



**Year 3 Science Medium Term Overview**

Topic	Autumn 2 Home and Away	Spring 1 A Peachy Adventure	Spring 2 A Step Back In Time	Summer 1 What Lies Beneath	Summer 2 Raiders and Invaders
<b>Science Topic</b>	Rocks and Soils	Animals (Including Humans)	Forces and magnets	Light	Plants
<b>Unit outcome</b>	Children report which soil is best for Old Tom based on their findings from their experiment.	Children will analyse the diets of different minibeasts from the rich read and investigate different types of skeletons.	Children will investigate magnets and forces.	Children will learn about lights and investigate shadows using investigations.	Children will explore the different parts of plants and investigate the factors that affect plant growth.
<b>Vocabulary</b>	Rocks, igneous, metamorphic, sedimentary, anthropic, permeable, impermeable, chemical fossil, body fossil, trace fossil, Mary Anning, cast fossil, mould fossil, replacement fossil, extinct, organic matter, top soil, subsoil, base rock.	Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, water, fibre, skeleton, bones, joints, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, muscles, contract, relax,	Force, push, pull, friction, surface, magnet, magnetic, magnetic field, pole, north, south, attract, repel, compass.	Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent.	Flower, seed, leaf, stem, roots, petal, pollen, life cycle, dispersal, pollination, fertilisation, germination, ovary, ovule, sepal, stamen, anther, filament, stigma, style, photosynthesis.
<b>Topic Specific Vocabulary</b>	permeable/impermeable	hydrostatic skeleton	repel	light source	photosynthesis
<b>Subject Specific Vocabulary</b>	organic (matter)	invertebrates	friction	translucent	fertilisation
<b>General Vocabulary</b>	properties	nutrition	force	transparent	life cycle
<b>Prior Learning</b>	<ul style="list-style-type: none"> <li>•May have some understanding of a variety of different rocks in the natural world.</li> <li>•Some understanding of what soil is. (how to identify soil etc)</li> <li>•May have some knowledge of what a fossil is.</li> </ul> Prior learning separate from school led learning: <ul style="list-style-type: none"> <li>• Some children may have a rock collection at home- encourage them to bring in and share.</li> <li>• Some children will know the different rock terminology from video games such as Minecraft.</li> </ul>	<ul style="list-style-type: none"> <li>•Should be able to notice that animals, including humans, have offspring that grow into adults.</li> <li>•Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</li> <li>•Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> </ul>	<ul style="list-style-type: none"> <li>•May have an awareness of how to make things stop and start.</li> <li>•Year 2 children will explore 'materials' to find out how they can change the shape of some solid objects using types of pushes and pulls (squashing, bending, twisting).</li> </ul>	<ul style="list-style-type: none"> <li>•May have some knowledge of where light comes from.</li> <li>•Will most likely have seen their shadows and may know they appear when it is sunny.</li> <li>•Some understanding of a reflection.</li> <li>•May understand they need light to be able to see things.</li> </ul>	<ul style="list-style-type: none"> <li>• Children should know how to identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li>•They should be able to identify and describe the basic structure of a variety of common flowering plants, including trees.</li> <li>•Children should be taught to observe and describe how seeds and bulbs grow into mature plants</li> <li>•Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>

<p><b>Later Learning</b></p>	<p><b>In Year 6 pupils will be taught to:</b> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p>	<p><b>In Year 4 pupils will be taught to:</b> 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.</p> <p><b>In Year 5 pupils will be taught to:</b> Describe the changes as humans develop to old age.</p> <p><b>In Year 6 pupils will be taught to:</b> 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.</p>	<p><b>In Year 5 pupils will be taught to:</b> 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.</p>	<p><b>In Year 6 pupils will be taught to:</b> 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.</p>	<p><b>In Year 5 pupils will be taught:</b> To describe the life process of reproduction in some plants</p>
<p><b>Year 3 Curriculum Objective</b></p>	<ul style="list-style-type: none"> <li>•compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>•describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>•recognise that soils are made from rocks and organic matter.</li> </ul>	<ul style="list-style-type: none"> <li>•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</li> <li>•identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul>	<ul style="list-style-type: none"> <li>•compare how things move on different surfaces</li> <li>•notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>•observe how magnets attract or repel each other and attract some materials and not others</li> <li>•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</li> <li>•describe magnets as having two poles</li> <li>•predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul>	<ul style="list-style-type: none"> <li>•recognise that they need light in order to see things and that dark is the absence of light</li> <li>•notice that light is reflected from surfaces</li> <li>•recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>•recognise that shadows are formed when the light from a light source is blocked by a solid object</li> <li>•find patterns in the way that the size of shadows change.</li> </ul>	<ul style="list-style-type: none"> <li>•identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>•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</li> <li>•investigate the way in which water is transported within plants</li> <li>•explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul>
<p><b>Working Scientifically Objectives</b></p>	<p>Review: Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Plan: Set up simple practical enquiries, comparative and fair tests.</p> <p>Review: Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Review: Use straightforward scientific evidence to answer questions or to support their findings.</p>	<p>Review: Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Review: Use straightforward scientific evidence to answer questions.</p> <p>Plan: Ask relevant questions and use different types of scientific enquiries to answer them.</p>	<p>Plan: Ask relevant questions and use different types of scientific enquiries to answer them.</p> <p>Record: Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Plan: Set up simple practical enquiries, comparative and fair tests.</p>	<p>Plan: Ask relevant questions and use different types of scientific enquiries to answer them.</p> <p>Do: Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers.</p> <p>Review: Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p>	<p>Record: Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Do: Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers.</p> <p>Review: Use straightforward scientific evidence to answer questions or to support their findings.</p>

