



Haresfield CE Primary School
Progression of Knowledge and Skills in Science
Year A LKS2

Year	Knowledge	Skills																								
Y3 / Y4 Term 1 Year B	<p><u>Focus:</u> Rocks _ <u>Enrichment:</u> Stroud Museum / mammoth tooth</p> <p><u>National Curriculum Knowledge</u></p> <ul style="list-style-type: none"> ✓ compare and group together different kinds of rocks on the basis of their appearance and simple physical properties ✓ describe in simple terms how fossils are formed when things that have lived are trapped within rock ✓ recognise that soils are made from rocks and organic matter <p><u>Prior Learning:</u> Hard or soft, rough or smooth? KS1</p> <p><u>Contributing towards:</u> Why aren't there dinosaurs in Stroud UKS2</p>	<p><u>Knowledge Skills and Understanding</u></p> <ul style="list-style-type: none"> • compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • describe in simple terms how fossils are formed when things that have lived are trapped within rock • recognise that soils are made from rocks and organic matter <p><u>Working Scientifically</u></p> <ul style="list-style-type: none"> • observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; • using 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. • research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. • 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. • raise and answer questions about the way soils are formed. • making systematic and careful observations • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • using straightforward scientific evidence to answer questions or to support their findings. 																								
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These gemstones have been polished and cut to make them into jewellery.</td> </tr> <tr> <td>To group rocks according to their hardness</td> <td>Some rocks are hard and some rock are softer and crumble easily. (Investigation scratch test rocks)</td> <td>Physical properties – features that can be observed or measured</td> <td> The diagram shows various rocks being scratched with a tool to test their hardness.</td> </tr> <tr> <td>To carry out a fair test and observe over time (which rocks are permeable)</td> <td>Permeable rocks, such as sandstone, let water pass through them. Impermeable rocks, such as marble, do not let water pass through them.</td> <td>Permeable - If a substance is permeable, it will allow water to pass through it. 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Y3 / Y4 Term 3 Year B	<p>Focus: Skeletons Muscles and Nutrition - What's inside my body? Enrichment: invite visitor with variety of creatures</p> <p>National Curriculum Knowledge -</p> <ul style="list-style-type: none"> ✓ 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 ✓ identify that humans and some other animals have skeletons and muscles for support, protection and movement <p>Prior Learning: How can I stay healthy? KS1</p> <p>Contributing towards : Which bits of my body could I live without? UKS2</p>				<p>Knowledge Skills and Understanding</p> <ul style="list-style-type: none"> • 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 • identify that humans and some other animals have skeletons and muscles for support, protection and movement 																				
	<p>Objective</p> <p>To Explain how the skeleton supports the body and gives it protection.</p>	<p>Sticky Knowledge</p> <p>All humans have a skeleton made up of many bones. The bones of the human skeleton are solid, strong and are various shapes A human adult skeleton has 206 bones</p>	<p>Key Vocabulary</p> <p>Skeleton - A skeleton is the set of bones inside an animal's body that supports its shape, helps it move, and protects important parts.</p>	<p>Resources</p>	<p>Working Scientifically</p> <ul style="list-style-type: none"> • identifying and grouping animals with and without skeletons • observing and comparing their movement; • exploring ideas about what would happen if humans did not have skeletons. • compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. • research different food groups and how they keep us healthy, • design meals based on what they find out. <p>Performing simple tests</p> <ul style="list-style-type: none"> • plan and carry out an investigation • measure carefully and record results • collect data and look for patterns • write a conclusion from what they have found out 																				
	<p>To plan and carry out an investigation to see if bones grow as we get older. Look for patterns in data and write a conclusion</p>	<p>Bone is a living thing. Our bones change throughout our lives.</p>	<p>Conclusion - In a conclusion, scientists explain what the results show or mean.</p>	<table border="1"> <thead> <tr> <th>Age of person (years)</th> <th>Circumference of skull (cm)</th> <th>Age of person (years)</th> <th>Length of foot (cm)</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>41</td> <td>2</td> <td>13</td> </tr> <tr> <td>7</td> <td>47</td> <td>7</td> <td>20</td> </tr> <tr> <td>16</td> <td>54</td> <td>16</td> <td>31</td> </tr> <tr> <td>40</td> <td>58</td> <td>40</td> <td>34</td> </tr> </tbody> </table>		Age of person (years)	Circumference of skull (cm)	Age of person (years)	Length of foot (cm)	2	41	2	13	7	47	7	20	16	54	16	31	40	58	40	34
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<p>To compare and group animal based on their skeleton</p>	<p>Different animals have different skeletons, including its size, shape and number of bones Animals that have a spine inside their bodies are classed as vertebrates</p>	<p>Vertebrate - A vertebrate is an animal with an internal skeleton, including a spine. Spine - The backbone of an animal is also called its spine.</p>	<p>Look at x-rays of different animals and compare – similarities and differences. Begin to classify animals with a spine – sort animal pictures into vertebrates / not v</p>																						
<p>Compare and group invertebrate animals according to their structure</p>	<p>Some animals do not have any bones. Animals that do not have bones, including a spine, inside their bodies are called invertebrates. Some invertebrate animals have a hard layer or shell for protection on the outside of their bodies called an exoskeleton</p>	<p>Invertebrates - Animals that do not have bones, including a spine, on the inside of their bodies are invertebrates. Exoskeleton - An exoskeleton is the hard outer layer that covers, supports, and protects the body of an invertebrate.</p>	<p>Sort pictures – vertebrates v invertebrates. Look at creatures that do not have an exoskeleton – why might this helpful? Sort invertebrates into exoskeleton / none</p>																						
<p>To explain why Humans have muscles</p>	<p>Humans and most other animals have muscles throughout their bodies that help them to move and balance Different muscles move different parts of the body Muscles work in pairs around our joints to help us move</p>	<p>Muscle - A muscle is a part of the body that pulls on bones to help us move. Joint - A joint is the place where two bones meet.</p>	<p>Muscles can only pull; they cannot push. One muscle pulls in one direction, while another pulls in the opposite direction to move a body part. When you bend your arm, your elbow joint moves as the biceps and triceps work together as a pair.</p>																						

