

Science Knowledge and Skills Progression 2020-21

	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Plants &amp; Rocks</b>	<p><i>This year is about observing plants</i> Use the school ground to watch how plants grow over time</p> <p><b>Working scientifically</b> Asking and answering questions e.g. How can we...? What would happen if...? Give opportunities to design practical, attractive environments such as taking care of the flowerbeds</p>	<p><i>This year is about careful observation of the parts of plants</i> Use the school grounds to identify and name a variety of common wild and garden plants including evergreen and deciduous trees Observe closely, draw and label the roots, stems, leaves, petals, flowers and fruits of some common plants</p> <p><b>Working scientifically</b> -observe closely, perhaps using magnifying glasses -compare and contrast familiar plants; describe how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees -keep records of how plants have changed over time, for example the leaves falling off trees and buds opening -compare and contrast what they have found out about different plants</p>	<p><i>This year is about the conditions plants need in order to grow</i> Design experiments to show that plants need water, light and suitable temperature to grow Summarise best conditions for growth</p> <p><b>Working scientifically</b> -observe and record, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observe similar plants at different stages of growth -set up a comparative test to show that plants need light and water to stay healthy</p>	<p><i>This year is about the functions of the different parts of a plant</i> Investigate how water is transported through plants Identify and describe the functions of different parts of the plant Explore how different plants have different requirements in order to live and grow e.g. cacti need dry conditions, water lilies need wet conditions Grow two courgettes- one in wet conditions and one in dry conditions Explore and describe the life cycle of flowering plants e.g. pollination, seed dispersal (video clips such as Life of Plants)</p> <p><b>Working scientifically</b> -compare the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser -discover how seeds are formed by observe the different stages of plant life cycles over a period of time -look for patterns in the structure of fruits that relate to how the seeds are dispersed -observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers</p> <p><b>Rocks</b> <a href="#">Link to Yr 2 – Geography – Alice Springs (Ayers Rock)</a> <i>The topic focus is the composition and formation of rocks and soil</i> Name and group a variety of rocks based on appearance and simple properties e.g. crystals, grains/ hard, rough, smooth, strong Identify how the different types of rocks are formed e.g. look at sedimentary,</p>			

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				<p>metamorphic and igneous rocks</p> <p>Identify/research where different rocks can be found around the UK e.g. coastal areas, volcanoes</p> <p><a href="#">Link to Year 5 Geography - Coasts</a></p> <p>-describe simply how fossils are formed and identify the animal the fossil comes from</p> <p>-Identify the different types of soils and where they can be found e.g. sandy soil, silty soil, peat, clay soil, chalky soil</p> <p><b><u>Working scientifically</u></b></p> <p>-observe rocks, including those used in buildings and exploring how and why they might have changed over time</p> <p>-use a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them</p> <p>-research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed</p> <p>-explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water</p> <p>-raise and answer questions about the way soils are formed</p>			
<p><b>Animals including humans</b></p>	<p><i>This year is about observing animals</i></p> <p>Name common animals and talk about how they change</p> <p>Visit local pet shop or visiting animals brought into school</p> <p>Visit local zoo to observe different animals</p> <p>Children compare how animals are similar/different to each other</p> <p><b><u>Working scientifically</u></b></p> <p>Draw pictures of animals</p>	<p><i>This year is about the structure of the body</i></p> <p>Identify and name common animals including classification e.g. carnivore, herbivore</p> <p>Describe and compare the structure of common animals</p> <p>Identify, name and label basic parts of the human body and the areas responsible for the various senses</p> <p><b><u>Working scientifically</u></b></p> <p>-use their observations to compare and contrast animals</p>	<p><i>This year is about requirements for healthy living</i></p> <p>Discuss the offspring of various animals and their adult form</p> <p>Find out the basic needs (air, water food and warmth) of animals and humans for survival</p> <p>Understand the importance of a healthy lifestyle for humans e.g. exercise, diet &amp; hygiene</p> <p><b><u>Working scientifically</u></b></p>	<p><i>This year looks more closely at healthy nutrition in animals</i></p> <p>Identify that animals do not make their own food and get nutrients from their food- they need the right balance of nutrition to survive</p> <p>Recognise the use of the skeleton and muscles needed for movement, protection and support</p> <p><b><u>Working scientifically</u></b></p> <p>-identify and group animals with and without skeletons</p>	<p><i>This year focuses on how the body processes food</i></p> <p>Identify different types of teeth and their simple functions</p> <p>Understand the functions of the basic parts of the digestive system</p> <p>Construct and interpret various food chains, identifying producers, predators and prey</p> <p><b><u>Working scientifically</u></b></p> <p>-compare the teeth of carnivores and herbivores</p>	<p><i>This year focuses on human development over time</i></p> <p>Describe the changes as humans develop to old age</p> <p><a href="#">Refer to SRE planning</a></p> <p><b><u>Working scientifically</u></b></p> <p>-research the gestation periods of other animals and compare them with humans</p> <p>-find out and record the length and mass of a baby as it grows</p> <p><a href="#">Link to Year 5 Maths – Spring 2 Measures</a></p>	<p><i>This year focuses on circulation &amp; healthy lifestyle</i></p> <p>Identify and name the main parts of the circulatory system and their functions</p> <p>Recognise the impact of a healthy lifestyle on the function of the body</p> <p>Describe the way nutrients and water are transported within the body</p> <p><b><u>Working scientifically</u></b></p> <p>-explore the work of scientists and scientific research about the relationship between diet,</p>

