



THROUGHOUT THE YEAR	Many plants have an annual cycle - having buds, flowers, seeds/berries at certain times in the year. This should be referred to when teaching the relevant topic.				
TOPIC	ANIMALS INCLUDING HUMANS (SKELETONS AND NUTRITION)	ROCKS	FORCES & MAGNETS	LIVING THINGS AND THEIR HABITATS (PLANTS)	LIGHT
KEY SCIENTIST	Charlotte Armah (Biologist)	Sanjeer Gupta (Rocks)	Isaac Newton (Physicist)	Anna Atkins (Botanist & Photographer)	Lewis Latimer (Inventor)
NATIONAL CURRICULUM OBJECTIVES (SUBSTANTIVE KNOWLEDGE)	<ul style="list-style-type: none"> <li>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</li> <li>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> </ul>	<ul style="list-style-type: none"> <li>compare 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 how things move on different surfaces</li> <li>Know how a simple pulley works and use making lifting an object simpler</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 predict whether two magnets will attract or repel each other, depending on which poles are facing.</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>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>Recognise that they need light in order to see things and that dark is the absence of light</li> <li>Notice that light is reflected from surfaces</li> <li>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>Recognise that shadows are formed when the light from a light source is blocked by a solid object</li> <li>Find patterns in the way that the size of shadows change.</li> </ul>
SCIENTIFIC ENQUIRY (DISCIPLINARY KNOWLEDGE)	<ul style="list-style-type: none"> <li>Use ideas to pose questions, independently about the world around them.</li> <li>Discuss investigation methods and describe simple fair tests. Complete fair tests by following instructions.</li> <li>Make decisions about what to observe during an investigation.</li> <li>Talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships.</li> <li>Record their findings using scientific language and present in note form, writing frame, diagrams, tables and charts.</li> </ul>	<ul style="list-style-type: none"> <li>Use ideas to pose questions, independently about the world around them.</li> <li>Discuss investigation methods and describe simple fair tests. Complete fair tests by following instructions.</li> <li>Make decisions about what to observe during an investigation.</li> <li>Talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships.</li> <li>Record their findings using scientific language and present in note form, writing frame, diagrams, tables and charts.</li> </ul>	<ul style="list-style-type: none"> <li>Use ideas to pose questions, independently about the world around them.</li> <li>Discuss investigation methods and describe simple fair tests. Complete fair tests by following instructions.</li> <li>Make decisions about what to observe during an investigation.</li> <li>Record their findings using scientific language and present in note form, writing frame, diagrams, tables and charts.</li> </ul>	<ul style="list-style-type: none"> <li>Use ideas to pose questions, independently about the world around them.</li> <li>Discuss investigation methods and describe simple fair tests. Complete fair tests by following instructions.</li> <li>Make decisions about what to observe during an investigation.</li> <li>Talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships.</li> <li>Record their findings using scientific language and present in note form, writing frame, diagrams, tables and charts.</li> </ul>	<ul style="list-style-type: none"> <li>Use ideas to pose questions, independently about the world around them.</li> <li>Discuss investigation methods and describe simple fair tests. Complete fair tests by following instructions.</li> <li>Make decisions about what to observe during an investigation.</li> <li>Record their findings using scientific language and present in note form, writing frame, diagrams, tables and charts.</li> </ul>
