



Our core subjects of maths and literacy are woven throughout the foundation subjects. We also have some **golden threads** which flow through our curriculum content, these threads are: **environmental consciousness**, **international mindedness**, **innovation & enterprise**. These threads are **highlighted** in the breadth of study.

Year 4					
Electricity	States of Matter	Animals inc. Humans	Sound	Living Things and Habitats	Working Scientifically (beyond Science units)
What do we already know?					
Knowledge Retrieval:					
Initially taught in Y4 – simple circuits. (Knowledge built upon in Y6 - complex circuit understanding).	Year 1 – everyday materials. Y2 – uses of everyday materials. Y3 – rocks, soils and fossils. (Knowledge built upon in Year 5 – properties/changes of materials).	Year 1 – naming animals and body parts. Year 2 – health and growth. Year 3 – skeletons and healthy eating. Year 4 – teeth, eating and digestion. (Knowledge built upon in Y5 – changes in humans and Y6 – health and circulations).	No prior or repeated topic work.	Year 2 – suitable habitats and simple food chains. (Knowledge built upon in Year 5 – life cycles and Y6 - classifying including micro-organisms).	
The Big Picturhains (Substantive Knowledge)					
This unit is the first introduction to studying 'Electricity' in Key Stage	This 'States of Matter' unit will teach the children about the differences between	This unit focuses on the 'digestive system' in humans and animals and	This 'Sound' unit focuses on how vibrations cause sounds and how sounds	In this unit, children explore a variety of ways to	Pattern Seeking which properties must a material



Science Breadth of Study



<p>2 (Y6 continued). Children will learn about what electricity is and how it was discovered (Benjamin Franklin 1700).</p> <p>They will identify which appliances use electricity in their homes and how to keep themselves safe. Children will produce a safety poster after learning about electricity dangers.</p> <p>Children will construct basic circuits and investigate how different types of circuits will break or reconnect.</p> <p>Children will be able to recognise with reasoning why a circuit is complete or incomplete.</p> <p>Children will conduct an experiment to determine which materials are</p>	<p>solids, liquids and gases, classifying objects and identifying their properties.</p> <p>The children will work scientifically and collaboratively to investigate if a gas is present.</p> <p>They will explore in-depth how water changes state, exploring melting, freezing, boiling, condensing as well as a focus on evaporation. The children will understand that materials change state when heated or cooled.</p> <p>They will learn how temperature changes and creates the water cycle.</p> <p>Why must we be conscious about saving water?</p>	<p>the functions of teeth. Children will learn more about herbivores, carnivores and omnivores in the context of teeth, digestion and the food chain.</p> <p>They be able to name the different types and know the function of teeth.</p> <p>Children will investigate whether fizzy drinks cause tooth decay via an enamel fair test (egg shells) to determine the effect that different drinks have on teeth.</p> <p>In addition, they will extend their understanding of food chains to more complex chains and food webs.</p> <p>Within this unit, the children recognise the simple functions of the</p>	<p>travel, as well as, how sounds can change pitch and volume.</p> <p>The children will learn about how sounds are made, carrying out demonstrations of vibrations, and completing a sound survey of their school.</p> <p>They will work in groups to create a model of the way particles pass sound vibrations. This will be via exploring how a tuning fork makes a vibration to create a sound. The children will then observe the tuning fork in a container of liquid to see the vibration waves move through.</p> <p>The children will work in a hands-on way to explore pitch and will use their understanding of how</p>	<p>identify, sort, group and classify living things.</p> <p>They learn how animals are split into 'vertebrates' and 'invertebrates' and begin to consider the differences between living things within these classifications.</p> <p>They use and create classification keys to group, identify and name living things from the local habitat and beyond.</p> <p>This unit also introduces children to the idea that environments are subject to man-made and natural changes, and that</p>	<p>have to conduct electricity?</p> <p>When is a circuit complete or incomplete? Which materials conduct electricity? What will happen if I increase the number of bulbs in a circuit? What are the dangers of domestic appliances?</p> <p>Observations Over Time will increasing the temperature effect the state of a solid? What part does evaporation and condensation play in the water cycle? Which materials are solid, liquid or gas? Identifying,</p>
--	--	---	--	--	---



