

## Year 4 Knowledge Objectives and Knowledge Goals – SCIENCE

	The Human Body	Classification of Plants and Animals	Ecology	Sound	The Water Cycle	Electricity
Week 1	<p><b><i>Cells are the building blocks of the human body and we need nutrition to keep our bodies working as they should</i></b></p> <p>All living things are made up of cells, too small to be seen without a microscope</p> <p>Our bodies require nutrients to keep healthy</p> <p>Nutrients are found in the food we eat</p>	<p><b><i>To understand that we can classify animals and plants</i></b></p> <p>A vertebrate is an animal with a backbone</p> <p>An invertebrate is an animal without a backbone</p> <p>Scientists sort living things using a process of classification</p>	<p><b><i>To know that living things depend on their habitats</i></b></p> <p>There are seven life processes which living things all have in common</p> <p>A habitat is the natural home or environment of an animal, plant, or other organism</p> <p>Living things depend on each other within their habitat</p>	<p><b><i>To understand how sound is produced and how it travels</i></b></p> <p>Sound is caused by a back and forth movement called vibration</p> <p>Sound waves move out from a vibrating object</p> <p>Sound can travel through different types of matter</p> <p>Sound is fainter further from the source</p>	<p><b><i>To know that there are three main states of matter: solid, liquid and gas</i></b></p> <p>There are three states of matter that water can form: solids, liquids and gases</p> <p>Water exists in these states of matter in nature</p> <p>Water can change into each state in both directions, we call this the Water Cycle</p>	<p><b><i>To know that electricity is useful, but it can also be very dangerous</i></b></p> <p>Electricity can be very dangerous</p> <p>We must use electricity safely to make sure it is not a danger to us</p> <p>We can use electricity safely by; not putting fingers in plug sockets, not using electrical items with wet hands and checking that wires are not frayed</p>
Week 2	<p><b><i>Identify the different types of teeth in humans and their simple functions</i></b></p> <p>There are four main different types of teeth: incisors, canines, pre-molars and molars</p> <p>Incisors cut, canines tear, premolars crush, molars grind food</p> <p>Humans have teeth for ripping and for grinding because we are omnivores</p>	<p><b><i>I know that fish and amphibians are vertebrates</i></b></p> <p>Fish are cold-blooded vertebrates that live in water</p> <p>Amphibians are cold blooded vertebrates that live both in water and on land</p> <p>Fish have gills that help them to take oxygen from the water</p>	<p><b><i>To understand that living things are linked within a food chain</i></b></p> <p>A producer makes their own food using sunlight, water and nutrients</p> <p>A consumer eats other living things to gain their energy</p> <p>A decomposer breaks down the remains of dead living things into smaller pieces which leaves nutrients in the soil</p>	<p><b><i>To know sound travels through the air</i></b></p> <p>In warm air, sound travels at about 340 metres per second</p> <p>The speed of sound in water is about four times faster than in air</p> <p>There are jet aeroplanes that can travel as fast as sound</p>	<p><b><i>To know that evaporation occurs when water turns into gas</i></b></p> <p>To know that water evaporates from all water sources (puddles, lakes, oceans even a cup)</p> <p>When water evaporates, it becomes water vapour</p> <p>The amount of water in the air is called humidity</p>	<p><b><i>To construct an electrical circuit</i></b></p> <p>An electrical circuit is a loop that allows electricity to travel around it</p> <p>An electrical circuit must have wires and a battery</p> <p>If a circuit is broken, electricity will not be able to flow around it</p>