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Y3 / Y4 Term 4 Year B	<p>Focus: Forces and Magnets – Can you feel the force?</p> <p>National Curriculum Knowledge –</p> <ul style="list-style-type: none"> ✓ observe how magnets attract or repel each other and attract some materials and not others ✓ 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 ✓ describe magnets as having 2 poles <p>Contributing towards : How can forces keep us safe? UKS2</p>	<p>Knowledge Skills and Understanding</p> <ul style="list-style-type: none"> • compare how things move on different surfaces • notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • observe how magnets attract or repel each other and attract some materials and not others • 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 • describe magnets as having 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing <p>Working Scientifically</p> <ul style="list-style-type: none"> • comparing how different things move and grouping them; • raising questions and carrying out tests to find out how far things move on different surfaces, • gathering and recording data to find answers to their questions; • exploring the strengths of different magnets and finding a fair way to compare them; • sorting materials into those that are magnetic and those that are not; • looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; • identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets. <p>Performing simple tests</p> <ul style="list-style-type: none"> • plan and carry out an investigation • measure carefully and record results • collect data and look for patterns • write a conclusion from what they have found out 																																																			
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Y3 / Y4 Term 4 Year B	Focus: Why Can't we see in the dark?				Knowledge Skills and Understanding <ul style="list-style-type: none"> recognise that they need light in order to see things and that dark is the absence of light notice that light is reflected from surfaces recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by an opaque object find patterns in the way that the size of shadows change Working Scientifically <ul style="list-style-type: none"> explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games answer questions about how light behaves. think about why it is important to protect their eyes from bright lights. look for, and measure, shadows, and find out how they are formed think about what might cause the shadows to change. looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses										
	National Curriculum Knowledge - Light <ul style="list-style-type: none"> ✓ recognise that they need light in order to see things and that dark is the absence of light ✓ recognise that shadows are formed when the light from a light source is blocked by an opaque object 														
	Contributing towards : Why Can't I see around corners ? UKS2														
	Objective identify and name natural and human-made light sources.	Sticky Knowledge A light source is something that produces and gives out light. Light sources can be natural or made by humans. The Sun is our main natural light source. The Moon is not a light source, it does not produce its own light.	Key Vocabulary Light source - Something that is a light source produces its own light.	Resources 											
	To compare different materials based on how transparent they are	Opaque materials do not let light pass through them. Transparent materials allow light through so objects can clearly be seen through them. Translucent materials allow some light to pass through but are not completely see-through.	Opaque - Light cannot pass through objects that are opaque. Transparent - Transparent materials are completely see-through. Translucent - Translucent materials allow some light to pass through but are not completely see-through.	torch with material to test in front repeat test for translucent 											
	Explain how shadows are formed – make a shadow puppet and discuss the shape of shadows	When light falls on some objects, a dark shape is formed on the other side of the object. A shadow is a dark shape that is formed when an object blocks light.	Shadow - A shadow is a dark shape that is formed when an object blocks light.	Investigate opaque and transparent objects and shadows 											
Investigate to measure and record information about shadow size	The size of a shadow changes depending on the distance of an object from the light source.		<table border="1"> <thead> <tr> <th>distance between torch and apple (cm)</th> <th>height of shadow (cm)</th> </tr> </thead> <tbody> <tr><td>50</td><td>8</td></tr> <tr><td>40</td><td>9</td></tr> <tr><td>30</td><td>12</td></tr> <tr><td>20</td><td>15</td></tr> <tr><td>10</td><td>23</td></tr> </tbody> </table>	distance between torch and apple (cm)	height of shadow (cm)	50	8	40	9	30	12	20	15	10	23
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To compare different materials based on how reflective they are.	Reflection involves a source of light and a surface. Light is measured in lux (lx) and can be recorded using a data logger.	Data logger - Data loggers are electronic devices which monitor and record changes in the environment over time. Lux - Lux is the unit used to measure the brightness of light.	<ul style="list-style-type: none"> make the room as dark as possible place the light source 20 cm away from the material place the data logger, facing the material, at a distance of 10 cm away from the material record the measurement in lux shown on the data logger repeat with each type of material. <table border="1"> <thead> <tr> <th>material</th> <th>amount of lux</th> </tr> </thead> <tbody> <tr><td>baking paper</td><td>35</td></tr> <tr><td>plastic bag</td><td>32</td></tr> <tr><td>cotton fabric</td><td>66</td></tr> <tr><td>laminated paper</td><td>79</td></tr> </tbody> </table>	material	amount of lux	baking paper	35	plastic bag	32	cotton fabric	66	laminated paper	79		
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Performing simple tests

