


Year Group: 5/6 Year B					
	Autumn 1	Autumn 2	Spring 1 Spring 2	Summer 1	Summer 2
	Electricity (Y6)	Earth and Space (Y5)	Properties of Materials (Y5)	Living Things and their Habitats (Y6) <i>(May need over 6 weeks)</i>	Evolution and Inheritance (Y6)
<p><b>NC Objectives Covered</b> (Taken directly from the National Curriculum)</p> <p><b>Red= substantive knowledge</b></p> <p><b>Blue= disciplinary knowledge</b></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>	<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>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>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>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>
<p><b>Working Scientifically-disciplinary</b> (Taken from the PLAN materials/NC)</p>	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	Identifying scientific evidence that has been used to support or refute ideas or arguments Making observations and taking measurements.	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Making observations and taking measurements. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Select from a range of practical resources to gather evidence to answer their questions.	Classifying, grouping and identifying. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys. Communicating their findings.	

<p><b>Previous Knowledge</b> -What have children learnt previously that will support this next step?</p>	<ul style="list-style-type: none"> <li>Identify common appliances that run on electricity. (Y4 - Electricity)</li> <li>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. (Y4 - Electricity)</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. (Y4 - Electricity)</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. (Y4 - Electricity)</li> <li>Recognise some common conductors and insulators, and associate metals with being good conductors. (Y4 - Electricity)</li> </ul>	<ul style="list-style-type: none"> <li>Explore the natural world around them. (Reception – Earth and space)</li> <li>Describe what they see, hear and feel whilst outside. (Reception – Earth and space)</li> <li>Observe changes across the four seasons. (Y1 - Seasonal changes)</li> </ul> <p>Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)</p>	<ul style="list-style-type: none"> <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. (Y2 - Uses of everyday materials)</li> <li>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)</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. (Y3 - Forces and magnets)</li> <li>Compare and group materials together, according to whether they are solids, liquids or gases. (Y4 - States of matter)</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). (Y4 - States of matter)</li> <li>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. (Y4 - States of matter)</li> </ul>	<ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats)</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats)</li> <li>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats)</li> </ul>	<ul style="list-style-type: none"> <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. (Y2 - Living things and their habitats)</li> <li>Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)</li> <li>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)</li> <li>Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks)</li> <li>Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)</li> <li>Describe the life process of reproduction in some plants and animals. (Living things and their habitats - Y5)</li> </ul>
<p><b>Misconceptions</b> -What are the common misconceptions in knowledge for this unit?</p>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>larger-sized batteries make bulbs brighter</li> <li>a complete circuit uses up electricity</li> <li>components in a circuit that are closer to the battery get more electricity</li> </ul>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>the Earth is flat</li> <li>the Sun is a planet</li> <li>the Sun rotates around the Earth</li> <li>the Sun moves across the sky during the day</li> <li>the Sun rises in the morning and sets in the evening</li> <li>the Moon appears only at night</li> <li>night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.</li> </ul>	<p>Lots of misconceptions exist around reversible and irreversible changes, including around the permanence or impermanence of the change. There is confusion between physical/chemical changes and reversible and irreversible changes. They do not correlate simply. Chemical changes result in a new material being formed. These are mostly irreversible. Physical changes are often reversible but may be permanent. These do not result in new materials e.g. cutting a loaf of bread. It is still bread, but it is no longer a loaf. The shape, but not the material, has been changed.</p> <p>Some children may think:</p> <ul style="list-style-type: none"> <li>thermal insulators keep cold in or out</li> <li>thermal insulators warm things up</li> <li>solids dissolved in liquids have vanished and so you cannot get them back</li> <li>lit candles only melt, which is a reversible change.</li> </ul>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>all micro-organisms are harmful</li> <li>Mushrooms are plants.</li> </ul>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>adaptation occurs during an animal's lifetime: giraffes' necks stretch during their lifetime to reach higher leaves and animals living in cold environments grow thick fur during their life</li> <li>offspring most resemble their parents of the same sex, so that sons look like fathers</li> <li>all characteristics, including those that are due to actions during the parent's life such as dyed hair or footballing skills, can be inherited</li> <li>cavemen and dinosaurs were alive at the same time.</li> </ul>