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<p><b>Week 3</b></p>	<p><b><i>To know how food is digested and excreted</i></b></p> <p>The stomach stirs up the food and mixes it with acid The intestines move the food around</p> <p>The small intestine is a long coiled up tube that winds around inside your tummy</p> <p>Whilst in the intestine, the nutrients are absorbed by the blood</p>	<p><b><i>To know some of the key features of reptiles, birds and mammals</i></b></p> <p>Reptiles are coldblooded vertebrates with scaly skin</p> <p>Birds are warm blooded vertebrates with feathers that can fly</p> <p>Mammals are hairy, warm blooded vertebrates that breathe air</p>	<p><b><i>To know that living things depend on each other in an ecosystem</i></b></p> <p>An ecosystem is the interaction of organisms in their environment</p> <p>Every ecosystem is very delicately balanced, so if one organism is removed or a new one introduced it can have a negative impact on other organisms</p> <p>Human beings are part of many ecosystems</p>	<p><b><i>To know the difference between pitch and volume</i></b></p> <p>Loud sounds are made by big vibrations</p> <p>More energy is needed to make louder sounds</p> <p>Quiet sounds are made by small vibrations</p> <p>More vibrations every second makes higher pitched sounds</p>	<p><b><i>To know that condensation occurs when water vapour turns into liquid water. (gas into water)</i></b></p> <p>To know that condensation is when water vapour turns back into liquid</p> <p>High in the sky the air is cooler and turns vapour back into water droplets</p> <p>There is always water vapour in the air and the temperature changes its appearance</p>	<p><b><i>Switches open and close a circuit</i></b></p> <p>A switch opens and closes a circuit</p> <p>Opening a circuit prevents electricity from flowing</p> <p>Sometimes we need to stop electricity from flowing for safety reasons, switches help to do this</p>
<p><b>Week 4</b></p>	<p><b><i>To know a healthy diet keeps our bodies healthy</i></b></p> <p>Our diet should include lots of different types of food</p> <p>Our diet needs to provide all the nutrients our bodies need</p> <p>Sugars are already naturally produced in many foods, such as fruit</p>	<p><b><i>To understand and describe key features of insects, arachnids and molluscs</i></b></p> <p>Insects are invertebrates, they have no backbone, six legs and three body parts</p> <p>Molluscs are invertebrates, they have no backbone and a soft body, some have shells</p> <p>Arachnids are invertebrates, they have no backbone, eight legs and two body parts</p>	<p><b><i>To understand that air pollution is a human threat to the environment</i></b></p> <p>Pollution is any substance that is introduced into an environment that can damage or affect quality of life</p> <p>Exhaust and smoke often contain harmful chemicals that pollute the air</p> <p>Air pollution can damage ecosystems</p>	<p><b><i>To understand how the human voice makes different sounds</i></b></p> <p>When you sing a high note, your vocal cords vibrate very fast, hundreds of times a second. When you sing a low note, your vocal cords vibrate more slowly</p> <p>Faster vibrations make a sound with a higher pitch</p> <p>Slower vibrations make a sound with a lower pitch.</p> <p>The larynx is in the throat and the muscles vibrate the vocal cords</p>	<p><b><i>To know that precipitation returns water to the surface of the Earth</i></b></p> <p>Clouds are formed of millions of water droplets or ice particles if the air is very cold, their shape, size and colour can tell us what the weather will be like</p> <p>When the water droplets get large enough, often in dark cumulonimbus or nimbostratus clouds they precipitate and fall as rain, sleet, hail or snow</p> <p>Precipitation returns water to the surface of the earth within the water cycle</p>	<p><b><i>To know that the lightbulb was a very important invention</i></b></p> <p>Thomas Edison invented the first lightbulb suitable to use in homes</p> <p>Lewis Latimer invented a lightbulb that could last for a long time</p> <p>A long time ago, electric lighting was used in streetlights before it was used in people's homes</p>

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<p><b>Week 5</b></p>	<p><b><i>To understand the essential vitamins and minerals needed in our body</i></b></p> <p>Vitamins and minerals are important nutrients</p> <p>Many vitamins and minerals are found in our food</p> <p>Your body needs the mineral iron to build blood cells, and calcium for strong bones and nails</p>	<p><b><i>To know that plants can be classified into two main groups: flowering and non-flowering plants</i></b></p> <p>To know that a flowering plant produces flowers to make seed in order to reproduce</p> <p>To know that a non-flowering plant grows from spores instead of seeds</p>	<p><b><i>To know how humans have changed the environment in our local area</i></b></p> <p>Clean air zone Bradford</p>	<p><b><i>Vibrations in sound waves travel through the different parts of the ear</i></b></p> <p>We hear sounds when