative

Science Y3
Forces

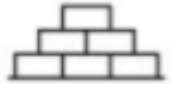
Science Y4
Electricity
States of matter
Sound

Science Y5
Earth and space

Science Y5
Properties and changes of materials

Previous learning

Year 2
Plants and bulbs

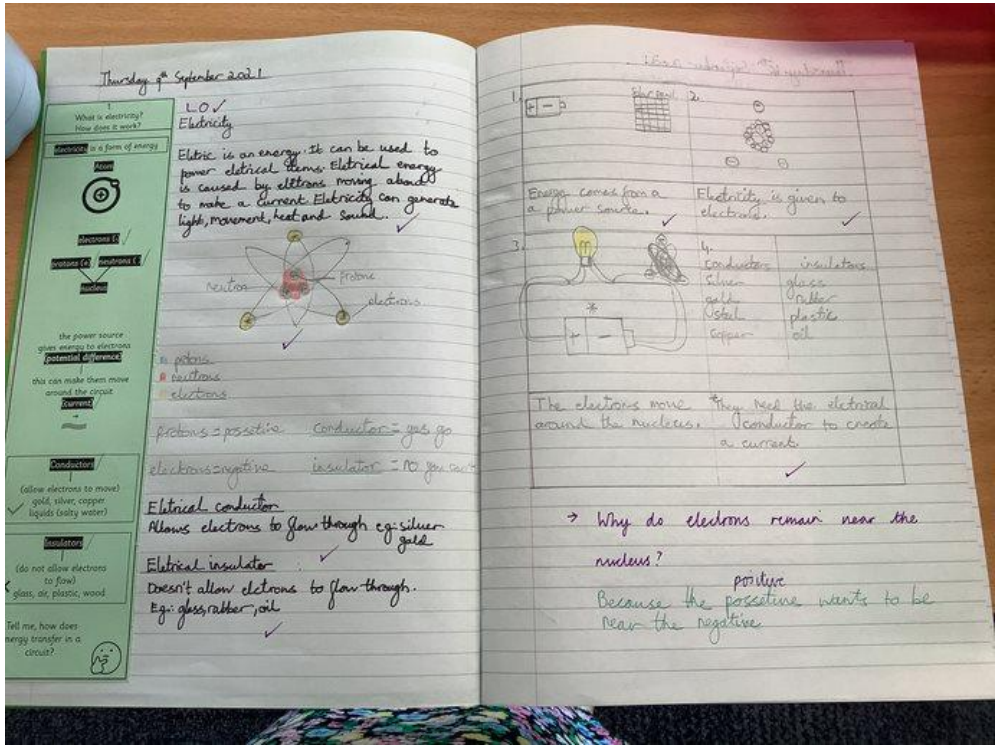


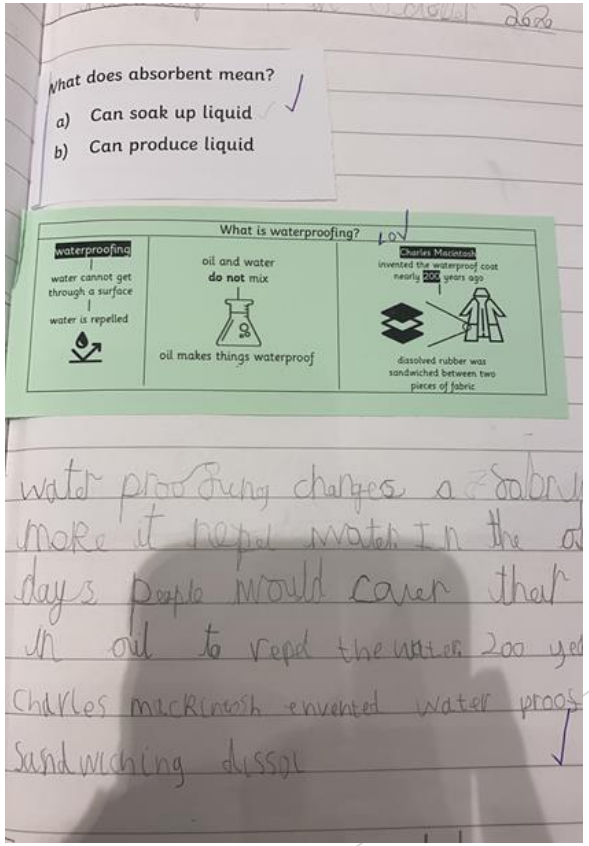
Year 3
Animals, including humans

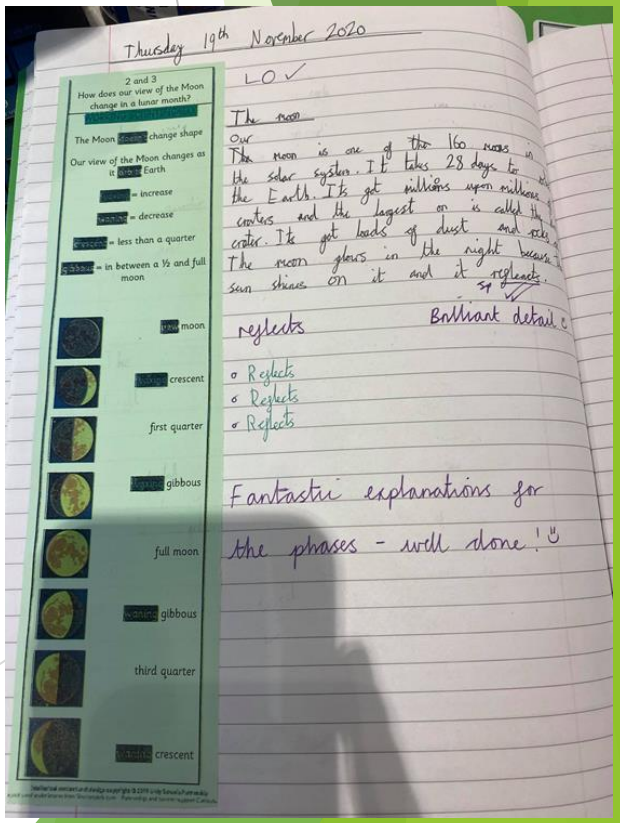
At Abbots Green, we believe that children learn best when they are enthused and challenged. Therefore, children are often given the opportunity to pose individual enquiry questions, thus challenging and addressing common misconceptions. Throughout each science unit, there are unique and valuable opportunities for involvement of parents, governors and the wider community in the children's learning. Example are harvesting fruit and vegetables, taking a trip to the London Science Museum or involving parents and carers through parent partnership projects.

IMPLEMENTATION

Knowledge notes are used by teachers to drive enquiry skills, developing children's scientific understanding and additionally supporting our vocabulary rich curriculum. The purpose of a knowledge note is to highlight etymology and morphology of words. Children use knowledge notes as a bookmark so they can constantly refer to it within a lesson to help aid their learning. These are used in individual lessons to introduce new topical vocabulary that is useful within a particular lesson. A knowledge note reduces the split-attention effect and keeps the foundational knowledge in an accessible location; they can be positioned on the right of a page to support left-handed pupils. With both resources (the knowledge organiser and the knowledge note), we use the noun project to support dual coding which ensures the resources are SEN friendly too.

