



**CALTON PRIMARY SCHOOL
SCIENCE CURRICULUM**



We develop creative, knowledgeable and independently thinking scientists through practical enquiry where we inspire curiosity and wonder in the world around us.

PRINCIPLES

- Science will be taught practically wherever possible to provide hands-on, interactive learning and investigation.
- Children will be able to talk about their learning in science and understand the importance of science to their daily lives.
- Science learning will be well sequenced so that knowledge and skills build on prior learning year on year.
- Science enrichment opportunities will be available to every child including a range of trips, workshops and visitors to school.
- Outdoor learning will be incorporated each term including aspects of the local area to increase children's science capital.

CONTENTS AND SEQUENCING

Knowledge and Skills

- Seasons
- Plants
- Living things and their habitats
- Rocks and soils
- Electricity
- Space
- Forces
- Everyday materials
- Animals (including Humans)
- Sound
- Light
- Evolution and inheritance
- States of matter
- Asking questions
- Observing and measuring
- Performing simple tests
- Identifying and classifying
- Using observations to suggest answers
- Gathering and recording data

Lessons are planned using key objectives from the Science National Curriculum programme of study. A variety of scientific enquiries are planned to allow children to investigate and practise key scientific skills (working scientifically).

PROGRESS

Units of work are carefully sequenced so prior knowledge and concepts are built upon from previous year groups leading to increased scientific knowledge and conceptual understanding.

Investigations are linked to a real-world context so learning is relevant to children's life experiences. Outdoor learning and using the school's local area are prioritised.

Teachers very quickly establish, through elicitation, prior knowledge and curriculum mapping that skill progression is appropriate to existing knowledge and understanding ensuring progression. Children learn new content whilst retaining prior learning.

RETRIEVAL PRACTICE

A repeating curriculum which uses retrieval practices to embed knowledge. Scientific enquiry and key skills are threaded through every year group and termly scientific investigations provide opportunity for children to practise and refine these skills.

Curriculum mapping indicates agreed topics for revision. Low stakes quizzing and 'Mini Science' for revision.

LINKS WITH MATHS AND ENGLISH

Each year group has the opportunity to access Science learning in English linked to texts (including fiction and non-fiction).

Mathematical skills are applied in science through learning about statistics and measure.

PERSONAL DEVELOPMENT

The science curriculum supports children in acquiring the knowledge and understanding the skills they need to be a scientist. Their scientific exploration and enquiry develop the qualities and attributes they need to thrive as individuals and members of society.

Our science curriculum develops and promotes:

- Equality of opportunity through our use of trips, visitors and exploring a diverse range of people in STEM careers.
- A healthy lifestyle where children understand the importance of a balanced diet, active lifestyle and how to support their own mental health.
- Pupil's confidence, resilience and knowledge through carefully sequenced small steps and structured revisit and review.

SUPPORT

Everyone has access to the Science National Curriculum which has been mapped into small steps planning.

Some children have further guidance from the teacher to access the learning effectively. A range of recording methods are used to ensure that writing does not present a barrier to learning.

Some children are mentored with mind-set techniques to develop resilience and perseverance in science.

Opportunities for promotion of British Values and children's spiritual, moral, social and cultural development have been mapped to our curriculum.



Science at Calton Primary School

We develop creative, knowledgeable and independently thinking scientists through practical enquiry where we inspire curiosity and wonder in the world around us.



We teach science in an exciting, engaging and practical way wherever possible.

We provide children with hands-on, interactive learning and investigation through scientific enquiry.

Teachers will make links to the real world so children can understand the importance of science in their daily lives.

Science enrichment is for all and will include trips, workshops and visitors to school supporting the learning in the classroom.

Outdoor learning in science will provide opportunities for further exploration and connection with the local area.

Children will be curious, ask questions and explore the world they live in.

Children will understand and use scientific vocabulary across a range of subjects.

Children will take part in practical, hands-on activities while keeping each other safe.

Children will talk about their science learning with their peers, teachers and families.

Children will be enthusiastic about science and use problem-solving strategies to answer challenging questions.

Children will be the scientists of the future!



CALTON PRIMARY SCHOOL - SCIENCE CURRICULUM

CURRICULUM TOPIC OVERVIEW (Mixed Age – 2-Year Cycle)

		AUTUMN TERM	SPRING TERM	SUMMER TERM
YR	EYFS learning leading towards National Curriculum in everyday materials, seasonal changes, animals including humans, plants and living things and their habitats			

CYCLE A (2023-24)	Y1/2	Everyday materials	Seasonal changes	Animals including humans	Plants	Living Things and Their Habitats	
	Y3/4	Sound	Living Things and their Habitats (Food Chains)	Animals including humans	States of matter	Electricity	Living Things and their Habitats (Environment)
	Y5/6	Animals including humans		Light	Electricity	Evolution and inheritance	Living things and their habitats

CYCLE B (2024-25)	Y1/2	Everyday materials	Seasonal changes	Animals including humans	Plants	Living things and their habitats	
	Y3/4	Animals including humans	Light	Rocks and soils	Plants	Forces and magnets	
	Y5/6	Earth and space		Forces	Living things and their habitats Animals including humans	Properties and changes of materials	



CALTON PRIMARY SCHOOL - SCIENCE ENRICHMENT

SCIENCE ENRICHMENT

		AUTUMN TERM	SPRING TERM	SUMMER TERM
CYCLE A (2023-24)	YR		British Science Week	Hatching chicks Great Science Share YR Trip – All Things Wild/St Augustine’s Farm
	Y1/2	STEM Ambassador – Curious Stories for Curious Children	Y1/2 Trip – Skill Zone British Science Week	Y1/2 Trip – Cotswold Wildlife Park Great Science Share
	Y3/4	GSP Science Festival (Y4 only)	Cloud Factory Workshop (Y4 only) British Science Week	Cheltenham Science Festival (Y3 only) GSP Science Festival (Y4 only) Great Science Share
	Y5/6	Gloucestershire Wildlife Quiz	K’nex Challenge (D&T link) British Science Week	Great Science Share King’s School Science and Engineering Challenge
CYCLE B (2024-25)	YR		British Science Week	Hatching chicks Great Science Share YR Trip – All Things Wild/St Augustine’s Farm
	Y1/2	STEM Ambassador – Curious Stories for Curious Children	British Science Week	Great Science Share
	Y3/4		Cloud Factory Workshop (Y4 only) British Science Week	Cheltenham Science Festival (Y3 only) GSP Science Festival (Y4 only) Great Science Share
	Y5/6	Space Dome Gloucestershire Wildlife Quiz	K’nex Challenge (D&T link) British Science Week	Great Science Share King’s School Science and Engineering Challenge



CALTON PRIMARY SCHOOL - SCIENCE CURRICULUM

SCIENCE READING SPINE – EYFS

YR	Ourselves and Our Body	Animals	Plants and Growing Things
	Movement	Sound	Space
	Light & Dark	Materials	



CALTON PRIMARY SCHOOL - SCIENCE CURRICULUM

SCIENCE READING SPINE – CYCLE A

CYCLE A (2023-24)	Y1/2	Everyday materials	Seasonal changes	Animals including humans	Plants	Living Things and Their Habitats
						
	Y3/4	Sound	Living Things and their Habitats	Animals including humans	States of matter	Electricity
						
	Y5/6	Animals including humans	Light	Electricity	Evolution and inheritance	Living things and their habitats
						



CALTON PRIMARY SCHOOL - SCIENCE CURRICULUM

SCIENCE READING SPINE – CYCLE B

CYCLE B (2024-25)	Y1/2	Everyday materials	Seasonal changes	Animals including humans	Plants	Living Things and Their Habitats
						
	Y3/4	Animals including humans	Light	Rocks and soils	Plants	Forces and magnets
						
	Y5/6	Earth and space	Forces	Living things and their habitats	Animals including humans	Properties and changes of materials
						









CALTON PRIMARY SCHOOL - SCIENCE CURRICULUM

CURRICULUM TOPIC REVIEW

Seasonal change	Plants	Animals, including humans	Living things and their habitats	Materials	Light	Rocks	Forces and magnets	Electricity	Sound	States of matter	Earth and Space	Evolution and inheritance
Y1	Y1	Y1		Y1								
Review	Y2	Y2	Y2	Y2								
Review	Y3	Y3	Review	Link to Forces and magnets	Y3	Y3	Y3					
	Link to Living things and their habitats	Y4	Y4		Review	Review		Y4	Y4	Y4		
Link to Earth and space	Review	Y5	Y5	Y5		Link to Earth and space	Y5	Review	Link to Earth and space	Link to Materials	Y5	
	Link to Evolution and inheritance	Y6	Y6	Review	Y6		Review	Y6	Review		Review	Y6







CALTON PRIMARY SCHOOL - SCIENCE CURRICULUM

WORKING SCIENTIFICALLY PROGRESSION – EYFS & KEY STAGE 1

		PLAN	DO		RECORD	REVIEW	
		Ask questions and plan enquiry	Set up enquiry	Observe and measure	Record	Interpret and Report	Evaluate
							
		<ul style="list-style-type: none"> Ask simple questions about what I see and the world around me 	<ul style="list-style-type: none"> Use my ideas to investigate how and why things work. 	<ul style="list-style-type: none"> Observe what I see and talk about it. Notice changes over time. 	<ul style="list-style-type: none"> Record my observations using photos, drawing and writing. 	<ul style="list-style-type: none"> Talk about what I have seen and link to simple scientific knowledge. 	<ul style="list-style-type: none"> Talk about what I have seen and link to simple scientific knowledge.
EFYS		<p>Asking simple questions and recognise they can be answered in different ways.</p> <ul style="list-style-type: none"> Ask and answer simple scientific questions. Recognise that questions can be answered in different ways. 	<p>Performing simple tests.</p> <ul style="list-style-type: none"> Use practical resources to gather evidence to answer questions. Carry out tests to classify. Carry out comparative tests. Carry out patterns seeking enquiries. Make observations over time. 	<p>Observing closely, using simple equipment.</p> <ul style="list-style-type: none"> Make careful observations to make comparisons. Make careful observations to notice change. Use simple equipment to support my observations. 	<p>Gathering and recording data to help in answering questions.</p> <ul style="list-style-type: none"> Record observations using photographs, videos, drawings, labelled diagrams, in my writing, prepared tables, pictograms, tally charts, block graphs. Classify using simple tables/sorting rings. 	<p>Identify and classify. Use appropriate scientific language to communicate ideas.</p> <ul style="list-style-type: none"> Make simple judgements from my data. Find patterns from my scientific data. 	<p>Use their observations and ideas to suggest answers to questions.</p> <ul style="list-style-type: none"> Use my observations to suggest answers to scientific questions. Use my evidence collected to answer questions. Use research to answer questions.
	KEY STAGE 1						







CALTON PRIMARY SCHOOL - SCIENCE CURRICULUM

WORKING SCIENTIFICALLY PROGRESSION – LOWER KEY STAGE 2

LOWER KEY STAGE 2	PLAN	DO		RECORD	REVIEW	
	Ask questions and plan enquiry	Set up enquiry	Observe and measure	Record	Interpret and Report	Evaluate
						
	<p>Asking relevant questions and using different types of scientific enquiries to answer them.</p> <ul style="list-style-type: none"> Ask relevant scientific questions. Use resources, gathering evidence to answer a question. Answer questions posed by the teacher. Identify the type of enquiry used to answer a question. 	<p>Set up simple practical enquiries, comparative and fair tests.</p> <ul style="list-style-type: none"> Plan a practical enquiry. Carry out observations over time. Test to classify, identify or group. Seek patterns. Carry out comparative tests. Carry out fair tests. 	<p>Make systematic and careful observations and where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <ul style="list-style-type: none"> Make systematic and careful observations. Take accurate measurements using scientific equipment. Begin to decide which equipment will give me accurate measurements. 	<p>Gather, record, classify and present data in a variety of ways to help in answering questions.</p> <p>Record finding using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p> <ul style="list-style-type: none"> Gather data using observations/measuring equipment. Record data using photographs or videos which involve scientific language and explanations. Record using drawings and labelled diagrams/keys/bar charts/tables. Classify data using tables/Venn diagrams/Carroll diagrams. Present the same data in a variety of ways to help answer the question. 	<p>Reporting on findings from enquiries, including orals and written explanations, displays or presentations of results and conclusions.</p> <ul style="list-style-type: none"> Communicate findings verbally. Communicate my findings in written explanations. Communicate my findings through displays and presentations. <p>Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <ul style="list-style-type: none"> Interpret my data to generate simple comparative statements based on my evidence. Identify naturally occurring patterns and causal relationships. 	<p>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <ul style="list-style-type: none"> Draw conclusions based on evidence. Predict results of a similar enquiry to the one I have just investigated. Identify ways to adapt my method to improve my investigation. Ask further questions from my scientific line of enquiry. <p>Use straightforward scientific evidence to answer questions or to support their findings.</p> <ul style="list-style-type: none"> Answer scientific questions based on observations I have made. Answer scientific questions based on data I have collected. Answer scientific questions based on information from secondary sources that I have collected.

CALTON PRIMARY SCHOOL - SCIENCE CURRICULUM

WORKING SCIENTIFICALLY PROGRESSION – UPPER KEY STAGE 2

UPPER KEY STAGE 2	PLAN	DO		RECORD	REVIEW	
	Ask questions and plan enquiry	Set up enquiry	Observe and measure	Record	Interpret and Report	Evaluate
						
	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables when necessary.</p> <ul style="list-style-type: none"> Plan/carry out an observation over time enquiry to answer a scientific question, deciding what observations or measurements to make and over how long. Answer my own question(s) by planning my own enquiry. Plan/carry out a pattern seeking enquiry to answer a scientific question looking for relationships. Plan/carry out an identifying, classifying and grouping enquiry to answer a scientific question. Plan/carry out a comparative enquiry to answer a scientific question. Plan/carry out a fair test to answer a scientific question. Plan to use secondary research to answer questions which cannot be answered through practical work. Recognise and control variables. 	<p>Using test results to make predictions to set up further comparative and fair tests.</p> <ul style="list-style-type: none"> Make predictions based on knowledge gained from enquiry work. 	<p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <ul style="list-style-type: none"> Take measurements using a range of scientific equipment. Select which equipment will give me the most precise results. Decide whether to take repeat readings to create a more reliable test. Decide whether to increase sample size to seek a pattern. Decide whether to adjust the observation period and frequency by observing over time. Decide whether to check further secondary sources by researching. 	<p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <ul style="list-style-type: none"> Decide how to record and present evidence. Record data using scientific diagrams/annotated photographs/videos/labelled diagrams/writing. Record measurements using tables/tally charts/bar graphs/line graphs/scatter graphs. Record measurements using tables/tally charts/bar graphs/line graphs/scatter graphs. Record classifications using tables/Venn diagrams/Carroll diagrams/classification keys. Present data in a variety of ways to help answer the question. 	<p>Report and present findings from enquiries, including conclusions and casual relationships in oral and written forms such as displays and other presentations.</p> <ul style="list-style-type: none"> Report and present findings from enquiries. Identify causal relationships from scientific evidence and report these in a conclusion. Identify results that do not fit the pattern or trend and represent this in my conclusion. Explain findings using subject knowledge. Evaluate the choice of method, control of variables, precision and accuracy of measurements and credibility of secondary sources. Identify any limitations that reduce the trust they have in their data. 	<p>Identify and evaluate scientific evidence (their own and others') that has been used to support or refute ideas or arguments.</p> <ul style="list-style-type: none"> Discuss whether evidence supports or refutes ideas or arguments. Discuss how my scientific ideas change due to new evidence that has been gathered. Talk about how new discoveries change scientific understanding.



SCIENCE CURRICULUM

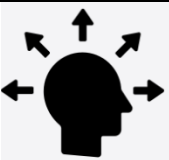


EYFS



CALTON PRIMARY SCHOOL – ANIMALS (incl. HUMANS) – EYFS

Animals (incl. Humans)	Development Matters & EYFS Framework		Knowledge (Components)	Skills (Composites)		
	<p>Development Matters. In Reception children are learning to: Explore the natural world around them. Describe what they see, hear and feel whilst outside.</p> <p>EYFS framework ELG: Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class</p>		<ul style="list-style-type: none"> Identify and name pets: dog, cat, rabbit, guinea pig, fish, hamster. Identify and name farm animals: cow, pig, sheep, horse, hen To name and identify body parts: head, shoulders, knees, toes, eyes, ears, mouth and nose. To know the senses: see, hear and feel and the body parts that are responsible for each. To know about oral hygiene. 	<p>Choose and use a method of grouping. Draw animals. Make observations of my surroundings.</p>		
				Common Misconceptions		
				<p>Some children may think:</p> <ul style="list-style-type: none"> Animals are furry and have four legs A bee is not an animal because it is an insect Animals adapt to their surroundings, e.g. a brown bear turns white and becomes a polar bear Animals living in the soil breathe by coming to the surface Dragons and other mythical creatures are real animals 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	<ul style="list-style-type: none"> Begin to understand how to respect and care for humans and animals for example the school guinea pigs. Begin to understand the key features of a life cycle such as caterpillars to butterfly and egg to chick. To begin to use and explore and recognise the senses: see, hear, feel, smell and taste <p>To begin to understand the importance of oral hygiene.</p>	<p>Dog, cat, rabbit, guinea pig, fish, hamster. Cow, pig, sheep, horse, chicken. Pets, farm Head, shoulders, knees, toes, eyes, ears, mouth, nose See, hear, touch, feel</p>	<p>Where do pets live? Where do farm animals live? What do we use to see? What do we use to hear? What do we use to feel?</p>		<p>Small world animals or pictures for sorting. Vets role play area/ pet shop</p>	<p>Senses outdoor walk. City Farm- visit Pet shop?</p>

Small Steps	Week	Review	Knowledge/Skills	Suggested task / learning outcome	Scaffolding	Challenge
		Who has a pet? Discuss. Flash cards to show the animals, can they name them	Identify and name pets: dog, cat, rabbit, guinea pig, fish, hamster.	Discuss pets we have at home. Name them. Show pictures of a dog, cat, rabbit, guinea pig, fish and hamster. Name them. Label them if able. Draw pictures of our pets or pets we would like to have. Read a dog related book- Hairy McLeary	Picture cards to copy. Cards show a variety of different dogs, cats etc. Scaffold the outline drawing	Introduce the children to Lizard, African snails, gerbil, stick insects, snake, tarantula, can they draw these
		Flash cards/PP of animals taught the previous day including challenge animals.	Identify and name farm animals: cow, pig, sheep, horse, chicken	Who has been to the farm? What is a farm? Which animals can we find here? Who looks after them? Show pictures of a cow, pig, sheep, horse and chicken. Name them. Discuss where we might find these animals. Draw pictures of them and label.	Picture cards to copy. Cards show a variety of different dogs, cats etc. Scaffold the outline drawing	Introduce the children to Goat, llama, alpaca, donkey, duck, bull Can they name the animal and their young?
		Review all animals taught	To know where pets and farm animals live.	Practical sorting activity classifying animals. House and farm and why they live there? Read 'a squash and a Squeeze'.	Assessment opportunity	
		Sing Head, Shoulders, Knees and Toes. Play Simon Says- identify who knows	Name parts of the body: head, shoulders, knees, toes, eyes, ears, mouth and nose.	Model how to write the parts of the body as a class- CI activity.	Can you point to? Instead of labelling	Draw and label own body

	Review parts of the body- game can you touch...	Know the senses: see, hear and feel, smell and taste and the body parts that are responsible for each.	Senses outdoor walk. Describe what we can see, hear and feel while outside. Repeat in different seasons.		
	Why do we brush our teeth?	Oral hygiene	Discussion about healthy eating and which foods can be bad for our teeth. Colgate programme if possible. Cleaning teeth activity – laminated teeth with toothbrushes and toothpaste.	Discussion	
	Read The Hungry Caterpillar story	Understand the key features of a life cycle such as butterfly and chick.	Hatching chicks	n/a	

End goals and assessment	Week 3- sorting activity in small groups- post-it/ picture, complete on insight	Possible evidence	<ul style="list-style-type: none"> • Can name and describe animals that live in different habitats. • Can describe different habitats.
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CALTON PRIMARY SCHOOL – LIVING THINGS AND THEIR HABITATS – EYFS

Living things and their habitats	Development Matters & EYFS Framework		Knowledge (Components)	Skills (Composites)		
	Development Matters. In Reception children are learning to: Explore the natural world around them. EYFS framework ELG: Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.		<ul style="list-style-type: none"> Know where pets live. Know where farm animals live 	Choose and use a method of grouping. Draw animals.		
				Common Misconception		
				Some children may think that: <ul style="list-style-type: none"> Trees are not plants. Trees are not living as they do not seem to change or grow. Weeds are bad plants. 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	<ul style="list-style-type: none"> To respect and care for living creatures in their natural environment for example spiders, woodlice, birds and squirrels 	Dog, cat, rabbit, guinea pig, fish, hamster. Cow, pig, sheep, horse, hen. Pets, farm, home	Where do pets live? Where do farm animals live?		Small world animals or pictures for sorting. Vets role play area/ pet shop	Senses outdoor walk. City Farm- visit Pet shop?