<b>Resources</b>	Examples of rock types Beakers Pipettes Compost, clay and gravel Basalt	Different animal skulls	Selection of materials that are magnetic/not magnetic Bar magnets	Opaque/ translucent/transparent materials Torches and batteries	Plants Celery
<b>More detailed knowledge required</b>	<p><b>Rocks and Rock Types</b> Know that rocks have different properties (permeable/ impermeable, soft, hard). Know that there are different rocks which have different names Know that natural materials (rocks) can be used for specific purposes because of their properties Know that plants grow in soil Know that soil is made of different materials and that there are different types of soil Know that certain types of soil absorb water more effectively and this will affect plant growth</p> <p><b>Fossils</b> Know that fossils can be found in rocks Know that the process of fossilisation happens over time Know that bones, minerals and pressure are part of fossilisation</p>	<p><b>Food groups, nutrition and balanced diet</b> Know that there are different food groups Know what nutrition is Know that nutrition is provided by a diet, food and food groups Know that humans need certain nutrients and types of nutrition Know what a balanced diet would include different food groups in correct amounts; for example, it is important to eat more fruit and vegetables than fats. Know where certain foods would be in food groups Know that different food groups provide different things: Carbohydrates – energy Protein – repairs and builds muscles Sugar and Fats – stored for energy and creates a layer of fat to keep us warm. Vitamins and Minerals – keeps us growing and fighting infections (fruit and vegetables).</p> <p><b>Skeletons and muscles</b> Know that certain humans and animals have skeletons Knowing there are different types of skeletons and that skeletons protect our internal organs, keep us supported and help us move. Know the role of muscles and that skeletons move because bones are attached to muscles. When a muscle contracts (bunches up), it gets shorter and pulls up the bone it is attached to. When a muscle relaxes, it goes back to its normal size.</p>	<p><b>Friction</b> Know that surfaces affect how an object moves When objects are pushed or pulled, an opposing force can be felt. This opposing force is called 'friction'. Friction causes things to slow down or stop. The rougher the surfaces, the greater the friction. This rubbing of two surfaces can release energy, causing heat.</p> <p><b>Magnets</b> Know that magnets can repel and attract A magnet is a special object which produces an area of magnetic force around itself called a magnetic field. If a metal object enters this magnetic field, they will be attracted towards the magnet and end up sticking to it - non-metallic objects would not be attracted to it. N.B. some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Know that magnetic materials are always made of metal, but not all metals are magnetic. Iron is magnetic, so any metal with iron in it will be attracted to a magnet. Nickel and Cobalt are also magnetic. Steel contains iron, so a steel paperclip will be attracted to a magnet too. Most other metals, for example aluminium, copper and gold, are not magnetic.</p>	<p><b>Reflection and how we see things:</b> Light is needed to see objects. Light beams are projected from a light source. Light travels in a straight line. The light beams are then reflected off the surface it meets until the light beam enters the eye. The light activates cells inside our eyes which are processed by our brain into an image. Sunlight can cause damage from UV rays.</p> <p><b>Darkness and how shadows are formed</b> Darkness is the absence of light. A shadow is an area of darkness produced by an object coming between beams of light and a surface. They look different depending on the transparency of the object. Transparent objects = faint shadows (more light gets through). Translucent objects = darker than transparent, lighter than opaque object shadows. Opaque objects = dark shadows. The distance between the object and the light source, near or far / high or low, will affect the size of the shadow.</p>	<p><b>What are the different parts of a plant and what are their functions?</b> <b>Flowers:</b> The flowers are often brightly coloured and smell to attract insects. Insects help with the plants reproduction through pollination.</p> <p><b>Leaves:</b> The leaves use light from the sun, along with carbon dioxide from the air and water to make food for the plant. This process is called photosynthesis.</p> <p><b>Stem / trunk:</b> The stem carries water and nutrients to different parts of the plant. They keep the plant upright.</p> <p><b>Roots:</b> The roots of a plant take up water and nutrients from the soil. The roots also keep the plant steady and upright in the soil; they "anchor" the plant.</p> <p><b>What does a plant need to grow?</b> Plants need air, water, sunlight, nutrients from the soil, room to grow and a sustainable temperature. The amount of each of these may vary depending on the type of plant. For example, cacti need less water than other plants.</p> <p><b>How do plants reproduce?</b> Pollination - Pollen is carried by insects or blown by the wind from one flower to another. This process is called pollination. Fertilisation - Pollen sticks to the flower and then travels to the ovary where it fertilises egg cells (ovules) to make seeds. This process is called fertilisation. Seed Dispersal - The seeds are scattered by animals or the wind. This process is called dispersal. Some of the seeds will grow into new plants.</p>
<b>Linked Scientists</b>	<ul style="list-style-type: none"> <li>• Dr Anjana Khatwa – Geologist</li> <li>• Katia Krafft – Geologist and volcanologist</li> </ul>	<ul style="list-style-type: none"> <li>• Wilhelm Rontgen/ Marie Curie – Xrays</li> <li>• Adele Davis – Nutritionist</li> </ul>	<ul style="list-style-type: none"> <li>• Henry Ford – Cars</li> <li>• Andre Marie Ampere – Electromagnetism</li> </ul>	<ul style="list-style-type: none"> <li>• Justus Von Liebig – Mirrors</li> <li>• James Clerk Maxwell – visible and invisible waves of light.</li> </ul>	<ul style="list-style-type: none"> <li>• Joseph Banks – Botanist</li> <li>• Ahmed Mumin Warfa – Botanist</li> </ul>
<b>Linked Texts</b> <b>Purple – Fiction</b>	<ul style="list-style-type: none"> <li>• Escape from Pompeii (Christina Balit)</li> <li>• The Pebble in my Pocket: A history of our Earth (Meredith Cooper and Chris Coady)</li> </ul>	<ul style="list-style-type: none"> <li>• Funny Bones (Janet and Allan Ahlberg)</li> <li>• I Will Not Ever Eat a Tomato (Lauren Child)</li> <li>• The Story of Frog Belly Rat Bone (Timothy Basil Ering)</li> </ul>	<ul style="list-style-type: none"> <li>• The Iron Man (Ted Hughes)</li> <li>• Mrs Armitage: Queen of the Road (Quentin Blake)</li> <li>• Mr Archimedes' Bath (Pamela Allen)</li> </ul>	<ul style="list-style-type: none"> <li>• The Owl Who Was Afraid of the Dark (Jill Tomlinson)</li> <li>• The Dark (Lemony Snicket)</li> </ul>	<ul style="list-style-type: none"> <li>• The Hidden Forest (Jennie Baker)</li> <li>• George and Flora's garden (Jo Elworthy)</li> </ul>

	<ul style="list-style-type: none"><li data-bbox="468 94 872 172">• The Rock Factory: A Story about Rocks and Stones (Jacqui Bailey and Matthew Lilly)</li></ul>				
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**Year 4 Science Medium Term Overview**

