

## Birley Spa Primary Academy – Science KS2 Curriculum

	Year 3	Year 4	Year 5	Year 6
Plants	<p><b>National Curriculum.</b> Pupils should be taught to:</p> <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>			
	<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>			
Animals, including Humans	<p><b>National Curriculum.</b> Pupils should be taught to:</p> <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>	<p><b>National Curriculum.</b> Pupils should be taught to:</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> <li>construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>	<p><b>National Curriculum.</b> Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>describe the changes as humans develop to old age.</li> </ul> <p><b>Living Things &amp; their Habitats</b></p> <ul style="list-style-type: none"> <li>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> </ul>	<p><b>National Curriculum.</b> Pupils should be taught to:</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> </ul>

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	<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>	<p><b>Living Things &amp; their Habitats</b></p> <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>	<ul style="list-style-type: none"> <li>describe the life process of reproduction in some plants and animals.</li> </ul>	<ul style="list-style-type: none"> <li>describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul> <p><b>Living Things &amp; their Habitats</b></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>
	<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>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 the simple functions.</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey.</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 this can sometimes pose dangers to living things.</li> </ul>	<ul style="list-style-type: none"> <li>Describe the changes as humans develop to old age.</li> <li>Draw a timeline to indicate stages in the growth and development of humans.</li> <li>They should learn about the changes experienced in puberty.</li> <li>Work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows</li> <li>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</li> <li>Describe the life processes of reproduction in some plants and animals.</li> </ul>	<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> <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>

Light	<p><b>National Curriculum</b> Pupils should be taught to:</p> <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>National Curriculum.</b> Pupils should be taught to:</p> <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>
	<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>			<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> </ul>

<b>Forces &amp; magnets</b>	<p><b>National Curriculum.</b> Pupils should be taught to:</p> <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>		<p><b>National Curriculum.</b> Pupils should be taught to:</p> <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>	
	<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>• Explain that unsupported objects fall towards 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>	

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Materials and States of Matter		<p><b>National Curriculum</b></p> <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>	<p><b>National Curriculum</b></p> <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>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>give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</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>	
	<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>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 cooled, and measure or research the temperature at which this happens in degrees Celsius.</li> <li>Identify the part played by evaporation and condensation of the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<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>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>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</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>	

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Sound			<p><b>National Curriculum.</b> Pupils should be taught to:</p> <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 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>• Recognise that some sounds get fainter as the distance from the sound increases.</li> </ul>	
Electricity		<p><b>National Curriculum</b> Pupils should be taught to:</p> <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>		<p><b>National Curriculum.</b> Pupils should be taught to:</p> <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>

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		<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 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>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>
Earth and Space			<p><b>National Curriculum</b></p> <ul style="list-style-type: none"> <li>describe the movement of the Earth, and other planets, relative to the Sun in the solarsystem</li> <li>describe the movement of the Moon relativeto the Earth describe the Sun, Earth and Moon as approximately spherical bodies</li> <li>use the idea of the Earth’s rotation toexplain day and night and the apparentmovement of the sun across the sky.</li> </ul>	
			<ul style="list-style-type: none"> <li>Describe the movement of the Earth, and other planets, relative to the sun.</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>Us the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky.</li> </ul>	

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<b>Rocks</b>	<p><b>National Curriculum</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>			
<b>Evolution</b>				<p><b>National Curriculum</b></p> <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>• 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 leave to evolution.</li> </ul>



## Birley Spa Primary Academy – Science KS2 Curriculum

	Year 3	Year 4	Year 5	Year 6
<b>Scientific Enquiry</b>	<ul style="list-style-type: none"> <li>• asking relevant questions and using different types of scientific enquiries to answer them</li> <li>• setting up simple practical enquiries, comparative and fair tests</li> <li>• making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>• gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</li> <li>• recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>• reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>• using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>• identifying differences, similarities or changes related to simple scientific ideas and processes</li> <li>• using straightforward scientific evidence to answer questions or to support their findings.</li> </ul>		<ul style="list-style-type: none"> <li>• planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>• taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>• recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>• using test results to make predictions to set up further comparative and fair tests</li> <li>• reporting and presenting 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</li> <li>• identifying scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>	