Small Steps	Week	Review	Knowledge/Skills	Suggested task / learning outcome	Scaffolding	Challenge
		Review all animals taught	To know where pets and farm animals live.	Practical sorting activity classifying animals. House and farm and why they live there? Read 'a squash and a Squeeze'.	Assessment opportunity	

End goals and assessment		Possible evidence	<ul style="list-style-type: none"> Can name and describe plants and animals in the school grounds and their environment. Can talk about how another environment is different to their surrounding natural environment.
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CALTON PRIMARY SCHOOL – PLANTS – EYFS

Plants	Development Matters & EYFS Framework		Knowledge (Components)	Skills (Composites)	
	Development Matters. In Reception children are learning to: <ul style="list-style-type: none"> • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Respond to new experiences that you bring to their attention. 		<ul style="list-style-type: none"> • Describe plants using the following vocabulary: plant, flower, shrub. • Name some common plants: daisy, buttercup, clover. • To know about how plants grow and change (cress and planting outside). 	Grouping and sorting flowers, plants and shrubs. Nurturing a plant to keep it alive and growing. Draw a plant. Make observations of the changes in a plant.	
	EYFS framework ELG: <ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter 			Common Misconceptions Some children may think that: <ul style="list-style-type: none"> - Plants are flowering plants grown in a pot with coloured petals, leaves and a stem - Trees are not plants - All leaves are green - All stems are green - A trunk is not a stem - Blossom is not a flower 	
	Review	Key Vocabulary	Big Questions		Resources
<ul style="list-style-type: none"> • To begin to know about how plants grow and change through planting fruit, vegetables and plants. • To experience the vocabulary seed, bulb, leaf, stem, petal. 	Plant, leaf, root, leaves, flowers stem, tree fruit, vegetables, seed, lifecycle, grow, change	Are all plants the same? What does a plant need to grow? How do plants change?		Cress seeds, cups, water, pictures of plants, cress diary.	Growing our own cress.

Small Steps	Week	Review	Knowledge/Skills	Suggested task / learning outcome	Scaffolding	Challenge
		Name the different parts of a plant leaf, stem, petal, seed, bulb	<ul style="list-style-type: none"> • Describe plants using the following vocabulary: plant, flower, shrub. 	Show pictures of plants, flowers and shrubs. Can the children sort them in to three categories.	Give examples of what a shrub/plant/flower looks like.	
		Give examples of a shrub, plant, flower	<ul style="list-style-type: none"> • Name some common plants: daisy, buttercup, clover. 	Pictures of common plants: daisy, buttercup and clover. Can the children name them? Children to go on a nature walk to find them.	Use simple prompt cards with picture and name of plant.	
		Flash card pictures of common plants to name.	<ul style="list-style-type: none"> • To know what plants need to grow. 	Discuss the important factors a plant needs to grow: water and sunlight, soil. Do a class investigation – place plants in different places, one in a cupboard and one on the windowsill. One with water and one without and one in soil and one in a pot with no soil. Children to make a class predictions of which they think will grow the best.	Picture prompt cards – light, water, warmth.	
		Thumbs up game. Children put their thumbs up if a plants needs the things that are said by the teacher – water, exercise, light, dark, soil etc.	<ul style="list-style-type: none"> • To know about how plants grow and change (cress and planting outside). 	Children are going to plant their own cress and keep a plant diary of their observations.	Diary format provided.	Link to seasons and changes in tress. Can they say what happens?

End goals and assessment		Possible evidence	<ul style="list-style-type: none"> • Can describe some differences between bulbs and seeds. • Can identify seeds and bulbs. • Can talk about how they planted and cared for seeds and bulbs. • Children show care and encourage others to care for things they encounter in the natural environment.
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CALTON PRIMARY SCHOOL – MATERIALS – EYFS

Materials	Development Matters & EYFS Framework		Knowledge (Components)		Skills (Composites)				
	<p>Development Matters. In Reception children are learning to: Explore the natural world around them.</p> <p>EYFS framework ELG: Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>		<ul style="list-style-type: none"> • Talk about natural materials (leaves, sticks, pebbles, bark) • Describe the texture of materials (sand, water, paint, playdough) • Explore changes to materials when cooking – heating, melting, freezing 		<p>Talk about natural materials and their texture. Investigate changes of state.</p>				
					Common Misconceptions				
					<p>Some children may think that:</p> <ul style="list-style-type: none"> - Only fabrics are materials - Only building materials are materials - Only writing materials are materials - The word 'rock' describes an object rather than a material - 'Solid' is another word for hard 				
Review		Key Vocabulary		Big Questions		Resources		Experiences	
<ul style="list-style-type: none"> • Talk about natural materials (leaves, sticks, pebbles, bark) • To explore natural materials dry sand, water, paint and playdough • To explore materials for textures, sounds, smells and tastes • Explore Floating and sinking • Explore changes to materials when cooking- heating, melting 		<p>Materials, leaves, sticks, pebbles, bark, texture, natural, sand, water, paint, playdough, changes of state, cooking, heating, cooling, freezing</p>		<p>How does it feel? What has changed? How has it changed? What do you notice?</p>		<p>Leaves, sticks, pebbles, bark Paint, playdough, sand, water Cooking resources</p>		<p>Outdoor walks Visit the allotment Visit the forest schools area</p>	




Week	Review	Knowledge/Skills	Suggested task / learning outcome	Scaffolding	Challenge
	Name leaves, sticks, pebbles, bark	Talk about natural materials (leaves, sticks, pebbles, bark)	Go on an outdoor walk. Collect natural resources. Name them and move on to describing what they look like and feel like.	Questioning	Have the children collected any other items on their walk? Can they name and describe them?
	Explore natural materials dry sand, water, paint and playdough	To describe the texture of materials (sand, water, paint playdough).	Have access to sand, water, paint and playdough in provision for the children to explore. Discussion about how each material feels.	Discussion	Expose the children to other materials and develop their use of vocabulary to describe the texture of the materials.
	Explore changes to materials when cooking- heating, melting	To understand some important processes and changes, including changes states of matter. Heating, melting, Freezing	Heating and melting – making biscuits, making porridge, cooking gingerbread men. Freezing – making ice lollies. Ice investigation – freeze some veggies in ice. Can the children free them? Explore ice in the outdoor area in Winter. What has happened? Talk about how the water has frozen because it is cold. What might make it melt?	Discussion	

End goals and assessment		Possible evidence	<ul style="list-style-type: none"> • Can name the materials they are using. • Can talk about multiple properties of the material and why it is suited for its purpose. • Can observe changes in their natural world and say why it is different now or will change in the future. • Can compare and describe how materials change over time and in different conditions.
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CALTON PRIMARY SCHOOL – SEASONAL CHANGES – EYFS

Seasonal Changes	Development Matters & EYFS Framework		Knowledge (Components)	Skills (Composites)	
	<p>Children in reception will be learning to: Understand the effect of changing seasons on the natural world around them. Explore the natural world around them. Describe what they see, hear and feel whilst outside.</p> <p>EYFS Framework: ELG: Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.</p>		<ul style="list-style-type: none"> Name the seasons Know about weather conditions in each season. 	Common Misconceptions	
				<p>Some children may think that:</p> <ul style="list-style-type: none"> It always snows in winter It is always sunny in the summer There are only flowers in spring and summer It rains most in the winter God controls the weather 	
	Review	Key Vocabulary	Big Questions		Resources
<ul style="list-style-type: none"> Exploring different types of weather and seasons using vocabulary such as cold, wet, hot, windy, 	Seasons Autumn Winter Spring Summer Weather Sunny Stormy Wind Rain Cloudy Changes Cold Hot Warm Chilly	What are the four seasons? What is the weather like in these seasons? How do things change around us in the different seasons? What do we wear in the different seasons?		Songs Videos	Learning walk during the different seasons to observe the world around us – discuss the weather, what we are wearing, what the trees are like, etc.

Small Steps	Week	Review	Knowledge/Skills	Suggested task / learning outcome	Scaffolding	Challenge
		Exploring different types of weather and seasons using vocabulary such as cold, wet, hot, windy.	Name the seasons.	Discuss the names of the seasons: Autumn, winter, spring and summer. Children to watch a video based on the four seasons. Talk about what the weather was like in the seasons: cold, rainy, snow, warm, windy, sunny.	Questioning and discussion	Tell me something that happens in each of the seasons for example: Halloween in the autumn, Christmas in the winter, Easter in the spring, summer holidays in the summer.
		Name the seasons.	Know about the weather conditions in each season.	Children to make a seasons poster. Fold the paper in to 4 squares. They draw the changes and weather we have discussed in each box to represent the seasons. (snow, a tree with no leaves etc for winter.)	Questioning and discussion	
		Talk about the weather conditions in each season.	Changes in the environment around them during each season.	Sorting activity: different pictures including (hat, scarf, sun cream, trees with leaves falling off them, snow). Can the children sort them into the 4 seasons and explain their reasoning.	Questioning and discussion	

End goals and assessment		Possible evidence	<ul style="list-style-type: none"> Can talk about different types of weather. Can talk about the four seasons. Can talk about the living things they see in the playground and on visits during each season.
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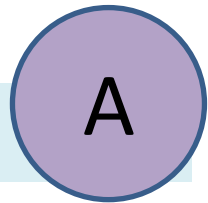
SCIENCE CURRICULUM

YEAR 1/2


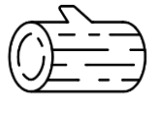



CYCLE A






CALTON PRIMARY SCHOOL – MATERIALS – YEAR 1/2



Materials	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> Identify and compare the suitability of a variety of everyday materials, including, wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 		<ul style="list-style-type: none"> Know the properties of wood, plastic, metal, fabric, cardboard, paper, sponge, glass, brick, stone and rubber. Know the uses of wood, plastic, metal, fabric, cardboard, paper, sponge, glass, brick, stone and rubber Understand how the following properties link to the range of materials taught in Y2: opaque/translucent/transparent, waterproof/absorbent. Know which materials can be stretched, twisted, bent or squashed. 	Investigate which materials can be squashed, twisted, stretched and bent (WS3) Test transparency of materials (WS1,WS6) Test absorbency of materials (boat to float on the river Thames) (WS1, WS6) Test how waterproof materials are (Diving Suit for Traction Man) Orrr.. Arctic expedition for Traction Man to test insulation of materials (WS3, WS5) Create a toy for a baby: textures – soft, hard, smooth, rough (WS1, WS4, WS5)		
				Common Misconceptions		
				Some children may think that: <ul style="list-style-type: none"> Only fabrics are materials Only building materials are materials Only writing materials are materials The word rock describes an object rather than a material Solid is another word for hard 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	Seasons Y1	Names of materials as Y1 (increase the range) Properties of materials – as Y1 plus: opaque, transparent, translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching.	How do we choose materials? How have the materials we use changed over time? How is plastic made? What is the best material for a rain hat? Why? What is the most suitable material for making.....?		Materials A scientist just like me: Candy Jiang (Analytical Chemist)	Materials walk around the school grounds Burning GFOL houses Skillzone DT – material selection for making different toys (puppets, peg dolls)

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Features of Autumn	Name everyday materials. Identify objects and the material they are made out of.	Elicitation to see what the children already know about materials. Material hunt around the school. Choose an object in the school environment and write down what material it is made out of. Record using a table.	Materials word bank with pictures.	Is there any way we can group similar uses together? Think about their purpose. E.g. what materials were used for building? What materials are things in your kitchen made out of?
		Features of Winter	Understand and explain why materials are suitable for different objects.	Choose pictures of everyday objects (E.g. a wooden chair, a glass window, a metal bridge) and write a sentence to describe why it is suitable for it's use.	Materials word bank with pictures.	Can the children use the following vocabulary in their writing? Transparent, opaque, translucent, absorbent and waterproof.
		Features of Spring	Understand and explain why materials are unsuitable for different objects.	Children to draw on object made out of a silly material and to explain why it is unsuitable.	Pictures of materials and real life objects for children to choose from.	What would be a more suitable material for your object? Why?
		Features of Summer	Find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Children to be given a table and to tick to show whether different materials can be twisted, squashed, bent or stretched.	Picture prompts on the table to show how to twist, bend, squash and stretch the materials.	What similarities and differences
		Day length across the seasons	Floating and sinking investigation: Find out which material will be most suited for a boat for the Londoner fleeing from the Great Fire of London.	INVESTIGATION: Children to test and observe if boats made out of different materials to see if they float or sink. D&T Link	Investigation questions on the children's table to use at different stages of the investigation. Key investigation vocabulary to be displayed on the board.	Can you name any other objects that can float or sink? Why is it important to know what materials can float or sink?





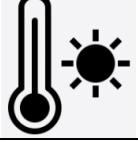
	Weather across the seasons	Transparent, translucent and opaque investigation: Which material will be most suited for Thomas Farriner's curtains?	INVESTIGATION: Children to test and observe whether materials are transparent, translucent and opaque.	Investigation questions on the children's table to use at different stages of the investigation. Key investigation vocabulary to be displayed on the board.	Can you name any other objects that are transparent, translucent and opaque? Why is it important to know what materials are transparent, translucent and opaque?
	Features of all four seasons (1)	Waterproof and absorbent investigation: Which materials will make the best waterproof suit for Traction Man?	INVESTIGATION: Children to test to see which materials are waterproof and absorbent.	Investigation questions on the children's table to use at different stages of the investigation. Key investigation vocabulary to be displayed on the board.	Can you name any other objects that are waterproof or absorbent? Why is it important to know what materials are waterproof or absorbent?
	Features of all four seasons (2)	Understand what materials can be recycled and why recycling is important.	Practically sort out materials into different recycle bins based on their materials.	Picture prompts.	Why is it important to recycle? What can you do in your life to make sure you recycle more?

Formative Assessment	TAPS Assessment: Waterproof TAPS Assessment: Separating colours TAPS Assessment: Rocket mice	Possible evidence	
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CALTON PRIMARY SCHOOL – SEASONAL CHANGES – YEAR 1/2

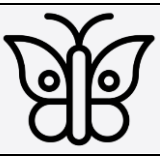


Seasonal Changes	NC Programme of Study		Knowledge (Components)		Skills (Composites)	
	<ul style="list-style-type: none"> Observe changes across the 4 seasons Characteristics of the season (weather, temperature, effect on plants and animals, trees. Link to months of the year. Observe and describe weather associated with the seasons and how day length varies. 		<ul style="list-style-type: none"> Name the seasons Know the months of the year. Recording temperatures Know the difference between day and night. 		<p style="text-align: center;">Common Misconceptions</p> <p>Some children may think that:</p> <ul style="list-style-type: none"> It always snows in winter It is always sunny in the summer There are only flowers in spring and summer It rains most in the winter 	
	Review	Key Vocabulary	Big Questions		Resources	Experiences
		season, spring, summer, autumn, winter, weather, hot/warm, cool/cold, sun/sunny, cloud/cloudy, wind/windy, rain/rainy, snow/snowing, hail/hailing, sleet, frost, fog/mist, ice/icy, rainbow, thunder, lightning, storm, light/dark, day/night, day length	Does the wind blow the same way all the time? What season is it now? How do you know? Does the sun ever shine when it's raining?		Weather station in allotment Thermometers Notable scientist: Anders Celsius (created the temperature scale)	






Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		What seasons can you remember?	Know the months of the year (Maths link) Know the order of the months	Song Sequencing months	Song playing in background Dots and dashes on words	How quickly can you recite the months of the year.
		What are the months	Name the seasons, Autumn (Sept, Oct, Nov), Winter (Dec, Jan, Feb), Spring (March, Apr, May), Summer (June, July, August)	Grouping months into seasons Matching images to each season (e.g. snowman, daffodil, beach ball etc.)	Mixed ability.	Can you identify which seasons your birthday is in?
		EXPLORIFY: Winter seeds (Odd one out)	Know the difference between day and night.	Create a daily routine (sorting images) which things happen in day light and which at night time. Day and night wheel.	Support group.	Is there any thing that you do at day time and night time.
		What are the seasons and their months?	Features of each season – typical weather patterns etc.	Time lapse photo taken once a week for the year Lesson each term where children describe the what the season is like at that point (English Link)	Word mats.	Adjective development
		EXPLORIFY: White and spiky (Zoom in, zoom out)	Recording temperatures	Take temperature once a week and log Have a weather station and use image to show weather for the day	Large scale thermometer	

Formative Assessment	TAPS Assessment: Seasonal change	Possible evidence	
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Animals (incl. Humans)	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance of humans for exercise, eating the right amounts of different types of food, and hygiene. 		<ul style="list-style-type: none"> Know that mammals are hot-blooded and have live young (recognise these features include humans). Know that amphibians live on water or land and lay eggs. Know that reptiles are cold-blooded. Know that birds tend to have feathers and lay eggs (some can fly some are ground-dwelling). Know that fish live in water and have gills for breathing. Know the range of animal diets. Know the stages of human development (baby, toddler, child, teenager, adult) and describe some feature of each stage. Describe the basic needs of humans for survival (air, water, food). Know that food can be categorised into different groups. Know the main food groups (protein, sugars, fat, dairy, fruit and vegetables). Know what makes a healthy plate. Know the importance of hand washing and brushing teeth. 	<p style="text-align: center;">Hygiene investigation – how do germs spread? (WS3) Observe changes to frogspawn over a series of weeks? (WS2, WS5)</p>		
				Common Misconceptions		
				<p>Some children may think:</p> <ul style="list-style-type: none"> An animal's habitat is like its 'home'. All animals that live in the sea are fish. Respiration is breathing. Breathing is respiration. 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	Properties of materials (opposites – flexible/rigid, shiny/dull, transparent/opaque). Suitability of materials.	offspring, grow, adults, young/old, nutrition, reproduce/reproduction, survival, water, food, air, exercise, heartbeat, breathing, hygiene, germs, disease, stages, egg-chick-chicken, egg-caterpillar-pupa-butterfly, baby-toddler-child-teenager-adult Examples of food (pasta, bread, meat, fish, fruit, vegetables)	<p>What do humans need to survive? Why do we need water/food? What do animals need to survive? How are you different from a toddler? Can we eat food from only one group?</p>		<p>Magnifying glasses Small world animals for sorting</p> <p>A scientist just like me: Dr Jo Montgomery (Animal Behavioural Neuroscientist)</p> <p>Notable scientist: Karl von Frisch (honey bee communication)</p>	<p>Robinswood Hill Planting in the allotment Growing seeds and bulbs British Science Week</p>

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge	
		Name different materials and their properties (wood, plastic, metal, fabric, cardboard, paper, sponge, glass, brick, stone and rubber).	<ul style="list-style-type: none"> Review of knowledge from Y1 		Elicitation – Create a KWL grid	Group work. Question stems.	High order question stems.
		Uses of different materials (wood, plastic, metal, fabric, cardboard, paper, sponge, glass, brick, stone and rubber).	<ul style="list-style-type: none"> Know that mammals are hot-blooded and have live young (recognise these features include humans). Know that amphibians live on water or land and lay eggs. Know that reptiles are cold-blooded. Know that birds tend to have feathers and lay eggs (some can fly some are ground-dwelling). Know that fish live in water and have gills for breathing. 		Sorting animals into groups (mammals, amphibians, reptiles, birds, fish) using pictures and headings for the animal groups.	Group work. Mixed ability groups. Adult support with focussed questioning.	Some animals that are more difficult to classify (flying fish, bats, dolphin, whale, duck-billed platypus)
		EXPLORIFY: Fascinating forks (odd one out)	<ul style="list-style-type: none"> Know that mammals are hot-blooded and have live young (recognise these features include humans). Know that amphibians live on water or land and lay eggs. Know that reptiles are cold-blooded. Know that birds tend to have feathers and lay eggs (some can fly some are ground-dwelling). Know that fish live in water and have gills for breathing. 		<p>Animals and their offspring: .Play the Classification Game (bingo game based on the characteristics of the different animal groups. Sort animals into those that do look like their offspring and those that do not. Choose an animal and its offspring – write sentences to say how the characteristics of the adult and offspring are similar and different.</p>	Sentence starters. Support group.	Challenge sentence stems.