Topic	Autumn 2 Villagers and Pillages	Spring 1 The Nowhere Emporium	Spring 2 Tragic Titanic	Summer 1 Mission: Survival	Summer 2 S.O.S Save Our Species
<b>Science Topic</b>	Animals and Humans	Sound	Electricity	States of Matter	Living Things and Their Habitats
<b>Unit Outcome</b>	Children learn about the digestive system and teeth. They investigate the different types of teeth and their function.	Children use an investigation to explore and learn about sound.	Children will learn about electricity and create a simple circuit to use in a lamp made as part of their DT learning.	Children perform survival-linked experiments relating to changes in state of matter and report their findings to the rich read character Beck Granger.	Children will use their learning about living things and their habitats to inform the discussion about the importance of conservation that takes place in their topic outcome.
<b>Vocabulary</b>	Digestive system, tongue, mouth, teeth, oesophagus, stomach, gall bladder, small intestine, pancreas, rectum, anus, large intestine, liver, duodenum, tooth, canine, incisor, molar, premolar.	Amplitude, volume, quiet, loud, ear, pitch, high, low, particles, instruments, wave.	Electricity, neutrons, protons, electrons, nucleus, atom, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator.	Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection,	Environment, flowering, non-flowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation,
<b>Topic Specific Vocabulary</b>	oesophagus	amplitude	electrons	precipitation	amphibians
<b>Subject Specific Vocabulary</b>	digestive system	particles	insulator	evaporation	classification
<b>General Vocabulary</b>	organs	pitch	appliances	state	deforestation
<b>Prior Learning</b>	<ul style="list-style-type: none"> <li>•Should be able to notice that animals, including humans, have offspring, which grow into adults.</li> <li>•Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</li> <li>•Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> <li>•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.</li> <li>•Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul>	<ul style="list-style-type: none"> <li>• May have some understanding that objects make different sounds.</li> <li>•Some understand that they use their ears to hear sounds.</li> <li>•Know about their different senses.</li> </ul>	<ul style="list-style-type: none"> <li>•May have some understanding that objects need electricity to work.</li> <li>•May understand that a switch will turn something on or off.</li> </ul>	<ul style="list-style-type: none"> <li>• Distinguish between an object and the material from which it is made.</li> <li>•Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</li> <li>•Describe the simple physical properties of a variety of everyday materials.</li> <li>•Compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> <li>•Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</li> <li>•Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul>	<ul style="list-style-type: none"> <li>•Comments and questions about the place they live or the natural world.</li> <li>•Shows care and concern for living things and the environment.</li> <li>•Can talk about things they have observed such as plants and animals.</li> <li>•Notices features of objects in their environment.</li> <li>•Comments and asks questions about their familiar world.</li> <li>•Explore and compare the differences between things that are living, dead, and things that have never been alive.</li> <li>•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.</li> <li>•Identify and name a variety of plants and animals in their habitats, including microhabitats.</li> <li>•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.</li> </ul>

<p><b>Later Learning</b></p>	<p><b>In Year 5 pupils will be taught to:</b> Describe the changes as humans develop to old age. <b>In Year 6 pupils will be taught to:</b> 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.</p>	<p><b>In KS3 pupils will be taught:</b> Sound waves •frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound •sound needs a medium to travel, the speed of sound in air, in water, in solids •sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal •the auditory range of humans and animals</p>	<p><b>In Year 6 pupils will be taught to:</b> 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.</p>	<p><b>In Year 5 pupils will be taught to:</b> 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.</p>	<p><b>In Year 5 pupils will be taught:</b> To 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. <b>In Year 6 pupils will be taught:</b> To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.</p>
<p><b>Year 4 Curriculum Objective</b></p>	<ul style="list-style-type: none"> <li>•Describe the simple functions of the basic parts of the digestive system in humans.</li> <li>•Identify the different types of teeth in humans and their simple functions.</li> </ul>	<ul style="list-style-type: none"> <li>•Identify how sounds are made, associating some of them with something vibrating.</li> <li>•Recognise that vibrations from sounds travel through a medium to the ear.</li> <li>•Find patterns between the pitch of a sound and features of the object that produced it.</li> <li>•Find patterns between the volume of a sound and the strength of the vibrations that produced it.</li> <li>•Recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>	<ul style="list-style-type: none"> <li>•Identify common appliances that run on electricity.</li> <li>•Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</li> <li>•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.</li> <li>•Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</li> <li>•Recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>	<ul style="list-style-type: none"> <li>•Compare and group materials together, according to whether they are solids, liquids or gases.</li> <li>•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).</li> <li>•Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<ul style="list-style-type: none"> <li>•Recognise that living things can be grouped in a variety of ways.</li> <li>•Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</li> <li>•Recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>
<p><b>Working Scientifically Objectives</b></p>	<p>Record: Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Review: Use straightforward scientific evidence to answer questions or to support their findings</p> <p>Review: Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Plan: Set up simple practical enquiries, comparative and fair tests.</p>	<p>Plan: Ask relevant questions and use different types of scientific enquiries to answer them.</p> <p>Do: Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers.</p> <p>Review: Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Plan: Set up simple practical enquiries, comparative and fair tests.</p>	<p>Record: Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Plan: Ask relevant questions and use different types of scientific enquiries to answer them.</p> <p>Review: Use straightforward scientific evidence to answer questions or to support their findings.</p>	<p>Review: Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Do: Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers.</p> <p>Plan: Set up simple practical enquiries, comparative and fair tests.</p>	<p>Plan: Ask relevant questions and using different types of scientific enquiries to answer them.</p> <p>Record: Gather, record, classify and present data in a variety of ways to help in answering questions.</p> <p>Review: Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Record: Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p>