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		Year 3					
		Autumn		Spring		Summer	
		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
		Light		Forces and magnets		Animals, including humans	
		Rocks					
<p><b>Lower KS2 End Points (NC):</b></p> <ul style="list-style-type: none"> <li>Has broadened their scientific view of the world around them through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living and non-living things and familiar environments and by beginning to develop ideas about functions, relationships and interactions.</li> <li>Asks their own questions about what they observe and is able to make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.</li> <li>Draws simple conclusions and uses some scientific language, to both and write about what they have found out.</li> <li>Reads and spells scientific vocabulary correctly and with confidence, using their growing word and spelling knowledge.</li> </ul>	<p><b>Term</b></p> <p><b>Half Term Coverage</b></p> <p><b>Topic</b></p> <p><b>Key Knowledge</b></p>	<ul style="list-style-type: none"> <li>Materials revision from Year 2</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>Knows that light is needed to see things and that dark is the absence of light.</li> <li>Knows that light is reflected from surfaces.</li> <li>Knows that light from the sun can be dangerous and that there are ways to protect the eyes.</li> <li>Knows that shadows are formed when the light from a light source is blocked by an opaque object.</li> <li>Knows and can explain some of the reasons why the size of shadows changes.</li> <li>Knows how the shadows of transparent, opaque and translucent materials vary.</li> </ul> <p><i>For instance: Simple Light Experiments for the Classroom.</i></p> <p><a href="https://bopprimaryscience.wikispaces.com/file/view/light+workshop.pdf">https://bopprimaryscience.wikispaces.com/file/view/light+workshop.pdf</a></p>	<ul style="list-style-type: none"> <li>Knows that friction affects the way that things move on different surfaces.</li> <li>Knows that some forces need contact between two objects, but magnetic forces can act at a distance.</li> <li>Knows that magnets attract or repel each other and attract some materials and not others.</li> <li>Knows and can describe magnets as having two poles.</li> <li>Knows whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul> <p><i>For instance: Magnetism</i></p> <p><a href="http://www.explainthatstuff.com/magnetism.html">www.explainthatstuff.com/magnetism.html</a></p>	<ul style="list-style-type: none"> <li>Knows and can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</li> <li>Knows 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>Knows through investigation, the ways in which water is transported within plants.</li> <li>Knows the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul> <p><i>For instance: seed germination to growth time lapse.</i></p> <p><a href="https://www.youtube.com/watch?v=1-Z1etoGp0QSeeds">https://www.youtube.com/watch?v=1-Z1etoGp0QSeeds</a></p>	<ul style="list-style-type: none"> <li>Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need.</li> <li>Food contains a range of different nutrients that are needed by the body to stay healthy - carbohydrates including sugars, protein, vitamins, minerals, fibre, fat, sugars, water.</li> <li>A piece of food will often provide a range of nutrients.</li> <li>Humans and some other animals have skeletons and muscles which help them move and provide protection and support.</li> </ul> <p><i>For instance: Food A Fact of Life</i></p> <p><a href="http://www.foodfactoflife.org.uk/">www.foodfactoflife.org.uk/</a></p>	<ul style="list-style-type: none"> <li>Rock is a naturally occurring material.</li> <li>There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties.</li> <li>Rocks can be hard or soft. They have different sizes of grain or crystal.</li> <li>Rocks can be different shapes and sizes (stones, pebbles, boulders) and some absorb water.</li> <li>Knows, in simple terms, how fossils are formed when things that have lived are trapped within rock.</li> <li>Knows that soils are made from rocks.</li> </ul> <p><i>For instance: Geology Rocks</i></p> <p><a href="http://www.funkidslive.com/features/geology-rocks/">www.funkidslive.com/features/geology-rocks/</a></p>
		<p><b>Cross Curricular Links (Examples)</b></p>	<ul style="list-style-type: none"> <li>R.E Festival of light and Christmas.</li> <li>Reflective playground signs and clothing for cycle school.</li> </ul> <p>Maths: Bar charts, Angles</p>	<ul style="list-style-type: none"> <li>Use of compasses in Geography</li> <li>PE athletic movements</li> </ul> <p>Maths: Compare and group materials following magnetic testing, recording findings and use the outcome to answer questions about which materials are magnetic.</p>	<p>Literacy: Report writing- record your predictions and findings. Information page about the functions of flower parts</p> <p>Maths: Temperature and scales Graphs</p>	<ul style="list-style-type: none"> <li>D&amp;T: Link to Y3 Food Technology Project; how can a salad deliver each food group?</li> </ul>	<ul style="list-style-type: none"> <li>Computing: Stop/go animation of how rocks are formed</li> </ul>
	<p><b>Lower KS2 Skills (Working Scientifically) End Points:</b></p> <ul style="list-style-type: none"> <li>Asks relevant questions and use different types of scientific enquiries to answer them.</li> <li>Sets up simple practical enquiries, comparative and fair tests.</li> <li>Makes systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</li> <li>Gathers, records, classifies and presents data in a variety of ways to help in answering questions.</li> <li>Records findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</li> </ul>	<p><b>Key Skills</b></p>	<p><b>FOR INSTANCE</b></p> <ul style="list-style-type: none"> <li>Observe and identify changes to the size and orientation of shadows, relative to their proximity to the light source.</li> <li>Observe and identify the difference in shadows of opaque, translucent and transparent objects/materials.</li> <li>Observe how shadows are formed and affected by different circumstances.</li> <li>To notice that light can be reflected off surfaces and Replace with 'investigate the visibility of different materials (eg shiny; foil, mirrors and matt; sugar paper) in a darker environment according to which reflect most light.'</li> <li>Investigate the size of shadows according to times of day and year, by tracing shadows outside and comparing differences.</li> <li>Classify materials according to opaque, transparent and translucent.</li> <li>Use oral and written explanations to report on why shadows are formed and how the length and size of a shadow can be changed.</li> <li>Investigates questions related to an object and the shadow it will cause..*</li> </ul>	<ul style="list-style-type: none"> <li>Record and report on findings from investigations, involving how things move on different surfaces*</li> <li>Compare and group materials following magnetic testing, recording findings and use the outcome to answer questions about which materials are magnetic.*</li> <li>Make and investigate predictions on whether two magnets will attract or repel, depending on which poles are facing.</li> </ul>	<ul style="list-style-type: none"> <li>Observe what happens to plants over time when the leaves or roots are removed.</li> <li>Observe the effect of putting cut white carnations or celery in coloured water.</li> <li>Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space.</li> <li>Spot flowers, seeds, berries and fruits outside throughout the year.</li> <li>Observe flowers carefully to identify the pollen.</li> <li>Observe flowers being visited by pollinators e.g. bees and butterflies in the summer.</li> <li>Observe seeds being blown from the trees e.g. sycamore seeds.</li> <li>Research different types of seed dispersal.</li> <li>Classify seeds in a range of ways including by how they are dispersed.</li> <li>Create a new species of flowering plant.</li> </ul>	<ul style="list-style-type: none"> <li>Classify food in a range of ways.</li> <li>Use food labels to explore the nutritional content of a range of food items.</li> <li>Use secondary sources to find out the types of food that contain different nutrients * * *</li> <li>Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks?</li> <li>Plan a daily diet contain a good balance of nutrients and record and present findings * * * * *</li> <li>Explore the nutrients contained in fast food.</li> <li>Use secondary sources to research the parts and functions of the skeleton*</li> <li>Investigate pattern seeking questions such as ; Can people with longer legs run faster?; Can people with bigger hands catch a ball better?</li> </ul>	<ul style="list-style-type: none"> <li>Can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</li> <li>Can devise tests to explore the properties of rocks and use data to rank the rocks*</li> <li>Can link rocks changing over time with their properties e.g. soft rocks get worn away more easily.</li> <li>Can present in different ways their understanding of how fossils are formed e.g. in role play, comic strip, chronological report, stop-go animation etc.</li> <li>Can identify plant/animal matter and rocks in samples of soil.</li> <li>Can devise a test to explore the water retention of soils.</li> </ul>