sound waves enter our ear, travel through it and messages are sent to our brain</p> <p>The structure of the ear includes ear drum, bones called the hammer, anvil, and stirrup, cochlea</p> <p>Hairs inside the cochlea are connected to nerves that carry the signals to the brain</p>	<p><b><i>To know how water changes state within the water cycle</i></b></p> <p>To know that water evaporates from all water sources (puddles, lakes, oceans even a cup)</p> <p>To know that condensation is when water vapour turns back into liquid</p> <p>Precipitation returns water to the surface of the earth within the water cycle</p>	<p><b><i>To identify materials that conduct electricity</i></b></p> <p>Materials that allow electricity to pass through them are conductors</p> <p>Materials that do not allow electricity to pass through them are insulators</p> <p>Many, but not all metals conduct electricity</p>
<p><b>ASSESSMENT</b></p>	<p><b><i>To show my understanding of the human body</i></b></p> <p>Scientific knowledge and understanding:</p> <ul style="list-style-type: none"> <li>• All living things are made up of cells</li> <li>• We have different teeth that have different jobs. The stomach stirs up the food and mixes it with acid, The intestines move the food around. The small intestine is a long coiled up tube that winds around inside your tummy. Whilst in the intestine, the nutrients are absorbed by the blood</li> <li>• To know that they need a balanced meal to be healthy Understand the parts of the food pyramid. To know the essential vitamins and minerals needed in our body</li> </ul>	<p><b><i>To understand that plants and animals can be classified according to characteristics</i></b></p> <p>Scientific knowledge and understanding:</p> <ul style="list-style-type: none"> <li>• Scientists classify animals into two groups: vertebrates and invertebrates</li> <li>• Vertebrates have a backbone or spinal column, whereas an invertebrate does not</li> <li>• Animals can be classified by whether they are cold-blooded or warm blooded</li> </ul>	<p><b><i>To show my knowledge and understanding of ecology</i></b></p> <p>Scientific Understanding:</p> <ul style="list-style-type: none"> <li>• Know that living things depend on each other within a habitat</li> <li>• Know the 7 life processes which living things have in common: Movement, Reproduction, Sensitivity, Growth, Respiration, Excretion, Nutrition</li> <li>• Know the three groups of living things which the cycle of nature depends on: producers, consumers and decomposers</li> <li>• Recognise that environments can change and that this can sometimes pose dangers to living things</li> </ul>	<p><b><i>To show my knowledge and understanding of sound</i></b></p> <p>Scientific Understanding:</p> <ul style="list-style-type: none"> <li>• Sound is caused by a back and forth movement called vibration</li> <li>• Sound waves move out from a vibrating object in all directions</li> <li>• In warm air, sound travels at about 770 miles per hour (340 metres per second)</li> <li>• Sound becomes quieter further from the source</li> <li>• Loud sounds have larger vibrations and quiet sounds have smaller vibrations</li> <li>• High pitched sounds have faster vibrations and low pitched sounds have slower vibrations</li> <li>• The larynx is in the throat and the muscles vibrate the vocal cords</li> </ul>	<p><b><i>To know that water changes state within the water cycle</i></b></p> <p>Scientific understanding:</p> <ul style="list-style-type: none"> <li>• When water evaporates, it becomes water vapor</li> <li>• Condensation is when water vapour turns back into liquid</li> <li>• Not all water evaporates and that some of this will soak into the ground and become groundwater</li> <li>• High in the sky the air is cooler and turns vapour back into water droplets</li> <li>• There is always water vapour in the air and the temperature changes its appearance</li> <li>• Precipitation returns water to the surface of the earth within the water cycle</li> </ul>	<p><b><i>To know that electricity flows around a circuit and can make components, such as a light bulb, work</i></b></p> <p>Scientific understanding:</p> <ul style="list-style-type: none"> <li>• Electricity is an energy that we can store or use to make things work</li> <li>• An electrical circuit is a wire loop that allows electricity to travel around it</li> <li>• Materials that allow electricity to pass through them are conductors</li> </ul>