<b>Resources</b>	Tights Digestive system figure Plastic cups Pestle and mortar	Ruler, spoons, string, twangy ruler, shaker, elastic band guitar straws  Data loggers	lightbulbs, batteries, lightbulb holder, battery holder, crocodile clips and paper clips, variety of conductors and insulators	Food colouring Sandwich bags thermometers	Examples of food webs and food chains Conservation project examples (websites and information leaflets)
<b>More detailed knowledge required</b>	<p><b>The Digestive System</b> The smell of food triggers saliva to be produced. The digestive system begins with the mouth and teeth where food is chewed. Saliva is mixed with the food which helps to break it up. When the food is small enough to be swallowed, it is pushed down the oesophagus by muscles to the stomach. In the stomach, food is mixed further. The mixed food is then sent to the small intestine which absorbs nutrients from the food. Any leftover broken down food then moves on to the large intestine. The food (minus the nutrients) arrives in the rectum where muscles turn it into faeces. It is stored here until it is pushed out by the anus. This is called excretion.</p> <p><b>What is the role of our teeth?</b> Teeth are used for cutting and chewing food. They start the digestive process.</p> <p><b>What are the different names and functions of our teeth?</b> Canines are pointed for tearing and ripping food - these are usually used when chewing meat. Incisors are shovel shaped and help bite lumps out of and cut food. Premolars and molars are flat and they grind and crush food.</p> <p><b>How do we look after them?</b> Humans look after their teeth by brushing and flossing and ensuring that they do not eat foods high in sugar. Not looking after teeth can lead to an increase in plaque and tooth decay.</p>	<p><b>What is sound?</b> Sound is a thing that can be heard. The object that makes the sound is called a source.</p> <p><b>How is a sound made?</b> When objects vibrate, a sound is made. The vibration makes the air around the object vibrate and the air vibrations enter your ear. These are called sound waves. If an object is making a sound, a part of it is vibrating, even if you cannot see the vibrations.</p> <p><b>How do we hear sounds?</b> Sound waves travel to the ear and make the ear drum vibrate. Messages are sent to the brain which recognises the vibrations as sound.</p> <p><b>How do sounds travel?</b> Sound waves travel through a medium (such as air, water, glass, stone, and brick).</p> <p><b>How do we measure sound?</b> Amplitude measures how strong a sound wave is. Decibels measure how loud a sound is. Frequency measures the number of times per second that the sound wave cycles.</p> <p><b>Pitch</b> High pitched sounds are made by short waves. Low pitched sounds are made by long waves.</p> <p><b>Volume</b> The closer you are to a sound source, the louder the sound. The further away you are to a sound source, the quieter the sound.</p>	<p><b>What are electrical conductors and insulators?</b> An electrical conductor lets electricity pass through it. They are often metal (e.g. iron, copper and gold) but also include carbon and water. As our bodies are 18% carbon, electricity is very dangerous to us. Because water is a very good conductor of electricity, it is dangerous to use electrical appliances near it.</p> <p>An insulator does not let electricity pass through it, e.g. wood, leather and plastic. Plastic is used to cover electrical wires because it is a good insulator.</p> <p><b>How does a circuit work?</b> In a series circuit all the components are joined together and the electricity can only flow in one direction In circuits, different symbols are used for different components. Switches can be used to open and close circuits.</p> <p>A circuit will not work properly if:</p> <ul style="list-style-type: none"> <li>- the cells aren't connected correctly (+ to - not ++ or - -)</li> <li>- a component is not working or there is no bulb</li> <li>- the circuit has gaps</li> <li>- one of the components acts as an insulator.</li> </ul>	<p><b>What is a solid?</b> A solid is when materials hold their shape. The particles are closely packed and form a regular pattern. The shape is fixed and they will always take up the same amount of space. Examples: ice, wood, glass, diamond.</p> <p><b>What is a liquid?</b> A liquid is when materials hold the shape of the containers they are in and so can change shape. The particles are close together but can move over each other. Liquids can be poured. Examples: water, milk, washing-up liquid.</p> <p><b>What is a gas?</b> Gases can escape from open containers. They often cannot be seen. They have particles which can spread it and move in all directions. Examples: steam, hydrogen, oxygen, carbon Dioxide</p> <p><b>The Water Cycle</b> Water continually moves around the Earth in the water cycle. The Sun evaporates water into water vapour. When the water vapour cools down it turns into liquid water and it rains. In very cold places the water freezes into snow or ice. The snow or ice melts into water. The cycle starts again.</p> <p><b>Changes of State (heating and cooling)</b> Warming solid ice makes it melt into liquid water. Adding more heat makes it evaporate, at 100°C, into steam (a gas). When it is cooled it condenses back into liquid water. If it is cooled to 0°C it freezes and forms ice.</p>	<p><b>How can living things be grouped?</b> All living things, which can also be called organisms, have to do certain things to stay alive. These are the life processes. Living things can be grouped according to different criteria—where they live, what type of organism they are, what features they have. E.g., a camel can belong in a group of vertebrates, a group of animals that live.</p> <p><b>How can environments change?</b> Habitats can change throughout the year and this can have an effect on the plants and animals living there. Humans can have positive effects on the environment, e.g. nature reserves, but instead often damage it.</p> <p><b>People-made Threats to the Environment:</b></p> <ul style="list-style-type: none"> <li>• Air-pollution from cars, e.g. carbon monoxide, and the burning of fossil fuels.</li> <li>• Water pollution through industrial waste and farm fertilisers that can pollute rivers and streams.</li> <li>• Rubbish—Plastic and household waste ends up on the streets, in the sea or in rubbish dumps, destroying habitats and wildlife.</li> </ul>
<b>Linked Scientists</b>	<ul style="list-style-type: none"> <li>• Ivan Pavlov (Digestive system mechanisms)</li> <li>• Washington and Lucius Sheffield (toothpaste in a tube)</li> </ul>	<ul style="list-style-type: none"> <li>• Aristotle (sound waves)</li> <li>• Galileo Galilei (frequency and pitch of sound waves)</li> <li>• Alexander Graham Bell (invented the telephone)</li> </ul>	<ul style="list-style-type: none"> <li>• Thomas Edison (lightbulb)</li> <li>• Joseph Swan (incandescent lightbulb)</li> <li>• Michael Faraday (relationship between magnets and electricity)</li> </ul>	<ul style="list-style-type: none"> <li>• Lord Kelvin (absolute zero)</li> <li>• Anders Celcius (temperature scale)</li> <li>• Daniel Fahrenheit (temperature scale/ invention of the thermometer)</li> </ul>	<ul style="list-style-type: none"> <li>• Jacques Cousteau (marine biology)</li> <li>• Joan Beauchamp Proctor (zoologist)</li> </ul>

<p><b>Linked Texts</b></p> <p><b>Purple – Fiction</b></p>	<ul style="list-style-type: none"> <li>• Human Body Odessey (Werner Holzwarth)</li> <li>• Crocodiles Don't Brush Their Teeth (Colin Fancy)</li> </ul>	<ul style="list-style-type: none"> <li>• Horrid Henry Rocks (Francesca Simon)</li> <li>• Moonbird (Joyce Dunbar)</li> <li>• The Pied Piper of Hamelin (Natalia Vasquez)</li> </ul>	<ul style="list-style-type: none"> <li>• Until I Met Dudley (Roger McGough)</li> <li>• Oscar and the Bird: A Book about Electricity (Geoff Waring)</li> <li>• Electrical Wizard: How Nikola Tesla Lit Up the World (Elizabeth Rusch)</li> </ul>	<ul style="list-style-type: none"> <li>• Once Upon a Raindrop: The Story of Water (James Carter)</li> <li>• Sticks (Diane Alber)</li> </ul>	<ul style="list-style-type: none"> <li>• The Vanishing Rainforest (Richard Platt)</li> <li>• The Morning I Met a Whale (Michael Morpurgo)</li> <li>• Journey to the River Sea (Eva Ibbotson)</li> </ul>
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Year 5 Science Medium Term Overview