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<ul style="list-style-type: none"> <li>● Reports on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</li> <li>● Uses results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</li> <li>● Identifies differences, similarities or changes related to simple scientific ideas and processes.</li> <li>● Use straightforward scientific evidence to answer questions or to support their findings.</li> </ul>					<ul style="list-style-type: none"> <li>● Can explain observations made during investigations.</li> <li>● Can look at the features of seeds to decide on their method of dispersal.</li> <li>● Can draw and label a diagram of their created flowering plant to show its parts, their role and the method of pollination and seed</li> </ul>	<ul style="list-style-type: none"> <li>● Compare, contrast and classify skeletons of different animals.</li> </ul>	
<b>School Context (Examples)</b>		<ul style="list-style-type: none"> <li>● Time of day</li> <li>● Classroom brightness in relation to productivity</li> </ul>	<ul style="list-style-type: none"> <li>● Classroom resources that are magnetic</li> <li>● Applying forces of push and pull around the school (gym, school dinners equipment)</li> </ul>	<ul style="list-style-type: none"> <li>● Children plant and observe flowering plants – visit to Botanical Gardens</li> </ul>	<ul style="list-style-type: none"> <li>● Visit to Cannon Hall Farm</li> </ul>		

Year 4							
Lower KS2 End Points (NC): ● Has broadened their scientific view of the world around them through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living and non-living things and familiar environments and by beginning to develop ideas about functions, relationships and interactions. ● Asks their own questions about what they observe and is able to make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. ● Draws simple conclusions and uses some scientific language, to both and write about what they have found out.	Term	Autumn		Spring		Summer	
	Half Term Coverage	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Topic	Famous scientists in history	States of matter	Sound	Animals, including humans	Living things and their habitats	Electricity
	Key Knowledge	<ul style="list-style-type: none"> <li>● Broaden their scientific view of the world around them.</li> <li>● Explore, discuss and develop knowledge about famous scientists in history.</li> <li>● Use primary and secondary sources to research information. e.g. Marie Curie Albert Einstein Louis Pasteur Alexander Fleming.</li> </ul>	<ul style="list-style-type: none"> <li>● Knows how to distinguish between a solid, liquid and gas.</li> <li>● Knows that some materials change state when they are heated or cooled.</li> <li>● Knows the temperatures at which ice, water and water vapour change state.</li> <li>● Knows the part played by evaporation and condensation in the water cycle.</li> </ul> <p><b>For instance: What is Evaporation and Condensation?</b></p> <p><a href="http://www.bbc.co.uk/guides/zydxmnb">http://www.bbc.co.uk/guides/zydxmnb</a></p>	<ul style="list-style-type: none"> <li>● Knows how sounds are made, associating some of them with vibrating.</li> <li>● Knows how sound travels from a source to our ears.</li> <li>● Knows the correlation between pitch and the object.</li> <li>● Knows the correlation between the volume of a sound and the strength of the vibrations that produced it.</li> <li>● Know that sounds get fainter as the distance from the sound source increases.</li> </ul> <p><b>For instance: Understanding Sound.</b></p> <p><a href="https://www.bbc.com/education/clips/z9h6n39">https://www.bbc.com/education/clips/z9h6n39</a></p>	<ul style="list-style-type: none"> <li>● Knows the basic parts of the digestive system in humans.</li> <li>● Knows and can identify the different types of teeth in humans and their simple functions.</li> <li>● Knows which organisms are producers, predators and prey and apply to the construction and interpretation of food chains.</li> </ul> <p><b>For instance: Digestive System</b></p> <p><a href="https://www.youtube.com/watch?v=7av19YhNkhE">https://www.youtube.com/watch?v=7av19YhNkhE</a></p>	<ul style="list-style-type: none"> <li>● Knows that living things can be grouped in a variety of ways.</li> <li>● Knows and can name living things in a range of habitats.</li> <li>● Knows and can relate the key adaptational features of an organism to the known features of its habitat.</li> <li>● Knows and can give examples of how an environment may change both naturally and due to human impact.</li> </ul> <p><b>For instance: Bee Saver Kit</b></p> <p><a href="https://friendsoftheearth.uk/bees/donate-save-britains-bees-get-your-bee-saver-kit-today">https://friendsoftheearth.uk/bees/donate-save-britains-bees-get-your-bee-saver-kit-today</a></p>	<ul style="list-style-type: none"> <li>● Can identify and name appliances that require electricity to function.</li> <li>● Knows the basic parts of a circuit, including cells, wires, bulbs, switches and buzzers.</li> <li>● Knows that for an appliance to work within a circuit, it has to be part of a complete loop with a battery.</li> <li>● Knows that a switch in a circuit is a temporary break in an otherwise 'complete circuit'.</li> <li>● All metals conduct electricity but some, such as aluminium and titanium, are relatively poor conductors.</li> <li>● Knows the recognised symbols used to represent components of a circuit and uses these to represent a circuit pictorially.</li> </ul> <p><b>For instance: Circuits and Conductors</b></p> <p><a href="http://www.sciencekids.co.nz/gamesactivities/circuitsconductors.html">http://www.sciencekids.co.nz/gamesactivities/circuitsconductors.html</a></p>
	Cross Curricular Links (Examples)		<ul style="list-style-type: none"> <li>● DT: Non-reversible change in the context of food preparation</li> <li>● Maths: Venn diagrams - classify materials according to whether they are solids, liquids and gases.</li> </ul>	<ul style="list-style-type: none"> <li>● Music: Exploration of sounds made by musical instruments with different vibrating components</li> </ul>	<ul style="list-style-type: none"> <li>● PE: Body systems</li> </ul>	<ul style="list-style-type: none"> <li>● Geography Y2 Autumn - Human impact on the environment</li> </ul>	<ul style="list-style-type: none"> <li>● D&amp;T: Incorporate a circuit into a 3D model (Y6 Motorised vehicle)</li> </ul>