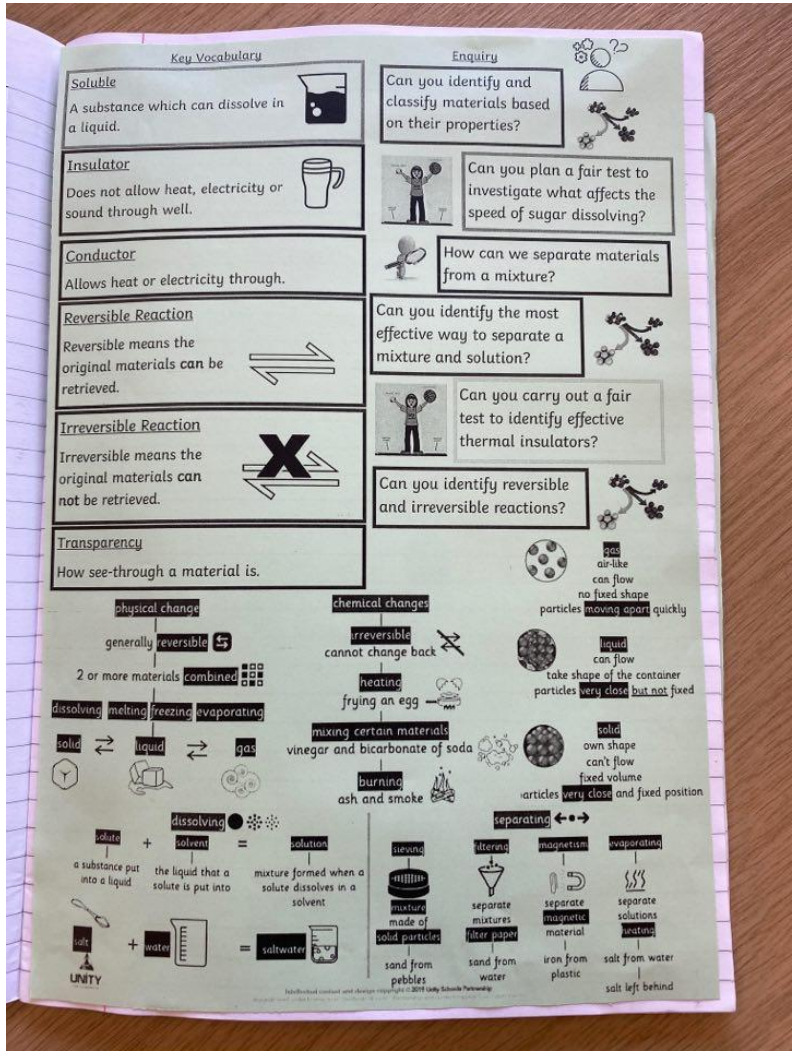


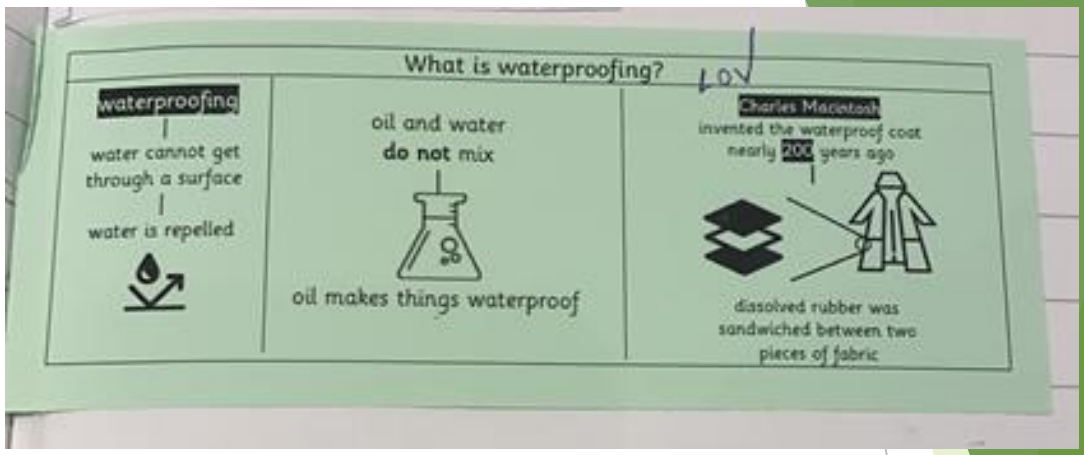




IMPLEMENTATION

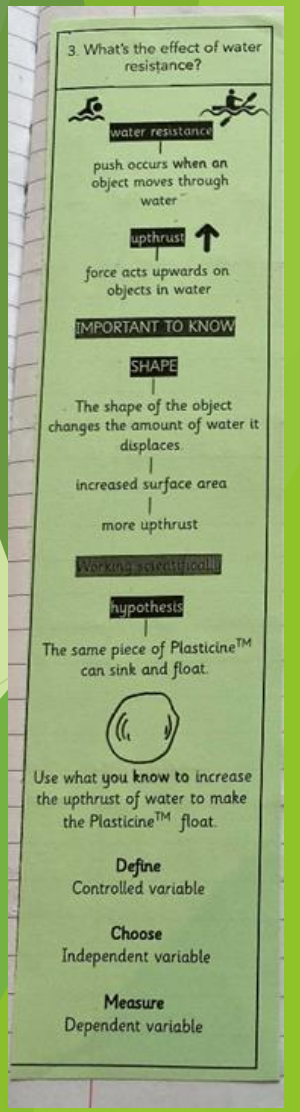
These are all printed on green paper, making them stand out and easier for the children to access.





Year 1 knowledge note

Year 5 knowledge note

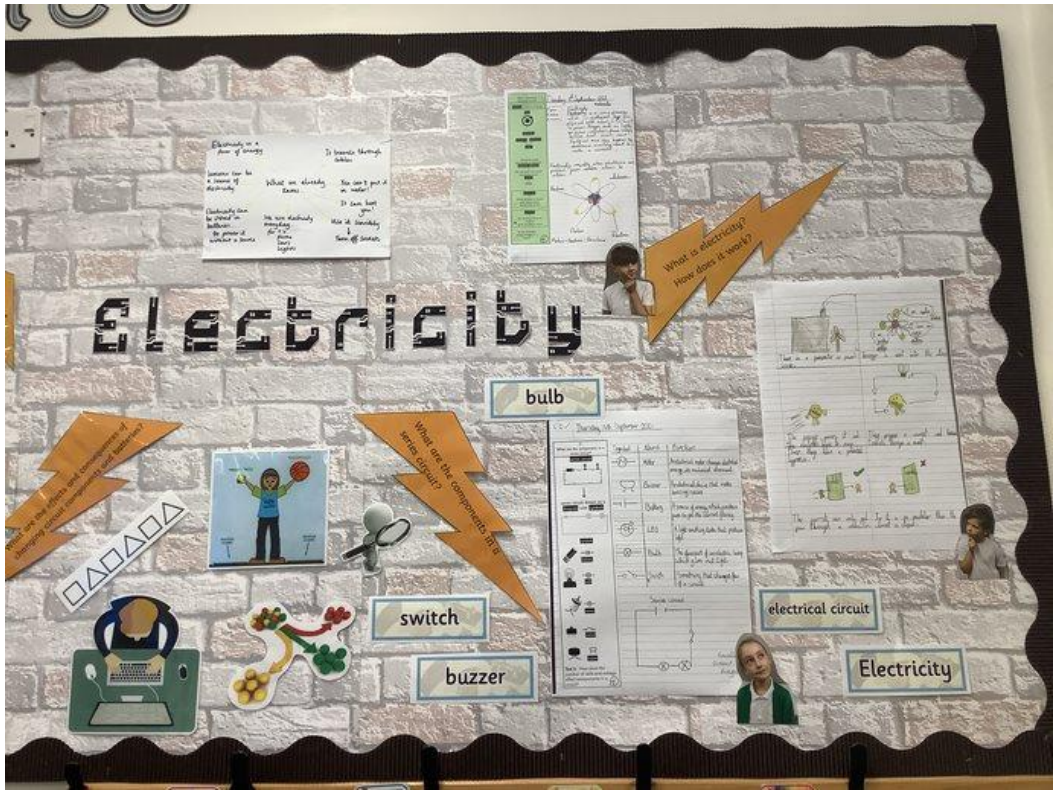


Year 5 knowledge organiser

Classroom Environment

IMPLEMENTATION

Every classroom has a science display to showcase children's work but also acts as a working wall. It stands as a platform for children to refer to the tier 2 and tier 3 vocabulary. To enhance the children's development in becoming scientists we provide them with exciting opportunities from our Abbots 50.



Abbots Green 50

IMPLEMENTATION

Every classroom has a science display to showcase children's work but also acts as a working wall. It stands as a platform for children to refer to the tier 2 and tier 3 vocabulary. To enhance the children's development in becoming scientists we provide them with exciting opportunities from our Abbots 50.