Topic	Autumn 1 A Land Faraway	Autumn 2 Into the Darkness	Spring 1 Walk Like and Egyptian	Summer 1 A Twist in the Tail		Summer 2 Fun at the Fair
<b>Science Topic</b>	Properties and Changes of Materials	Space	Properties and Changes of Materials	Animals including humans & Living things		Forces
<b>Unit Outcome</b>	Children will use their previous and current learning to test and group materials by their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.	Children use their learning to create a profile of our solar system to present to others.	Children to investigate the properties of materials and if they can make reversible or irreversible changes.	Children investigate the life stages of butterflies to see the different characteristics of each stage.		Children to investigate which material they think will be the best brake pad for their rollercoaster.
<b>Vocabulary</b>	Material, conductor, insulator, transparent, flexible, permeable, soluble, property, magnetic, hard.	Earth, sun, moon, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, day, night, rotate, orbit, axis, spherical, geocentric, heliocentric.	dissolve, insoluble, suspension, chemical, physical, irreversible, solution, reversible, separate, mixture	<b>Animals Including Humans:</b> Puberty, life cycle, gestation, growth, reproduction, foetus, baby, fertilisation, toddler, child, adult, old age, life expectancy, adolescence, childhood, adulthood, womb, life, death.	<b>Living things:</b> Sexual, asexual, reproduction, cell, fertilisation, pollination, male, female, pregnancy, gestation, young, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant.	Force, push, pull, opposing, gravity, air resistance, water resistance, friction, streamline, brake, gear, mechanism, lever, cog, pulley, machine.
<b>Topic Specific Vocabulary</b>	conductor	solar system	insoluble	gestation	metamorphosis	air resistance
<b>Subject Specific Vocabulary</b>	change of state	gravity	solution (solutions are simply one thing dissolved in another)	foetus	pollination	friction
<b>General Vocabulary</b>	property	rotation	reversible/irreversible	life expectancy	reproduction	mechanism
<b>Prior Learning</b>	<ul style="list-style-type: none"> <li>• Distinguish between an object and the material from which it is made.</li> <li>• Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</li> <li>• Describe the simple physical properties of a variety of everyday materials.</li> <li>• Compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> <li>• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</li> <li>• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> <li>• Compare and group materials together, according to whether they are solids, liquids or gases.</li> <li>• Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which</li> </ul>	<ul style="list-style-type: none"> <li>• May have some knowledge about space.</li> <li>• May have some understanding about how the earth orbits the sun.</li> </ul>	<ul style="list-style-type: none"> <li>• Compare and group materials together, according to whether they are solids, liquids or gases.</li> <li>• 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).</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Animals including Humans:</b> Should be able to notice that animals, including humans, have offspring which grow into adults.</li> <li>• Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</li> <li>• Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> <li>• 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.</li> <li>• Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> <li>• Describe the simple functions of the basic parts of the digestive system in humans.</li> <li>• Identify the different types of teeth in humans and their simple functions.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Living Things:</b> Explore and compare the differences between things that are living, dead, and things that have never been alive.</li> <li>• 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.</li> <li>• Identify and name a variety of plants and animals in their habitats, including microhabitats.</li> <li>• 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.</li> <li>• Recognise that living things can be grouped in a variety of ways.</li> <li>• Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</li> </ul>	<ul style="list-style-type: none"> <li>• May have an awareness of how to make things stop and start.</li> <li>• Compare how things move on different surfaces.</li> <li>• Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</li> <li>• Observe how magnets attract or repel each other and attract some materials and not others.</li> <li>• 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.</li> <li>• Describe magnets as having two poles.</li> <li>• Predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul>

	this happens in degrees Celsius (°C).			<ul style="list-style-type: none"> <li>•Construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>	<ul style="list-style-type: none"> <li>•Recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>	
<b>Later Learning</b>	<p><b>In Year 7 pupils will be taught:</b> The particulate nature of matter. Atoms, elements and compounds. Pure and impure substances. Chemical reactions. Periodic table. Materials such as carbon, ceramics, polymers and composites.</p>	<p><b>In Year 7 pupils will be taught:</b> The composition of the Earth and the structure of the Earth. The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. Earth as a source of limited resources and the efficacy of recycling. The carbon cycle and the composition of the atmosphere. The production of carbon dioxide by human activity and the impact on climate. Gravity forces between the earth and the moon and the earth and the sun. The Sun as a star and stars in other galaxies. Seasons and the Earth's tilt and day length. About light years.</p>	<p><b>In Year 7 pupils will be taught:</b> The particulate nature of matter. Atoms, elements and compounds. Pure and impure substances. Chemical reactions. Periodic table. Materials such as carbon, ceramics, polymers and composites.</p>	<p><b>In Year 6 pupils will be taught to:</b> 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.</p>	<p><b>In Year 7 pupils will be taught:</b> Forces as pushes or pulls, arising from the interaction between two objects. Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. Moment as the turning effect of a force. Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water. Forces measured in newtons, measurements of stretch or compression as force is Changed. Force-extension linear relation; Hooke's Law as a special case Work done and energy changes on deformation. Non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity.</p>	
<b>Year 5 Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>•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.</li> <li>•Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</li> </ul>	<ul style="list-style-type: none"> <li>•Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</li> <li>•Describe the movement of the Moon relative to the Earth.</li> <li>•Describe the Sun, Earth and Moon as approximately spherical bodies.</li> <li>•Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li> </ul>	<ul style="list-style-type: none"> <li>•Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</li> <li>•Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</li> <li>•Demonstrate that dissolving, mixing and changes of state are reversible changes.</li> <li>•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.</li> </ul>	<p><b>Animals Including Humans:</b></p> <ul style="list-style-type: none"> <li>•Describe the changes as humans develop to old age.</li> </ul> <p><b>Living Things:</b></p> <ul style="list-style-type: none"> <li>•To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</li> <li>•Describe the life process of reproduction in some plants and animals.</li> </ul>	<ul style="list-style-type: none"> <li>•Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</li> <li>•Identify the effects of air resistance, water resistance and friction that act between moving surfaces.</li> <li>•Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li> </ul>	
<b>Working Scientifically Objectives</b>	<p>Record: Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Do: Take measurements, using a range of scientific equipment, with increasing accuracy and precision,</p>	<p>Review: Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p>	<p>Plan: Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Record: recording data and results of increasing complexity <b>using scientific diagrams</b> and labels, classification keys, tables, scatter graphs, bar and line graphs.</p>	<p>Review: Identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Review: Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p>	<p>Review: Identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Do: Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p>	