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<ul style="list-style-type: none"> <li>● Reads and spells scientific vocabulary correctly and with confidence, using their growing word and spelling knowledge.</li> </ul>							
<p><b>Lower KS2 Skills (Working Scientifically) End Points:</b></p> <ul style="list-style-type: none"> <li>● Asks relevant questions and use different types of scientific enquiries to answer them.</li> <li>● Sets up simple practical enquiries, comparative and fair tests.</li> <li>● Makes systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</li> <li>● Gathers, records, classifies and presents data in a variety of ways to help in answering questions.</li> <li>● Records findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</li> <li>● Reports on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</li> <li>● Uses results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</li> <li>● Identifies differences, similarities or changes related to simple scientific ideas and processes.</li> <li>● Use straightforward scientific evidence to</li> </ul>	<p><b>Key Skills</b></p>		<ul style="list-style-type: none"> <li>● Observe closely and classify a range of solids and liquids.</li> <li>● Explore making gases visible</li> <li>● Classify materials according to whether they are solids, liquids and gases.</li> <li>● Observe a range of materials melting.</li> <li>● Investigate how to melt ice more quickly.</li> <li>● Observe the changes that are non-reversible relating (common ingredients).</li> <li>● Investigate melting point of different materials.</li> <li>● Explore freezing different liquids.</li> <li>● Observe and measure temperature of icy water, tap water, hot water.</li> <li>● Observe water evaporating and condensing.</li> <li>● Set up investigations to explore changing the rate of evaporation.*</li> <li>● Use secondary sources to find out about the water cycle.*</li> <li>● Using their data, can explain what affects how quickly a solid melts.</li> <li>● From their data, can explain how to speed up or slow down evaporation.</li> <li>● Present learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet.</li> </ul>	<ul style="list-style-type: none"> <li>● Experiment with at least three different instruments to observe and explore volume and pitch.</li> <li>● Make predictions and draw conclusions about the pitch and volume of sounds.*</li> <li>● Note how vibrations make sounds of different volumes and travel to our ears.</li> <li>● Identify and show how sound travels through particles and into the ear.</li> <li>● Make own instruments that produce a range of pitches.</li> </ul>	<ul style="list-style-type: none"> <li>● Construct and interpret a variety of food chains, identifying producers, predators and prey.</li> <li>● Can create food chains based on research.*</li> <li>● Identifies differences, and similarities of different types of teeth according to herbivore, omnivore and carnivore.</li> <li>● Can record the teeth in their mouth (make a dental record).</li> <li>● Recreate the human stomach and observe representation of how food breaks down.</li> <li>● Label the different parts of the digestive system.</li> </ul>	<ul style="list-style-type: none"> <li>● Observe plants and animals in different habitats throughout the year and use recordings to compare and contrast the living things observed.</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>● Classify living things found in different habitats based on their features.</li> <li>● Create a simple identification key based on observable features.</li> <li>● Use research to explore human impact on the local environment e.g. litter, tree planting.*</li> <li>● Use secondary sources to find out about how environments may naturally change.*</li> <li>● Use secondary sources to find out about human impact, both positive and negative, on environments and write a report on this.*</li> </ul>	<ul style="list-style-type: none"> <li>● Construct and investigate a range of circuits.</li> <li>● Investigate which materials can be used instead of wires to make a circuit.</li> <li>● Classify materials that conduct electricity and those that don't following investigation and record findings.*</li> <li>● Investigate the effect of a switch and combinations of switches in simple circuits.</li> <li>● Investigate switches and consider variations for specific uses, such as a pressure switch for a burglar alarm.</li> <li>● Apply their knowledge of conductors and insulators to design and make different types of switch.</li> </ul>
<p><b>School Context (Examples)</b></p> <ul style="list-style-type: none"> <li>● Reports on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</li> <li>● Uses results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</li> <li>● Identifies differences, similarities or changes related to simple scientific ideas and processes.</li> <li>● Use straightforward scientific evidence to</li> </ul>	<p><b>School Context (Examples)</b></p>		<ul style="list-style-type: none"> <li>● Use of equipment from school kitchen.</li> </ul>	<ul style="list-style-type: none"> <li>● Use of equipment from the music room</li> </ul>	<ul style="list-style-type: none"> <li>● Visit Yorkshire Wildlife Park</li> </ul>	<ul style="list-style-type: none"> <li>● Environmental Dangers Record Activity Sheet on local habitat</li> </ul>	