Year group	Science
Reception	Grow and harvest fruit and vegetables Experience a life cycle in nature Take part in Great Garden Birdwatch Take part in Science week.
1	Take part in Great Garden Birdwatch Take part in Science week.
2	Promoting healthy eating and exercise Take part in Great Garden Birdwatch Take part in Science week.
3	Take part in Great Garden Birdwatch Take part in Science week.
4	Grow and harvest fruit and vegetables Promoting healthy eating and exercise Take part in Great Garden Birdwatch Take part in Science week.
5	To visit a science museum. Experience a life cycle in nature Take part in Great Garden Birdwatch Take part in Science week.
6	Take part in Great Garden Birdwatch, take part in Science week.

Abbots Green 50

IMPLEMENTATION

IMPLEMENTATION

At Abbots Green, we use the concept of revisit and retrieve to formatively assess children's scientific understanding in each year group. As teachers, we believe this is vital, ensuring that any potential misconceptions are recognised and addressed. Our cumulative quizzing ensures knowledge is retained and embedded. At the beginning of each lesson, the children answer a quiz question based on learning from the previous lesson; this is paired with a verbal quiz which takes place at the end of each lesson, assessing the retention of knowledge. Our children thrive within this structured quizzing approach and enjoy demonstrating their excellent subject knowledge and understanding.

Properties and Changes of Materials – Year 5 – Summer

Question 1:

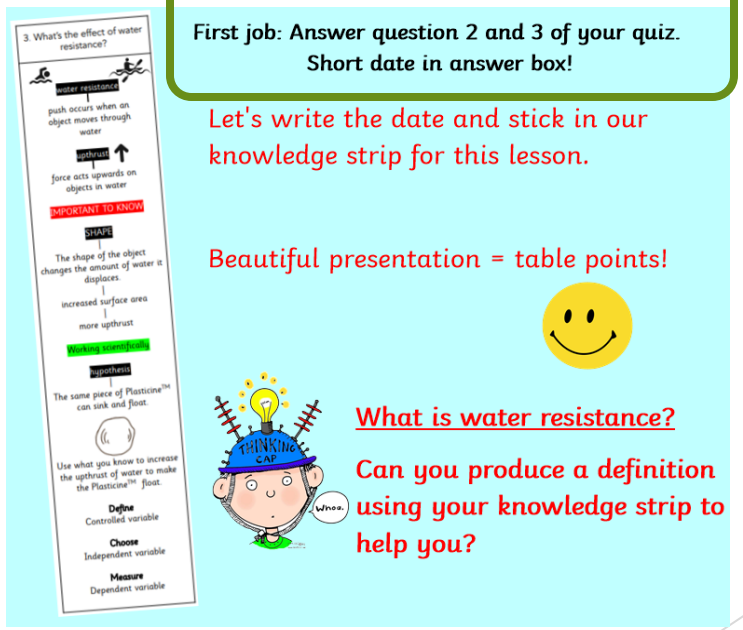
Everything it made from atoms and molecules.	True	
	False	

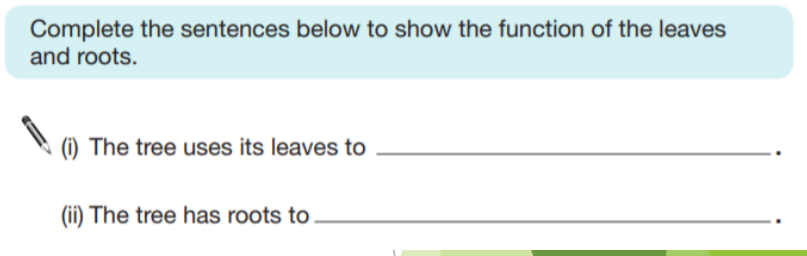
Question 2:

Tick the correct answer.

A material that is a conductor...

- allows electricity and heat to travel through it.
- does not allow electricity and heat through it.
- describes the toughness of a material.
- describes how well a substance mixes into a liquid.
- describes how well you can see through a material.
- describes how a material is attracted by the force of magnetism.





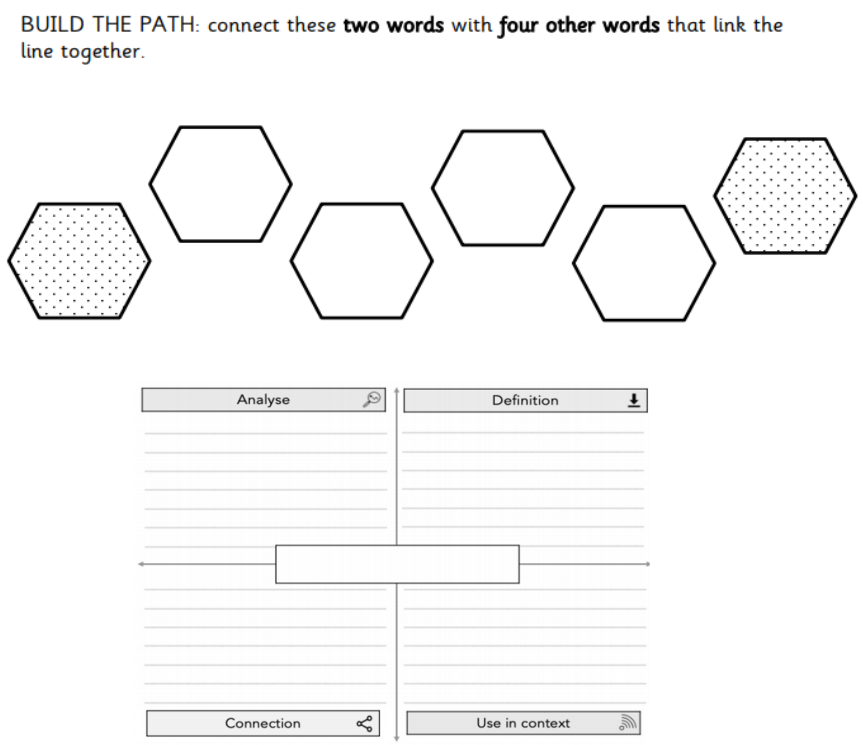
In UKS2, we also expose children to previous SATS questions. This exposes children to vocabulary used in test questions in preparation for KS3. For example, the term 'function' used in this question.

IMPLEMENTATION

Vocabulary

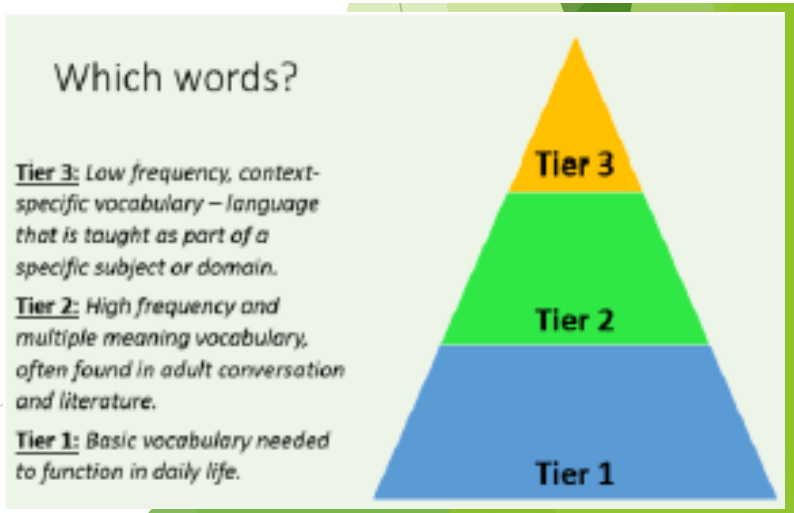
Vocabulary plays a vital role in our science curriculum. Subject specific tier 2 and 3 words are incorporated into each module and taught explicitly throughout the sequence of lessons. Children create their own 'Vital Vocabulary' sheets developing their own bank of vocabulary.

Children are also exposed to a range of vocabulary tasks, deepening and developing children's understanding of new tier 2 and 3 vocabulary. These encourage children to connect, analyse, define and link vocabulary.