	<p>taking repeat readings when appropriate.</p> <p>Plan: Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p>	<p>Review: Identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Record: Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p>		<p>Record: Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, <b>scatter graphs</b>, bar and line graphs.</p>	<p>Review: Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p>
<b>Resources</b>	<p>Range of everyday materials Magnets Thermometers</p>	<p>Different sized balls Torches Trundle wheels</p>	<p>Filter paper Sieves Petri dishes Sand Gravel Bicarbonate of soda Vinegar</p>	<p>Potatoes Caterpillars/ butterfly nets (order from Insect Lore) Measuring Tapes</p>	<p>Pulleys Levers Newton Meters</p>
<b>More detailed knowledge required</b>	<ul style="list-style-type: none"> <li>- Know and explore the features of a range of materials e.g. absorbent, flammable, permeable</li> <li>- Know that materials which are good electrical conductors allow electricity to pass through them. Electrical insulators do not allow electricity to travel through them.</li> <li>- Know that materials which are good thermal conductors allow heat to move through them easily. Thermal insulators do not let heat travel through them easily. E.g. flasks or woollen.</li> </ul>	<p><b>Planets</b> - The Sun is a hot ball of gas which is classified as a star. The Sun is placed at the centre of our solar system and makes life possible on Earth. -Planets are celestial objects that orbit a star like our solar system's Sun. -Our solar system is currently believed to include eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.</p> <p><b>The Moon</b> The Moon is a celestial body which orbits the Earth. One orbit takes approximately a month (almost 28 days). We only see the part of the Moon that is lit by the Sun which is why it appears to be different shapes at different times of the month. The Moon is described as waxing as it gets larger from new moon to full moon. As the Moon gets smaller from full moon to new moon, it is described as waning. There is no life on the Moon because it has no atmosphere (no air or weather).</p> <p><b>The Earth</b> The Earth, Sun and Moon are spherical The Sun's rays hit the side of the Earth which faces the Sun. This causes day and night. It takes the Earth 24 hours to make one complete spin on its axis.</p>	<p><b>Reversible and irreversible changes</b> Some materials can be separated after they have been mixed based on their properties - this is called a reversible change. Some methods of separation include the use of a magnet, a filter (for insoluble materials), a sieve (based on the size of the solids) and evaporation, e.g. The Water Cycle.</p> <p>When a mixture cannot be separated back into original components, this is called an irreversible change.</p>	<p><b>Human Life cycle</b> New born - this is a baby that has just been born. Infancy - this is a period of rapid change. Many toddlers learn to walk and talk at this stage. Childhood - children learn new things as they grow. They become more independent. Adolescence - this is when the body starts to change and prepare itself for adulthood. Hormonal changes take place over a few years. This is also known as puberty. Early adulthood - this is when humans are usually at their fittest and strongest. Normally the time where reproduction happens. Middle adulthood - changes such as hair loss may happen. There are also some hormonal changes again and the ability to reproduce decreases. This is called the menopause. Late adulthood - there is a decline in fitness and strength.</p> <p><b>What is puberty?</b> Puberty is the change that happens in late childhood and adolescence where the body starts to change because of hormones. Some changes include growth in height, more sweat, hair growth on arms and legs, under the armpits and on genitals, and growth in parts of the body such as male genitals and breasts. Females begin to menstruate.</p> <p><b>Seven life processes:</b> movement, reproduction, sensitivity, growth respiration, excretion and nutrition.</p> <p><b>Sexual reproduction of a plant</b> The stamen is the male part of the flower which holds pollen The carpel is the female part of the flower which contains eggs. Pollen travels from the anthers of one flower to the stigma of another plant. This is called pollination. Plants rely on bees or other insects to carry their pollen while some pollen floats in the wind. After pollination, the pollen grain and the egg join together, fertilisation. The fertilised egg will develop into a seed.</p> <p><b>Asexual reproduction of a plant:</b> <b>Plant cuttings:</b> Some plants stems can grow roots if they are planted in the correct conditions, such as geraniums. This allows for people to make lots of copies of the same plant.</p>	<p><b>Different types of force:</b> Contact—Contact forces are forces that require contact to push or pull another object e.g. friction and air, water and surface resistance.</p> <p>Non-contact - Forces acting at a distance are forces that do not require direct contact between the objects to be able to push or pull them. Two examples are gravity and magnetism</p> <p>Friction—Friction is a 'sticking' force – the resistance that a surface or object encounters when moving over another surface or object.</p> <p>Air resistance—Air resistance is the force on an object moving through air. Air resistance affects how fast or slowly objects move through the air.</p> <p>Water resistance - Water resistance is the force on objects floating on or moving in water.</p> <p>Gravity—Gravity is the pulling force acting between the Earth and a falling object. Gravity pulls objects to the ground</p> <p>Unbalanced forces—can cause an object to change its motion. If an object is at rest and an unbalanced force pushes or pulls the object, it will move</p> <p>Balanced forces—do not cause a change in motion. When two</p>

		<p>The Earth orbits the Sun. One orbit takes 365 days (a year).</p> <p><b>Forces acting upon Earth</b> Forces acting at a distance are forces that do not require direct contact between them. Gravity is the pulling force acting between the Earth and other planets.</p>		<p><b>Runners:</b> Some plants, like strawberry plants, grow runners which have new plants on the end. These plants are an exact copy of the parent plant from which they have grown. <b>Bulbs:</b> Other plants (onions, daffodils, garlic and tulips) produce bulbs which will grow if they are planted. The bulbs form under the soil. This helps the plant to survive during the winter months.</p>	<p>forces are the same strength but act in opposite directions, they are called balanced forces.</p>
<b>Linked Scientists</b>	<ul style="list-style-type: none"> <li>Jamie Garcia (BP website) – invention of a new plastic</li> <li>Ruth Benerito – wrinkle free cotton</li> <li>Becky Schroeder – fluorescent material</li> </ul>	<ul style="list-style-type: none"> <li>Mae Jemison – Astronaut</li> <li>Ptolemy and Copernicus Heliocentric vs Geocentric universe</li> <li>Stephen Hawking – Black Holes</li> </ul>	<ul style="list-style-type: none"> <li>Melitta Bentz – coffee filter paper</li> <li>Jamie Garcia (BP website) – invention of a new plastic</li> </ul>	<p><b>Animals Including Humans:</b></p> <ul style="list-style-type: none"> <li>Virginia Apgar – obstetrics</li> <li>Louis Pasteur – Vaccination</li> </ul> <p><b>Living Things:</b></p> <ul style="list-style-type: none"> <li>Eva Crane – reproduction in bees</li> <li>Jane Goodall – naturalist</li> <li>Sir David Attenborough – animal behaviourist</li> <li>James Brodie – reproduction by spores</li> </ul>	<ul style="list-style-type: none"> <li>Isaac Newton – Gravity</li> <li>Albert Einstein – Theory of relativity</li> <li>Galileo Galilei – gravity and acceleration</li> <li>Archimedes of Syracuse - levers</li> </ul>
<b>Linked Texts</b> <b>Purple – Fiction</b>	<ul style="list-style-type: none"> <li>Kensuke’s Kingdom (Michael Morpurgo)</li> </ul>	<ul style="list-style-type: none"> <li>Hidden Figures (Margot Lee Shetterly)</li> <li>Counting on Katherine (Helaine Becker)</li> <li>The Skies above my Eyes (Charlotte Guillain &amp; Yuval Zommer)</li> <li>George’s Secret Key to the Universe (Lucy and Stephen Hawking)</li> <li>The Way Back Home (Oiver Jeffers)</li> </ul>	<ul style="list-style-type: none"> <li>Itch (Simon Mayo)</li> </ul>	<ul style="list-style-type: none"> <li>The Land of Neverbelieve (Norman Messenger)</li> <li>Giant (Kate Scott)</li> <li>You’re Only Old Once (Dr. Suess)</li> </ul>	<ul style="list-style-type: none"> <li>The Enormus Turnip (Katie Daynes)</li> <li>Leonardo’s Dream (Hans de Beer)</li> <li>The Aerodynamics of Biscuits (Clare Helen Welsh)</li> <li>The Tin Snail (Cameron McAllister)</li> </ul>