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		-describe how they identify and group them according to what they eat	-observe how different animals, including humans, grow -ask questions about what things animals need for survival and what humans need to stay healthy -suggest ways to find answers to their questions	and observing and comparing their movement -explore ideas about what would happen if humans did not have skeletons -research different food groups and how they keep us healthy and design meals based on what they find out	and suggest reasons for differences -find out what damages teeth and how to look after them -draw and discuss ideas about the digestive system and compare them with models or images		exercise, drugs, lifestyle and health
<b>Living things and their habitats</b>			<b><u>This year is about habitats and what they provide</u></b> Explore stems, roots and leaves of two plants- one alive and one dead Compare two different habitats- mountain and a rainforest Look at animals, their appearance, their homes, any camouflage, how much they need to eat Explore simple food chains between animals and plants e.g. cabbage- slug- toad- bird- fox Refer back to Y1 carnivore, herbivore and omnivore <b><u>Link to Yr 1 Geography – Study of local grounds (pond)</u></b> <b><u>Working scientifically</u></b> -sort and classify things according to whether they are living, dead or were never alive, and recording their findings using charts -describe how they decide where to place things and explore questions and talk about ways of answering them -construct a simple food chain that includes humans -describe the conditions in different habitats and micro-habitats and find out how the conditions affect the number and type(s) of plants and animals that live there		<b><u>This year is about environments and how they can change (e.g. the Amazon burning/ the polar ice caps melting)</u></b> Use the school grounds to classify living things e.g. plants, mini-beasts, pond-life, birds’ nests Recognise that environments can change due to positive and negative impact of humans e.g. deforestation, litter, plastic pollution <b><u>Link to Year 5 Geography – Coasts</u></b> <b><u>Link to Year 6 – Geography – South America</u></b> Explore how a change in the environment can pose dangers to living things e.g. polar ice caps melting means that polar bears starve <b><u>Working scientifically</u></b> -use and make simple guides or keys to explore and identify local plants and animals	<b><u>This year is about life cycles and reproduction in plants</u></b> Compare the life-cycles of mammals, amphibians, insects and birds e.g. whale, newt, ladybird, eagle <b><u>Use the school pond</u></b> Describe the process of reproduction in some plants and animals Compare flowering plants (lily) with a non-flowering plant (mint) Compare reproduction of mammals/ birds/ fish/ butterflies <b><u>Working scientifically</u></b> -observe and compare the life cycles of plants and animals in their local environment with other plants and animals around the world, asking questions and suggesting reasons for similarities and differences -grow new plants from different parts of the parent plant -observe changes in an animal over a period of time -compare how different animals reproduce and grow	<b><u>This year is about classifying living things</u></b> Classify living things into micro-organisms, plants and animals (birds, fish, mammals, reptiles, amphibians- look at some anomalies such as a duck-billed platypus or a seahorse) Include marsupials Explain reasons for groupings Research work of Carl Linnaeus <b><u>Working scientifically</u></b> -use classification systems and keys (flow diagram/ decision tree) to identify some animals and plants in the immediate environment -research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system <b><u>Link to Year 6 Geography – Biomes</u></b> <b><u>Link to Year 6 Geography – Fieldwork – secondary sources</u></b>
<b>Materials &amp; States of Matter</b>	<b><u>This year is about recognising the similarities and differences between materials</u></b> Look at a range of objects around school/ in the classroom and explore what is similar/different about them	<b><u>This year is about properties of materials</u></b> Name the material different objects are made of Observe wood, metal, plastic, paper, glass, and describe their properties (smooth, rough, hard, soft,	<b><u>This year is about the suitability of a material for its purpose and how objects can change shape</u></b> Identify which materials are suitable for making a table, house, cup, box		<b><u>This year focuses on states of matter connected to the water cycle</u></b> Group materials based on the state of matter Observe that some materials change state when they are heated or cooled and	<b><u>This year is about reversible and irreversible changes</u></b> Group everyday materials based on their properties e.g. hardness, solubility Demonstrate and explain reversible and irreversible changes e.g. dissolving, filtering	