Vocabulary for explicit instruction

Tier 2 multiple meaning or high frequency		Tier 3 subject specific	
property	a quality or characteristic that something has	atom	the smallest particle of a chemical element that can exist
particle	a very small piece of something	molecule	a group of atoms
separate	divide something into different parts	chemical (changes)	processes that involve changes to atoms or molecules
combine	join two or more things to form a single one	physical (changes)	how forces such as heat, light, sound, etc. affect objects
recover	return to its original state	reversible	can be changed so that something returns to its original state
comparative	measured or judged by how similar or different it is to something else	reaction	a chemical change produced by two or more substances acting on each other



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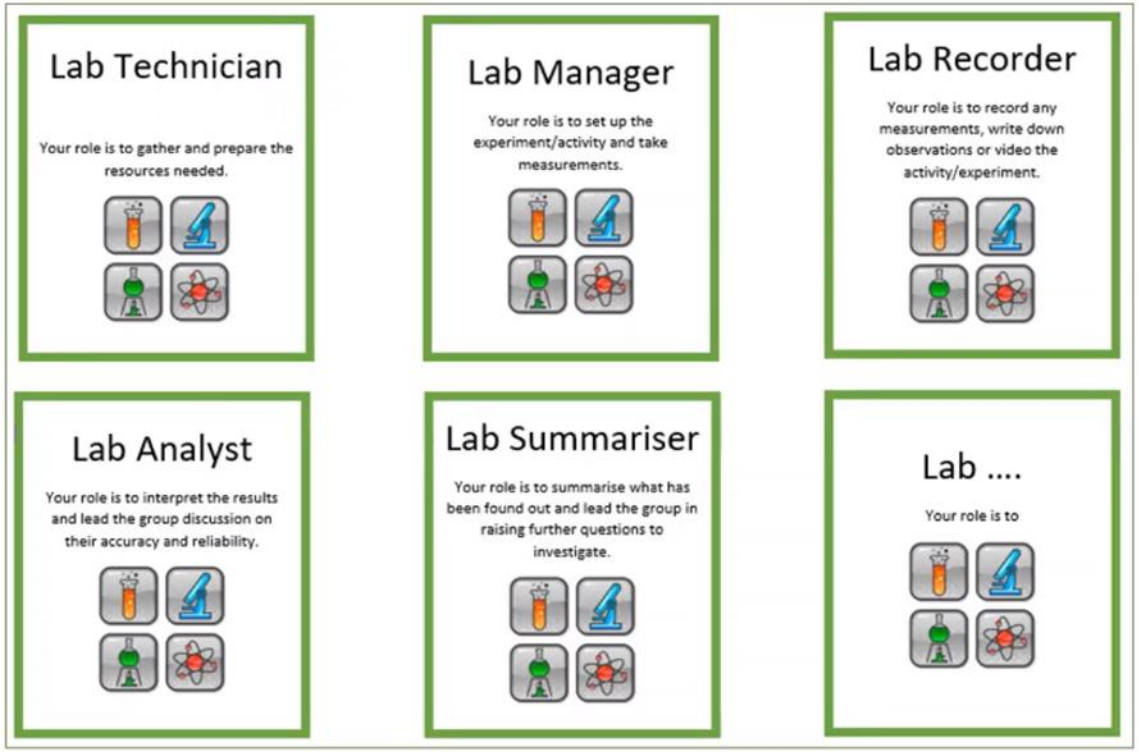


Pupil Data:

Pupil Premium – 16.5%
(National 22.8%)

<u>Pupil-Premium Pre-teach</u>

Pupil Premium children are our Lab Technicians. They have weekly 'technician time' in a small group with a teacher or teaching assistant. During this slot, they are pre-taught the vocabulary for the next lesson.

<u>Assigning Roles</u>

Children are assigned lab roles during investigations and experiments. This ensures each child has a key role.

Science

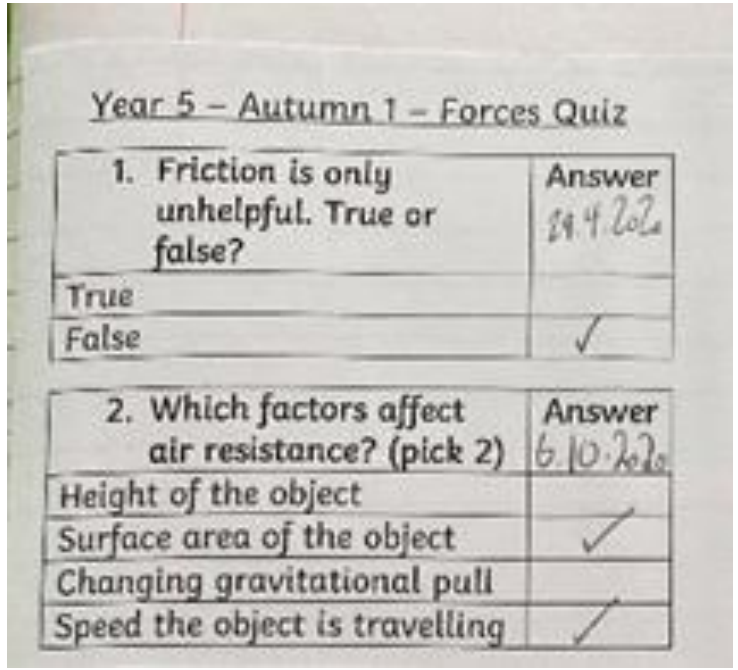
Impact

ABBOTS GREEN ACADEMY

IMPACT

At Abbots Green, we use the concept of revisit and retrieve to formatively assess children's scientific understanding in each year group. As teachers, we believe this is vital, ensuring that any potential misconceptions are recognised and addressed. Our cumulative quizzing ensures knowledge is retained and embedded. At the beginning of each lesson, the children answer a quiz question based on learning from the previous lesson; this is paired with a verbal quiz of previously answered questions to embed knowledge and understanding. Our children thrive within this structured quizzing approach and enjoy demonstrating their excellent subject knowledge and understanding. Teachers look at the children's responses to these questions. If a small number of children are struggling, they will receive 'technician time' to address misconceptions.

As the children reach the end of a learning module, they complete the full quiz again, answering all the questions without their book to refer back to. This acts as an end of unit 'quiz' which is used by teachers to assess children's retained knowledge and understanding.

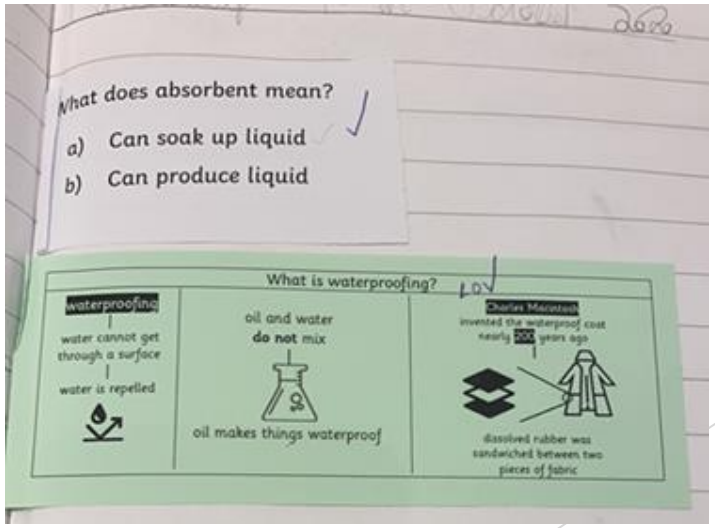


Year 5 – Autumn 1 – Forces Quiz

1. Friction is only unhelpful. True or false?	Answer 19.9.20
True	
False	✓

2. Which factors affect air resistance? (pick 2)	Answer 6.10.20
Height of the object	
Surface area of the object	✓
Changing gravitational pull	
Speed the object is travelling	✓

Key Stage 2 write the short date next to their answer.



Key Stage 1 complete one quiz question at the beginning of each lesson and stick this into their books above the knowledge note.