SUGGESTED TASKS	<p>Food and nutrition:</p> <ul style="list-style-type: none"> <li>Research different food groups and what benefits they have for us display on a poster/IT program</li> <li>Design a meal to keep a child healthy and an adult healthy (variate with Vegetarian, Coeliac, allergy based)</li> <li>Compare and contrast the diets of different animal groups and let pupils decide on how to group them</li> </ul> <p>Skeletons:</p> <ul style="list-style-type: none"> <li>Identify and groups animals with and without a skeleton using videos as evidence so that movement can be observed</li> <li>Explore own skeleton in PE and why we have them. Label skeletons</li> <li>Use APPs to look inside the body: Why do we have muscles? What function does: the heart have? Lungs? Stomach? Brain, Intestine?</li> </ul>	<ul style="list-style-type: none"> <li>Visit forest schools and collect soil samples from different areas.</li> <li>Use magnifying glasses to sort, rocks, organic matter (leaves and roots etc), seeds etc</li> <li>Use magnifying glasses to observe and classify rocks (grains, crystals and fossils).</li> <li>Observe fossils in sedimentary rocks predicting how they died, where they lived.</li> <li>Sort rock by location (including metamorphic volcanic)</li> <li>Sort and organise rocks from properties when rubbed together, scratched or submerged in water.</li> <li>Investigate: which rock would make the best house, sea defence etc</li> </ul>	<ul style="list-style-type: none"> <li>Explore bar, ring, button and horseshoe magnets.</li> <li>Order and rank magnets on strength.</li> <li>Sort materials by attraction or repelling properties.</li> <li>Label the poles and explain that this technology is used for compass'</li> <li>Explore which ends of magnets attract or repel and draw diagrams to show this.</li> <li>Draw diagrams to show that a magnet does not need direct contact to act.</li> <li>Select the best magnet for the job and explain why</li> <li>Research some of the biggest magnets (including Earth) and some of the smallest and note their uses.</li> </ul>	<ul style="list-style-type: none"> <li>Label plants to the jobs the part do (roots, stem, leaves, flowers)</li> <li>Observe the the roots of different plants (including potatoes) and predict why they might be different. Sketch and label.</li> <li>Cut white carnations and use dye to show the job of a stem- draw and annotate findings over several days</li> <li>Look at the job of light, water and fertiliser on plants</li> <li>Cut up and observe a variety of fruits, organising and sorting by the methods of seed dispersal (animal digestion, animal carried, wind, water or explosion). Watch videos for evidence.</li> <li>Design own plant and explain how it's seeds will be dispersed/ spread.</li> <li>Design a plant to survive a certain habitat/ environment.</li> </ul>	<ul style="list-style-type: none"> <li>Play mirror games to show light reflecting off different surfaces including mirrored surfaces</li> <li>Look at light travelling, how does it change when water is involved? (pencil, water, clear cup)</li> <li>Investigate shadows including moving the light source further away and closer</li> <li>Measure and record the length or height of shadows and record as a bar chart</li> <li>Identify different light sources (bulbs and other electrical lights and the sun)</li> <li>Investigate why we should never look at the sun directly, even when wearing sun glasses.</li> <li>Create pin hole cameras to do this safely.</li> </ul>

<b>STICKY KNOWLEDGE</b>	<ul style="list-style-type: none"> <li>• Different animals are adapted to eat different foods.</li> <li>• To stay healthy, humans need to exercise, eat a healthy diet and be hygienic.</li> <li>• Many animals have skeletons to protect vital organs inside the body, allow movement and support the body and stop it from falling on the floor.</li> <li>• Muscles are connected to bones and move them when they contract.</li> <li>• Movable joints connect bones.</li> </ul>	<ul style="list-style-type: none"> <li>• Some rocks are natural and some are human-made.</li> <li>• There are 3 types of naturally occurring rock</li> <li>• Soil is the uppermost layer of the earth and is made up of different things.</li> <li>• Different plants grow in different soils.</li> <li>• Fossils tell us what has happened before (they give us evidence) and show that living things have changed over time.</li> <li>• Fossils are most commonly found in sedimentary rock</li> <li>• Palaeontologists use Fossils to find out about the past.</li> </ul>	<ul style="list-style-type: none"> <li>• Forces can be pushes or pulls.</li> <li>• Friction is a force that acts between two surfaces or objects that are moving (or trying to move) across each other.</li> <li>• Magnets exert attractive and repulsive forces on each other.</li> <li>• Magnets exert non-contact forces, which work through some materials.</li> <li>• Magnets exert attractive forces on some materials which are affected by magnet strength, object mass, distance from object and object material.