	Opposites language - flexible/rigid, shiny/dull, transparent.	<ul style="list-style-type: none"> Know the stages of human development (baby, toddler, child, teenager, adult) and describe some feature of each stage. 	Introducing life cycles of different animals (duck, butterfly, sheep, human). Explore similarities and differences between different life cycles.	Pictures to create life cycles.	Challenge sentence stems.
	Discuss materials that can be bent, twisted, stretched and squashed.	<ul style="list-style-type: none"> Know the stages of human development (baby, toddler, child, teenager, adult) and describe some feature of each stage. 	Describe stages of human development (baby, toddler, child, teenager, adult, elderly).	Pictures to order life stages.	Additional task to explain the differences between two different life stages.
	Match materials to their purpose	<ul style="list-style-type: none"> Know the 5 animal groups previously taught. Group animals by diet and by observable features. 	Basic needs for survival of animals and humans (water, air, food).	Support group.	Explain what would happen if one of the basic needs were lacking.
	EXPLORIFY: The space in between (Zoom in, zoom out)	<ul style="list-style-type: none"> Know the main food groups (protein, sugars, fat, dairy, fruit and vegetables). Know what makes a healthy plate. 	How to create a healthy food plate. Sort foods into different categories. Understand proportions of each group for the Eatwell plate.	Support group. Template to support with different sections on plate.	Discussion activity asking children to compare plates or spot errors based on new learning.
	EXPLORIFY: Gear up (odd one out)	<ul style="list-style-type: none"> Know the stages of human development (baby, toddler, child, teenager, adult) and describe some feature of each stage. Describe the basic needs of humans for survival (air, water, food). 	INVESTIGATION: The importance of exercise	Mixed ability groups.	Use children for modelling of activities.

Formative Assessment	TAPS Assessment: Handspans	Possible evidence	
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Plants	NC Programme of Study		Knowledge (Components)	Skills (Composites)	
	<ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. 		<ul style="list-style-type: none"> Know that seeds and bulbs need water, sunlight, nutrients (soil) and air to germinated and grow into mature plants. Understand the functions of roots, stem, trunk, leaves and flowers. 	Observe growth of narcissus bulb and sunflower over a period of six weeks. Test the effects of temperature on growing plants using cress.	
				Common Misconceptions	
			Some children may think that: <ul style="list-style-type: none"> Plants are not alive as they cannot be seen to move Seeds are not alive All plants start out as seeds Seeds and bulbs need sunlight to germinate 		
Review	Key Vocabulary	Big Questions	Resources	Experiences	
Animals Y1	water, light, shade, sun, warm, cool, grow, suitable temperature, healthy, germination, reproduction	How does a cactus survive in the desert without water? Do the biggest plants grow from the biggest seeds? Can a plant grow without soil?	Bulbs/seeds/soil/pots A scientist just like me: Dr Ben Woodcock (Ecological Entomologist)	Robinswood Hill Planting in the allotment Growing seeds and bulbs	




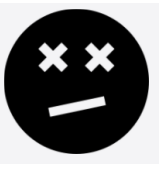
Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Review 5 animals groups: mammals, amphibians, reptiles, birds, fish.	Investigation: Know the difference between seeds and bulbs. Know how water and sunlight may affect plant growth.	INVESTIGATION 1: Plant a sunflower seed and a daffodil bulb to observe how they grow. Continue to measure their growth each week. What do plants need to grow? INVESTIGATION 2: Plant four bean seeds for a comparative test. Make predictions – what will happen to plants in different conditions (e.g. with sunlight and water, without sunlight with water etc.)	Picture prompts for the criteria we are putting each plant in.	Make predictions – which plant will grow the best? Why do you think?
		Carnivores, herbivores, omnivores.	Know a plant's life cycle from seed to flowering plant. Begin to use MRS GREN to identify ways we can tell plants are living things.	Sequence four parts of a plants life cycle – seed, seedling, flowering plant, seed falls	Drama activity to act out the stages of a plant life cycle	Explain: How do we know that plants are living things?
		Visible human body parts (incl. heel, hip, shin, thigh, elbow, knuckles, wrist, calf).	Investigation: Know that plants need water, sunlight and nutrients to grow well. Know the word 'germinate' and use it in a sentence. Investigation 3: How does temperature affect how plants grow?	Draw the bean plants from the comparative test set up in Lesson 1. Draw what has happened to each plant and comment on how each plant has grown. Record measurements in centimetres. INVESTIGATION 3: Plant cress seeds in two trays and place one outside, one inside. Observe over the week which grows the best to determine how temperature affects plant growth.	Observational drawings, picture prompts for each criterion.	Write comparative sentences to explain which plants have germinated and why.
		EXPLORIFY: Muddy meals (What's going on?)	Determine that temperature plays a part in how well plants grow. Know that some plants like different conditions, e.g. grow better in warmer or colder climates, or drier or wetter climates. Know that some plants are grown for us to eat.	Check cress investigation 3 to see which tray of cress has grown. Plant seeds to grow and care for (radishes/carrots).	Support sheet with prompts of scientific vocabulary.	
		Know the 5 senses and which body parts are responsible for each.	Know the functions of the roots, stem, trunk, leaves and flowers of plants and trees.	Matching activity with pictures and explanations.	Support group.	
		EXPLORIFY: Baby animals (Odd one out)	Know a variety of plants and animals that live in microhabitats (minibeasts).	INVESTIGATION: Survey of a microhabitat. Look at microhabitats in the school grounds. Create a pictogram (link to computing) of minibeasts within microhabitats.	Microhabitat enquiry support sheet, including vocab to describe what the habitat is like e.g. dry, rocky, leafy, springy, soft.	Answer question: Do all minibeast like living in the same microhabitats

	Formative Assessment	TAPS Assessment: Compare growth	Possible evidence	<ul style="list-style-type: none">• Can name trees and other plants that they see regularly.• Can describe some of the key features of these trees and plants e.g., the shape of the leaves, the colour of the flower/blossom.• Can point out trees which lost their leaves and those that kept them the whole year.• Can point to and name the parts of a plant, recognising that they are not always the same e.g., leaves and stems may not be green.
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Living things and their habitats	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> Explore and compare the differences between things that are living, dead and things that have never been alive. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds or animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in the habitats, including microhabitats. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. 		<ul style="list-style-type: none"> Know the signs of life (movement, respiration, sensitivity, growth, reproduction, excretion, nutrition). Covered in plants and Animals Know that some things are alive, some have been alive and have died and some have never lived. Understand the features of different world habitats for living things (desert, woodland, grassland, tundra, rainforest, ocean). Know a variety of plants and animals that live in a range of world habitats and know the adaptations of some plants and animals to these environments. Know a variety of plants and animals that live in microhabitats (minibeasts). Know how animals obtain their food from plants and other animals using a simple food chain. 	Mini-beast observation? Design ideal habitat for an African snail (or some other kind of classroom pet!)		
				Common Misconceptions		
				Some children may think that: <ul style="list-style-type: none"> - An animal's habitat is like its 'home' - Plants and seeds are not alive as they cannot be seen to move - Fire is living - Arrows in a food chain means 'eats' 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	How seasonal changes affect habitats (effects on the environment, climate change). Needs for survival of living things.	living, dead, never been alive, suited/suitable, habitats, micro-habitats, basic needs, food, food chain, alive, healthy, logs, leaf litter, stony path, under bushes, shelter, seashore, woodland, ocean, rainforest, conditions, hot/warm/cold, dry/damp/wet, bright/dark/shade	Can living things live forever? Is a flame alive? Is a deciduous tree dead in winter? How does the habitat of the Arctic compare with the rainforest? All habitats are the same. Do you agree or disagree? Animals and plants can live in any habitat. Do you agree or disagree? Meerkats are not suited to hot conditions. Do you agree or disagree? How can we find out how many minibeasts live in a microhabitat? All living things consume the same diet. True or false? All things that move are alive. True or false?		Magnifying glasses Small world animals for sorting	Cotswold Wildlife Park

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Recap seasonal changes we have observed this year	Identify different habitats, focusing on rain forests, hot deserts, oceans, fresh water, grasslands, cold deserts (Arctic/Antarctic)	All habitats are the same. Do you agree or disagree? Draw a picture of each habitat and use a word bank to write words to describe each one.	Word and phrase bank e.g., dry, warm, cold, wet, temperate, tropical, vast, salt water, rainfall	Write questions about what you would like to find out about habitats. E.g., How do animals cope with the cold temperatures of the Arctic?
		Examine how changes to weather/environment affect bees.	Recap of last week's knowledge focusing on the features of different world habitats for living things.	All habitats are the same. Do you agree or disagree? Describe a habitat using key vocabulary.	Word and phrase bank e.g., dry, warm, cold, wet, temperate, tropical, vast, salt water, rainfall	Compare to another habitat.
		Day length: How length of the days affects animals in certain habitats	Know a variety of animals that live in a range of world habitats and know some adaptations of animals to these environments.	Animals can live in any habitat. Do you agree or disagree? Habitat detectives: Decide which animals belong to which habitat. Match the suitability descriptions to the animals.	Matching activity: animals to habitats and clues to how they adapt to	Write a definition for the words: nocturnal, camouflage
		Climates: recap climate in deserts, rainforest, beaches and arctic	Recap last week's knowledge: Know a variety of animals that live in a range of world habitats and know some adaptations of animals to these environments.	Meerkats are not suited to hot conditions. Do you agree or disagree? Focus on one habitat (desert) and animals' suitability (meerkats).	Pictures and keywords e.g. claws, tail, mob, eyes, food	Apply examples of other animals and how they are suited to the same environment (desert).

	Climate change: how change in temperature affects warmer habitats - desert	Know a variety of plants that live in a range of world habitats and know some adaptations of plants to these environments.	Plants can live in any habitat. Do you agree or disagree? Habitat detectives: Decide which plants belong to which habitat. Match the suitability descriptions to each plant.	Pictures and keywords e.g. fern, cactus, kelp	Write an explanation for how plants grow in hot, dry or cold places.
	Climate change: how change in temperature affects colder habitats – cold desert	Know a variety of plants and animals that live in microhabitats (minibeasts).	How can we find out how many minibeasts live in a microhabitat? INVESTIGATION: Survey of a microhabitat. Look at microhabitats in the school grounds. Create a pictogram (link to computing) of minibeasts within microhabitats.	Microhabitat enquiry support sheet, including vocab to describe what the habitat is like e.g. dry, rocky, leafy, springy, soft.	Answer question: Do all minibeast like living in the same microhabitats.
	Climate change: How can we help? Link to materials knowledge – recycling, use less electricity	Know how animals obtain their food from plants and other animals using a simple food chain.	All living things consume the same diet. True or false? Create food chains using language producer, consumer, prey, predator.	Picture prompts, visual examples of chains Food chain cards for pupils to make as many different food chains as they can	Link to habitats: Which habitats do these food chains belong to? E.g. leaf, insect, scorpion, meerkat, eagles.
	Climate change: How can we help?	Know that some things are alive, some have been alive and have died and some have never lived.	All things that move are alive. True or false? Recap MRS GREN (first taught in plants unit). Complete table to determine whether a thing is living or non-living.	Sentence stems Picture cards for pupils to vote if the image is of a living thing or not 'Which one am I?' game – pupils try to work out yes/no clues	Give reasons how you can classify a thing that is living, dead or never alive.

Formative Assessment	TAPS Assessment: woodlice habitats		Possible evidence	<ul style="list-style-type: none"> • Can find a range of items outside that are living, dead and never alive. • Can name a range of animals and plants that live in a habitat and micro-habitats that they have studied. • Can talk about how the features of these animals and plants make them suitable to the habitat. • Can talk about what the animals eat in a habitat and how the plants provide shelter for them. • Can construct a food chain that starts with a plant and has the arrows pointing in the correct direction.
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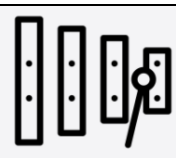
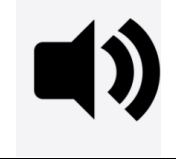
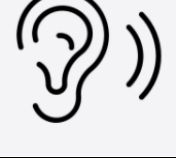
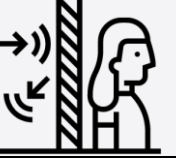
SCIENCE CURRICULUM

YEAR 3/4

CYCLE A






Sound	NC Programme of Study		Knowledge (Components)		Skills (Composites)	
	<ul style="list-style-type: none"> identify how sounds are made, associating some of them with something vibrating recognise that vibrations from sounds travel through a medium to the ear find patterns between the pitch of a sound and features of the object that produced it find patterns between the volume of a sound and the strength of the vibrations that produced it recognise that sounds get fainter as the distance from the sound source increases 		<ul style="list-style-type: none"> Know how sounds are made, associating some of them with something vibrating. Know that sounds can be high or low (pitch), loud or quiet (loudness) and how this relates to vibrations. Know that the volume of sound changes over distance and understand that it gets fainter as the distance from the sound's source increases. Know that vibrations from sounds travel through a medium to the ear and understand why sound cannot travel in a vacuum. Know some materials that will absorb sounds. 		<ul style="list-style-type: none"> How to making sounds and how does It travel Find the pitch using different instruments Learn sign language Identify different materials to help reduce sounds Create string phones 	
	Review		Key Vocabulary		Common Misconceptions	
	Year 2 - Materials		sound, noise, vibrate, travel, solid, liquid, gas, pitch (high/low), tune, high, low, volume, loud, quiet, fainter, muffle, insulation, instrument, percussion, strings, brass, woodwind, tuned instrument		Pitch and volume are frequently confused, as both can be described as high or low. Some children may think that: <ul style="list-style-type: none"> - Sound is only heard by the listener - Sound only travels in one direction from the source - Sound can't travel through solids and liquids - High sounds are loud and low sounds are quiet 	
Big Questions			Resources		Experiences	
Why happens when you strike a drum or pluck a string? How does the speed of vibrations affect the pitch of the sound produced? How fast is sound? What happens to your voice when you sing in the bathroom?			Pitching forks, string, cups, instruments, balloons, sign language, paper, foil, sponge, fabric, rice, Notable scientist: Alexander Graham Bell		Creating string phones Experiment with different instruments finding pitch and vibrations Using different materials to reduce sounds	

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Mini quiz on Y2 Materials	Know how sounds are made, associating some of them with something vibrating.	Is there a link between the time of day and the amount of sound in school? Sound walk – listen to different sounds at different locations around school. Identifying how different musical instruments made sound	Adult support to promote scientific discussion and appropriate use of vocabulary. Knowledge organiser.	Explanation how sound is made using scientific vocab
		How sounds are made	Know that sounds can be high or low (pitch), loud or quiet (loudness) and how this relates to vibrations.	How does the speed of the vibrations affect the pitch? Using musical instruments and household items – notice the difference in pitch and volume	Adult support to promote scientific discussion and appropriate use of vocabulary. Knowledge organiser.	Explain how sound travels
		Different vibrations	Know that the volume of sound changes over distance and understand that it gets fainter as the distance from the sound's source increases.	What can sound travel through? Practical activity listening to different sounds using string cups	Adult support to promote scientific discussion and appropriate use of vocabulary. Knowledge organiser.	Explanation on why there are different pitches
		Sound changes	Know that vibrations from sounds travel through a medium to the ear and understand why sound cannot travel in a vacuum.	How do we hear different sounds? Create paper cones to replicate sound travelling into the ear and identified different ear positions. Learn some BSL	Adult support to promote scientific discussion and appropriate use of vocabulary. Knowledge organiser.	Create name or basic words using BSL. Explain how vibrations enter the ear and travel to the brain
		BSL	Know some materials that will absorb sounds	What is the best way to muffle the sound of an alarm? Identify different materials for ear defenders	Adult support to promote scientific discussion and appropriate use of vocabulary. Knowledge organiser.	Explanation why some materials are better at absorbing sound using scientific vocab
	Y4 Sound Unit	Understand how different levels of pitch are created	How is pitch created? Can we make it? Recap the difference between volume and pitch. Practical activity using paper straws to blow through to create varying levels of pitch	Adult support to promote scientific discussion and appropriate use of vocabulary. Knowledge organiser.	Reflect and explain using key vocab how the size of the straws and the use of air affects the pitch	

	Formative Assessment	TAPS Assessment: Investigating pitch TAPS Assessment: String telephones	Possible evidence	<ul style="list-style-type: none">• Can name sounds sources and state that sounds are produced by the vibration of an object.• Can state that sounds travel through different mediums such as air, metal, water.• Can give examples to demonstrate how the pitch of a sound are linked to the features of the object that produced it.• Can give examples of how to change the volume of a sound e.g. increase the size of vibrations by hitting or blowing harder.• Can give examples to demonstrate that sounds get fainter as the distance from the sound source increases.
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Living things and their habitats	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> recognise that living things can be grouped in a variety of ways explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment recognise that environments can change and that this can sometimes pose dangers to living things 		<ul style="list-style-type: none"> Know a variety of living things (plants and animals) in Gloucester and the school grounds. Know that animals from different habitats can be grouped by size, land/air/sea, number of legs, features, fur/feathers/scales, vertebrates/invertebrates. Know that animals can be grouped into mammals, amphibians, reptiles, birds, fish, insects, arthropods, arachnids. Know how animals and plants are affected by natural environmental changes (earthquakes, storms, floods, hurricanes, wildfires, droughts) 	<ul style="list-style-type: none"> Identify environmental changes Classify animals into their groups Use a Dichotomous key 		
			Common Misconceptions		Some children may think that: <ul style="list-style-type: none"> The death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain Animals are only land-living creatures Animals and plants can adapt to their habitats, however they change All changes to habitats are negative 	
	Review	Key Vocabulary	Big Questions		Resources	Experiences
Year 3 Plants	environment, flowering, non-flowering, vertebrate, danger, populations, development, litter, deforestation, classification keys, habitat, human impact, migrate	How might an environment change both naturally and due to human impact? What do we need plants for? What would the world be if there weren't any plants? Why are people cutting down the rainforests and what effect does that have?		Paper, pictures of household, farm and wild animals Notable scientist: Rachel Carson (Marine Biologist)		



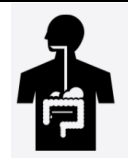

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Mini quiz on Y3 Plants	<ul style="list-style-type: none"> Know a variety of living things (plants and animals) in Gloucester and the school grounds. Know how animals and plants are affected by natural environmental changes (earthquakes, storms, floods, hurricanes, wildfires, droughts). 	Identify environmental changes – man made and natural, using fact cards.	Easier environmental changes.	Explanation changes using scientific vocabulary.
		Environmental changes	<ul style="list-style-type: none"> Know that animals from different habitats can be grouped by size, land/air/sea, number of legs, features, fur/feathers/scales, vertebrates/invertebrates. 	Classifying animals into 5 animal groups.	Familiar animals to classify.	Explanation of why they classify animals into their groups using scientific vocabulary.
		Basic classification	<ul style="list-style-type: none"> Know that animals can be grouped into mammals, amphibians, reptiles, birds, fish, insects, arthropods, arachnids. 	Classify using Dichotomous key.	Simpler key to complete.	Create different dichotomous keys.