**Year 6 Science Medium Term Overview**

<b>Topic</b>	<b>Autumn 2 Born to Survive</b>	<b>Spring 1 Dragonology</b>	<b>Spring 2 Lest We Forget</b>	<b>Summer 1 Lest We Forget</b>	<b>Summer 2 Location, Location, Location</b>
<b>Science Topic</b>	Living things and their habitats  Animals including humans	Evolution and Inheritance	Electricity		Light
<b>Unit Outcome</b>	Children to investigate the impact exercise has on heart rates and how this corresponds to maintaining a healthy circulatory system.	Children to investigate how genetics play a role in offspring and how fossils are formed.	Children to use their knowledge of electricity to solve a range of problems posed by local business.		Children to investigate how light travels and use this knowledge to find a solution to look around corners.
<b>Vocabulary</b>	<u>Living things and their habitats</u> Classify, compare, bacteria, characteristics, classification, microorganism, organism, invertebrates, vertebrates, flowering, non-flowering, Linnaean.  <u>Animals including humans</u> Circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco.	Evolution, adaptation, inherited traits, inheritance, adaptive traits, natural selection, Charles Darwin, Alfred Wallace, DNA, genes, variation, parent, offspring, fossil, environment, habitat, fossilisation, plants, animals, living things.	Electricity, electric current, Thomas Edison, Nikola Tesla, Alessandro Volta, alternating current, direct current, battery, cell, bulb, wire, open switch, closed switch, motor, buzzer, circuit, voltage, brightness, loudness.		Shadow, light, filter, colour, reflect, absorb, refract, spectrum, wavelength, prism, visible, lens, angle, incidence, straight, ray, beam, wave, energy.
<b>Topic Specific Vocabulary</b>	Vertebrate	Genetics	Voltage		Periscope
<b>Subject Specific Vocabulary</b>	Classification	Inherited traits	Electrical current		Refract (where a light source bounces off a surface in a different direction/bends).
<b>General Vocabulary</b>	Characteristics	Variation	Resistance		Opaque
<b>Prior Learning</b>	<u>Living things and their habitats</u> <ul style="list-style-type: none"> <li>•Explore and compare the differences between things that are living, dead, and things that have never been alive.</li> <li>•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 microhabitats.</li> <li>•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.</li> <li>•Recognise that living things can be grouped in a variety of ways.</li> <li>•Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</li> <li>•Recognise that environments can change and that this can sometimes pose dangers to living things.</li> <li>•To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</li> <li>•Describe the life process of reproduction in some plants and animals.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</li> <li>•Describe the changes as humans develop to old age.</li> <li>•Describe the life process of reproduction in some plants and animals.</li> <li>• Recognise that environments can change and that this can sometimes pose dangers to living things.</li> <li>•Notice that animals, including humans, have offspring which grow into adults.</li> </ul>	<ul style="list-style-type: none"> <li>•Identify common appliances that run on electricity.</li> <li>•Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</li> <li>•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.</li> <li>•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.</li> </ul>	<ul style="list-style-type: none"> <li>•Recognise that they need light in order to see things and that dark is the absence of light.</li> <li>•Notice that light is reflected from surfaces.</li> <li>•Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</li> <li>•Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</li> <li>•Find patterns in the way that the size of shadows change.</li> </ul>	