- plan and carry out an investigation
- measure carefully and record results
- collect data and look for patterns
- write a conclusion from what they have found out

Year	Knowledge	Skills																											
Y3 / Y4 Term 5 Year B	<p>Focus: How Does Your Garden Grow?_ Enrichment: visit garden centre/ The living rainforest</p> <p>National Curriculum Knowledge - Plants</p> <ul style="list-style-type: none"> ✓ identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers ✓ explore the requirements of plants for life and growth <p>Contributing towards : What Lives in this habitat? LKS2 T6</p>	<p>Knowledge Skills and Understanding</p> <ul style="list-style-type: none"> ✓ identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers ✓ 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 ✓ investigate the way in which water is transported within plants ✓ explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal <p>Working Scientifically</p> <ul style="list-style-type: none"> • explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. • comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; • discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; • looking 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>Note: pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.</p> <p>Performing simple tests</p> <ul style="list-style-type: none"> • plan and carry out an investigation • measure carefully and record results • collect data and look for patterns • write a conclusion from what they have found out 																											
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Photosynthesis - The way in which plants make food in their leaves is called photosynthesis</td> <td></td> </tr> <tr> <td>describe why plants have roots.</td> <td>Roots provide support for the plant by holding the plant upright, especially in windy conditions. Roots absorb water and nutrients from soil to provide the plant with what it needs to grow and stay healthy.</td> <td>Absorb - To absorb is to soak something up. Root Hairs – these help the roots absorb water and nutrients from the soil.</td> <td></td> </tr> <tr> <td>investigate the way in which water is transported in plants.</td> <td>Plants use their roots to absorb the water they need from the soil. The functions of a stem are to provide support for the plant and to transport water and nutrients. 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