Formative Assessment	TAPS Assessment: Local survey	Possible evidence	<ul style="list-style-type: none"> Can name living things living in a range of habitats, giving the key features that helped them to identify them. Can give examples of how an environment may change both naturally and due to human impact.
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Animals (incl. Humans)	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> describe the simple functions of the basic parts of the digestive system in humans identify the different types of teeth in humans and their simple functions construct and interpret a variety of food chains, identifying producers, predators and prey 		<ul style="list-style-type: none"> Name the organs that make up the digestive system (incl. mouth, oesophagus, stomach, small intestine, large intestine, colon, rectum). Understand the basic function of the gallbladder, pancreas, liver. Know the journey of food from mouth to rectum. Know the importance of saliva (enzymes) in digestion. Know that digestion is how the body absorbs nutrients. Name the different types of human teeth and know their function (incisors, canines, pre-molars, molars). Know that adult humans have 32 teeth. Know that animal teeth vary depending on diet (e.g., canines in carnivores). Know how to produce more complex food chains (4/5 links, including apex predators). Define the terms consumer, producer, prey, predator. 	<ul style="list-style-type: none"> Investigate the movement of foods and materials in the digestive system WS3 Label body parts of digestive system WS4 Identify function of teeth using models WS4 Put eggs in different liquid and see the effect WS3 Identify uses of different animal teeth WS4 		
				Common Misconceptions		
				Some children may think: <ul style="list-style-type: none"> Arrows in the food chain mean 'eats' The death of one of the parts of a food chain or web has no, or limited, consequences on the rest of the chain There is always plenty of food for wild animals Your stomach is where your belly button is Food is digested only in the stomach When you have a meal, your food goes down one tube and your drink goes down another. The food you eat becomes 'poo' and the drink becomes 'wee'. 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	Year 3 – food groups, fuel and balanced diet.	human digestive system, mouth, tongue, moistens, saliva, teeth, incisors, canines, molars, premolars, chewing, grinding, oesophagus, transports, stomach, acid, enzymes, small intestine, large intestine, rectum, anus, carnivore, herbivore, omnivore, brush, floss, food chain, sun, producers, prey/predators, hibernate	What does our body do with the food eat? How do dentists mend broken teeth? How is food digested? What might happen if predators and prey swapped roles? Which teeth were used in which part of the eating process?		Tights, cereal, milk, water Teeth, vinegar, sugar A scientist just like me: Dawood Qureshi Notable scientist: Jane Goodall	Active demonstration of digestive system process

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Y3 - Mini quiz and model of food groups	Name the organs that make up the digestive system (incl. mouth, oesophagus, stomach, small intestine, large intestine, colon, rectum). Know the journey of food from mouth to rectum.	How do we digest our food? Active demonstration of digestion journey – tights, bananas, liquid, cereal	N/A	Questioning using scientific vocab
		Recap main muscle groups including pairs for contraction and extension.	Understand the basic function of the gallbladder, pancreas, liver. Know the importance of saliva (enzymes) in digestion. Know that digestion is how the body absorbs nutrients.	What do our digestive organs actually do? Match function to organs	Less organs to match	Explain in full sentences using scientific vocab
		EXPLORIFY: Fuel up (Odd one out)	Know how to produce more complex food chains (4/5 links, including apex predators). Define the terms consumer, producer, prey, predator).	What is a food chain? Create and label food chains – include consumer, producer, prey, predator	Simpler food chain to label	Identify more complex food chains using; primary, secondary and tertiary consumer
		Recap of consumer, producer, prey, predator	Name the different types of human teeth and know their function (incisors, canines, pre-molars, molars). Know that adult humans have 32 teeth. Know that animal teeth vary depending on diet (e.g. canines in carnivores).	Why are teeth so important? Label and describe functions of human teeth Discuss animal teeth	Label basic teeth	Explain and compare human teeth to animal teeth

	Recap of function of main teeth	Consolidate previous lesson with an investigation	Why should we keep our teeth clean? Part 1 INVESTIGATION: Eggs (shells replicate enamel) in different solutions – vinegar, coke, milk, water, orange juice, coffee	Mixed ability group work	Explain using scientific vocab
	Recap of investigation lesson and variables	Investigation Part 2: Evaluations and observations	Why should we keep our teeth clean? Part 2 Take eggs out of drinks, make observations and evaluations.	Word bank of vocabulary	Explain using scientific vocabulary why this happened to the eggs.
	Recap names of organs	Review the organs of the digestive system (added lesson as too much content to be covered in one lesson)	Where would you find our digestive organs? Children to draw around a child and stick on organs. Then label organs with explanations – teeth, oesophagus, stomach, liver, small intestine, large intestine, rectum	Practical Activity in mixed ability groups with appropriate adult support.	Label further organs of the digestive system.
	Match digestive organs with explanations	Know how to produce more complex food chains (4/5 links, including apex predators). Define the terms consumer, producer, prey, predator.	What are the different parts of a food chain? 3 food chains already made. Children to label with correct vocabulary. 3 pictures of animals for children to sort into correct order for a food chain and label with correct vocabulary.	Food chains already made, adult support for low ability/SEND.	

Formative Assessment	TAPS Assessment: Teeth (eggs) in liquid	Possible evidence	<ul style="list-style-type: none"> • Can sequence the main parts of the digestive system. • Can draw the main parts of the digestive system onto a human outline. • Can describe what happens in each part of the digestive system. • Can point to the three different types of teeth in their mouth and talk about their shape and what they are used for. • Can name producers, predators and prey within a habitat. • Can construct food chains.
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States of Matter	NC Programme of Study		Knowledge (Components)		Skills (Composites)	
	<ul style="list-style-type: none"> compare and group materials together, according to whether they are solids, liquids or gases observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature 		<ul style="list-style-type: none"> Know the properties and behaviours of solids, liquids and gases. Know that all materials will change state in response to heating or cooling. Know that melting point of water is 0°C and boiling point is 100°C. Understand the part that evaporation and condensation play in the water cycle. Understand that the rate of evaporation is dependent on temperature. 		<ul style="list-style-type: none"> Identity changes within different states Observe changes in states Identify evaporation and condensation within the water cycle, matching definitions 	
					Common Misconceptions	
					Some children may think that: <ul style="list-style-type: none"> 'Solid' is another word for hard or opaque Solids are hard and cannot break or change shape easily and are often in one piece Substances made of very small particles like sugar or sand cannot be solids Particles in liquids are further apart than in solids and they take up more space When air is pumped into balloons, they become lighter Water in different forms – steam, water, ice – are all different substances All liquids boil at the same temperature as water (100 degrees) Melting, as a change of state, is the same as dissolving Steam is visible water vapour (only the condensing water droplets can be seen) 	
Review	Key Vocabulary	Big Questions		Resources	Experiences	
Year 2 – Materials Year 3 – Rocks and Soils	solid, liquid, gas, air, oxygen, powder, grain, crystals, ice, water, steam, water vapour, heated/heating, cooled/cooling, temperature, degrees Celsius, solidify, molten, boil, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle	Why is water always wet? What are hurricanes and why do they happen? How do some things melt more quickly? Why is there condensation on the inside of a cup of hot water? Why is there condensation on the outside of a cup of icy water?		Water, chocolate, salt, ice cubes, beakers, thermometer, jugs, cling film, kettle	Active experiment using ice cubes	

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Year 2 Materials	Know the properties and behaviours of solids, liquids and gases.	Identity changes within different states	Mixed ability groups	Explaining the changes and why they occur using scientific vocab
		Review properties	Know that all materials will change state in response to heating or cooling. Know that melting point of water is 0°C and boiling point is 100°C.	INVESTIGATION: using ice cubes to observe changes in states	Mixed ability groups	Explain how ice cubes have changes states and why?
		Review changing states	Understand the part that evaporation and condensation play in the water cycle. Understand that the rate of evaporation is dependent on temperature.	Create water cycle wheel to identify evaporation and condensation within the water cycle, matching definitions	Cutting and sticking definitions	Explain evaporation and condensation in context using scientific language

Formative Assessment	TAPS Assessment: Dunking biscuits TAPS Assessment: Measuring temperature	Possible evidence	<ul style="list-style-type: none"> Can create a concept map, including arrows linking the key vocabulary. Can name properties of solids, liquids and gases. Can give everyday examples of melting and freezing. Can give everyday examples of evaporation and condensation. Can describe the water cycle.
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Electricity	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors 		<ul style="list-style-type: none"> Know a range of appliances that are powered by electricity. Know a range of components (cell, battery, wire, lamp, buzzer, switch) that can make a simple series circuit. Know the difference between a complete or incomplete simple series circuit. Know that switch opens or closes a circuit. Know some materials which will act as a conductor or insulator. 	<ul style="list-style-type: none"> Sorting pictures/ appliances into electric non-electric WS1 Identifying different types of electricity; mains and battery electricity WS1 Construct a simple circuit WS4 Identify materials or fruit that are good at conducting electricity WS5 		
			Common Misconceptions			
					Some children may think that: <ul style="list-style-type: none"> Electricity flows to bulbs, not through them Electricity flows out of both ends of a battery Electricity works by simply coming out of one end of a battery into the component 	
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	Year 3 - Light	appliances, electricity, device, electrical circuit, cell, wire, bulb, buzzer, danger, electrical safety, sign, insulators, switch, open, closed, components, motor, mains/plug, circuit, complete circuit, connect, battery/positive/negative, connection, loose connection, short circuit, clip, motor connector, metal/non-metal, symbol	Can we control electricity? How has electricity changed the way we live? How does a light bulb work? What alters the brightness of a bulb? How can you make a bulb dimmer without changing the battery? Which materials are conductors/insulators of electricity? Will silver foil act as a conductor? How do switches work?		Log boxes, bulbs, wires, cells, batteries, motors, circuits, lemons, potatoes, carrots, materials Notable scientist: Nikola Tesla	Construct and complete an electrical circuit Investigate good conductors and insulators using fruit and materials

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Y3 - Mini quiz on light	Know a range of appliances that are powered by electricity.	Sorting pictures/ appliances into electric non-electric Identifying different types of electricity; mains and battery electricity	Less pictures to sort	Explanation on different types of energy. Heat, kinetic, light and sound.
		Recap on different appliances	Know a range of components (cell, battery, wire, lamp, buzzer, switch) that can make a simple series circuit.	Construct a simple circuit	Mixed ability groups.	Draw circuit that was completed using correct symbols.
		Recap on components for a simple circuit	Know the difference between a complete or incomplete simple series circuit. Know that switch opens or closes a circuit.	Construct a simple circuit – with switches using a diagram to follow	Mixed ability groups.	Draw circuit that was completed using correct symbols and explain the purpose of a switch.
		Recap on complete and incomplete circuits	Know some materials which will act as a conductor or insulator.	Investigation into good conductors and insulators using fruit and materials	Mixed ability groups.	Explain a conductor and insulator using scientific vocabulary.

Formative Assessment	TAPS Assessment: Circuit products TAPS Assessment: Conductors	Possible evidence	<ul style="list-style-type: none"> Can name the components in a circuit. Can make electric circuits. Can control a circuit using a switch. Can name some metals that are conductors. Can name materials that are insulators.
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SCIENCE CURRICULUM




YEAR 5/6

CYCLE A



Animals (incl. Humans)	NC Programme of Study		Knowledge (Components)	Skills (Composites)	
	<ul style="list-style-type: none"> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies' function describe the ways in which nutrients and water are transported within animals, including humans 		<ul style="list-style-type: none"> Name the four chambers of the heart. Know that the circulatory system is a closed system and the heart is a pump. Understand the role of the lungs in oxygenation of blood (oxygenated/deoxygenated). Know the role of arteries, veins and capillaries. Know the consequences of poor diet and lifestyle on the circulatory system. Know that the heart beats faster to deliver oxygenated blood to the organs and muscles. Know that nutrients and water are transported around the body by the blood and absorbed in both the small and large intestine. 	Common Misconceptions	
				Some children may think that: <ul style="list-style-type: none"> Your heart is on the left side of your chest The heart makes blood The blood travels in one loop from the heart to the lungs and around the body When we exercise, our heart beats faster to work the muscles more Some blood in our bodies is blue and some blood is red We just eat food for energy All fat is bad for you All dairy is good for you Protein is good for you and you can eat as much as you want Food only contains fat is you can see it All drugs are bad for you 	
	Review	Key Vocabulary	Big Questions		Resources
<ul style="list-style-type: none"> Y3 Skeleton and muscles Y3 Nutrients Y4 Digestion system Y5 Materials 	Circulatory system, heart, blood, blood vessels, pumps, oxygen, carbon dioxide, lungs, nutrients, water, diet, exercise, drugs, lifestyle, pulse rate, transported, water, muscles	How do our choices affect how our bodies work? What do different types of organisms do? Are micro-organisms harmful? How have medicines changed over time? Does everyone's heart beat at the same rate? The fitter you are, the faster your heart rate will be. Is this true?		Tommy the torso Stanley the skeleton 4D Augmented reality on iPads A scientist just like me: Dr Jo Montgomery (Animal Behavioural Neuroscientist) Notable scientist: William Harvey (first scientist to explain circulation of the blood)	<ul style="list-style-type: none"> Acting as blood cells to collect oxygen and be pumped by the heart round a body on the playground. Sticking the main body organs on a paper body

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Recap digestive system organs and where they are in the body.	<ul style="list-style-type: none"> Name the four chambers of the heart. Know that the circulatory system is a closed system and the heart is a pump. Know that the heart beats faster to deliver oxygenated blood to the organs and muscles. 	The Heart Label parts of the heart. Create a living model of the heart using PE equipment.	Scaffolded worksheet Mixed ability groups.	Write correct statements about the heart. Mixed ability groups.
		Year 5 Materials EXPLORIFY: Big hitters (Odd one out)	<ul style="list-style-type: none"> Understand the role of the lungs in oxygenation of blood (oxygenated/deoxygenated). Know the role of arteries, veins and capillaries. Know that nutrients and water are transported around the body by the blood and absorbed in both the small and large intestine. 	Blood Follow the instructions to build their own blood models.	Working mixed ability groups.	Working mixed ability groups.
		Recap circulatory system.	<ul style="list-style-type: none"> Know that the heart beats faster to deliver oxygenated blood to the organs and muscles 	INVESTIGATION: Measure resting heart rate and compare this to the heart rate taken after exercise. How has it changed?	Working in mixed ability groups.	Working mixed ability groups.

		EXPLORIFY: Fuel up (Odd one out)	<ul style="list-style-type: none"> Know the consequences of poor diet and lifestyle on the circulatory system. 	Diet and Exercise Compare four people's diet and exercise, highlighting the healthy choices that each person should continue making as well as suggesting how they could potentially make their lifestyle healthier. Focus on different nutrients in food and how maintaining a healthy balanced diet helps to acquire them and promote positive health outcomes.	Questions and prompts given to help support the comparison.	Answer the question: 'Do all people need the same amount of calories?'
		EXPLORIFY: What if an astronaut gets thirsty	<ul style="list-style-type: none"> Know the consequences of poor diet and lifestyle on the circulatory system. 	Drugs and Alcohol (PSHE LINK) Create an information sheet about the effects on the body of smoking and the effects of drinking too much alcohol.	Word bank and statements.	Explain how drugs and alcohol can affect our bodies.
		EXPLORIFY: Have you ever tasted sugar in your cereal milk?	<ul style="list-style-type: none"> Know the consequences of poor diet and lifestyle on the circulatory system. 	Drugs and Alcohol (PSHE LINK) – Part 2 Complete the information sheet (as above).	Word bank and statements.	Explain how drugs and alcohol can affect our bodies.

Formative Assessment	TAPS Assessment: heart rate	Possible evidence	<ul style="list-style-type: none"> Can draw a diagram of the circulatory system and label the parts and annotate it to show what the parts do. Produces a piece of writing that demonstrates the key knowledge e.g. explanation text, job description of the heart. Can explain both the positive and negative effects of diet, exercise, drugs and lifestyle on the body.
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Light	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	Pupils should be taught to: <ul style="list-style-type: none"> recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them 		<ul style="list-style-type: none"> Know that light enables us to see colours as some objects absorb or reflect light. Know that a prism allows us to see the visible spectrum. Know that objects can be seen because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Know that the angles of incidence and reflection are equal. Know that different surfaces change the direction in which light travels (refraction). Know that shadows can be a similar shape as the object that cast them because light travels in straight lines. 	Observe that light travels in a straight line. Observe that light can travel through some objects.		
				Common Misconceptions		
				Some children may think that: <ul style="list-style-type: none"> We see objects because light travels from our eyes to the object 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	Y5 Earth and Space	light, travels, straight, reflect, reflection, light source, object, shadows, mirrors, periscope, rainbow, filters, straight lines, light rays, diffusion, refraction, angle of incidence, opaque, transparent and translucent.	How do we see light? Can we see light? How does the length of shadows change through the seasons? Why does an apple look green? How do we see the moon at night? Can we see around corners? What is the difference between light 'bouncing' and light 'reflecting'?		Torches, mirrors, prism, lasers, video clips, concept cartoons A scientist just like me: Professor Colin Webb (Laser Physicist)	Creating a laser maze. Year 6 residential: laser maze and laser tag.