<p><b>Later Learning</b></p>	<p><u>Living things and their habitats</u> In Year 7 pupils will be taught: Genetics and evolution. Chromosomes, genes and DNA in hereditary. Differences between species. Variations within a species. Changes in the environment which may lead to a species less well adapted to compete and reproduce. The importance of maintaining biodiversity.</p> <p><u>Animals including humans</u> In Year 7 pupils will be taught about: Cells and organisation. The skeletal and muscular system. Nutrition and digestion. Gas exchange stems. Reproduction and health.</p>	<p>In Year 7 pupils will be taught: Inheritance, chromosomes and DNA. Hereditary as the process by which genetic information is transmitted from generation to generation. Simple models of chromosomes, DNA and genes including the part played by Watson, Crick, Wilkins, and Franklin. Differences between species. Variation between species. Changes in the environment may leave some species less well adapted to compete successfully and reproduce, leading to extinction. Importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.</p>	<p>In Year 7 pupils will be taught: Electrical currents, measured in amperes, in circuits, series and parallel circuits. Currents add where branches meet and current as a flow of charge. Measuring in volts. Battery and bulb rating, resistance, measured in ohms. Differences in resistance. Static electricity- the separation of positive or negative charges when objects are rubbed together. Force between charged objects. Electrical field and forces acting across the space between objects not in contact.</p>	<p>In Year 7 pupils will be taught: Light waves. Including the speed of light, light waves and the transmission of light through materials. Light refraction and light transferring energy from source to absorber leading the chemical and electrical effects. Colours and different frequencies of light.</p>
<p><b>Year 6 Curriculum Objectives</b></p>	<p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> <li>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</li> <li>give reasons for classifying plants and animals based on specific characteristics.</li> </ul> <p><u>Animals (including humans)</u></p> <ul style="list-style-type: none"> <li>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>describe the ways in which nutrients and water are transported within animals, including humans</li> </ul>	<ul style="list-style-type: none"> <li>recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</li> </ul>	<ul style="list-style-type: none"> <li>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</li> <li>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.</li> <li>Use recognised symbols when representing a simple circuit in a diagram.</li> </ul>	<ul style="list-style-type: none"> <li>recognise that light appears to travel in straight lines</li> <li>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</li> <li>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</li> <li>use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>
<p><b>Working Scientifically Objectives</b></p>	<p>Record: Record data and results of increasing complexity using scientific diagrams and labels, <b>classification keys</b>, tables, scatter graphs, bar and line graphs.</p> <p>Review: Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>Review: Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>Do: Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Record: Record data and results of increasing complexity using <b>scientific diagrams</b> and labels, classification keys, tables, scatter graphs, bar and line graphs.</p>	<p>Review: Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>Review: Identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Record: Record data and results of increasing complexity using <b>scientific diagrams and labels</b>, classification keys, tables, scatter graphs, bar and line graphs.</p>	<p>Record: Record data and results of increasing complexity using <b>scientific diagrams</b> and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Do: Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Plan: Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p>	<p>Plan: Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Review: Identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Review: Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p>
<p><b>Resources</b></p>	<p>Heart rate monitors Stopwatches Wide range of animal pictures</p>	<p>Pictures of staff &amp; their family members Examples of real fossils</p>	<p>Voltmeters Wires Bulbs Buzzers Cells</p>	<p>Mirrors Torches Card Periscope template</p>
<p><b>More detailed knowledge required</b></p>	<p>Know that vertebrae have a back bone and invertebrates have no spine. Mammals have hearts with four chambers. The blood that has come from the body is deoxygenated and the blood that has come from the lungs is</p>	<p>Life cycles have evolved to help organisms survive to adulthood</p>	<p>Series Circuit - A circuit that has only one route for the current to take. If more bulbs or buzzers are added, the power has</p>	<p>We need light to be able to see things. Light waves travel out from sources of light in straight lines. These lines are often called rays or beams of light. These rays hit objects, reflect off the</p>

	<p>oxygenated again. The blood isn't actually red and blue: this is used to show which is oxygenated and deoxygenated on a diagram.</p> <p>Arteries carry oxygenated blood away from the heart.</p> <p>Veins carry deoxygenated blood toward the heart.</p> <p>Regular exercise is beneficial because it keeps your heart healthy.</p>	<p>Over time the characteristics that are most suited to the environment become increasingly common.</p> <p>Organisms best suited to their environment are more likely to survive long enough to reproduce.</p> <p>Organisms that are best adapted to reproduce are more likely to do so.</p> <p>Organisms reproduce and offspring have similar characteristic patterns.</p>	<p>to be shared and so they will be dimmer or quieter. If just one part of this series circuit breaks, the circuit is broken and the flow of current stops.</p> <p>What will make a bulb dimmer or a buzzer quieter?</p> <ul style="list-style-type: none"> <li>- Fewer batteries or a lower voltage give less power to the circuit.</li> <li>- More buzzers or bulbs mean the power is shared by more components.</li> <li>- Lengthening the wires means the electrons have to travel through more resistance.</li> </ul> <p>What will make a bulb brighter or a buzzer louder?</p> <ul style="list-style-type: none"> <li>- More batteries or a higher voltage create more power to flow through the circuit.</li> <li>- Shortening the wires means the electrons have less resistance to flow through.</li> </ul>	<p>object and travel in a straight line into the eye.</p> <p>Light travels as a wave. But unlike waves of water or sound waves, it does not need a medium to travel through. This means light can travel through a vacuum - a completely airless space.</p> <p>A shadow is always the same shape as the object that casts it. This is because when an opaque object is in the path of light travelling from a light source, it will block the light rays that hit it, while the rest of the light can continue travelling.</p> <p>Shadows can also be elongated or shortened depending on the angle of the light source. A shadow is also larger when the object is closer to the light source. This is because it blocks more of the light.</p>
<p><b>Linked Scientists</b></p>	<p><u>Living things and their Habitats</u></p> <ul style="list-style-type: none"> <li>• Carl Linnaeus (classification)</li> <li>• Libby Hyman (classification of invertebrates)</li> </ul> <p><u>Animals including Humans</u></p> <ul style="list-style-type: none"> <li>• Leonardo Da Vinci (anatomy)</li> <li>• Dr Katherine Dibb (cardiovascular science)</li> <li>• Sir Richard Doll (smoking and health problems)</li> </ul>	<ul style="list-style-type: none"> <li>• Charles Darwin (evolution)</li> <li>• Alfred Wallace (naturalist)</li> <li>• Rosalind Franklin (DNA)</li> <li>• Nettie Stevens (geneticist)</li> <li>• Professor Alice Roberts (evolutionary biologist)</li> </ul>	<ul style="list-style-type: none"> <li>• Nikola Tesla (alternating currents)</li> <li>• Alessandro Volta (electrical battery)</li> <li>• Edith Clarke (electrical engineer)</li> </ul>	<ul style="list-style-type: none"> <li>• Thomas Edison (light bulb)</li> <li>• Thomas young (wave theory of light)</li> <li>• Ibn al-Haytham (light and our eyes)</li> <li>• Percy Shaw (the cats eye)</li> </ul>
<p><b>Linked Texts</b></p> <p><b>Purple – Fiction</b></p>	<p>Living things and their Habitats</p> <ul style="list-style-type: none"> <li>• Beetle Boy (M G Leonard)</li> <li>• Insect Soup (Barry Louis Polisar)</li> <li>• Fur and Feathers (Janet Halfmann)</li> </ul> <p>Animals including Humans</p> <ul style="list-style-type: none"> <li>• Pig-Heart Boy (Malorie Blackman)</li> <li>• A heart Pumping Adventure (Heather Manley)</li> </ul>	<ul style="list-style-type: none"> <li>• One Smart Fish (Christopher Wormell)</li> <li>• The Molliebird (Jules Pottle)</li> <li>• Our Family Tree (Lisa Westberg Peters)</li> </ul>	<ul style="list-style-type: none"> <li>• Goodnight Mister Tom (Michelle Magorian)</li> <li>• Blackout (John Rocco)</li> <li>• Hitler's Canary (Sandi Toksvig)</li> </ul>	<ul style="list-style-type: none"> <li>• Letters from the Lighthouse (Emma Carroll)</li> <li>• The Gruffalo's Child (Julia Donaldson)</li> <li>• The King Who Banned the Dark (Emily Haworth-Booth)</li> </ul>