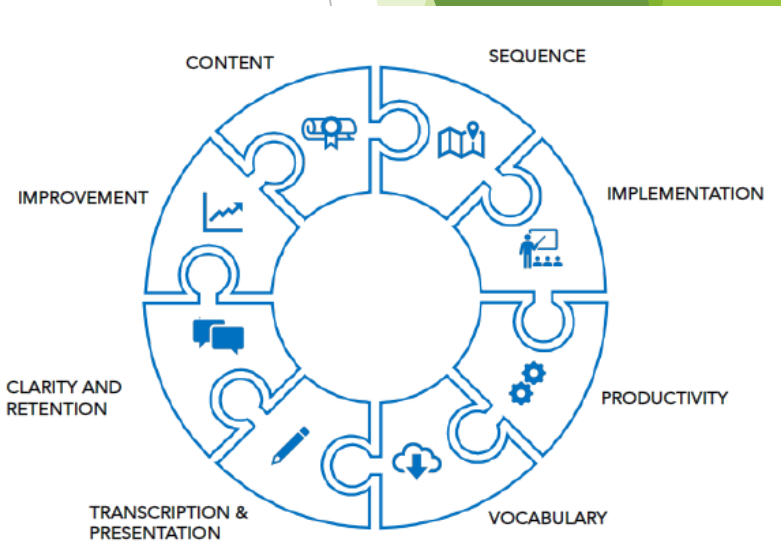
IMPACT

Book Studies

Previously, each term, book looks have taken place. To develop our assessment on impact, we have moved over (September 2021) to using book studies.

The subject lead has undergone training and been supported by leaders in the trust to develop this approach. Book study includes groups of children discussing their work and understanding. It provides an opportunity for children to share their knowledge by talking through the journey of their learning. Also, it acts as a CPD tool allowing staff to see where good practice is.

Date: 4th May 2021 Study: Science Class: Teacher: Annie Thurlow		Helping		Hindering		Actions to be reviewed next half-term
		Strong	Developing plus	Developing minus	Limitation	Notes
STRUCTURE	Content and knowledge	X				All children had a strong knowledge and understanding of planets / seasons. Sequence of lessons followed Alex's module. Children could explain how these were cumulative. Knowledge notes used in all lessons and children were aware of why and how to use them. Key vocabulary retained and used throughout.
	Teaching Sequence	X				
	Vocabulary		X			
PARTICIPATION	Explanation and Modelling			X		Children were exposed to a range of different tasks. This included a practical that children remembered and used to explain day and night. Quizzing was evident in books and children understood why they were doing this each lesson. Children were given next steps and time to respond to them.
	Tasks		X			
	Questioning and Retrieval	X				
	Feedback		X			
DIFFERENCE (Next half term)	- Ensure children are utilising their vital vocabulary sheets effectively/ word paths/ word maps - Ensure LAP children respond to next steps - Ensure worked examples are used for extended pieces of writing					