</li> </ul>	<ul style="list-style-type: none"> <li>• Plants are producers, they make their own food.</li> <li>• Their leaves absorb sunlight and carbon dioxide.</li> <li>• Plants have roots, which provide support and draw water from the soil.</li> <li>• Flowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed production.</li> <li>• Seed dispersal improves a plant's chances of successful reproductions</li> <li>• Seeds/bulbs require the right conditions to germinate and grow.</li> <li>• Seeds contain enough food for the plant's initial growth.</li> </ul>	<ul style="list-style-type: none"> <li>• There must be light for us to see; without light it is dark</li> <li>• We need light to see things, even shiny things.</li> <li>• Transparent materials let light through them and opaque materials don't let light through.</li> <li>• Beams of light bounce off some materials (reflection).</li> <li>• Smooth, shiny materials reflect light beams better than bumpy, non-shiny materials.</li> <li>• Light comes from a source.</li> <li>• Reflective materials can be very useful e.g. cat's eyes, hi-vis jacket.</li> </ul>
<b>PRIOR LEARNING</b> 	<p>Year 1 - Animals including humans (Identifying and classifying animals and body parts)</p> <p>Year 2 - Animals including humans (Offspring growing into adults and animals basic needs) Healthy Me (Exercise, diet and hygiene)</p>	<p>Year 1 - Everyday materials (Identifying and simple properties of materials)</p> <p>Year 2 - Use of materials. (Suitability of materials and changes of solids)</p>	<p>Year 1 - Everyday materials (Identifying and simple properties of materials)</p> <p>Year 2 - Use of materials. (Suitability of materials and changes of solids)</p>	<p>Year 1 - Plants (Identify and describe basic structure)</p> <p>Year 2 - Living things and their habitats (Identifying habitats and needs) &amp; Plants (How seeds and bulbs grow and mature and plants needs)</p>	
<b>FUTURE LEARNING</b> 	<p>Year 4 - Animals including humans (Food chains, Teeth and Digestion)</p> <p>Year 5 - Animals including humans (Changes in human development)</p> <p>Year 6 - Animals including humans (Circulatory system and how bodies function)</p>	<p>Year 4 - States of Matter</p> <p>Year 5 - Properties and changes of materials</p>	<p>Year 5 - Forces</p>	<p>Year 4 - Living things and their habitats (Grouping &amp; Identifying and Environmental changes)</p> <p>Year 5 - Living things and their habitats (Life Cycles and reproduction)</p> <p>Year 6 - Living things and their habitats (Classification)</p>	<p>Year 4 - Sound</p> <p>Year 6 - Light</p>
<b>VOCABULARY</b>	<p>amount, animals, body parts, carbohydrates, diet, eat, endoskeleton, exoskeleton, fats, fibre, food, food groups, functions, healthy, humans, invertebrates, joints, meals, minerals, movement, muscles, nutrition, protection, protein, skeletons, support, types, vertebrates, vitamins</p>	<p>appearance, buildings, crystals, formed, fossils, grains, gravestones, organic matter, physical properties, rocks, sedimentary rock, soils, trapped</p>	<p>attract, compass, contact, distance, forces, magnetic, materials, move, objects, poles, properties, pull, push, repel, strength, surface, uses</p>	<p>air, anchor, fertiliser, flowering plants, flowers, functions, growth, leaves, life, life cycle, light, nutrients, nutrition, plants, pollination, reproduction, requirements, room to grow</p>	<p>absence, beam, blocked, danger, dark, distance, glare, light, light source, mirror, opaque, patterns, protect, ray, reflect, shadows, Sun, surfaces</p>
<b>SCIENCE CAPITAL</b>	<ul style="list-style-type: none"> <li>• Who uses knowledge of skeletons and nutrition in their occupation?</li> <li>• Nutrition at home/school/local community.</li> <li>• Nutrition and knowledge of body to athletes.</li> </ul>	<ul style="list-style-type: none"> <li>• Where fossils are found</li> <li>• Who needs knowledge of soils in their jobs?</li> <li>• How fossils have an impact on our lives.</li> </ul>	<ul style="list-style-type: none"> <li>• Magnets/forces used in the home.</li> <li>• Use of magnets/forces in the wider world.</li> <li>• Jobs that rely on the use of magnets/forces.</li> </ul>	<ul style="list-style-type: none"> <li>• Who might rely on knowledge of plants for a job?</li> <li>• Plants in the home.</li> <li>• Plants in the wider world and importance of them.</li> </ul>	<ul style="list-style-type: none"> <li>• How is light used in our world? Real world applications.</li> <li>• Who relies on light for their occupation?</li> <li>• How staying safe from the sun is important to their lives.</li> </ul>