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Where does light come from? How are shadows made?	<ul style="list-style-type: none"> Know that objects can be seen because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Know that shadows can be a similar shape as the object that cast them because light travels in straight lines. 	Working in a group, produce an educational programme for children all about how light enables us to see.	Working in mixed ability groups	Working in mixed ability groups
		EXPLORIFY: What if you worked at NASA but weren't an astronaut?	<ul style="list-style-type: none"> Know that the angles of incidence and reflection are equal. 	Create and test a periscope and then to explain how a periscope works.	Template, word banks, sentence starters, HAP/ Adult support	Create own periscopes with no template given.
		Seasons / Rotation of the Earth (Y5)	<ul style="list-style-type: none"> Know that different surfaces change the direction in which light travels (refraction). 	Investigating how images change when seen through a glass of water.	Adult support, word bank, sentence starters, mixed ability groups	Explain how refraction caused the effects seen in each investigation.
		EXPLORIFY: Awesome observing	<ul style="list-style-type: none"> Know that a prism allows us to see the visible spectrum. 	Use a torch to shine a ray of light through a prism, holding a piece of white card in front of the refracted ray of light as it leaves the prism. Explain what can be seen. Make a Newton's Colour Wheel, predict what will happen if it spun. Explain what can be seen.	Adult support, word bank, sentence starters, mixed ability groups.	Explain the effects.
		Reflection and refraction: what's the difference?	<ul style="list-style-type: none"> Know that light enables us to see colours as some objects absorb or reflect light. 	Secret Message Challenge: write a secret message that says different things when viewed through different coloured filters.	Adult support, word bank, sentence starters, mixed ability groups.	Write an explanation of how they created their secret message.

Formative Assessment	TAPS Assessment: Light questions TAPS Assessment: Investigating shadows	Possible evidence	<ul style="list-style-type: none"> Can describe, with diagrams or models as appropriate, how light travels in straight lines either from sources or reflected from other objects into our eyes. Can describe, with diagrams or models as appropriate, how light travels in straight lines past translucent or opaque objects to form a shadow of the same shape.
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	NC Programme of Study	Knowledge (Components)	Skills (Composites)		
Electricity	Pupils should be taught to: <ul style="list-style-type: none"> associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram 	<ul style="list-style-type: none"> Know that the brightness of a lamp or the volume of a buzzer is affected by the number of cells used or voltage in a circuit. Know how to represent a series circuit using recognised circuit symbols. Know that a typical cell (battery) has a voltage of 1.5V and that these can be connected together to create circuits with a higher voltage. To know the names and discoveries/inventions (Volta, Tesla, Franklin, Faraday, Swan, Edison, Haslett, Parpart, Forbes) 	Measuring effect of number of cells and number of bulbs etc. on a circuit		
			Common Misconceptions Some children may think that: <ul style="list-style-type: none"> Larger-sized batteries make bulbs brighter A complete circuit uses up electricity Components in a circuit that are closer to the battery get more electricity 		
	Review	Key Vocabulary	Big Questions	Resources	Experiences
	<ul style="list-style-type: none"> Recap a range of components (cell, battery, wire, lamp, buzzer, switch) that can make a simple series circuit. Recap the difference between a complete or incomplete simple series circuit. Recap that switch opens or closes a circuit. Recap the definitions of conductors and insulators with examples 	appliances, electrical circuit, complete circuit, circuit diagram, components, cell/battery, positive/negative, terminal, connection, loose connection, short circuit, wire, crocodile clip, lamp, brightness, switch, buzzer, volume, motor, conductor, insulator, voltage, current, resistance, danger, series circuit, parallel circuit	What is electricity? Is electricity manmade? How has our understanding of electricity changed over time? How can a motor be made to turn more quickly? What do you think is happening to the little particles (electrons)?	Wires, cells, bulbs, motors, switches, lasers, Hot Wires game	Creating different circuits with laser beams in the style of laser maze.

	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
Small Steps			<ul style="list-style-type: none"> Elicitation of what they knew: referencing Year 3 (Light) and Year 4 (reflection, resistance, complete circuit, insulator and conductor) Scientist discoveries in electricity (Volta, Tesla, Franklin, Faraday, Swan, Edison, Haslett, Parpart, Forbes) 	Elicitation - concept cartoons Guided reading - cross curricular	Differentiated text	n/a
		Recap a range of components (cell, battery, wire, lamp, buzzer, switch) that can make a simple series circuit.	<ul style="list-style-type: none"> Components in a circuit. Know that the brightness of a lamp or the volume of a buzzer is affected by the number of cells used or voltage in a circuit. Know how to represent a series circuit using recognised circuit symbols. 	In groups, children make a complete circuit (bulb, wire, cells, motors, buzzers) New content: adding bulbs into a series circuit to see if the bulb's brightness is affected	Chn given correct number of resources instead of them taking the resources. Chn being shown a diagram of a circuit.	Explaining what happens when the number of bulbs is changed in the circuit.
		Component names and symbols Circuit diagrams	<ul style="list-style-type: none"> Know that a typical cell (battery) has a voltage of 1.5V and that these can be connected together to create circuits with a higher voltage 	Using different batteries with different volts, the chn create circuits and observe the effects that the voltage has on the brightness of the bulb.	Chn referred to a complete circuit at the front of the class.	Explaining what happens when the voltage in the circuit is changed.
		Draw a simple circuit	<ul style="list-style-type: none"> Know that the brightness of a lamp or the volume of a buzzer is affected by the number of cells used or voltage in a circuit. Know how to represent a series circuit using recognised circuit symbols. 	Plan an investigation: Does wire length affect how components in a circuit work?	Mixed ability groups	Mixed ability groups
		Effect of adding more components to a circuit e.g. bulbs, batteries	<ul style="list-style-type: none"> Know that the brightness of a lamp or the volume of a buzzer is affected by the number of cells used or voltage in a circuit. Know how to represent a series circuit using recognised circuit symbols. 	Conduct an investigation: Does wire length affect how components in a circuit work? Review previous investigation then create and carry out a new investigation based on their findings from the previous investigation	Mixed ability groups	Mixed ability groups

Formative Assessment	TAPS Assessment: Bulb brightness TAPS Assessment: Conductive dough	Possible evidence	<ul style="list-style-type: none"> Can make electric circuits and demonstrate how variation in the working of particular components, such as the brightness of bulbs, can be changed by increasing or decreasing the number of cells or using cells of different voltages. Can draw circuit diagrams of a range of simple series circuits using recognised symbols.
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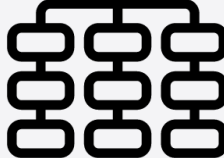


Animals (incl. Humans) Habitats	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution 		<ul style="list-style-type: none"> Know that inheritance refers to the characteristic traits that are genetically passed to their offspring from parents (eye colour, hair colour, height). Know that natural selection refers to the strongest traits survive over generations (Darwin). Know that Charles Darwin wrote 'The Origin of Species'. Know that animals change over time and adapt to the surrounding in which they live. Know that living things produce offspring of the same kind but are not identical to their parents. Know that plants and animals are adapted to their environment in different ways and that adaptation may lead to evolution. Know that fossils provide information and evidence of the changes to living things. 			
				Common Misconceptions		
			Some children may think that: <ul style="list-style-type: none"> Adaptation occurs during an animal's lifetime: giraffes' necks stretch during their lifetime to reach higher leaves and animals living in cold environments grow thick fur during their life Offspring most resemble their parents of the same sex, so that sons look like fathers All characteristics, including those that are due to actions during the parent's life such as dyed hair or footballing skills can be inherited Cavemen and dinosaurs were alive at the same time 			
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	Y5 Forces and Magnets	Evolution, suited/suitable, adapted/adaptation, offspring, characteristics, vary/variation, inherit/inheritance, fossils, sexual reproduction, environment	Gills and lungs – what's the difference between them? If you were plant, would you prefer to be brightly coloured or strongly scented? Why? Why are polar bears white? How have human skulls evolved? Why do some birds need long beaks? Why do we have an appendix? How does natural selection drive evolution?		Notable scientist: Charles Darwin Rosalind Franklin	Trip to Pitt-Rivers Museum

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		EXPLORIFY: Making work easier	<ul style="list-style-type: none"> Know that inheritance refers to the characteristic traits that are genetically passed to their offspring from parents (eye colour, hair colour, height). Know that living things produce offspring of the same kind but are not identical to their parents. 	Identify the characteristics that have been inherited from each parent.	Adult support, word bank, sentence starters, scaffolded sentences	Explain why they believe that they are inherited traits. Can personality be inherited?
		EXPLORIFY: What if penguins could fly?	<ul style="list-style-type: none"> Know that animals change over time and adapt to the surrounding in which they live. Know that plants and animals are adapted to their environment in different ways and that adaptation may lead to evolution. 	Choose an environment and research the plants and animals that live there. Children identify adaptive traits for each living thing.	Working in mixed ability groups	Working in mixed ability groups
		EXPLORIFY: Force for good	<ul style="list-style-type: none"> Know that natural selection refers to the strongest traits survive over generations (Darwin). Know that Charles Darwin wrote 'The Origin of Species' 	Write a diary entry from the point of view of either Darwin or Wallace, reflecting on their investigations that led them to the idea of evolution.	Adult support, word bank, sentence starters, scaffolded sentences	
		What is the difference between inheritance and adaptation?	<ul style="list-style-type: none"> Know that fossils provide information and evidence of the changes to living things. 	Write a paragraph to compare modern humans with Homo Neanderthalensis, and Australopithecus Afarensis.	Adult support, word bank, sentence starters, scaffolded sentences	
		What is a fossil and how are they made?	<ul style="list-style-type: none"> Know that plants and animals are adapted to their environment in different ways and that adaptation may lead to evolution. 	Decide on an adaptive trait that humans might evolve in the future and explain the advantages and disadvantages this adaptation would cause.	Working in mixed ability groups	Working in mixed ability groups

Formative Assessment	TAPS Assessment: Fossil habitats TAPS Assessment: Egg strength	Possible evidence	<ul style="list-style-type: none"> Can explain the process of evolution. Can give examples of how plants and animals are suited to an environment. Can give examples of how an animal or plant has evolved over time e.g. penguin, peppered moth.
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Living Things and their Habitats	NC Programme of Study		Knowledge (Components)	Skills (Composites)	
	<ul style="list-style-type: none"> Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. 		<ul style="list-style-type: none"> Know about the order of Linnean taxonomy family. Know how to group animals using observable characteristics using dichotomous keys. Understand the difference between animals, plants, fungi, and bacteria. Know that bacteria are single-celled organisms and animals are multi-celled organisms. Know different types of microorganism (virus, bacteria, fungus). Know the useful and harmful effects of different types of microorganism. 	Common Misconceptions	
				Some children may think that: <ul style="list-style-type: none"> All micro-organisms are harmful Mushrooms are plants 	
	Review	Key Vocabulary	Big Questions		Resources
Y4 Sound	organism, micro-organism, fungus, mushrooms, classification keys, environment, fish, amphibians, reptiles, birds, mammals, vertebrates, invertebrates, insects, spiders, snails, worms, flowering, non-flowering	What are the five animal vertebrate groups? What are some of the invertebrate groups? What are the key characteristics of the five vertebrate groups?			

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
Small Steps		Explorify – The Sound of Silence	<ul style="list-style-type: none"> Know how to group animals using observable characteristics using dichotomous keys. Know about the order of Linnean taxonomy family. Understand the difference between animals, plants, fungi, and bacteria. 	Design the layout for their zoo, making sure that similar animals are housed near to each other.	Mixed ability groups	Mixed ability groups
		Explorify – Sounds like science	<ul style="list-style-type: none"> Know how to group animals using observable characteristics using dichotomous keys. Know about the order of Linnean taxonomy family. Understand the difference between animals, plants, fungi, and bacteria. 	Design a new creature and accompanying fact file. The creature should exhibit characteristics of a particular group of animals, so that it can classify it correctly later.	Scaffolding for fact file, word prompts, word bank	
		Explorify – What if you could hear every sound at an equal volume?	<ul style="list-style-type: none"> Know that bacteria are single-celled organisms and animals are multi-celled organisms. Know different types of microorganism (virus, bacteria, fungus). 	What Makes Mould Grow? Investigation.	Use the prompts to describe their variables.	Explain their prediction, referring to microorganisms.

Formative Assessment	TAPS Assessment: Outdoor keys TAPS Assessment: Invertebrate research	Possible evidence	<ul style="list-style-type: none"> Can give examples of animals in the five vertebrate groups and some of the invertebrate groups. Can give the key characteristics of the five vertebrate groups and some of the invertebrate groups. Can compare the characteristics of animals in different groups.
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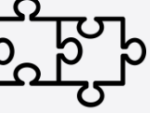

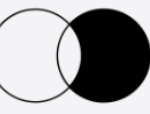


SCIENCE CURRICULUM

YEAR 1/2

CYCLE B



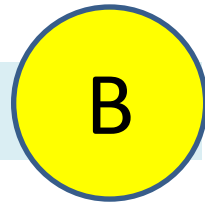
Materials	NC Programme of Study		Knowledge (Components)	Skills (Composites)	
	<ul style="list-style-type: none"> Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties. 		<ul style="list-style-type: none"> Recognise different materials (wood, plastic, metal, fabric, cardboard, paper, sponge, glass). Talk about some of the properties of these materials. Distinguish between what an object is and what it is made from. Understand how the following properties link to the range of materials taught in Y1: hard/soft, rough/smooth, shiny/dull, heavy/light, colour 	Three Little Pigs - building houses to withstand the huff & puff of the wolf (WS3) Sorting materials investigation (WS4).	
				Common Misconceptions	
					Some children may think that: <ul style="list-style-type: none"> Only fabrics are materials Only building materials are materials Only writing materials are materials The word 'rock' describes an object rather than a material 'Solid' is another word for hard
	Review	Key Vocabulary	Big Questions	Resources	Experiences
	Senses language (touch, see, smell, taste, feel)	object, material, wood, plastic, glass, metal water, rock, brick, clay, properties, hard/soft, stretchy, stiff, shiny, dull, rough/smooth, bendy/stiff, waterproof, absorbent, paper, fabrics, elastic, foil, card/cardboard, floppy	Is there a pattern to the types of materials that are used to make objects in school?	KS1 mixed materials box A scientist just like me: Dr Pearl Agyakwa (Materials scientist)	Materials walk around the school grounds.

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Show a selection of materials – Can you name them	Recognise different materials (wood, plastic, metal, fabric, cardboard, paper, sponge, glass).	Given a large pile of different material – can they sort them into each of the different materials.	Mixed ability Review session at the beginning Key vocab	Can you suggest what these materials might be good for?
		Can you name some of the different materials we looked at last lesson?	Talk about some of the properties of these materials.	Selection of vocab (see key vocab) which of these terms match with the material.	Images to go with the vocab	Can you think of several materials that arestrong/bendy/absorbent?
		Look at some key vocab, can you give examples of materials with that property.	Distinguish between what an object is and what it is made from.	Take a selection of classroom resources, can you state what it is, and what it is made from?	Vocab mats with images for different materials. Display boards	Can you find an object in the classroom that is made out of 3 different materials? 4 different materials?
		Look at a couple of objects, what are they made from?	Understand how the following properties link to the range of materials taught in Y1: hard/soft, rough/smooth, shiny/dull, heavy/light, colour	Using hoops/sorting hoops to group materials based on their properties (e.g. hard and soft)	Word mats Display resources Mixed ability groups.	Complete the same activity but with a Venn diagram – activities that might overlap.
		What have we learnt about materials so far? Which ones are strong? Which ones are absorbent?	Apply materials knowledge.	INVESTIGATION – Which material is waterproof and would be most suitable to protect a dragon's egg?	Mixed ability	Predict beforehand, give reasons why we have the results that we have.
		What have we learnt about materials so far? Which ones are strong? Which ones are absorbent?	Apply materials knowledge.	Can you build a house for the 3 little pigs? It needs to be strong! Which materials (out of the ones we have) would be the best to build a house with? – DT link!	Talk about which materials are strong/water proof etc.	Explain why you have chosen these materials?



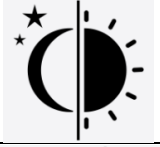

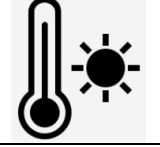
Formative Assessment	TAPS Assessment: Reflection test TAPS Assessment: Floating and sinking TAPS Assessment: Bridge testers	Possible evidence	<ul style="list-style-type: none"> Can name an object, say what material it is made from, identify its properties and make a link between the properties and a particular use. Can label a picture of diagram of an object made from different materials. For a given object can identify what properties a suitable materials needs to have. Whilst changing the shape of an object can describe the action used (stretch, twist, squash etc.)
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CALTON PRIMARY SCHOOL – SEASONAL CHANGES – YEAR 1/2



Seasonal Changes	NC Programme of Study		Knowledge (Components)		Skills (Composites)	
	<ul style="list-style-type: none"> Observe changes across the 4 seasons Characteristics of the season (weather, temperature, effect on plants and animals, trees. Link to months of the year. Observe and describe weather associated with the seasons and how day length varies. 		<ul style="list-style-type: none"> Name the seasons Know the months of the year. Recording temperatures Know the difference between day and night. 			
					Common Misconceptions	
					Some children may think that: <ul style="list-style-type: none"> It always snows in winter It is always sunny in the summer There are only flowers in spring and summer It rains most in the winter 	
	Review	Key Vocabulary	Big Questions		Resources	Experiences
		season, spring, summer, autumn, winter, weather, hot/warm, cool/cold, sun/sunny, cloud/cloudy, wind/windy, rain/rainy, snow/snowing, hail/hailing, sleet, frost, fog/mist, ice/icy, rainbow, thunder, lightning, storm, light/dark, day/night, day length	Does the wind blow the same way all the time? What season is it now? How do you know? Does the sun ever shine when it's raining?		Weather station in allotment Thermometers Notable scientist: Anders Celsius (created the temperature scale)	

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		What seasons can you remember?	Know the months of the year (Maths link) Know the order of the months	Song Sequencing months	Song playing in background Dots and dashes on words	How quickly can you recite the months of the year.
		What are the months	Name the seasons, Autumn (Sept, Oct, Nov), Winter (Dec, Jan, Feb), Spring (March, Apr, May), Summer (June, July, August)	Grouping months into seasons Matching images to each season (e.g. snowman, daffodil, beach ball etc.)	Mixed ability.	Can you identify which seasons your birthday is in?
		EXPLORIFY: Winter seeds (Odd one out)	Know the difference between day and night.	Create a daily routine (sorting images) which things happen in day light and which at night time. Day and night wheel.	Support group.	Is there any thing that you do at day time and night time.
		What are the seasons and their months?	Features of each season – typical weather patterns etc.	Time lapse photo taken once a week for the year Lesson each term where children describe the what the season is like at that point (English Link)	Word mats.	Adjective development
		EXPLORIFY: White and spiky (Zoom in, zoom out)	Recording temperatures	Take temperature once a week and log Have a weather station and use image to show weather for the day	Large scale thermometer	

Formative Assessment	TAPS Assessment: Seasonal change	Possible evidence	<ul style="list-style-type: none"> Name the four seasons and identify when in the year they occur. Can describe weather in different seasons over a year. Can describe days as being longer (in time) in the summer and shorter in the winter. Use evidence gathered to describe the general types of weather and changes in day length over the seasons.
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Animals (incl. Humans)	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets). Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. 		<ul style="list-style-type: none"> Know the terms mammals, amphibians, reptiles, birds, fish. Know that mammals have babies, amphibians live in water and on land, reptiles have scales, birds lay eggs, fish live in water. Understand the terms carnivores, herbivores, omnivores. Know that humans are also mammals. Name visible body parts (incl. heel, hips, shin, thigh, elbow, knuckles, wrist, calf). Name the 5 senses and know which body part is responsible for each. 	Senses investigation – feely boxes experiencing the 5 senses (WS2). Eyesight investigation – dropping pennies into a cup (WS1)		
				Common Misconceptions		
				Some children may think: <ul style="list-style-type: none"> Only four-legged mammals, such as pets, are animals Humans are not animals Insects are not animals All 'bugs' and 'creepy crawlies' such as spiders, are part of the insect group. Amphibians and reptiles are the same 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	Plants – needs for survival, link to seasons (opportunities for exploration of language during trip)	head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves. touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear, tongue.	Do you get better at smelling as you get older? Where do animals live? Do all animals have ears/eyes? What makes you unique? How do animals in Australia differ to the ones in the UK? Do animals have the same senses as humans? What is alive?		Magnifying glasses Small world animals for sorting A scientist just like me: Tanisha Allen (Zoologist) Notable scientist: Florence Nightingale	Forest-based outdoor learning trip.