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answer questions or to support their findings.						
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Year 5											
Upper KS2 End Points: ● Has developed a deeper understanding of a wide range of scientific ideas through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. ● Has encountered more abstract ideas and is beginning to recognise how these help them to understand and predict how the world operates. ● Is beginning to recognise that scientific ideas change over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative fair tests and finding things out using a wide range of secondary sources of information. ● Is able to draw conclusions based on their data and observations, using evidence to justify their ideas and their scientific knowledge and understanding to explain their findings.	Term	Autumn		Spring		Summer					
	Half Term Coverage	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2				
	Topic	Properties and changes of materials		Earth and Space	Forces	Living Things and Their Habitats	Animals, including humans				
	<b>Key Knowledge</b>	<ul style="list-style-type: none"> <li>Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets.</li> <li>Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment.</li> <li>Mixtures can be separated by filtering, sieving and evaporation.</li> <li>Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.</li> </ul> <p><i>For instance: How to make filthy water drinkable.</i></p> <p><a href="https://www.ted.com/talks/michael_pritchard_invents_a_water_filter/up-next">https://www.ted.com/talks/michael_pritchard_invents_a_water_filter/up-next</a></p>		<ul style="list-style-type: none"> <li>The Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits.</li> <li>Earth takes <math>365\frac{1}{4}</math> days to complete its orbit around the Sun.</li> <li>The Earth rotates (spins) on its axis every 24 hours.</li> <li>As Earth rotates half faces the Sun (here it is day) and half is facing away from the Sun (night). As the Earth rotates the Sun appears to move across the sky.</li> <li>The Moon orbits the Earth. It takes about 28 days to complete its orbit.</li> <li>The Sun, Earth and Moon are approximately spherical.</li> </ul> <p><i>For instance: Planet Movement Animation</i></p> <p><a href="https://www.youtube.com/watch?v=gvSUPFZp7Yo">https://www.youtube.com/watch?v=gvSUPFZp7Yo</a></p>		<ul style="list-style-type: none"> <li>Knows that unsupported objects fall to Earth because of the force of gravity acting between the earth and the falling object</li> <li>Knows and can identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>Knows that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li> </ul> <p><i>For instance: Galileo's Law of Falling Bodies</i></p> <p><a href="https://www.youtube.com/watch?v=Z789eth4IFU">https://www.youtube.com/watch?v=Z789eth4IFU</a></p>		<ul style="list-style-type: none"> <li>Knows and can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>Knows and can describe the life processes of reproduction in some plants (including the pollination process) and animals</li> <li>Knows that bulbs, tubers, runners and plantlets are examples of plant reproduction involving only one parent.</li> </ul> <p><i>For instance: How plants and animals reproduce</i></p> <p><a href="https://www.bbc.com/education/clips/zcwk39q">https://www.bbc.com/education/clips/zcwk39q</a></p>		<ul style="list-style-type: none"> <li>Human life cycles including puberty - Comparing life cycles -Differences between animals</li> <li>Describe the changes as humans develop to old age.</li> <li>Draw a timeline to indicate stages in the growth and development of humans.</li> <li>They should learn about the changes experienced in puberty.</li> </ul> <p><i>For instance: Birth to 12 years in 2 mins 45 secs</i></p> <p><a href="https://www.youtube.com/watch?v=RtyqS68ViWk">https://www.youtube.com/watch?v=RtyqS68ViWk</a></p>	
	<b>Cross Curricular Links (Examples)</b>	Literacy - Explanation texts, recount of experiments. Maths - Drawing tables and recording data.		<ul style="list-style-type: none"> <li>History: historical misconceptions about the earth and scientists who challenged these.</li> <li>Geography: Time Zones</li> </ul> Literacy – Discussion texts – do we need to take humans to Mars?		Report on conclusions relating to an object's mass and its weight in Newtons.		<ul style="list-style-type: none"> <li>write a leaflet containing information on different life cycles (literacy)</li> <li>write a report about a life cycle of a mammal (literacy)</li> <li>PSHE (SRE): Coverage of specific knowledge related to reproduction</li> </ul>		Art = create an exhibition of art work that reflects the complexity of the human body and acts as an accurate presentation of the systems that make us human.	
<b>Upper KS2 Skills End Points (Working Scientifically):</b> ● Plans different types of scientific enquiries to answer questions, including	<b>Key Skills FOR INSTANCE</b>	<ul style="list-style-type: none"> <li>Investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test waterproofness and thermal insulation to identify a suitable fabric for a coat.</li> <li>Explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate.</li> </ul>		<ul style="list-style-type: none"> <li>Use secondary sources to help create a model e.g. role play or using balls, to show the movement of the Earth around the Sun and the Moon around the Earth.</li> <li>Use secondary sources to create a model to show why day and night occur.</li> <li>Make first-hand observations of how shadows caused by the Sun change through the day.</li> </ul>		<ul style="list-style-type: none"> <li>Investigate the pull on different objects using a newton meter and record forces in Newtons (N).</li> <li>Report on conclusions relating to an object's mass and its weight in Newtons.</li> <li>Investigate the effect of friction in a range of contexts .</li> <li>Investigate the effects of water resistance in a range of contexts e.g. dropping shapes through</li> </ul>		<ul style="list-style-type: none"> <li>Grow and observe plants that reproduce asexually e.g. strawberries, spider plant, potatoes.</li> <li>Organise mammals into different groups - sea and land and marsupials and use scientific evidence to refute/support correct/incorrect statements (such as 'dolphins are fish').</li> </ul>		<ul style="list-style-type: none"> <li>Work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.</li> </ul>	

