



Science Medium Term Plan Cycle B

Year 3/4	Autumn 1 - Electricity	Autumn 2 - Sound	Spring 1 - Human nutrition	Spring 2 - Changing States	Summer 1 - Grouping living things	Summer 2 - Dangers to living things
Big Concept						
Big questions	How could we cope without electricity for the day?	How do we hear different sounds?	What do our bodies do with the food we eat?	Is water always wet?	What's the same and what's different?	How can changes to the environment affect the things that live there?
Prior Knowledge	In Early Years children: • May have some understanding that objects need electricity to work. • May understand that a switch will turn something on or off.	EYFS - be able to ask questions about the place they live. Talk about why things happen and how things work. Discuss the things they have observed such as natural and found objects. In KS1 children: • May have some understanding that objects make different sounds. • Some understanding of that they use their ears to hear sounds. • Know about their different senses.	EYFS - Know the effects exercise has on their bodies, be able to identify different parts of their body, have some understanding of healthy food and the need for variety in their diet, have some understanding of growth and change. Y1 - Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. In Year 3 children should: • Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. • Know how nutrients, water and oxygen are transported within animals and humans. • Know about the importance of a nutritious, balanced diet.	EYFS - be able to ask questions about the place they live. Talk about why things happen and how things work. Discuss the things they have observed such as natural and found objects. Manipulates materials to achieve a planned effect. In KS1 children should: • 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 based on their simple physical properties. • Identify and compare the suitability of a variety of everyday materials, including wood, metal, and rock.	EYFS - Explore the natural world around them, making observations and drawing pictures of animals and plants. In Year 2, children should: • Explore and compare the difference between things that are living, dead and things that have never been alive. • Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food.	EYFS - Comments and questions about the place they live or the natural world. Shows care and concern for living things and the environment. Can talk about things they have observed such as plants and animals. Notices features of objects in their environment. Comments and asks questions about their familiar world. In Year 2, children should: • 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 of animals and plants, and how they depend on each other. • Identify and name a variety of plants and animals in their habitats, including micro habitats.

			Identify that humans and some other animals have skeletons and muscles for support, protection and movement	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		
Overview of knowledge	Children will identify common appliances that run on battery and mains electricity, and name some appliances that do the same job but are operated manually. Children will know the names and functions of simple electrical components including batteries, bulbs, buzzers, wires and switches. They will understand the need for a complete loop for a bulb to light or a buzzer to buzz, and will construct simple circuits to light a bulb and make a buzzer buzz.	Children will work towards answering the question, 'How can we make different sounds?' Children will identify and describe different sounds. They will learn that sounds are produced by vibrations and that these vibrations travel from the source of the sound through a variety of materials to the ear. Children will use musical instruments and household materials to investigate the range of ways of producing sounds and how the pitch and volume of a sound can be altered. They will have the opportunity to make sounds and will create a short soundtrack for a piece of film.	Children will develop their understanding of their personal health and how this is related to human nutrition, dentition and digestion. They will describe, sequence and investigate the simple functions and the basic parts of the digestive system in humans and they will identify and name the different types of teeth in humans and some other animals, and their simple functions. Children will understand how their teeth could decay and how they could keep teeth healthy.	Children will have identified, grouped and described different materials as solids, liquids or gases. They will have described and actively modelled simple scientific ideas of solids, liquids and gases in terms of the arrangement of particles. They will have recognised that the same material can exist in different states. Children will have developed their ideas about states of matter and changes of state which can be reversed. They will have observed that some materials change state when they are heated or cooled and they will have had the opportunity to measure or research the temperature at which this happens expressed in degrees Celsius (°C). Children will have used their knowledge of changes of state to identify the part played by evaporation and condensation in the water cycle and will have associated the rate of evaporation of water with temperature.	Children will have some understanding of classification keys. They will have found out why scientists need to use classification keys and will have learnt about some newly discovered species. They will have looked at different ways of grouping living things and will have built up their knowledge of making and using classification keys. They will have started by classifying and identifying familiar items such as classmates or maths shapes but will have gone on to develop keys to classify a wide variety of living things. They will have compared the living things in the northern and southernmost parts of the British Isles and compared this to their own location.	Children will work towards answering the question 'How can changes to the environment affect the things that live there?' Children will construct and interpret food chains, identifying producer, prey, consumer and predator. They will realise that the availability of food is an important factor when considering how animals respond to changes in the environment.
Common Misconceptions	Some children may think: - 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.	Some children may think: - 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. Pitch and volume are frequently confused, as both can be described as high	Some children may think: - 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	Some children may think: '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	Some children may think: - 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 - animals are only land-living creatures - animals and plants can adapt to their habitats, however they change - all changes to habitats are negative.	Some children may think: - 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 - animals are only land-living creatures - animals and plants can adapt to their habitats, however they change - all changes to habitats are negative.



		or low.		- 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)		
Working Scientifically	Children will raise questions related to electrical insulation and conductivity. They will plan and carry out investigations, make predictions, record results in appropriate ways and draw conclusions. They will apply knowledge about electrical circuits and conductors to design and make a switch.	Children will investigate how sound travels through solids, liquids and gases. They will investigate changing the pitch of sounds and they will find patterns between the pitch of a sound and the features of the object that produced it. They will investigate sound through creating their own instruments and they will investigate the pattern between the volume of a sound and the strength of vibrations which produced it. They have the opportunity to use data logging equipment to measure the volume of various sounds and to notice that sounds get fainter as the distance from the source of the sound increases.	Children will have the opportunity to set up simple enquiries and fair tests, asking questions and using different types of scientific enquiries to answer them. They will have compared and contrasted human and other animal dentition. They will have conducted an investigation on tooth decay by substituting eggshells as a close representation of human teeth. Children will have used their results to draw simple conclusions and raise further questions. Children will also have had the opportunity to make a comparison of the various qualities of toothpaste and they will have reported on their findings from their enquiries in various ways including written and oral presentations.	Children will investigate how materials change when they are heated or cooled and they will have set up simple practical enquiries to investigate evaporation and condensation. They will have made systematic and careful observations and, where appropriate, have taken accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. They will have reported on their findings in a variety of ways including oral and written explanations.	Children will have collected data about living things in different areas of the school grounds or local area. They will have presented the information in a series of classification keys as a guide to the living things around them. They will have looked at different classification keys and decided which ones are most effective and explained why.	Children will investigate the effect of a small change to an environment by placing carpet or other covering on the ground, and will consider the impact of larger changes to the environment such as fire and flood. They will consider how humans can reduce the impact of some environmental changes. They will finish by answering the Question about the effects on pond life of diverting a river to build new houses, when the original course of the river feeds into the pond.
Key Vocabulary	Circuits, conductors, electricity, electrical, battery, bulb, crocodile clip, buzzer, motor, conduct, insulate, switch, break, power, bright, dim	Pitch, loudness, vibration, vibrate, muffle, tuning, quiet, soft, noise, source, loud, high, low, soundproof	Unhealthy, decay, nutrition, root, food, healthy, diet, canine, molar, incisor, teeth, tooth, starches, fat, protein, sugars, fruit, vegetables, growth, feeding, food groups.	Solids, liquids, separating materials, gas, melt, freeze, solidify, dissolve, solution, filter, undissolved, sieve, mix, evaporate, celsius, temperature, thermometers, data loggers	Classify, classification keys, similar, different, compare, contrast, branching tree,	food chains, producer, prey, consumer, predator, organism keys,