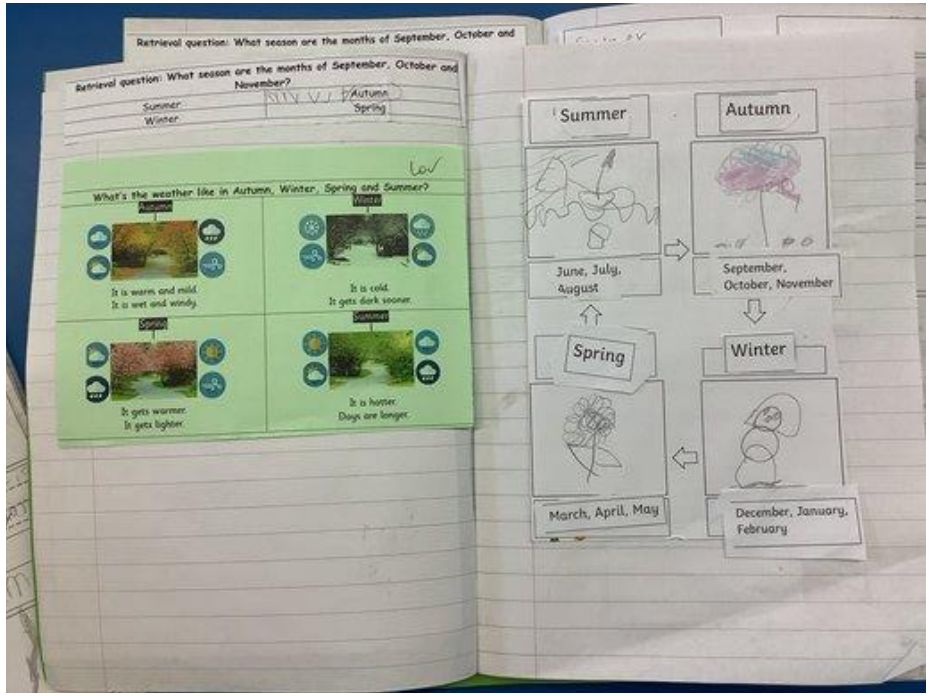


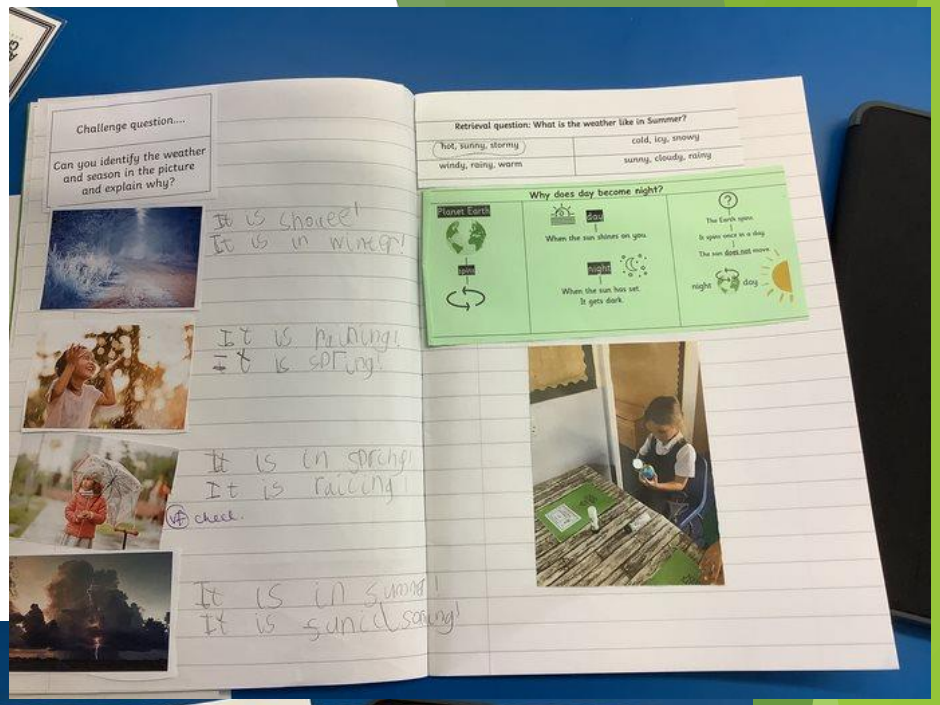
EYFS

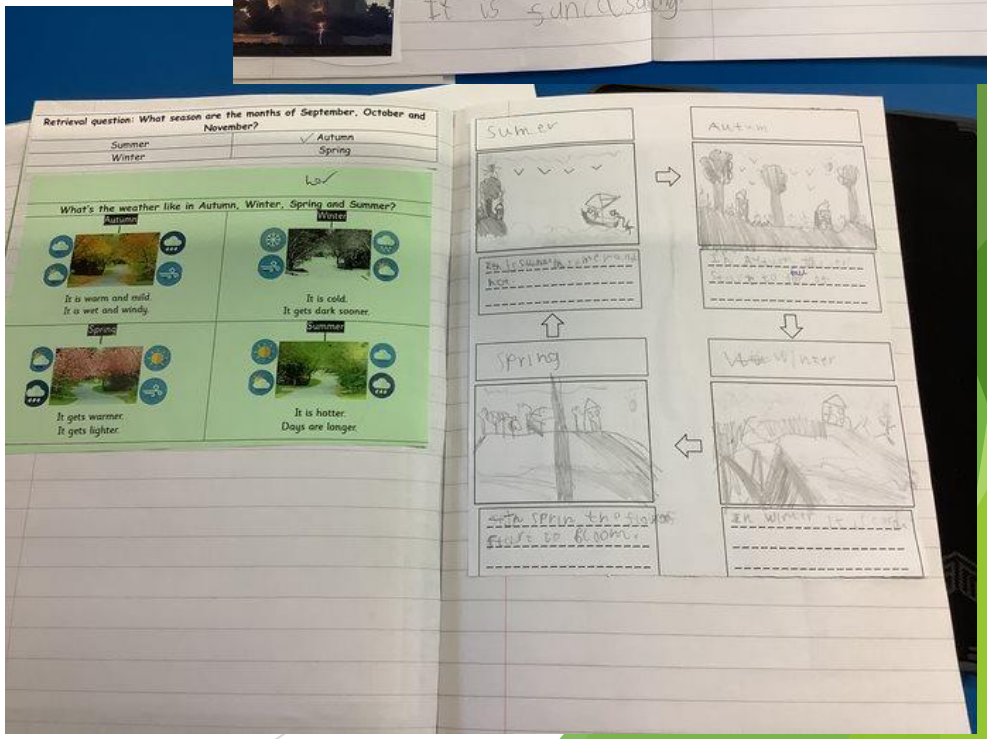
IMPACT

Year 1

IMPACT

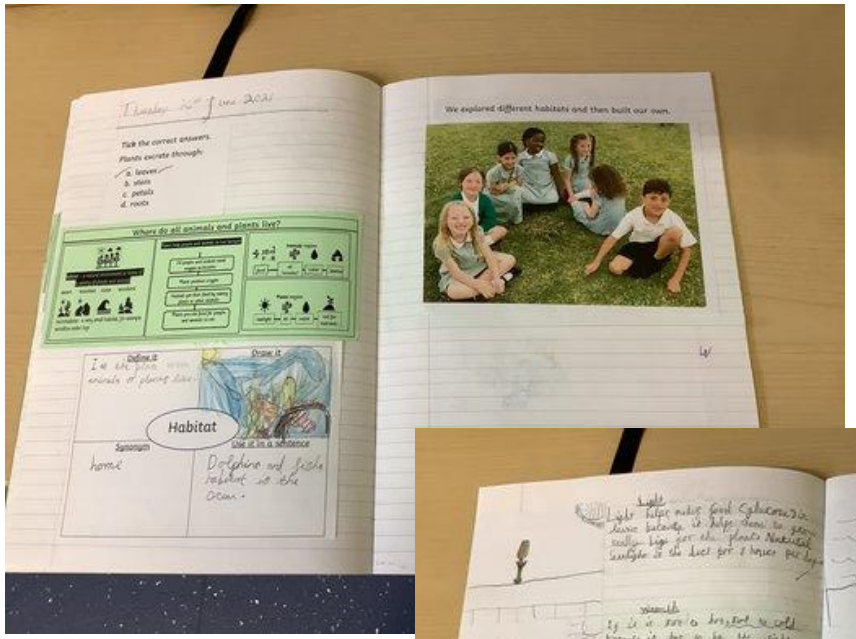


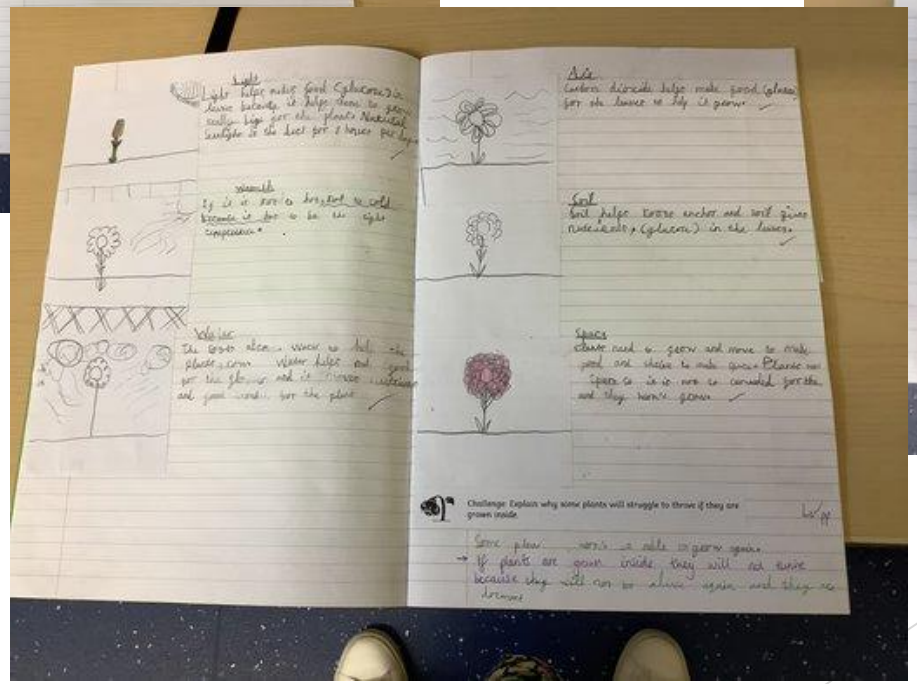


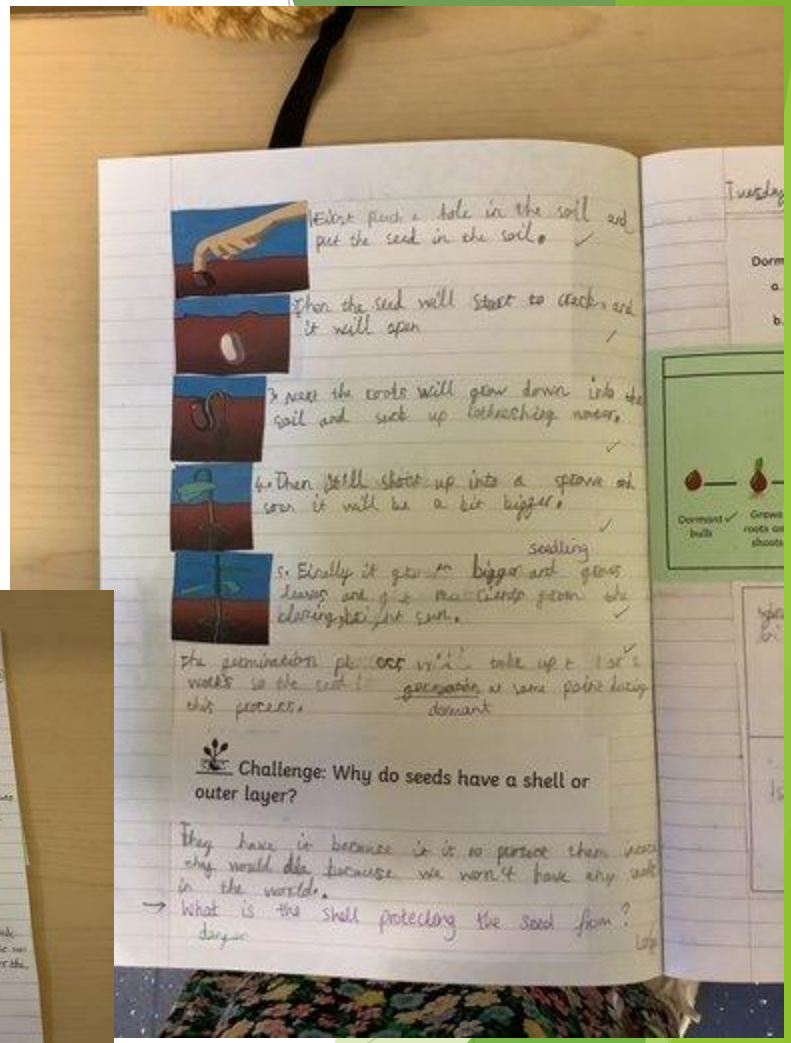


Year 2

IMPACT

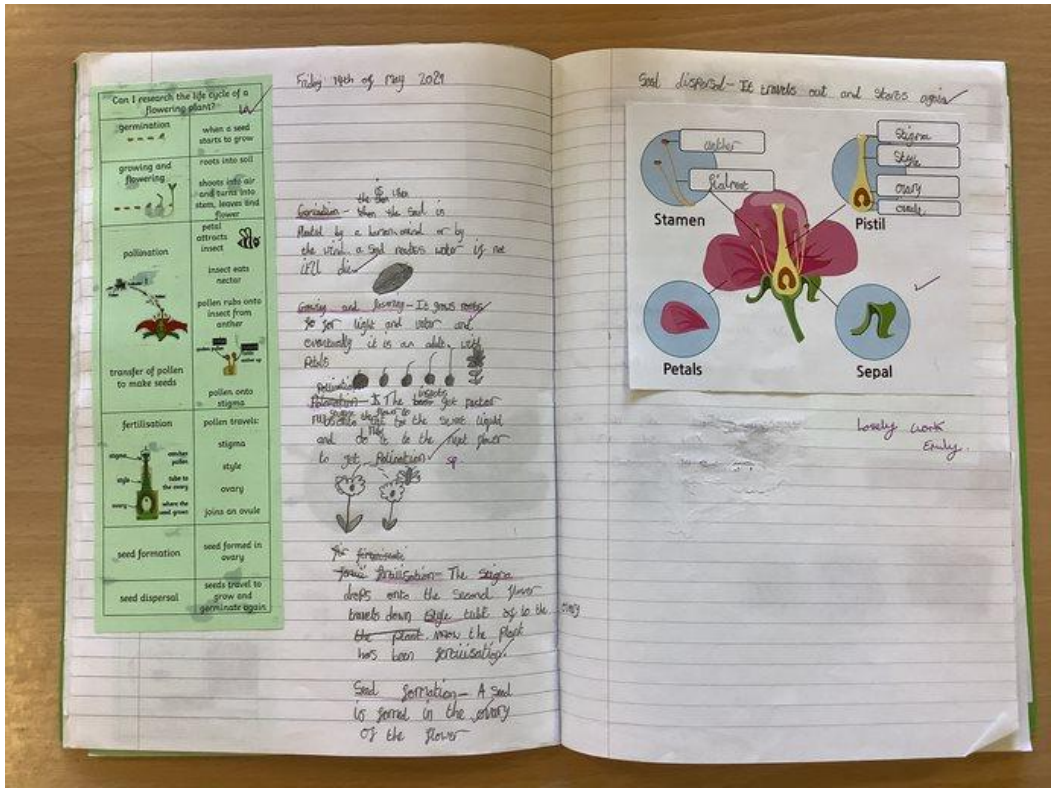






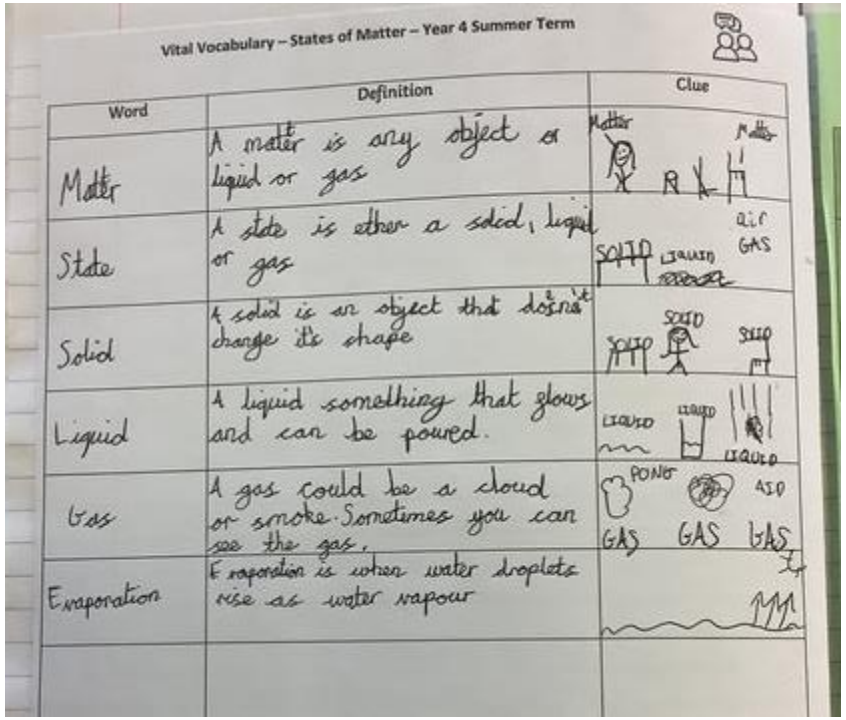
Year 3

IMPACT



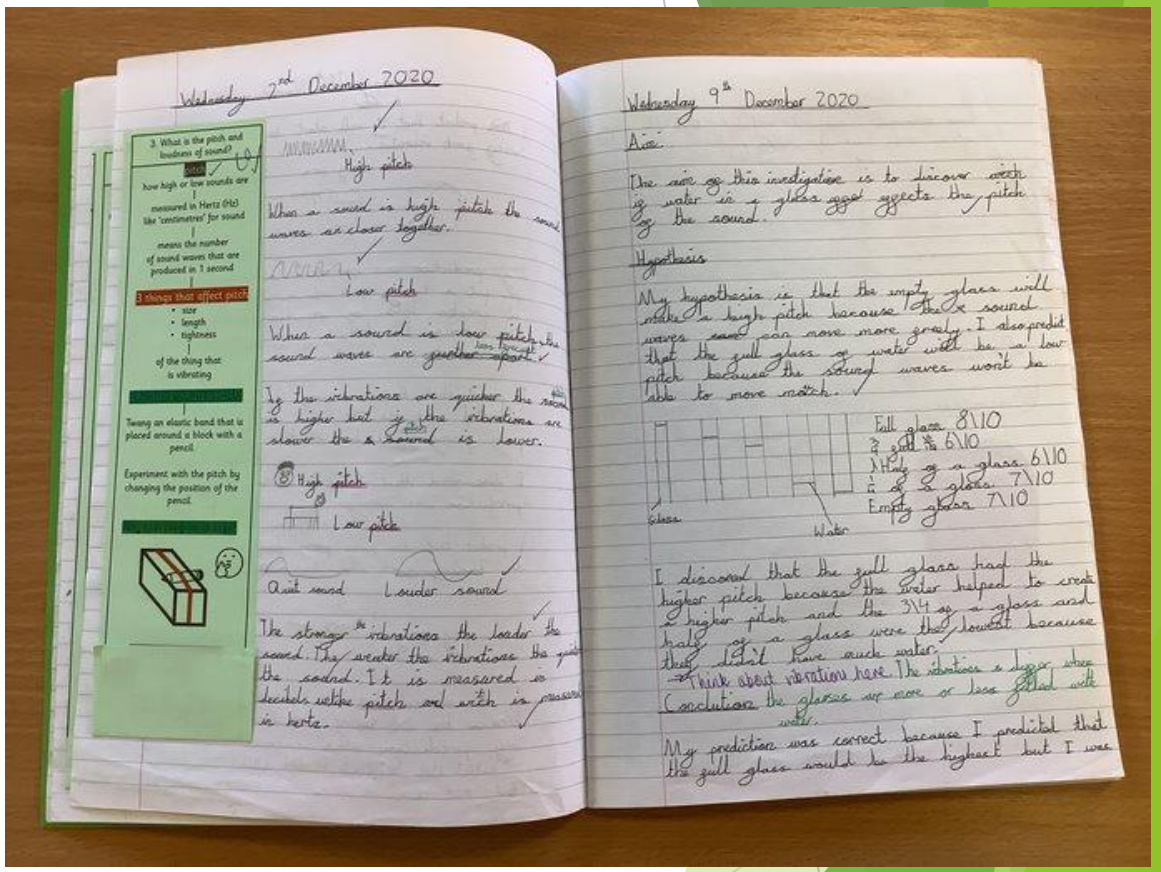
Year 4

IMPACT



Vital Vocabulary – States of Matter – Year 4 Summer Term

Word	Definition	Clue
Matter	A matter is any object or liquid or gas	
State	A state is ether a solid, liquid or gas	
Solid	A solid is an object that doesn't change its shape	
Liquid	A liquid something that glows and can be poured.	
Gas	A gas could be a cloud or smoke. Sometimes you can see the gas.	
Evaporation	Evaporation is when water droplets rise as water vapour	



Wednesday 2nd December 2020

3. What is the pitch and loudness of sound?

how high or low sounds are

measured in Hertz (Hz) like 'centimetres' for sound

means the number of sound waves that are produced in 1 second

3 things that affect pitch

- size
- length
- tightness

of the thing that is vibrating

Twang an elastic band that is placed around a block with a pencil

Experiment with the pitch by changing the position of the pencil

High pitch

When a sound is high pitch the sound waves are closer together.