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<p><b>recognising and controlling variables where necessary.</b></p> <ul style="list-style-type: none"> <li>• Takes measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</li> <li>• Records data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</li> <li>• Reports and presents 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.</li> <li>• Uses test results to make predictions to set up further comparative and fair tests.</li> <li>• Identifies scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>		<ul style="list-style-type: none"> <li>• Investigate rates of dissolving by carrying out comparative and fair test and records findings * *</li> <li>• Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture.</li> <li>• Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning.</li> <li>• Carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced?</li> <li>• Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton)</li> </ul>	<ul style="list-style-type: none"> <li>• Make a sundial and report on findings following observation of the changing place of the shadow, making conclusions as to what this demonstrates and how the sundial was used to indicate the time.</li> <li>• Research time zones.</li> <li>• Consider the views of scientists in the past and how evidence was used to deduce the shapes and movements of the Earth, Moon and planets before space travel.</li> </ul>	<p>water, pulling shapes e.g. boats along the surface of water.</p> <ul style="list-style-type: none"> <li>• Investigate the effects of air resistance in a range of contexts e.g. parachutes, spinners, sails on boats.</li> <li>• Explore how levers, pulleys and gears work.</li> <li>• Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.</li> </ul>	<ul style="list-style-type: none"> <li>• Draw and label appropriate scientific diagrams following use of secondary sources and first hand observations relating to the life cycle of a range of animals.</li> <li>• Compare and contrast the life cycles of different living things and present findings identify which insects complete which type of metamorphosis and present findings identify the key differences between some amphibians – for example, toads and frogs, and present findings in different forms.</li> <li>• Use data to compare and find patterns, for example to compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth/Look for patterns between the size of an animal and its expected life span).</li> </ul>	
	<p><b>School Context (Examples)</b></p>	<p>Pupils might work scientifically by investigating questions such as ‘Which materials would be the most effective for making a warm jacket, or for wrapping ice cream to stop it melting?’</p>	<p>Visit to the Space Museum.</p> <ul style="list-style-type: none"> <li>• LOtC: Use playground to create role play of the solar system</li> </ul>		<ul style="list-style-type: none"> <li>• LOtC: “Pupils should study their local environment throughout the year and observe life-cycle changes in a variety of living things, for example plants in the vegetable garden or flower border, and animals in the local environment.”</li> </ul>	

Year 6						
<p><b>Upper KS2 End Points:</b></p> <ul style="list-style-type: none"> <li>• Has developed a deeper understanding of a wide range of scientific ideas through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.</li> <li>• Has encountered more abstract ideas and is beginning to recognise how these help them to understand and predict how the world operates.</li> <li>• Is beginning to recognise that</li> </ul>	Term	Autumn		Spring 1	Spring	Summer
	Half Term Coverage	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
	Topic	Evolution and inheritance	Living things and their habitats	Animals, including humans	Light	Electricity
	Key Knowledge	<ul style="list-style-type: none"> <li>• All living things have offspring of the same kind. The offspring are not identical to their parents and vary.</li> <li>• Plants and animals have characteristics that make them suited (adapted) to their environment.</li> <li>• If the environment changes rapidly some variations may not suit the new environment and will die. If it changes slowly, animals and plants</li> </ul>	<ul style="list-style-type: none"> <li>• Plants can be divided broadly into two main groups - flowering plants and nonflowering plants.</li> <li>• Living things can be formally grouped according to characteristics.</li> <li>• Animals can be divided into two main groups - vertebrates and invertebrates.</li> <li>• Each group has common characteristics.</li> </ul>	<ul style="list-style-type: none"> <li>• Can 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</li> </ul>	<ul style="list-style-type: none"> <li>• Light appears to travel in straight lines.</li> <li>• Knows and can explain that objects are seen because they give out or reflect light into the eye.</li> <li>• Knows and can 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> </ul>	<ul style="list-style-type: none"> <li>• that the brightness of a bulb, or the volume of a buzzer, correlates with the voltage of cells used in the circuit.</li> <li>• Knows and can 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> </ul>