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	<p>Look at a selection of materials e.g. sponge, wood, metal, fabric, cotton wool, plastic Children to talk about what is similar/different about them <b>Working scientifically</b> Explore a range of materials by touching, observing with magnifying glass</p>	<p>transparent, opaque, strong, weak, flexible, absorbent) <b>Working scientifically</b> -perform simple tests to explore questions, for example: How could you test how hard a material is? How could you test if a material is absorbent? - group object based on their properties into rough and smooth, hard and soft, strong and weak</p>	<p>Explain why they are suitable based on their properties e.g. strong, transparent, flexible Compare two materials and decide which is the most suitable for a particular situation e.g. a wooden bench for the garden, a cup for children Explore how the shapes of plasticine, rubber band, paper clip, solid objects can be changed by squashing, bending, stretching <b>Working scientifically</b> -identify and compare the uses of everyday materials in and around the school with materials found in other places e.g. Copnor road, park. Record their finding</p>		<p>research the temperature at which this happens Identify the role of evaporation and condensation within the water cycle and the speed of evaporation based on temperature <b>Working scientifically</b> -group and classify a variety of different materials -explore the effect of temperature on substances such as chocolate, butter, cream and the temperature at which changes happen <a href="#">Link to Year 4 Maths – Spring 1 – Negative Numbers</a> -observe and record evaporation over a period of time <a href="#">Link to Year 4 Maths – Spring 2/Summer 2 Statistics</a> <a href="#">Link to Year 6 – Geography – Rivers (South America)</a></p>	<p>Explain how some changes result in the formation of new materials <b>Working scientifically</b> -carry out tests to answer questions, for example, Which materials would be the most effective for making a warm jacket?</p>	
<p><b>Seasonal Changes/ Earth &amp; Space</b></p>		<p><i>This topic focuses on comparing the seasons through experiences</i> Describe the differences of the four seasons e.g. changes in weather, temperature, length of daylight <a href="#">Link to other countries where they do not have 4 seasons and discuss why they do not</a> <b>Working scientifically</b> -Record the weather a week and make tables and charts about the weather (pictogram) <a href="#">Link to Year 1 Maths – Pictograms</a></p>				<p>Describe the movement of Earth and other planets in relation to the Sun Describe the movement of the Moon in relation to the Earth Use the Earth, Moon and Sun to explain how we experience day and night and the movement of the Sun across the sky <b>Working scientifically</b> Compare the time of day at different places on the Earth <a href="#">Link to Year 5 Geography – Greenwich Meridian (Explorers)</a> <a href="#">Link to Year 6 Geography – Time Zones (South America)</a> Create simple models of the solar system Construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day Find out why some people think that structures such as Stonehenge might have been used as astronomical clocks Identify scientific evidence that has been used to support or refute ideas or arguments</p>	