<p><b>Learning Sequence</b></p> <p>-Detail the learning sequence using key questions in an ordered sequence.</p> <p>-The questions should have a sequential build up to answer the overall learning challenge.</p>	<ol style="list-style-type: none"> <li>Can I create a simple circuit? (Recap Year 4 content)</li> <li>Can I use symbols to draw simple circuits?</li> <li>Can I understand how circuits are complete or incomplete?</li> <li>Can I compare and give reasons for how components function in a circuit?</li> <li>Can I investigate how the voltage can affect the brightness of a bulb?</li> </ol> <p>6 &amp; 7. Can I research a scientist?</p>	<ol style="list-style-type: none"> <li>What do I know about the Solar System?</li> <li>Can I describe the movement of the Earth, moon and other planets relative to the sun in the solar system?</li> <li>Can I explain day and night?</li> <li>Can I investigate how shadows change during the day?</li> <li>Can I compare the planets in our solar system?</li> <li>LC: Can I find out about what people thought about the Solar System in the past?</li> <li>Can I research a scientist?</li> </ol>	<ol style="list-style-type: none"> <li>LC: Can I explain the difference between a solid, a liquid and a gas? (Checking Year 4 knowledge is secure)</li> <li>Can I compare and group materials based on their everyday properties</li> <li>Can I form a solution and describe how to recover a substance from it?</li> <li>Can I carry out a fair test linked to solutions?</li> <li>Can I separate mixtures using filtering, sieving or evaporation? <i>Problem solving lesson.</i></li> <li>Can I explain the difference between a reversible and irreversible change?</li> <li>Can I set up an investigation to explore how well different materials can keep something warm? (Thermal insulators) <i>Planning</i></li> <li>Can I set up an investigation to explore how well different materials can keep something warm? (Thermal insulators) <i>Investigation</i></li> <li><i>Thermal investigation may need 3 weeks.</i></li> <li>Can I research a scientist?</li> </ol>	<ol style="list-style-type: none"> <li>Can I classify vertebrates? (Pre-assessment and Year 4 re-cap).</li> <li>Can I research and explain how invertebrates are classified?</li> <li>Can I identify and classify invertebrates?</li> <li>What is a micro-organism? Can I investigate the best conditions for mould to grow on bread?</li> <li>Can I classify and identify different types of plants?</li> <li>Can I classify and identify different types and species of plants?</li> <li>Can I find out about Carl Linnaeus and create a classification key based on his system?</li> </ol>	
<p><b>Curriculum End Points</b></p> <p>-What will children know and be able to do by the end of the unit?</p> <p>-What will the children produce to demonstrate this knowledge?</p>	<p>Children will make electric circuits and demonstrate how variation in the working of particular components, such as the brightness of bulbs, can be changed by increasing or decreasing the number of cells or using cells of different voltages.</p> <p>Children will know and be able to demonstrate that turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow.</p> <p>Children will be able to use recognised circuit symbols to draw simple circuit diagrams.</p>	<p>Children will 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.</p> <p>Children will make first-hand observations of how shadows caused by the Sun change through the day.</p>	<p>Children will be able to group and compare materials and explain their choices.</p> <p>Children will demonstrate how a solution can be made and then separated.</p> <p>Children will separate mixtures and choose the most appropriate way. Children will be able to explain the difference between reversible and irreversible changes and give examples.</p> <p>Children will conduct a comparative test to decide the best material for a specific job – Thermal insulation.</p> <p>Children will collect results and create a line graph.</p>	<p>Children will be able to write about and use diagrams to explain characteristics that explain why an animal belongs to a particular group.</p> <p>Children will use classification materials to identify unknown plants and animals.</p> <p>Children will investigate plants and invertebrates in their local environment.</p> <p>Children will create their own classification keys for plants and animals.</p> <p>Children will set up an investigation to see how micro-organisms spread/grow.</p>	