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<p>scientific ideas change over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative fair tests and finding things out using a wide range of secondary sources of information.</p> <ul style="list-style-type: none"> <li>• Is able to draw conclusions based on their data and observations, using evidence to justify their ideas and their scientific knowledge and understanding to explain their findings.</li> </ul>		<p>with variations that are best suited survive and reproduce.</p> <ul style="list-style-type: none"> <li>• Over a very long period of time these characteristics may be so different that a new species is created. This is evolution.</li> <li>• Fossils give us evidence of what lived on the Earth millions of years ago scientists such as Darwin and Wallace observed how living things adapt to different environments.</li> </ul> <p><b>For instance: Fossils for kids</b></p> <p><a href="http://www.fossilsforkids.com/">http://www.fossilsforkids.com/</a></p>	<p><b>For instance: Scientific Classification</b></p> <p><a href="https://www.ducksters.com/science/scientific_classification.php">https://www.ducksters.com/science/scientific_classification.php</a></p>	<p>lifestyle on the way the body functions.</p> <ul style="list-style-type: none"> <li>• Knows and can describe the way in which nutrients and water are transported within animals, including humans.</li> </ul>	<ul style="list-style-type: none"> <li>• Knows and can explain, with reference to how light travels, why shadows have the same shape as the objects that cast them.</li> </ul> <p><b>For instance: The Human Eye</b></p> <p><a href="https://www.bbc.com/education/clips/zf9c87h">https://www.bbc.com/education/clips/zf9c87h</a></p>	<ul style="list-style-type: none"> <li>• Knows the effect of adding more components to a circuit with one cell and the effect of adding multiple cells.</li> <li>• Knows and can use the recognised symbols to represent a simple circuit in a diagram.</li> </ul> <p><b>For instance: Using electricity to make games and activities</b></p> <p><a href="https://www.bbc.com/education/clips/z7k3cdm">https://www.bbc.com/education/clips/z7k3cdm</a></p>
	<p><b>Cross Curricular Links (Examples)</b></p>	<p>Literacy: Write a biography of a scientist.</p>	<p>Classify plants and animals and record conclusions from the use of classification keys</p>	<ul style="list-style-type: none"> <li>• Literacy: Report Writing <ul style="list-style-type: none"> <li>• Maths Graphs and Data Collection Analyse whole class data after investigation to compare and reflect on findings and draw conclusions</li> </ul> </li> <li>• PE - Physical Exercise</li> <li>• PSHE - Healthy Eating</li> <li>• D&amp;T - Healthy Meals</li> </ul>	<p>Measure and record the angle of incidence and angle of reflection using a protractor and detailed diagram</p>	<p>Spring Term DT Project incorporates mechanics alongside electronics.</p>
<p><b>Upper KS2 Skills End Points (Working Scientifically):</b></p> <ul style="list-style-type: none"> <li>• Plans different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</li> <li>• Takes measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</li> <li>• Records data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</li> <li>• Reports and presents 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.</li> <li>• Uses test results to make predictions to set up further comparative and fair tests.</li> <li>• Identifies scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>	<p><b>Key Skills</b></p>	<ul style="list-style-type: none"> <li>• Follow lines of enquiry to support Explanation of the process of evolution.</li> <li>• Demonstrate an understanding, with specific examples, of how an animal or plant has evolved over time e.g. penguin, peppered moth.</li> <li>• Identify characteristics that will make a plant or animal suited or not suited to a particular habitat.</li> <li>• Compare the ideas of Charles Darwin and Alfred Wallace on evolution.</li> <li>• Research the work of Mary Anning and understand how this provided evidence of evolution.</li> <li>• Referring to and using examples of fossil evidence that support the theory of evolution.</li> </ul>	<ul style="list-style-type: none"> <li>• Classify plants and animals and record conclusions from the use of classification keys.</li> <li>• Use information about the characteristics of an unknown animal or plant to assign it to a group.</li> <li>• Use secondary sources to learn about the formal classification system devised by Carl Linnaeus and why it is important.</li> <li>• Research an unfamiliar animal or plant using its characteristics to establish where it belongs in the classification system.</li> </ul>	<ul style="list-style-type: none"> <li>• Plan and conduct a scientific enquiry to identify different food groups.</li> <li>• Use labelled diagrams to support understanding of how nutrients and oxygen are delivered around the body.</li> <li>• Use information to identify the main components of the heart.</li> <li>• Predict what will happen to the heart during exercise.</li> <li>• Construct and analyse the variables that make a fair test.</li> <li>• Conduct a fair investigation on the effects of exercise on the heart.</li> <li>• Use scientific equipment to track results and record data using tables and graphs. **</li> <li>• Analyse whole class data after investigation to compare and reflect on findings and draw conclusions.</li> <li>• Use information acquired to write a scientific report on how the human circulatory system works.</li> </ul>	<ul style="list-style-type: none"> <li>• Plan and conduct a test to investigate how light travels and explain/present the findings.</li> <li>• Investigate the use of mirrors to reflect light and record using straight line diagrams to indicate the direction of light.</li> <li>• Use mirrors, torches and protractors to demonstrate and record how light is reflected in a mirror and how we see ourselves in a mirror.</li> <li>• Measure and record the angle of incidence and angle of reflection using a protractor and detailed diagram.</li> </ul>	<ul style="list-style-type: none"> <li>• Draw circuit diagrams of a range of simple series circuits, using recognised symbols.</li> <li>• Communicate structures of circuits using circuit diagrams with recognised symbols.</li> <li>• make electric circuits and demonstrate, following investigation, how variation in the working of particular components can be changed.</li> <li>• Plan and select resources for a fair scientific enquiry, deciding which variables to control.</li> <li>• Record results from an experiment using tables and graphs.</li> <li>• Evaluate and explain their investigation, results and conclusions.</li> </ul>
	<p><b>School Context examples</b></p>	<p>Adaptation Workshop at Weston Park Museum</p>	<p>Visit to Yorkshire Wildlife Park</p>	<p>Circulatory System Workshop at Eureka</p>		<p>Dragons Den celebration of inventions using electrical circuits</p>