Small Steps	Week	Review	Knowledge/Skills	Suggested task / learning outcome	Scaffolding	Challenge
		Show a couple of different materials, what properties do they have? (hard, transparent, smooth)	The 5 animal groups: mammals, amphibians, reptiles, birds & fish. Mammals have babies, amphibians live in water and on land, reptiles have scales, birds lay eggs, fish live in water.	Discussion and practical group sorting activity.	Mixed ability groups	Prove to me; A penguin is a bird A bat is a mammal A platypus is a mammal
		Name the 5 animal groups, and one animal for each group.	Consolidate learning from previous lesson.	Classifying animals within groups addressing misconceptions from previous lesson.	Mixed ability groups Display resources for clues	Can you teach it to someone else?
		Name the 5 animal groups, and one animal for each group.	Know the definition of carnivore, herbivore and omnivore. Classify a range of animals within these groups.	Practical sorting activity classifying animals.	Mixed ability groups Vocab mat with images	Write a sentence in your own words what carnivore, herbivore and omnivore means.
		What are the 3 dietary groups?	Name visible parts of the human body (incl. heel, hips, shin, thigh, elbow, knuckles, wrist, calf). Know that humans are also mammals.	Draw around a child. Class discussion and introduce new vocabulary.	Word and image mat Mixed ability / and class discussion to start	Give a couple of body parts, can they use the iPad App/text from the library to find scientific names for certain body parts. E.g. tibia, fibula,
		Head shoulders knees and toes, replaced with 8 different body parts.	Know the five senses and which body parts are responsible for each.	INVESTIGATION: feely boxes for children to investigate taste, touch, smell and hearing.	Group work	Can you write sentences about each of your senses in your own words.
		EXPLORIFY: Special delivery (What's going on?)	Know the 5 animal groups previously taught. Group animals by diet and by observable features.	Venn diagrams classifying animals by class and by diet.	Mixed ability groups Word mats/ vocab Work on display board	Add in a third criteria, e.g. mammal, furry and herbivore

End goals and assessment	TAPS Assessment: animal classification TAPS Assessment: body parts	Possible evidence	<ul style="list-style-type: none"> Can describe how animals, including humans, have offspring which grow into adults, using the appropriate names for the stages. Can state the basic needs of animals, including humans for survival. Can state the importance of exercise, diet and hygiene.
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Plants	NC Programme of Study		Knowledge (Components)		Skills (Composites)				
	<ul style="list-style-type: none"> Name different parts of a plant: roots, stem, leaf, stamen, petals. Name and identify wild and garden plants (Recap - daisy, buttercup, clover. Teach - nettle, dandelion, ivy, bramble, bluebell, rose, poppy, sunflower). Name and identify trees (beech, ash, holly, oak, horse chestnut). 		<ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. 		Planting cress seeds				
					Common Misconceptions				
					Some children may think that: <ul style="list-style-type: none"> Plants are flowering plants grown in a pot with coloured petals, leaves and a stem Trees are not plants All leaves are green All stems are green A trunk is not a stem Blossom is not a flower 				
Review		Key Vocabulary		Big Questions		Resources		Experiences	
Properties of materials (opposites – flexible/rigid, shiny/dull, transparent/opaque)		common wild plants, garden plants, tree, deciduous, evergreen, trunk/bark, branches, leaf, root, plant, leaf, bud, flowers, blossom, petal/s, root, stem/stalk, fruit, berry, vegetables, bulb, seed		Do trees with bigger leaves lose their leaves first in Autumn? Is there a pattern in where we find moss growing in the school grounds? What are the most common British plants and where can they be found? What plants can you see out of the window? What is your favourite flower and why?		Seeds Clear cups Compost A scientist just like me: Angie Burnett (Plant Biologist)		Visit a waterside location (Gloucester Quays/Beach) Growing plants in the allotment.	

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
Q	1	Animals (topic from previous term) name the 5 animal groups.	See the different parts of plant – identify them as they grow (roots, stem, leaf, stamen, petals)	INVESTIGATION: Beans in a plastic bag – watching them grow. – bean diary.	Giving the language – bean, root, stem, leaf, soil, growth.	What do other plants grow from?
Flowers	2	Look at a selection of photos of shrubs, plants and trees – can they identify which is which.	Recognise the different parts of a plant (roots, stem, leaf, stamen, petals)	Bean diary Week 2. Dissect a flower (daffodil/tulip) Looking for different parts – sort them into the different parts.	Mixed ability pairs	Start to suggest what these parts might do.
Flower	3	Can you remember any of the different parts of a plant you found yesterday?	Know the different parts of a plant (roots, stem, leaf, stamen, petals)	Bean diary week 3 Cupcake flowers! – creating own plant using cupcake case (petals), straw (stem), string (roots), actual leaf, matches (stamen). Then label the parts	Ready-made labels.	Add a sentence explaining what each part does.
Seedling	4	Show pictures of daisy, buttercup, clover – can the children identify the different plants?	Name and identify wild and garden plants (Recap - daisy, buttercup, clover. nettle, dandelion, ivy, bramble, bluebell, rose, poppy, sunflower).	Bean diary week 4 Look at images of nettles, dandelion, ivy, bramble, bluebell, rose, poppy and sunflower. Complete a matching activity in class, then go for a walk complete a 'bingo style' activity to spot the different plants.	Pictures and labels of the plants that the children are looking for.	If you didn't spot a certain plant, can you suggest a reason why?
Tree	5	Name some plants from the previous lesson.	Name and identify trees (beech, ash, holly, oak, horse chestnut).	Bean diary week 5 Look at images of different trees. Complete a matching activity in class, then go for a walk complete a 'bingo style' activity to spot the different trees. – this lesson may have to be finished off on school trip.	Pictures and labels of the tree that the children are looking for.	If you didn't spot a certain tree, can you suggest a reason why?

Formative Assessment	TAPS Assessment: Structure leaf look	Possible evidence	<ul style="list-style-type: none"> Can describe how plants that they have grown from seeds and bulbs have developed over time. Can identify plants that grew well in different conditions. Can spot similarities and differences between bulbs and plants.
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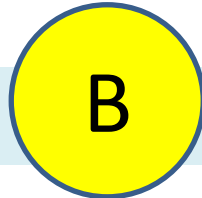
SCIENCE CURRICULUM

YEAR 3/4

CYCLE B


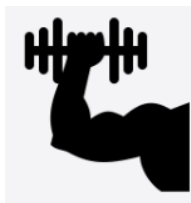


CALTON PRIMARY SCHOOL – ANIMALS (incl. HUMANS) – YEAR 3/4



Animals (incl. Humans)	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> Pupils should be taught to: identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat identify that humans and some other animals have skeletons and muscles for support, protection and movement 		<ul style="list-style-type: none"> Know the main food groups (carbohydrate, protein, fat, vitamins/minerals, fibre). Know that humans need food as a source of fuel (as oppose to plant that photosynthesise). Understand the importance of a balanced diet (the right amount of nutrition) Name main bones that make up the human skeleton (tibia, fibia, phalanges, metatarsal, metacarpals, patella, skull, clavicle, spine, radius, ulna). Know that the skeleton has multiple functions including, support, movement and protection. Know which organs the ribcage protects (heart, lungs). Know that humans have muscles for support, protection and movement. Know that muscles protect the bones and organs by absorbing shock and reducing friction in the joints. Name some muscle groups (bicep/tricep, pectorals, abdominals, hamstring/quads) Name and identify animals with exoskeletons and endoskeletons. 	Muscle investigation – two activities and they need to predict what muscles they are using (WS2).		
				Common Misconceptions		
				Some children may think: <ul style="list-style-type: none"> Certain whole food groups like fats are ‘bad’ for you Certain specific foods, like cheese are also ‘bad’ for you Diet and fruit drinks are ‘good’ for you Snakes are similar to worms, so they must also be invertebrates Invertebrates have no form of skeleton 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	Y2 Animals	nutrition, nutrients, vitamins, minerals, fat, protein, carbohydrates, sugars, fibre, water, skeletons (support, protection), skulls (brain), ribs (heart, lungs), joint, muscles (movement, pull, contract, relax)	Do living things need different things to stay alive? Can living things live forever? Why do different types of vitamins keep us healthy? Can people with the biggest hands grab the most sweets? Can people with longer legs run faster? What bones are needed for protection, support and movement? How can we live a healthy life?		Skeleton model. Torso model. Skeleton 4D app. A scientist just like me: Amy Pickering (Microbiologist)	

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		<ul style="list-style-type: none"> Know the basic needs of humans for survival: air, water, food Know that food can be categorised into different groups Know the main food groups: protein, sugars, fats, dairy, fruit and vegetables Know the components of a healthy plate 	<ul style="list-style-type: none"> Know the main food groups (carbohydrate, protein, fat, vitamins/minerals, fibre). Know that humans need food as a source of fuel (as oppose to plant that photosynthesise). Understand the importance of a balanced diet (the right amount of nutrition). 	Why do different types of vitamins keep us healthy? Writing out the nutrient types, giving examples of which food you get from each.	Picture prompts and labelling and elimination exercise.	To explain how the nutrients are used by the body.
		<ul style="list-style-type: none"> Know the importance of hand washing and brushing teeth. 	<ul style="list-style-type: none"> Recap last lesson knowledge – mini quest Name and identify animals with exoskeletons and endoskeletons. 	What bones are needed for protection, support and movement? Skeleton types in animals and humans (endoskeleton, exoskeleton, hydrostatic skeleton). Sorting animals into groups.	Sorting exercise using pictures. Support group.	Identify animals and insects with hydrostatic skeletons.
		<ul style="list-style-type: none"> Know the stages of human development (baby, toddler, child, teenager, adult) and describe some feature of each stage. 	<ul style="list-style-type: none"> Recap last lesson knowledge – mini quest Name main bones that make up the human skeleton (tibia, fibia, phalanges, metatarsal, metacarpals, patella, skull, clavicle, spine, radius, ulna). Know that the skeleton has multiple functions including, support, movement and protection. Know which organs the ribcage protects (heart, lungs). 	Can people with longer legs run faster? Labelling a human skeleton from video using word bank.	Starter letters and word bank.	Find the scientific names of: mandible, talus, vertebral column, phalanges, cranium, scapula, thoracic cage, carpals Do all animals have the same types of bones? Do the bones look alike?


		<ul style="list-style-type: none"> • Know that mammals are hot-blooded and have live young (recognise these features include humans) • Know that amphibians live on water or land and lay eggs. • Know that reptiles are cold-blooded. • Know that birds tend to have feathers and lay eggs (some can fly some are ground-dwelling) • Know that fish live in water and have gills for breathing. • Know the range of animal diets. 	<ul style="list-style-type: none"> • Recap last lesson knowledge – mini quest • Know that humans have muscles for support, protection and movement. • Know that muscles protect the bones and organs by absorbing shock and reducing friction in the joints. 	<p>How do muscles work together?</p> <p>INVESTIGATION: two activities and they need to predict what muscles they are using (WS2).</p>	<p>Video describing how muscles move and words used to describe the movement (voluntary/involuntary)</p>	<p>Explain how muscles move and work. Sentence stems.</p>
		<ul style="list-style-type: none"> • Know that mammals are hot-blooded and have live young (recognise these features include humans) • Know that amphibians live on water or land and lay eggs. • Know that reptiles are cold-blooded. • Know that birds tend to have feathers and lay eggs (some can fly some are ground-dwelling) • Know that fish live in water and have gills for breathing. • Know the range of animal diets. 	<ul style="list-style-type: none"> • Recap last lesson knowledge – mini quest • Name some muscle groups (bicep/tricep, pectorals, abdominals, hamstring/quads) 	<p>Which muscles are the most important for movement?</p> <p>Draw around a child and label the main muscle groups.</p>	<p>Group work.</p>	<p>Identify muscle groups that work in pairs on the main diagram.</p>
		<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<p>Food groups/nutrients</p>		
		<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<p>Naming the bones in the human body using the large skeleton model.</p>		
		<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<p>Practical activity: Making muscles</p>		

	<p>Formative Assessment</p>	<p>TAPS Assessment: Investigating skeletons</p>	<p>Possible evidence</p>	<ul style="list-style-type: none"> • Can name the nutrients found in food. • Can state that to be healthy we need to eat the right types of food to give us the correct amount of these nutrients. • Can name some bones that make up their skeleton, giving examples that support, help them move or provide protection. • Can describe how muscles and joints help them to move.
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Light	NC Programme of Study		Knowledge (Components)	Skills (Composites)	
	<ul style="list-style-type: none"> Recognise that they need light in order to see things and that dark is the absence of light Notice that light is reflected from surfaces Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Recognise the way that shadows are formed when the light from a light source is blocked by opaque object Find patterns in the way that the size of shadows change 		<ul style="list-style-type: none"> Recognise that light is needed in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect the eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change. 	Investigate and choose the most reflective materials for a new book bag (WS4) Testing and choosing materials to create blackout curtains (WS4) Answering the question – What do you notice about shadows when you change the distance between object and light. (WS6)	
	Review		Key Vocabulary	Big Questions	Resources
Materials – Y2		light, light source, see, dark, absence of light, reflect, reflective, surface, natural, star, Sun, moon, artificial, torch, candle, lamp, translucent, transparent, opaque, shiny, matt, shadow, reflect, mirror, sunlight, dangerous	What is the dark? How does the sun make light? How are shadows formed? When it is completely dark, can you still see things?	Torches Mirrors Box of materials A scientist just like me: Professor Colin Webb (Laser Physicist) Notable scientist: Thomas Edison	Looking at materials around the environment

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		<ul style="list-style-type: none"> Identify and compare the suitability of a variety of everyday materials, including, wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Know the uses of wood, plastic, metal, fabric, cardboard, paper, sponge, glass, brick, stone and rubber 	<ul style="list-style-type: none"> Know different sources of light. Know that the moon, windows and mirrors are not light sources. Know that darkness is absence of light. Understand how light reflects on surfaces and know that this reflected light travels to the eye so we can see the object. Understand that we need light to see. 	What is the dark? INVESTIGATION: Feely bag investigation – why do we need light? Lesson 1: Elicitation and sources of light. Lesson 2: Investigating reflective surfaces.	Materials given to investigate reflective surfaces Adult support as a scaffold Predicting and discussing prior to investigation	Discuss why certain materials are more reflective than others Identify appropriate materials as part of investigation and explain why it is suited for the purpose
		<ul style="list-style-type: none"> Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<ul style="list-style-type: none"> Know that light is a form of energy. Know that light travels in straight lines. Know the main part of the human eye (cornea, retina, iris, pupil). Understand how the sun can damage parts of the eye and how the eyes can be protected. Know that some light is invisible to the human eye but we can see and feel its effects. 	How does the sun make light? Design sunglasses or hat to protect someone's eyes from harmful affects of the sun. Advertise sun protection item.	Videos – BBC class clips Discussion of own experiences with sunburn/sunglasses/hats/sun cream Pictures showing affects of sun damage	Tell your customers why they need to buy the item Explain the affects of the sun and why/how your item will protect against them
		<ul style="list-style-type: none"> Understand how the following properties link to the range of materials taught in Y2: opaque/translucent/transparent, waterproof/absorbent 	<ul style="list-style-type: none"> Know that shadows are formed when light is blocked from a light source by a solid object. 	What is a shadow and how are shadows formed? Testing and choosing materials to create blackout curtains.	Variety of materials on tables – shining torch onto them to identify those that are opaque/translucent/transparent. Predicting and discussing prior to investigation.	Discuss why certain materials are more reflective than others Identify appropriate materials as part of investigation and explain why it is suited for the purpose.