Science Breadth of Study



<p>conductors of electricity and which are insulators.</p> <p>How is electricity generated and which is the most environmentally friendly way of generating energy?</p>		<p>basic parts of the digestive system in humans.</p> <p>To finish the unit, they recognise what is a food chain.</p>	<p>high and low sounds are made.</p> <p>They will have the opportunity to make a string telephone and will use this to investigate how sounds change over distance and through different materials.</p> <p>The children will work scientifically and collaboratively to investigate the best material for soundproofing, in the context of making a music studio quieter.</p> <p>Finally, they will demonstrate their learning from the whole unit by designing and creating their own sound proof head phones, choosing their own materials which absorb sounds and vibrations.</p>	<p>these changes have a significant impact on living things.</p> <p>They will learn how animals have adapted to survive in different environments.</p>	<p>Classifying and Grouping - Which materials are conductors or insulators?</p> <p>Can heating or cooling change a materials state? How can water change from a liquid into a solid or gas? At what temperature does water evaporate? What part does evaporation and condensation play in the water cycle?</p> <p>Is there a pattern Do sounds get fainter as the distance from the sound source increases?</p> <p>Is there a pattern between the</p>
---	--	---	--	--	--



Science Breadth of Study



					<p>volume of sound and strength of vibrations? How does the features of a material effect pitch?</p> <p>Which objects can be recycled? Comparative and Fair Testing.</p> <p>Research Using Secondary Sources - How does environment change pose dangers to living things?</p> <p>Working</p>
Sticky Knowledge (Substantive Knowledge)					
<p>When we refer to electricity, what we usually mean is electric current, which is the flow of electric charge. Over time, scientists have learnt how to generate an electric</p>	<p>Within this unit, the children discover whether increasing the temperature effects the state of a solid.</p> <p>They find out which materials are solid, liquid or gas.</p>	<p>There are different parts of the digestive system which our food passes through.</p> <p>Each part of the digestive system has a different function. Each part helps</p>	<p>Within this unit, the children look for patterns between the volume of sound and strength of vibrations.</p>	<p>Within this unit the children will have the opportunity to identify, classify and group living things.</p>	<p>oral and written explanations, conclusion, predictions, criteria, classify, changes, data, contrast, evidence,</p>



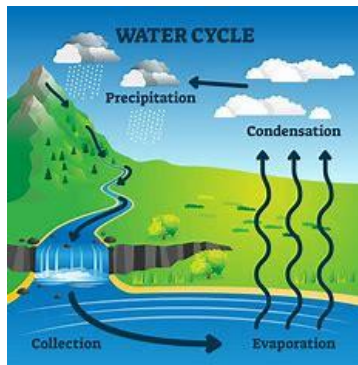
current which can be used safely. The two types we use are: Alternating current and direct current.

Every solid, liquid and gas are made up of atoms. Every atom contains a nucleus with protons and neutrons, as well as electrons which orbit the nucleus. If the electrons are free to move within a material, they create an electrical charge. Electrical appliances use different types of electricity. Electrical appliances can be dangerous. An electrical circuit can be complete or incomplete. In some materials, some of the electrons are free electrons and can move. If you create a circuit with these materials, the free electrons can be made to move in one

The children will take temperature readings of a solid changing to a liquid.

The children experiment to see if heating or cooling can change a materials state.

They find out how water changes from a liquid into a solid or gas and at what temperature water evaporates.

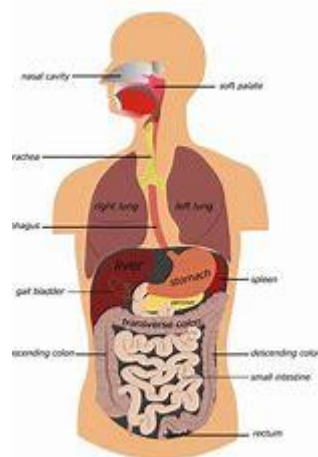


humans and animals digest food.