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<p><b>Light and Sound</b></p>				<p><b><i>This year is about sunlight and shadows</i></b>                  Notice that light can be reflected from surfaces                  Recognise that sunlight can be dangerous and ways to protect our eyes                  Understand how shadows are formed and find patterns in the way that their sizes change  <b><u>Working scientifically</u></b>                  -look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes</p>	<p>Identify how sound is made and recognise how vibrations travel through a medium to the ear                  Find patterns between pitch and the size of the instrument/object and volume and how hard it is plucked/hit                  Recognise how distance effects the volume of sound. (Don't use a tin can telephone!)  <b><u>Working scientifically</u></b>                  -make earmuffs from a variety of different materials to investigate which provides the best insulation against sound                  -make and play their own string instruments by using what they have found out about pitch and volume</p>		<p><b><i>This year is about light travelling in straight lines</i></b>                  Recognise that light travels in straight lines and use this to explain how we see                  Explain why shadows have the same shape as the objects that cast them  <b><u>Working scientifically</u></b>                  -decide where to place rear-view mirrors on cars                  -design and make a periscope and using the idea that light appears to travel in straight lines to explain how it works                  -investigate the relationship between light sources, objects and shadows by using shadow puppets                  -construct a route for light to be reflected around</p>
<p><b>Forces and Magnets</b></p>				<p>Compare how things move on different surfaces (push, pull – release of energy, friction – but not measuring it)                  Notice that magnets can act at a distance unlike others that need contact                  Observe and predict whether two magnets will attract or repel based on which poles are facing                  Group everyday materials based on their attraction to magnets  <b><u>Working scientifically</u></b>                  -compare how different things move and grouping them                  -raise questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions                  -explore the strengths of different magnets and finding a fair way to compare them                  -sort materials into those that are magnetic and those that are not                  -look for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the</p>		<p>Use gravity to explain why unsupported objects fall towards the Earth                  Identify the effects of air resistance, water resistance and friction                  Recognise how levers and pulleys help smaller forces to have more effect  <b><u>Working scientifically</u></b>                  -design and make a variety of parachutes and carrying out fair tests to determine which designs are the most effective                  -explore resistance in water by making and testing boats of different shapes                  -design and make products that use levers, pulleys, gears and/or springs and explore their effects</p>	

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				<p>magnet or which pole faces another</p> <p>- identify how these properties make magnets useful in everyday items and suggesting creative uses for different magnets</p> <p><a href="#">Link to Year 5 Geography – Explorers</a></p>			
<p><b>Electricity</b></p>					<p><i><b>This year focuses on constructing simple and complete circuits</b></i></p> <p>Identify common electrical appliances</p> <p>Construct a simple circuit and name the various parts</p> <p>Understand the role of a switch within a circuit and how closing the loop makes a complete circuit</p> <p>Recognise common conductors and insulators and identify metals that are good conductors</p> <p><b><u>Working scientifically</u></b></p> <p>- observe patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit</p>		<p>Associate the bulb brightness or buzzer volume with the voltage connected and give reasons for variations</p> <p>Use recognised symbols when drawing circuit diagrams</p> <p><b><u>Working scientifically</u></b></p> <p>- systematically identify the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit</p>
<p><b>Evolution &amp; Inheritance</b></p>							<p>Recognise that living things have changed over time and how fossils provide information about living things from the past</p> <p>Recognise that the offspring of living things are not identical to their parents or each other</p> <p>Explain how animals and plants have adapted to suit their environment and that a daption may lead to evolution</p> <p><b><u>Working scientifically</u></b></p> <p>- observe and raise questions about local animals and how they are adapted to their environment</p> <p>- compare how some living things are adapted to survive in extreme conditions</p>

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							<p><a href="#">Link to Year 5 Geography - Explorers</a></p> <ul style="list-style-type: none"><li>-analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four</li><li>-identify scientific evidence that has been used to support or refute ideas or arguments</li></ul> <p><a href="#">Link to Year 6 Geography - Biomes</a></p>
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