		<ul style="list-style-type: none"> Know which materials can be stretched, twisted, bent or squashed. 	<ul style="list-style-type: none"> Know how shadows change size. 	<p>Can a fire have a shadow?</p> <p>Making shadows with objects and torches and measuring the size of the shadow</p> <p>Answering the question – What do you notice about shadows when you change the distance between object and light.</p>	<p>Variety of objects given</p> <p>Children to work in small groups and some scaffolded via adult to support with measuring</p>	<p>Do you notice a pattern?</p> <p>Does the size of the shadow change when the distance between the object and light source changes?</p>
		<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<p>Lesson 6: Using a mirror to reflect light and explain how mirrors work.</p>		
		<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<p>Lesson 7: Can everything make a shadow?</p>		

<p>Formative Assessment</p>	<p>TAPS Assessment: making shadows</p>	<p>Possible evidence</p>	<ul style="list-style-type: none"> Can describe how we see objects in light and can describe dark as the absence of light. Can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses.
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Rocks	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and organic matter 		<ul style="list-style-type: none"> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter. 	Experiment – planting and growing cress in different types of soils – clay, sandy and compost. Predict/record data on which cress grew the best. (WS5)		
				Common Misconceptions		
				Some children may think that: <ul style="list-style-type: none"> Rocks are all hard in nature Rock-like, man-made substances such as concrete or bricks are rocks Materials, which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer 'natural' Certain found artefacts, like old bits of pottery or coins are fossils A fossil is an actual piece of the extinct animal or plant Soil and compost are the same thing 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	Living things and their habitats – Y2	rock, stone, pebble, boulder, soil, layers, hard/soft, fossil, grains, crystals, hard/soft, texture, absorb water, marble, chalk, granite, sandstone, slate, sandy soil, clay soil, chalky soil, peat	Where do rocks come from? Who was Mary Anning and what did she discover? How are fossils formed? Is there a pattern in where we find volcanoes on planet earth? What are the different uses of rocks? What happens to plants when they are put in darkness/cold/deprived of air? What would happen to a plant if you removed the roots? Do all plants have the same lifespan? Why do some plants only live for one year		Seeds, soil, small plant pots A scientist just like me: Fangxian Fang (Earth Scientist) Notable scientist: Marie Curie (radiation) Mary Anning (paleontologist)	Looking at rocks around the environment




Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Know the signs of life (movement, respiration, sensitivity, growth, reproduction, excretion, nutrition).	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.	What are rocks? Where do they come from? The 3 types of rock – metamorphic, igneous, sedimentary Watch video followed by drawing a diagram of igneous rock Watch video followed by drawing a diagram of sedimentary rock Watch video followed by drawing a diagram of metamorphic rock	Videos Box of rocks – different types Adult scaffolding	Naming the rock types and explaining how they are formed and why they are different
		Know that some things are alive, some have been alive and have died and some have never lived.	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.	Are all rocks the same? Sorting rocks into natural and man – made Geography Link	Videos Box of rocks Adult scaffolding	Fact or fiction quiz – types of rocks
		Know how animals obtain their food from plants and other animals using a simple food chain.	Describe in simple terms how fossils are formed when things that have lived are trapped within rock.	Who was Mary Anning and what did she discover? Fossilisation process and the relation to sedimentary rocks List the three main types of fossils – chemical, body, trace Order the steps that happen to create a body or trace fossil Recap 3 main types of rocks	Videos Fossils to be shown around the class Pictures of fossils	Identify and discuss relationship between types of rocks and the fossilisation process
		Understand the features of different world habitats for living things (desert, woodland, grassland, tundra, rainforest, ocean).	Recognise that soils are made from rocks and organic matter.	Which is the most important layer of soil? Identify what soils are made of and the layers (base rock, sub soil and top soil) Four processes of soil formation	Discussions in the class and in small groups	Match the four processes that are involved in soil formation and what compost is. Moving around the classroom to appropriate place – additions, losses, translocations, transformations, compost
		EXPLORIFY: Wrigglers (What's going on?)	Recognise that soils are made from rocks and organic matter.	Why is soil important? INVESTIGATION: planting and growing cress in different types of soils – clay, sandy and compost. Predict/record data on which cress grew the best.	Planting cress as a class Taking it in turns to water cress	Explain why soils have different properties and how this affects plant growth.

Formative Assessment	TAPS Assessment: Rock reports	Possible evidence	<ul style="list-style-type: none"> Can name some types of rock and give physical features of each. Can explain how a fossil is formed. Can explain that soils are made from rocks and also contain living/dead matter.
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Plants

NC Programme of Study		Knowledge (Components)	Skills (Composites)		
<ul style="list-style-type: none"> identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal 		<ul style="list-style-type: none"> Describe the functions of roots, stem, trunk, leaves and flowers. Know the requirements for survival and growth of plants (air, nutrients, light, space to grow). Understand the different requirements for survival of small common garden plants vs. trees (leaf size, growth rate, stem thickness – support/water transportation), room to grow). Understand transpiration as the movement of water through the plant from the roots. Know the life cycle of a flowering plant (germination, growing and flowering, pollination, fertilisation and seed formation, seed dispersal). Know that petals are used to attract pollinators. Know different methods of seed dispersal (water, gravity, wind, animal, ballistic). Know that plants obtain their nutrition through the process of photosynthesis. 	Planting seeds – what do they need to grow well? Celery or white flower with food colouring to investigate water transportation Looking at and investigating different flowers Common Misconceptions Some children may think that: <ul style="list-style-type: none"> - Plants eat food - Food comes from the soil via the roots - Flowers are merely decorative rather than a vital part of the life cycle in reproduction - Plants only need sunlight to keep them warm - Roots suck in water which is then suck up the stem 		
Review	Key Vocabulary	Big Questions		Resources	Experiences
Y2 Plants	structure (flowering plants, roots, stem/trunk, leaves, flowers) function (nutrition, support, reproduction) requirements for life and growth (air, light, water, nutrients from soil, room to grow), fertiliser, life cycle (pollination, seed formation, seed dispersal), photosynthesis, pollen, insect/wind pollination, seed dispersal (wind, animal, water)	What happens to plants when they are put in darkness/cold/deprived of air? What would happen to a plant if you removed the roots? Do all plants have the same lifespan? Why do some plants only live for one year?		Celery Flowers Food colouring A scientist just like me: Dr Kelsey Biologist (Evolutionary Biologist)	Investigation: water transportation dye experiment Observing real plants

Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
	Observe and describe how seeds and bulbs grow into mature plants.	<ul style="list-style-type: none"> Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers Know that petals are used to attract pollinators. 	What is the life cycle of a plant? <ul style="list-style-type: none"> Draw a flower in your books. Can you label each part? 	Picture prompts and labelling and elimination exercise	To Write a few sentences to explain what each part of the plant does and why it is important.
	Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	<ul style="list-style-type: none"> Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant Understand the different requirements for survival of small common garden plants vs. trees (leaf size, growth rate, stem thickness – support/water transportation), room to grow). 	What happens to plants when they are put in darkness/cold/deprived of air? <ul style="list-style-type: none"> Split page in half - on one side label it 'healthy' and the other 'unhealthy.' Draw or stick in 2 plants that represent good and bad growth. Write explanation underneath using to explain what that plant had/didn't have/had too much of. 	Sentence starters Bullet pointing for SEND Language bank	Explain why room is important for plant growth – how will it affect growth? How will leaf size, stem thickness affect growth?
	Investigate the way in which water is transported within plants	<ul style="list-style-type: none"> Understand transpiration as the movement of water through the plant from the roots. 	What would happen to a plant if you removed the roots? INVESTIGATION: <ul style="list-style-type: none"> Celery and flower practical experiment with food dye. Write up of prediction, materials and method. Results next lesson after reviewing. 	Showing photos of each stage before writing up. Watching video of experiment to recap before writing. Sentence starters: Firstly, secondly, then, after that, finally etc.	Write explanation on what would happen to a plant if you removed the roots?

Small Steps

		<p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>	<ul style="list-style-type: none"> • Know the life cycle of a flowering plant (germination, growing and flowering, pollination, fertilisation and seed formation, seed dispersal). • Know different methods of seed dispersal (water, gravity, wind, animal, ballistic). 	<p>Do all plants have the same lifespan?</p> <ul style="list-style-type: none"> • Timeline of life cycle of plants 	<p>Acting out seed dispersal in small groups</p> <p>Picture prompts in different order</p>	<p>Write paragraph under each stage of seed dispersal.</p>
	<p>Formative Assessment</p>	<p>TAPS Assessment: Measuring plants TAPS Assessment: Function of a stem</p>	<p>Possible evidence</p>	<ul style="list-style-type: none"> • Can explain the function of the parts of a flowering plant. • Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal and germination. • Can give different methods of pollination and seed dispersal, including examples. 		



NC Programme of Study		Knowledge (Components)	Skills (Composites)		
<ul style="list-style-type: none"> Compare how things move on different surfaces. Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other depending on which poles are facing. 		<ul style="list-style-type: none"> Know that forces are pushes or pulls. Know that some forces require contact between two surfaces but magnetic forces can act at a distance. Know that friction is a force that slows down objects. Know that a magnet has two poles which repel and attract and have different strengths. Know some materials which will be attracted to a magnet. 	Compare how toy cars move on different surfaces (WS3) Sort magnetic and non-magnetic materials – scrapyards challenge Explore how magnets attract or repel each other (WS5) Testing the strength of different magnets (WS6)		
			Common Misconceptions		
			Some children may think that: <ul style="list-style-type: none"> The bigger the magnet the stronger it is All metals are magnetic 		
Review	Key Vocabulary	Big Questions		Resources	Experiences
Y2 Materials – link to Forces and magnets	force, magnetic force, magnetic, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, push, pull, twist, contact, non-contact, open, surface, attract, repel, magnetic poles, north pole, south pole, metal, iron, steel	What can magnets do? How does a compass work? Can magnets work in water? How is friction important? What forces are there acting on the Earth? When would it be useful for there to be less friction? How do the poles of a magnet work? What type of surface would be good to slide across and why?		Magnets Material box A scientist just like me: Danial Azahan (Mechanical Engineer) Notable scientist: Michael Faraday	Cheltenham Science Festival

Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
	<ul style="list-style-type: none"> Know the properties of wood, plastic, metal, fabric, cardboard, paper, sponge, glass, brick, stone and rubber. 	<ul style="list-style-type: none"> Compare how things move on different surfaces. 	What is a force? INVESTIGATION: What is a force? Pushes and Pulls Toy cars and variety of surfaces – identify how the car moves on different surfaces when pushed/pulled.	Videos Hands on investigation Class discussion 1:1 adult support Working in small groups	Explain using key words how and why the toy car moves on different surfaces Think of a new investigation on how we can test moving things on different surfaces – predict the outcome.
	<ul style="list-style-type: none"> Know the uses of wood, plastic, metal, fabric, cardboard, paper, sponge, glass, brick, stone and rubber Know which materials can be stretched, twisted, bent or squashed. 	<ul style="list-style-type: none"> Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials Describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other depending on which poles are facing. 	How do the poles of a magnet work? INVESTIGATION: What is a magnet? Testing with 2 magnets + and +, + and -, - and -. Test magnets and materials provided to see which are magnetic. List results in a table.	Videos Box of rocks Adult scaffolding	Discuss and explain to your partner why the same poles repel.
	<ul style="list-style-type: none"> Understand how the following properties link to the range of materials taught in Y2: opaque/translucent/transparent, waterproof/absorbent. 	<ul style="list-style-type: none"> Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. 	What can magnets do? INVESTIGATION: Recap: what are magnets? Look at different types of magnets Testing magnet strength using paper clips Identify which magnets are the strongest.	Videos – BBC bitesize Recap on what are magnets Hands on investigation.	Fact or fiction magnets quiz.

Formative Assessment	TAPS Assessment: Shoe grip TAPS Assessment: Magnet test	Possible evidence	<ul style="list-style-type: none"> Give examples of forces in everyday life. Give examples of objects moving differently on different surfaces. Name a range of types of magnets and show how poles attract and repel. Draw diagrams using arrows to show the attraction and repulsion between the poles of magnets.
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SCIENCE CURRICULUM

YEAR 5/6

CYCLE B



Earth and Space	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> Describe the movement of the Earth, and other planets, relative to the Sun in the solar system Describe the movement of the Moon relative to the Earth Describe the Sun, Earth and Moon as approximately spherical bodies Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 		<ul style="list-style-type: none"> Know how the Earth and planets move relative to the Sun in our solar system (geocentric/heliocentric) Know the movement of the Moon relative to the Earth. Know the names of the 8 planets in our solar system and their order in distance from the Sun. Know that day and night is due to the rotation of the Earth. Know that different places on the Earth experience day and night at different times. Know that the Earth, Sun and Moon are approximately spherical bodies 	<ul style="list-style-type: none"> Oreos Phases of the moon diary (WS2) Make a model solar system (WS4) Create rockets (WS2) 		
				Common Misconceptions		
				Some children may think that: <ul style="list-style-type: none"> The Earth is flat The Sun is a planet The Sun rotates around the Earth The Sun moves across the sky during the day The Sun rises in the morning and sets in the evening The Moon appears only at night Night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	Seasonal changes Y1 / Rocks Y3 – link to Earth and space	Earth, planets, Sun, solar system, Moon, celestial body, sphere/spherical, rotate/rotation, spin, night and day, star, planets, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, dwarf planet, orbit, revolve, geocentric model, heliocentric model, shadow clocks, sundials, astronomical clocks	How have our ideas about the solar system changed over time? How does a sundial work? When we see the sun and moon in the sky, why does the moon seem bigger? Does the moon have days and nights? How do astronomers know what the stars are made of? Why do we have time zones? How does the movement of the Earth change the positions of shadows?		Torches Globe A scientist just like me: Helen Mason (Solar Scientist) Notable scientist: Albert Einstein	Planetarium K'Nex


Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Seasonal changes – rotation of the earth around the sun	<ul style="list-style-type: none"> Know how the Earth and planets move relative to the Sun in our solar system (geocentric/heliocentric) Know that the Earth, Sun and Moon are approximately spherical bodies 	<p>EARTH, SUN AND MOON. WHAT IS MOVING?</p> Create a model solar system and annotate it with the relevant information	Mixed ability groups	Mixed ability groups
		Temperature changes in different parts of the world (Equator/poles)	<ul style="list-style-type: none"> Know the movement of the Moon relative to the Earth. 	<p>WHY DOES THE MOON ALWAYS LOOK DIFFERENT?</p> Create a diagram of the phases of the moon and annotate it with the relevant information Oreos to show phases	Word bank and diagrams for reference	Explanation of how the reflection of the sun's light on the moon creates the phases
		Biomes	<ul style="list-style-type: none"> Know the names of the 8 planets in our solar system and their order in distance from the Sun. 	<p>WHAT'S BETWEEN THE PLANETS?</p> Create a mnemonic to remember the planets and their order Create a solar system model to hang up in the classroom (Wow Day!)	Mixed ability groups	Planets hung in order from the sun Mnemonic with detail to aid memory
		Climate	<ul style="list-style-type: none"> Know that day and night is due to the rotation of the Earth. Know that different places on the Earth experience day and night at different times. 	<p>DOES THE MOON HAVE DAY AND NIGHT?</p> Torch investigation using the globe and write up in their books. Accurate vocabulary to be used.	Word bank. Sentence starters	Explain in further detail the differences in length of day and night/shadows relative to position of the sun.

Formative Assessment	TAPS Assessment: Craters	Possible evidence	<ul style="list-style-type: none"> Can show, using diagrams, the movement of the Earth and Moon. Can explain the movement of the Earth and Moon. Can show using diagrams the rotation of the Earth and how this causes day and night. Can explain what causes day and night.
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Properties and Changes of Materials	NC Programme of Study		Knowledge (Components)	Skills (Composites)		
	<ul style="list-style-type: none"> Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction that act between moving surfaces. Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. 		<ul style="list-style-type: none"> Know that unsupported objects fall towards the Earth because of the forces of gravity acting between the Earth and the object. Know how air resistance, water resistance and friction act on an object in motion. Know that friction can be used to affect the rate of travel of an object (e.g., car brake pads). Know that levers, pulleys and gears allow a smaller force to have a greater effect. 	<ul style="list-style-type: none"> Friction on different surfaces – cars down a ramp (WS6) Gravity and air resistance – dropping paper/feathers (WS3) Life cycle of butterfly (WS4) 		
				Common Misconceptions		
				Some children may think that <ul style="list-style-type: none"> The heavier the object the faster it falls, because it has more gravity acting on it. Forces always act in pairs which are equal and opposite Smooth surfaces have no friction Objects always travel better on smooth surfaces A moving object has a force which is pushing it forwards and it stops when the pushing force wears out A non-moving object has no forces acting on it Heavy objects sink and light objects float 		
	Review	Key Vocabulary	Big Questions		Resources	Experiences
	Materials – Rocks Y3	fall, gravity, force, Earth, air resistance, water resistance, friction, moving surfaces, mechanisms, levers, pulleys, gears, magnetic force, magnet, attract	How do submarines sink if they are full of air? Can we demonstrate the effect of gravity acting on an unsupported object? How do things move? When is it beneficial to have high or low friction, air resistance?		Paper, paperclips, feathers, newton meters, friction boards, friction blocks, cars A scientist just like me: Rafsan Chowdhury (Mechanical Engineer)	Bloodhound car investigation

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Know and group different types of rocks based on their appearance and simple physical properties (igneous, sedimentary, metamorphic).	Know that unsupported objects fall towards the Earth because of the forces of gravity acting between the Earth and the object.	WHAT WOULD HAPPEN IF EARTH LOST IT'S GRAVITY FOR A DAY? Investigation: Drop different items and time how long they take to fall	Children work in pairs with additional support where needed	What happens if paper is flat? What happens if paper is scrunched up? Why does this happen?
		Know how fossils are formed (things that have lived are trapped in rock).	Know how air resistance acts upon an object in motion.	IF BIRDS CAN FLY, WHY CAN'T HUMANS? Parachute investigation using different materials, different size canopies <i>(Additional lesson to follow up – explore misconceptions – deepen learning – look at dummy data and evaluate)</i>	Pair children according to abilities. Complete experiment with probing questions provided by class teacher.	Detailed explanation of why each parachute was slower/faster falling using appropriate vocabulary
		Know that soil is made from rock and organic matter.	Know how water resistance acts upon an object in motion	IF GRAVITY PULLS THINGS DOWN, WHY DOES THE BUBBLES IN MY LEMONADE GO UP? Investigate different objects moving through water Design a streamlined water vessel	Mixed ability groups. Create design labelled using a word bank to support.	Explain the effect of streamlining and where it is important in the real world
		Know the different types of soil (clay, peat, chalk, loam, silt, sand)	Know that friction can be used to affect the rate of travel of an object (e.g., car brake pads).	DO ALL THINGS TRAVEL IN THE SAME WAY? Use friction boards and toy cars to test speed Use newton metres and friction bricks to test force needed to move the block	Put children in mixed ability groups. Create a write up based on what they have learnt using a word bank to support.	Create a write up based on what they have learnt using a broader range of accurate vocabulary.