Low pitch

When a sound is low pitch the sound waves are further apart.

If the vibrations are quicker the sound is higher but if the vibrations are slower the sound is lower.

High pitch

Low pitch

Quiet sound

Louder sound

The stronger the vibrations the louder the sound. The weaker the vibrations the quieter the sound. It is measured in decibels while pitch and with is measured in hertz.

Wednesday 9th December 2020

Aim:

The aim of this investigation is to discover weather is water in a glass can affects the pitch of the sound.

Hypothesis

My hypothesis is that the empty glass will make a high pitch because the sound waves can move more freely. I also predict that the full glass of water will be a low pitch because the sound waves won't be able to move much.

Full glass 8\10
¾ full = 6\10
½ full of a glass 6\10
¼ of a glass 7\10
Empty glass 7\10

Glass

Water

I discovered that the full glass had the higher pitch because the water helped to create higher pitch and the ¾ of a glass and half of a glass were the lowest because they didn't have much water.

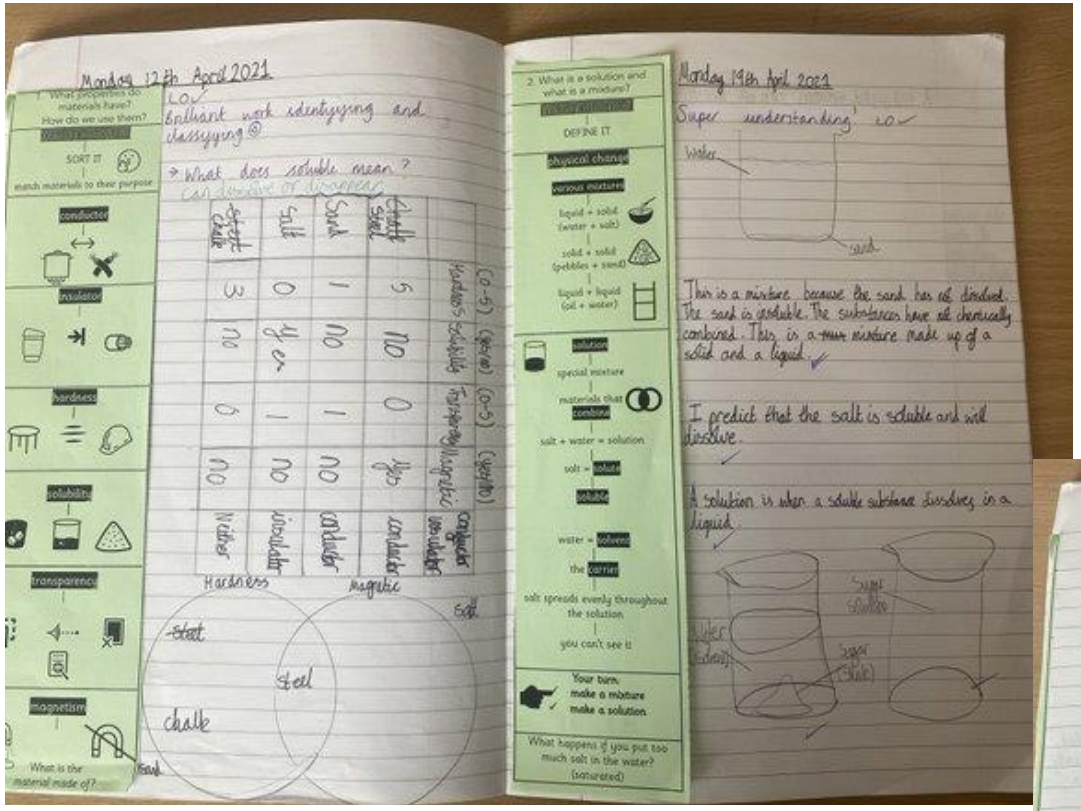
Think about vibration here. The vibrations a bigger when

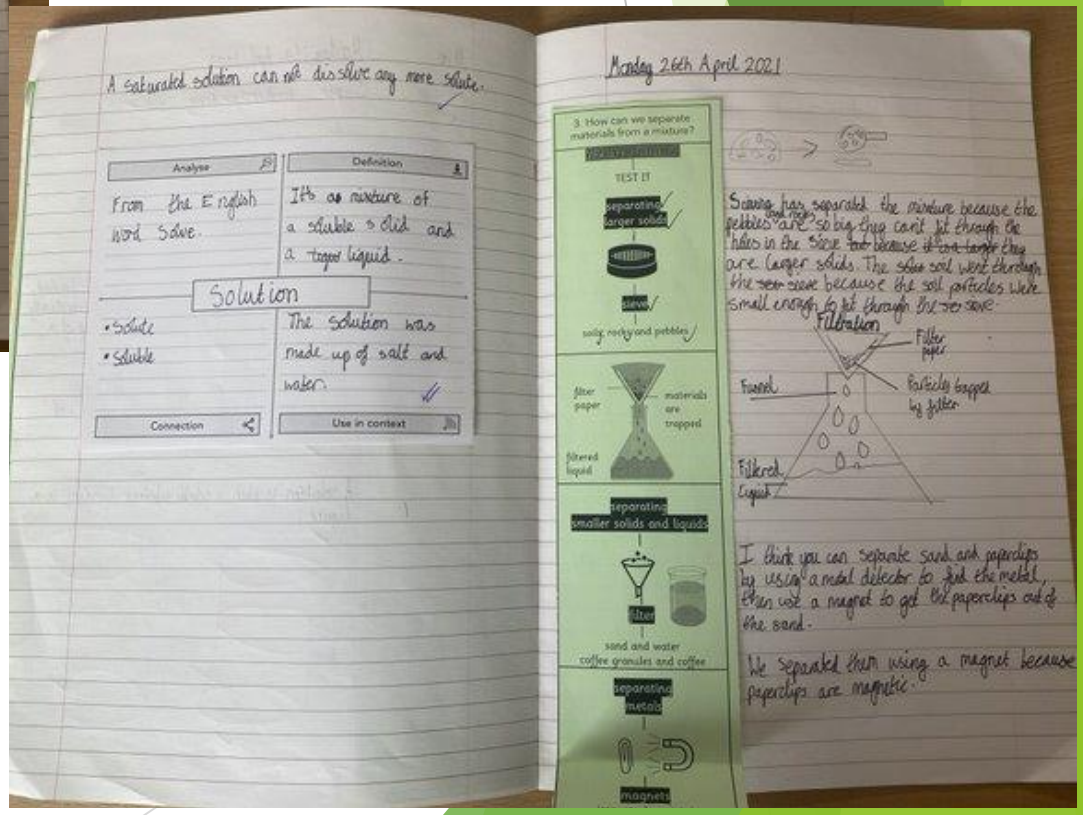
Conclusion the glasses we more or less filled with water.

My prediction was correct because I predicted that the full glass would be the highest but I was

Year 5

IMPACT





Year 6

IMPACT