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Y3 End Of Year Expectations:	Y4 End Of Year Expectations:	Y5 End Of Year Expectations:	Y6 End Of Year Expectations:
<p><b>Plants</b></p> <ul style="list-style-type: none"> <li>I describe the function of different parts of flowering plants and trees.</li> <li>I explore and describe the needs of different plants for survival.</li> <li>I explore and describe how water is transported within plants.</li> <li>I describe the plant life cycle, especially the importance of flowers.</li> </ul> <p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>I explain the importance of a nutritious, balanced diet.</li> <li>I explain how nutrients, water and oxygen are transported within animals and humans.</li> <li>I describe and explain the skeletal system of a human.</li> <li>I describe and explain the muscular system of a human.</li> <li>I describe the purpose of the skeleton in humans and animals.</li> </ul> <p><b>Rocks</b></p> <ul style="list-style-type: none"> <li>I compare and group rocks based on their appearance and physical properties, giving a reason.</li> <li>I describe how fossils are formed.</li> <li>I describe how soil is made.</li> <li>I describe and explain the difference between sedimentary and igneous rock.</li> </ul> <p><b>Light</b></p> <ul style="list-style-type: none"> <li>I describe what dark is (the absence of light).</li> <li>I explain that light is needed in order to see.</li> <li>I explain that light is reflected from a surface.</li> <li>I explain and demonstrate how a shadow is formed.</li> <li>I can explore shadow size and explain.</li> <li>I explain the danger of direct sunlight and describe how to keep protected.</li> </ul> <p><b>Forces and magnets</b></p> <ul style="list-style-type: none"> <li>I explore and describe how objects move on different surfaces.</li> <li>I explain how some forces require contact and some do not, giving examples.</li> <li>I explore and explain how objects attract and repel in relation to objects and other magnets.</li> <li>I predict whether objects will be magnetic and carry out an enquiry to test this out.</li> <li>I describe how magnets work.</li> <li>I predict whether magnets will attract or repel and give a reason.</li> </ul>	<p><b>Living things and their habitats</b></p> <ul style="list-style-type: none"> <li>I group living things in different ways.</li> <li>I use classification keys to group, identify and name living things.</li> <li>I create classification keys to group, identify and name living things (for others to use).</li> <li>I describe how changes to an environment could endanger living things.</li> </ul> <p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>I identify and name the parts of the human digestive system.</li> <li>I describe the functions of the organs in the human digestive system.</li> <li>I identify and describe the different types of teeth in humans.</li> <li>I describe the functions of different human teeth.</li> <li>I use food chains to identify producers, predators and prey.</li> <li>I construct food chains to identify producers, predators and prey.</li> </ul> <p><b>States of matter</b></p> <ul style="list-style-type: none"> <li>I group materials based on their state of matter (solid, liquid, gas).</li> <li>I describe how some materials can change state.</li> <li>I explore how materials change state.</li> <li>I measure the temperature at which materials change state.</li> <li>I describe the water cycle.</li> <li>I explain the part played by evaporation and condensation in the water cycle.</li> </ul> <p><b>Sound</b></p> <ul style="list-style-type: none"> <li>I describe how sound is made.</li> <li>I explain how sound travels from a source to our ears.</li> <li>I know how sounds are made, associating some of them with vibrating.</li> <li>I explore the correlation between pitch and the object producing a sound.</li> <li>I explore the correlation between the volume of a sound and the strength of the vibrations that produced it.</li> <li>I describe what happens to a sound as it travels away from its source.</li> </ul> <p><b>Electricity</b></p> <ul style="list-style-type: none"> <li>I identify and name appliances that require electricity to function.</li> <li>I construct a series circuit.</li> </ul>	<p><b>Living things and their habitats</b></p> <ul style="list-style-type: none"> <li>I describe the life cycle of different living things, e.g. mammal, amphibian, insect bird.</li> <li>I describe the differences between different life cycles.</li> <li>I describe the process of reproduction in plants.</li> <li>I describe the process of reproduction in animals.</li> </ul> <p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>I create a timeline to indicate stages of growth in humans.</li> </ul> <p><b>Properties and changes of materials</b></p> <ul style="list-style-type: none"> <li>I compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical &amp; thermal], and response to magnets).</li> <li>I describe how a material dissolves to form a solution; explaining the process of dissolving.</li> <li>I describe and show how to recover a substance from a solution.</li> <li>I describe how some materials can be separated.</li> <li>I demonstrate how materials can be separated (e.g. through filtering, sieving and evaporating).</li> <li>I know and can demonstrate that some changes are reversible and some are not.</li> <li>I explain how some changes result in the formation of a new material and that this is usually irreversible.</li> <li>I discuss reversible and irreversible changes.</li> <li>I give evidenced reasons why materials should be used for specific purposes.</li> </ul> <p><b>Earth and space</b></p> <ul style="list-style-type: none"> <li>I describe and explain the movement of the Earth and other planets relative to the Sun.</li> <li>I describe and explain the movement of the Moon relative to the Earth.</li> <li>I explain and demonstrate how night and day are created.</li> <li>I describe the Sun, Earth and Moon (using the term spherical).</li> </ul> <p><b>Forces</b></p> <ul style="list-style-type: none"> <li>I explain what gravity is and its impact on our lives.</li> <li>I identify and explain the effect of air resistance.</li> <li>I identify and explain the effect of water resistance.</li> <li>I identify and explain the effect of friction.</li> <li>I explain how levers, pulleys and gears allow a smaller force to have a greater effect.</li> </ul>	<p><b>Living things and their habitats</b></p> <ul style="list-style-type: none"> <li>I classify living things into broad groups according to observable characteristics and based on similarities &amp; differences.</li> <li>I describe how living things have been classified.</li> <li>I give reasons for classifying plants and animals in a specific way.</li> </ul> <p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>I identify and name the main parts of the human circulatory system.</li> <li>I describe the function of the heart, blood vessels and blood.</li> <li>I discuss the impact of diet, exercise, drugs and life style on health.</li> <li>I describe the ways in which nutrients and water are transported in animals, including humans.</li> </ul> <p><b>Evolution and inheritance</b></p> <ul style="list-style-type: none"> <li>I describe how the Earth and living things have changed over time.</li> <li>I explain how fossils can be used to find out about the past.</li> <li>I explain about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents).</li> <li>I explain how animals and plants are adapted to suit their environment.</li> <li>I link adaptation over time to evolution.</li> <li>I explain evolution.</li> </ul> <p><b>Light</b></p> <ul style="list-style-type: none"> <li>I explain how light travels.</li> <li>I explain and demonstrate how we see objects.</li> <li>I explain why shadows have the same shape as the object that casts them.</li> <li>I explain how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.</li> </ul> <p><b>Electricity</b></p> <ul style="list-style-type: none"> <li>I explain how the number &amp; voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer.</li> <li>I compare and give reasons for why components work and do not work in a circuit.</li> <li>I draw circuit diagrams using correct symbols.</li> </ul>



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|  | <ul style="list-style-type: none"><li>• I identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers).</li><li>• I draw a circuit diagram.</li><li>• I predict and test whether a lamp will light within a circuit.</li><li>• I describe the function of a switch in a circuit.</li><li>• I describe the difference between a conductor and an insulator; giving examples of each.</li></ul> |  |  |
|--|---|--|--|