		Understand what happens to soil over time (additions, losses, translocations, transformations)	Know that levers, pulleys and gears allow a smaller force to have a greater effect.	HOW DO HUMANS BUILD BIG PROJECTS? Identify pulleys, levers and gears in common objects Create a flip book to explain each mechanism with labelled diagrams	Picture sorting to identify pulleys, levers or gears	Design a machine that uses pulleys, levers or gears
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	Formative Assessment	TAPS Assessment: Spinners TAPS Assessment: Marble Run	Possible evidence	<ul style="list-style-type: none"> • Can demonstrate the effect of gravity acting on an unsupported object. • Can give examples of friction, water resistance and air resistance. • Can give examples of when it is beneficial to have high or low friction, water resistance or air resistance. • Can demonstrate how pulleys, levers and gears work.
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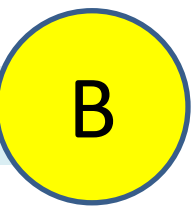
Living things and their habitats	NC Programme of Study		Knowledge (Components)	Skills (Composites)	
	<ul style="list-style-type: none"> Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. 		<ul style="list-style-type: none"> Know birth, growth, reproduction and death represent the stages of the life cycles of all animals. Know the similarities and differences between the life cycles of a mammals, amphibian, insect and bird. Know the difference between sexual and asexual reproduction. Know different ways that plants can be pollinated (insect or wind). Know how new plants can grow other than from seeds (cuttings, grafts, runners e.g. strawberries). 	New plant investigation – Cuttings, grafts, runners (WS2).	
				Common Misconceptions	
			Some children may think that: <ul style="list-style-type: none"> All plants start out as seeds All plants have flowers Plants that grow from bulbs do not have seeds Only birds lay eggs 		
Review	Key Vocabulary	Big Questions		Resources	Experiences
Sound Y4	plants, animals, reproduction, plants (sexual/asexual), animals (sexual), life cycles (mammal, amphibian, insect, bird), rainforest, oceans, desert, prehistoric, germination, pollination, stamen, stigma, sperm, fertilises, egg, live young, metamorphosis, plantlets, runners, bulbs, cuttings	What are the differences between the life cycle of an insect and a mammal? How many litters can a female mouse have in a year? Is there a relationship between a mammal's size and its gestation period?		Plants to take cuttings/grafts Plan runners – blackberry/strawberry/ivy Notable scientist: Alexander Fleming	

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Know that sounds can be high or low (pitch), loud or quiet (loudness) and how this relates to vibrations.	Know birth, growth, reproduction and death represent the stages of the life cycles of all animals.	WHAT CHANGES DO MAMMALS GO THROUGH AS THEY DEVELOP? Draw and label diagram to show a life cycle (frog or butterfly)	Diagrams and information boxes to support wording/ordering	Explain lifecycles of other animals.
		Know that the volume of sound changes over distance and gets fainter as the distance from the sound's source increases.	Know the similarities and differences between the life cycles of a mammals, amphibian, insect and bird.	HOW ARE HUMANS DIFFERENT TO OTHER MAMMALS? Identify the differences/similarities between the different groups	Pictures of different animals and their young	Write explanation/summary of the life cycle of each group of animals
		EXPLORIFY: Have you ever heard your neighbours in the next house or flat?	Know different ways that plants can be pollinated (insect or wind)	HOW DO PLANTS GROW? Use scientific vocabulary to complete sentences.	Key vocabulary word bank. Diagrams and modelling.	Write explanations for different pollination processes, using scientific vocabulary.
		Know some materials that will absorb sound and understand why sound cannot travel through a vacuum.	Know the difference between sexual and asexual reproduction	WHY ARE BEES SO IMPORTANT TO OUR ECOSYSTEM? https://www.bbc.co.uk/bitesize/guides/zykp34j/revision/2	Word banks and diagrams – use of whiteboards to scribe answers.	Write definitions and draw links to individual plants/insects that fit the description.
		EXPLORIFY: Sounds like science!	Know how new plants can grow other than from seeds (cuttings, grafts, runners e.g. strawberries).	WILL A PLANT GROW ON THE MOON? INVESTIGATION: grow plants from grafts, runners or cuttings	Group children together in different abilities.	Group children together in different abilities, give full explanations with technical vocabulary.




Formative Assessment	TAPS Assessment: Life cycles research	Possible evidence	<ul style="list-style-type: none"> Can draw the life cycle of a range of animals identifying similarities and differences between the life cycles. Can explain the difference between sexual and asexual reproduction and gives examples of how plants reproduce in both ways.
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CALTON PRIMARY SCHOOL – ANIMALS (incl. HUMANS) – YEAR 5/6



Animals (incl. Humans)	NC Programme of Study		Knowledge (Components)	Skills (Composites)	
	<ul style="list-style-type: none"> Describe the changes as humans develop to old age. 		<ul style="list-style-type: none"> Know the stages of foetal development in humans. Know the main changes that happen during puberty, including the difference between boys and girls. Know the main changes that happen during old age (physical and mental changes to the body). 	Common Misconceptions	
				Children may think that: <ul style="list-style-type: none"> A baby grows in a mother's tummy A baby is 'made' 	
	Review	Key Vocabulary	Big Questions	Resources	Experiences
Plants (Year 3)	Fertilisation, prenatal, gestation, reproduce, asexual reproduction, sexual reproduction, life cycle, adolescence, puberty, menstruation, adulthood, baby, child, toddler, teenager, adult, gestation, growth, foetus, embryo, womb, elderly, development, puberty	Why do people get grey/white hair as they get older? Can you explain the changes that take place in boys and girls during puberty?	A scientist just like me: Dr Aarti Sehdev (Neurobiologist)	Midwife to visit and talk. Possibly listen to baby heartbeat of pregnant member of staff	



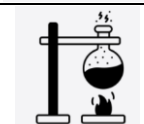
Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		Functions of living parts of flowering plants (root, stem, trunk, leaf, flower).	Know the stages of foetal development in humans	HOW DO WE KNOW WE ARE AGING? To learn and accurately recall (and order) the stages of foetal development in humans	Pictures to support identification and ordering.	When do the organs develop?
		Plant life cycle (germination, growing and flowering, pollination, fertilisation, seed formation, seed dispersal).	Know the main changes that happen during puberty, including the difference between boys and girls.	INVESTIGATION: PSHE lesson – Changing Me unit	Mixed ability groups.	
		Seed dispersal methods (water, gravity, wind, water, ballistic)	Know the main changes that happen during old age (physical and mental changes to the body).	WHAT CHANGES OCCUR IN OUR LIFE CYCLE? Explain the mental and physical changes that happen after the age of 60	Word bank. Sentence starters.	What is the impact of the mental and physical changes on quality of life?

Formative Assessment	TAPS Assessment: Growth survey	Possible evidence	<ul style="list-style-type: none"> Can explain the changes that takes place in boys and girls during puberty. Can explain how a baby changes physically as it grows, and also what it is able to do.
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Properties and Changes of Materials	NC Programme of Study		Knowledge (Components)	Skills (Composites)	
	<ul style="list-style-type: none"> compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. 		<ul style="list-style-type: none"> Understand how the following properties link materials: hardness, solubility, transparency, conductivity (electrical & thermal), response to magnets. Know which materials are conductors and insulators. Know that some materials will dissolve in liquid to form a solution (salt/sugar). Know how to recover a substance from a solution. Know how to separate mixture by using knowledge of solids, liquids and gases (filtering, sieving, evaporating). Know which materials to use for a particular purpose (see Y1/2). Know that changes of state are sometimes reversible (dissolving/mixing). Know that some changes result in the formation of new materials and are not usually reversible (burning, acid-base reactions). 	<ul style="list-style-type: none"> Reversible and irreversible changes Mixing solution/evaporation to separate (WS1) <ul style="list-style-type: none"> Volcanoes – bicarb/acid (WS5) 	
	Review	Key Vocabulary	Big Questions	Resources	Experiences
States of Matter Y4 Electricity Y4	solid, liquid, gas, air, oxygen, powder, grain/granular/crystals, ice/water/steam, water vapour, heated/heating, cooled/cooling, temperature, degrees Celsius, melt, freeze, solidify, melting point, molten, boil, change of state, soluble/insoluble, transparency, conductive, magnets, dissolve, solution, separate, filtering/sieving, evaporating, reversible changes, non-reversible, evaporation, irreversible, insulation, thermal/electrical, insulator/conductor, burning, chemical, opaque/transparent, rusting, residue, condensing	<p>What are materials made from and why?</p> <p>What are micro plastics and why are they harming the planet?</p> <p>What is a non-reversible change?</p> <p>Which materials would be the most effective for making a warm jacket?</p> <p>Which materials would be the best for making blackout curtains?</p>	<p>Range of materials: bubble wrap, tin foil, paper towel, fabric.</p> <p>Notable scientist: Stephanie Kwolek (invented Kevlar)</p>	Grouping materials – outdoor exploration (Robinswood Hill/Forest area)	

Small Steps	Week	Review	Knowledge/Skills	Task/Assessment	Scaffolding	Challenge
		States of matter: Properties and behaviours of solids, liquids and gases.	Understand how the following properties link materials: hardness, solubility, transparency, conductivity (electrical & thermal), response to magnets.	WHAT ARE THE PROPERTIES OF A SOLID? Sorting activity/explanation	Fewer cards in the sorting activity for SEN children. Support from class teacher.	Children to provide explanations for their sorting choices. Justification to be written in their books.
		States of matter: How materials change state in response to heating and cooling.	Know which materials are conductors and insulators.	WHY ARE INSULATORS AS IMPORTANT AS CONDUCTORS? Experiment with a range of materials to see which could keep an ice cube (or something similar) cold	Pair children according to abilities. Complete experiment with probing questions provided by class teacher.	Use analysis of experiment and predictions for insulators to design a lunch box. Annotate using scientific vocabulary.
		States of matter: The water cycle	Know that some materials will dissolve in liquid to form a solution (salt/sugar).	WHAT ARE THE PROPERTIES OF A LIQUID? Experiment with a range of different materials to test if they dissolve when mixed with water. Create a write up to outline their learning.	Put children in mixed ability groups. Create a write up based on what they have learnt using a word bank to support.	Create a write up based on what they have learnt using a broader range of accurate vocabulary.
		EXPLORIFY: Delicious drinks (Odd one out)	Know how to recover a substance from a solution.	CAN THE PROPERTIES OF A MATERIAL CHANGES? Participate in an evaporation investigation	Simplified list of steps.	Create list of steps. Make predictions of other substances and how they would be recovered.
		Electricity: range of appliances in the home	Know how to separate mixture by using knowledge of solids, liquids and gases (filtering, sieving, evaporating).	WHERE DOES A PUDDLE GROW? Filtering/Sieving/evaporating	Focus on one process with full description and explanation	Write an explanation of each process.

	Electricity: components used to make a simple circuit (cell, battery, wire, lamp, buzzer, switch)	Know which materials to use for a particular purpose (see Y1/2).	CAN MATERIALS BE USED FOR DIFFERENT THINGS? Sorting and discussion-based activity	Word banks, mixed ability grouping. Questioning.	Use of accurate vocabulary. Sorting activity annotated accurately.
	Electricity: Circuit diagrams (complete/incomplete)	Know that changes of state are sometimes reversible (dissolving/mixing).	WHERE DO ES SUGAR GO WHEN IT IS DISSOLVED IN WATER? Melting chocolate experiment	Adult support when using heat sources.	Able to articulate accurately what they learned during the experiment.
	EXPLORIFY: Take your turn (Odd one out)	Know that some changes result in the formation of new materials and are not usually reversible (burning, acid-base reactions).	CAN COFFEE BE CHANGES BACK INTO WATER? Volcanoes activity – bicarb/vinegar	Mixed ability groups to provide SEN/LA children with further support.	Able to articulate accurately what they learned during the experiment.

Formative Assessment	TAPS Assessment: Dissolving TAPS Assessment: Nappy absorbency TAPS Assessment: Insulation layers		Possible evidence	<ul style="list-style-type: none"> • Can use understanding of properties to explain everyday uses of materials, for example, how bricks, wood, glass and metals are used in buildings. • Can explain what dissolving means, giving examples. • Can name equipment used for filtering and sieving. • Can use knowledge of liquids, gases and solids to suggest how materials can be recovered from solutions or mixtures by evaporation, filtering or sieving. • Can describe some simple reversible and non-reversible changes to materials, giving examples.
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CALTON PRIMARY SCHOOL - SMSC

SPIRITUAL, SOCIAL, MORAL, CULTURAL DEVELOPMENT

SPIRITUAL DEVELOPMENT (SP)

Our science curriculum contributes to the **Spiritual** development of pupils by:

- Offering opportunities to experience the awe and wonder of scientific development and achievement
- Encouraging pupils to develop a fascination with the world around them
- Inspiring pupils to ask and answer questions about scientific phenomena
- Emphasising the importance of reflection when evaluating or drawing conclusions through scientific enquiry

SMSC statements:

- Ability to be reflective about their own beliefs (religious or otherwise) and perspective on life
- Knowledge of, and respect for, different people's faiths, feelings and values
- Sense of enjoyment and fascination in learning about themselves, others and the world around them
- Use of imagination and creativity in their learning
- Willingness to reflect on their experiences

MORAL DEVELOPMENT (MD)

Our science curriculum contributes to the **Moral** development of pupils by:

- Raising ethical issues relating to science, such as sustainability of materials, environmental impact and sustainability.

SMSC statements:

- Ability to recognise the difference between right and wrong and to readily apply this understanding in their own lives, and to recognise legal boundaries and, in doing so, respect the civil and criminal law of England
- Understanding of the consequences of their behaviour and actions
- Interest in investigating and offering reasoned views about moral and ethical issues and ability to understand and appreciate the viewpoints of others on these issues

SOCIAL DEVELOPMENT (SD)

Our science curriculum contributes to the **Social** development of pupils by:

- Giving them opportunities to collaborate with a group towards a shared outcome.
- Enabling them to make decisions as a group, discuss observations and outcomes during scientific enquiry and deal with conflict when it arises, treating each other with respect.
- Encouraging children to consider the safety of themselves and others.

SMSC statements:

- Use of a range of social skills in different contexts, for example, working and socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds
- Willingness to participate in a variety of communities and social settings, including by volunteering, cooperating well with others and being able to resolve conflicts effectively
- Acceptance of and engagement with the fundamental British values of democracy, the rule of law, individual liberty and mutual respect and tolerance of those with different faiths and beliefs. They will develop and demonstrate skills and attitudes that will allow them to participate fully in and contribute positively to life in modern Britain

CULTURAL DEVELOPMENT (CD)

Our science curriculum contributes to the **Cultural** development of pupils by:

- Asking them to consider cultural influences on people in STEM careers including under-represented groups.
- Showing children that the global science community is extremely diverse using examples of real people working in STEM industries from a range of cultural backgrounds taking into account gender, ethnicity, disability, age.

SMSC statements:

- Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others
- Understanding and appreciation of the range of different cultures in the school and further afield as an essential element of their preparation for life in modern Britain
- Ability to recognise, and value, the things we share in common across cultural, religious, ethnic and socio-economic communities
- Knowledge of Britain's democratic parliamentary system and its central role in shaping our history and values, and in continuing to develop Britain
- Willingness to participate in and respond positively to artistic, musical, sporting and cultural opportunities
- Interest in exploring, improving understanding of and showing respect for different faiths and cultural diversity and the extent to which they understand, accept, respect and celebrate diversity. This is shown by their respect and attitudes towards different religious, ethnic and socio-economic groups in the local, national and global communities



CALTON PRIMARY SCHOOL – SMSC & SCHOOL VALUES (STARS)

SPIRITUAL, SOCIAL, MORAL, CULTURAL DEVELOPMENT

SKILLS TOGETHERNESS ASPIRATION RESILIENCE SUCCESS		YEAR 1/2									
		CYCLE A					CYCLE B				
		Everyday Materials	Seasonal Changes	Animals incl. Humans	Plants	Living Things	Everyday Materials	Seasonal Changes	Animals incl. Humans	Plants	Living Things
SPIRITUAL	Ability to be reflective about their own beliefs (religious or otherwise) and perspective on life TOGETHERNESS				✓					✓	
	Knowledge of, and respect for, different people's faiths, feelings and values TOGETHERNESS			✓							
	Sense of enjoyment and fascination in learning about themselves, others and the world around them ASPIRATION / SUCCESS		✓		✓		✓		✓		
	Use of imagination and creativity in their learning SKILLS / ASPIRATION	✓				✓					
	Willingness to reflect on their experiences TOGETHERNESS			✓				✓			
MORAL	Ability to recognise the difference between right and wrong and to readily apply this understanding in their own lives, and to recognise legal boundaries					✓				✓	
	Understanding of the consequences of their behaviour and actions TOGETHERNESS / RESILIENCE										
	Interest in investigating and offering reasoned views about moral and ethical issues and ability to understand and appreciate the viewpoints of others on these issues TOGETHERNESS			✓		✓			✓	✓	
SOCIAL	Use of a range of social skills in different contexts, for example, working and socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds TOGETHERNESS			✓				✓			
	Willingness to participate in a variety of communities and social settings, including by volunteering, cooperating well with others and being able to resolve conflicts effectively TOGETHERNESS					✓				✓	
	Acceptance of and engagement with the fundamental British values of democracy, the rule of law, individual liberty and mutual respect and tolerance of those with different faiths and beliefs. ASPIRATION / SUCCESS			✓					✓		
CULTURAL	Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others SKILLS / TOGETHERNESS										
	Understanding and appreciation of the range of different cultures in the school and further afield as an essential element of their preparation for life in modern Britain ASPIRATION / SUCCESS			✓				✓			
	Ability to recognise, and value, the things we share in common across cultural, religious, ethnic and socio-economic communities TOGETHERNESS										
	Knowledge of Britain's democratic parliamentary system and its central role in shaping our history and values, and in continuing to develop Britain SUCCESS										
	Willingness to participate in and respond positively to artistic, musical, sporting and cultural opportunities TOGETHERNESS / SUCCESS	✓					✓				
	Interest in exploring, improving understanding of and showing respect for different faiths and cultural diversity and the extent to which they understand, accept, respect and celebrate diversity. TOGETHERNESS			✓					✓		



CALTON PRIMARY SCHOOL – SMSC & SCHOOL VALUES (STARS)

SPIRITUAL, SOCIAL, MORAL, CULTURAL DEVELOPMENT

SKILLS TOGETHERNESS ASPIRATION RESILIENCE SUCCESS		YEAR 5/6									
		CYCLE A					CYCLE B				
		Animals including Humans	Light	Electricity	Evolution and Inheritance	Living Things	Earth and Space	Forces	Living Things	Animals including Humans	Properties of Materials
SPIRITUAL	Ability to be reflective about their own beliefs (religious or otherwise) and perspective on life TOGETHERNESS				✓						
	Knowledge of, and respect for, different people's faiths, feelings and values TOGETHERNESS				✓						
	Sense of enjoyment and fascination in learning about themselves, others and the world around them ASPIRATION / SUCCESS										
	Use of imagination and creativity in their learning SKILLS / ASPIRATION						✓				
	Willingness to reflect on their experiences TOGETHERNESS	✓							✓	✓	
MORAL	Ability to recognise the difference between right and wrong and to readily apply this understanding in their own lives, and to recognise legal boundaries				✓				✓		
	Understanding of the consequences of their behaviour and actions TOGETHERNESS / RESILIENCE				✓				✓		
	Interest in investigating and offering reasoned views about moral and ethical issues and ability to understand and appreciate the viewpoints of others on these issues TOGETHERNESS				✓				✓		
SOCIAL	Use of a range of social skills in different contexts, for example, working and socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds TOGETHERNESS										
	Willingness to participate in a variety of communities and social settings, including by volunteering, cooperating well with others and being able to resolve conflicts effectively TOGETHERNESS				✓		✓				
	Acceptance of and engagement with the fundamental British values of democracy, the rule of law, individual liberty and mutual respect and tolerance of those with different faiths and beliefs. ASPIRATION / SUCCESS										
CULTURAL	Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others SKILLS / TOGETHERNESS				✓				✓		
	Understanding and appreciation of the range of different cultures in the school and further afield as an essential element of their preparation for life in modern Britain ASPIRATION / SUCCESS				✓				✓		
	Ability to recognise, and value, the things we share in common across cultural, religious, ethnic and socio-economic communities TOGETHERNESS						✓		✓		
	Knowledge of Britain's democratic parliamentary system and its central role in shaping our history and values, and in continuing to develop Britain SUCCESS										
	Willingness to participate in and respond positively to artistic, musical, sporting and cultural opportunities TOGETHERNESS / SUCCESS										
	Interest in exploring, improving understanding of and showing respect for different faiths and cultural diversity and the extent to which they understand, accept, respect and celebrate diversity. TOGETHERNESS				✓				✓		