<p><b>Knowledge Sentences</b> -Using the end points, what are the key statements children need to remember by the end of the unit? (I know that...)</p> <p>(To share with children when it is taught during the unit)</p>	<ol style="list-style-type: none"> <li>I know that a simple circuit can include cells, wires and components such as bulbs, switches, buzzers and motors.</li> <li>I can draw symbols to represent wires, cells, bulbs, motors and switches. (Display symbols)</li> <li>I know that a complete circuit is when electricity can travel around the whole circuit. A switch can turn this on (closed) or off (open).</li> <li>I know that the greater the number of cells the louder, quicker or brighter a component will work and that the more components I add the less well they will work.</li> <li>I know that the more cells I add the brighter the bulb will become. I know that the more bulbs I add to the circuit the dimmer they will shine.</li> <li>I can name and tell you about 1 or more scientists involved in electricity from the past and current day.</li> </ol>	<ol style="list-style-type: none"> <li>I know that the Sun is a star. It is at the centre of our solar system.</li> <li>I know that the 8 planets travel around the Sun in fixed orbits. I know that the sun, earth and moon are spherical bodies.</li> <li>I know that the Earth takes 365 ¼ days to complete its orbit around the sun. The earth rotates (spins) on its axis. As the earth rotates, half faces the Sun (here it is day) and half is facing away from the Sun (night). I know that the moon orbits the earth. I know that it takes about 28 days to complete its orbit.</li> <li>I know that shadows change during the day because of the position of the sun in the sky which is caused because the earth is spinning on it's axis.</li> <li>I know that there are 8 planets and can name them in order. (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune)</li> <li>I can explain how our understanding of the Solar System has changed over time.</li> <li>I can name and tell you about 1 or more scientists involved in space exploration and discovery.</li> </ol>	<ol style="list-style-type: none"> <li>A) I can explain that in a solid the molecules are close together, in a liquid they are more spaced apart and can move around and in a gas they are very spaced apart.  B) I can give an example of each.  C) I can explain that a solid becomes a liquid through melting; a liquid becomes a gas through evaporation when heated; a gas becomes a liquid when it cools and this is condensation; a liquid becomes a solid when it cools (freezes) and solidifies.</li> <li>I know that there is a range of ways to group and compare materials including hardness, transparency, electrical and thermal conductivity and attraction to magnets.</li> <li>I know that some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. I can explain that evaporation will recover a solute from a solution</li> <li>I can carry out a fair test, choosing my own variables and using my knowledge about solutions.</li> <li>I know that materials/mixtures can be separated by using filtering/sieving and evaporation.</li> <li>I know that 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> <li>I know that materials have different uses based on their properties and can set up a comparative test to decide which is the best for a particular job.</li> <li>I know that materials have different uses based on their properties and can conduct a comparative test to decide which is the best for a particular job.</li> <li>I can use results to create a line graph and draw a conclusion.</li> <li>I can name and give information about a scientist.</li> </ol>	<ol style="list-style-type: none"> <li>I know that the 5 groups of vertebrates are: mammals, birds, fish, reptiles and amphibians.</li> <li>I know that invertebrates can be put into the following groups: insects, molluscs, worms, arachnids, crustaceans and myriapods.</li> <li>I can identify invertebrates in my local environment and can create a classification key.</li> <li>I know that micro-organisms include bacteria, fungi and viruses.</li> <li>I know that there are different species of plants that belong to each group. I can name some flowering and non-flowering plants in the local environment.</li> <li>As above</li> <li>I know who Carl Linnaeus and can explain what he invented.</li> </ol>		
<p><b>Key Vocabulary</b> (To share with children and add to working walls/knowledge mats)</p>	<p>Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage N.B. Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably.</p>	<p>Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets</p>	<p>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material</p>	<p>Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering</p>	<p>Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils</p>	
<p><b>What</b></p>	<p><b>Enrichment Activities</b> (trips, residential,</p>		<p>Wonderdome Astro – Physicist visit</p>		<p>Wildlife garden</p>	

	<b>speakers, SMSC)</b>					
	<b>Physical Resources (artefacts)</b>	Wires Batteries Bulbs Buzzers Switches Materials Motors		Sieves Materials to separate, dissolve etc Filter paper Containers/measuring jugs/cylinders PSTT – A scientist like me Standing on the shoulders of giants	Clipboards and outdoor observation equipment Equipment to collect insects Plants to observe	Chopsticks and tweezers
	<b>Cross Curricular learning (Include opportunities for writing and quality texts)</b>	Computing – using micro:bits in a circuit	Art - sketches		Computing – Branching databases	Mr Men Moth Origin of species The story of life  Darwin’s Dragons – English text
	<b>Local Learning including outdoor learning (These need editing)</b>		The playground provides a larger space to create models showing the movement of the Sun, Earth and Moon and the impact of this on day and night and the apparent movement of the Sun. Role play the movement of the planets around the sun.  Observe movement of shadows across the playground throughout the day to discuss the movement of the sun across the sky.		Pupils classify plants and animals found in the playground or wildlife garden.	Pupils talk about how the living things in the playground or local environment are adapted to suit the habitat in which they found them.
	<b>Opportunities for cultural Diversity</b>	Scientist – Science capital	Scientist – Science capital	Scientist – Science capital	Scientist – Science capital Citizen science	Scientist – Science capital