Teeth have different names and functions. Carnivores, Herbivores and Omnivores have teeth which are linked to their diet.

Teeth can decay.

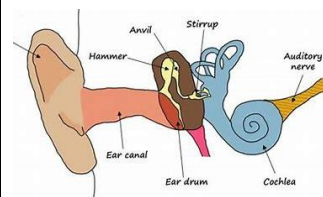
There are a variety of food chains containing producers, predators and prey.



They find how the feature of an object effecting pitch.

They will conduct an experiment to find out whether sounds get fainter as the distance from the sound source increases.

They research how sounds travel from a medium to an ear by researching sound-proofing materials.

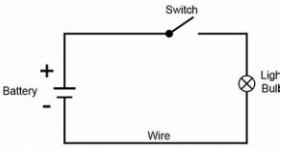


They find out which environments are best suited to groups of living things.

How does environment change poses dangers to living things?

improve, secondary sources, guides, keys, construct, interpret research – relevant question equipment – thermometer, data – gather, standard units, record, classify, present record – drawings, labelled diagrams, keys, bar charts, tables Skills



<p>direction, creating an electric current. These materials are called electrical conductors. When free electrons are unable to move the materials are called insulators. A switch can open and close a circuit.</p> 					
---	--	--	--	--	--

Key Vocabulary and understanding for concept connectors

<p>appliance, battery power, main power, circuit, series, cell, battery, wire, bulb, switch, break in circuit conductor, insulator</p>	<p>solid, liquid, gas, evaporation, condensation, precipitation, particle, temperature, freezing, heating</p>	<p>mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine, nutrients, absorb, canine, incisor, molar, producer, consumer, apex predator</p>	<p>Vibration, wave, volume, pitch, tone, insulation</p>	<p>vertebrates, invertebrates (+ 1 example of each), adaptation, environment, habitat, classification key</p>	<p>oral and written explanations, conclusion, predictions, criteria, classify, changes, data, contrast, evidence, improve, secondary sources, guides, keys, construct, interpret research – relevant</p>
--	---	--	---	---	--



					question equipment – thermometer, data – gather, standard units, record, classify, present record – drawings, labelled diagrams, keys, bar charts, tables Skills
Disciplinary Knowledge (Second order concepts)					
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 a lamp will light in a simple series circuit, based on whether the lamp is part of a complete circuit with a battery. Recognise that a switch opens and closes a	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	Describe the simple functions of the basic parts of the digestive system in humans and animals. Identify the different types of teeth in humans and animals, describe their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey.	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 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	Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate,



<p>circuit and associate this with whether a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p>of evaporation with temperature.</p>		<p>Recognise that sounds get fainter as the distance from the sound source increases.</p>	<p>pose dangers to living things.</p>	<p>taking accurate measurements. using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Reporting on findings from</p>
---	---	--	---	---------------------------------------	--



Science Breadth of Study



					<p>enquiries, including oral and written explanations, displays or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to</p>
--	--	--	--	--	---



					support their findings.
--	--	--	--	--	-------------------------

Disciplinary Knowledge

<p>Asking Scientific Questions</p>	<p>Planning an Enquiry</p>	<p>Observing Closely</p>	<p>Taking Measurements</p>	<p>Gathering and Recording Results</p>
<p>Presenting Results</p>	<p>Interpreting Results</p>	<p>Drawing Conclusions*</p>	<p>Making Predictions*</p>	<p>Evaluating Enquiries*</p>

Trips/visitors/books/resources

Think Tank Museum, Birmingham – energise, harmless renewable energies	Hereford Waterworks Museum – Broomy Hill Elan Valley Visitor’s Centre – Rhayader.	Dentist/vets		Local wildlife Park – West Midlands Safari Park/Small Breeds Farm/Open Farms. Birds of Prey Centre – Newent. Local area.
---	--	--------------	--	---