

Wylle Valley  
Primary School



**Love Care Respect**

*To aspire to being outstanding in everything we  
do, by always aiming higher.*

**"Let your light shine in all you say and do."**

***Matthew 5:16***

## Progression of knowledge and scientific enquiry for Science

Year Group	Scientific content – sequence of learning	Working Scientifically Investigation (Suggested Investigations)	Why now ?	Vocabulary
REC	<p><b>Autumn:</b></p> <p>Talk about what they can see outside using a wide vocabulary</p> <p>Explore collections of materials with similar and/or different properties.</p> <p>Talk about what they see, using a wide vocabulary.</p> <p>Explore how things work.</p> <p>Plant seeds and care for growing plants.</p> <p>Understand the key features of the life cycle of a plant and an animal.</p> <p>Begin to understand the need to respect and care for the natural environment and all living things.</p>	Forces, Changes in materials		

<p>Explore and talk about different forces they can feel.</p> <p>Talk about forces they feel e.g. push, pull etc.</p> <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Describe what they can see, hear and feel outside.</p> <p>Talk about the area they live in, including the weather etc.</p> <p>Talk about the differences between materials and changes they notice.</p> <p>Change materials e.g. adding water to cornflour, mixing paint etc.</p> <p><b><u>Spring:</u></b> Describe another environment e.g. desert, Artic etc.</p> <p>Talk about the weather linked to seasonal change.</p> <p>Talk about changes e.g. freezing, melting (linked to baking, paint mixing, mud play, etc.)</p> <p>Explore the natural world around them Describe what they see, hear and feel whilst outside.</p> <p>Understand the effect of changing seasons on the natural world around them. Recognise some environments that are different from the one in which they live.</p> <p><b><u>Summer:</u></b> Describe animals and plants (both from photos and real-life experiences)</p> <p>Describe their own environment and local area</p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what</p>	<p>Melting and freezing Volcano experiment</p> <p>Floating and sinking</p>		
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	<p>has been read in class.</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>			
<p><b>Year 1&amp;2</b></p> <p><b>Year A</b></p>	<p><b><u>Animals including Humans</u></b>  <b>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</b>  <b>Identify and name a variety of common animals e.g. fish, amphibians, reptiles, birds. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</b></p> <p><b>Can they name the parts of the human body and link them to their senses?</b></p> <ul style="list-style-type: none"> <li>● Can they talk about what they see, touch, smell, hear or taste?</li> <li>● Can they identify and classify things they observe?</li> <li>● Can they give a simple reason for their answers?</li> </ul> <p><b>Can they identify some of the differences between different animals?</b></p> <ul style="list-style-type: none"> <li>● Can they name the parts of an animal's body?</li> <li>● Can they identify living and non-living things?</li> <li>● Can they identify and name a variety of common animals?</li> <li>● Can they describe how an animal is suited to its environment?</li> <li>● Can they explain what they have found out?</li> <li>● Can they identify and name a variety of common animals that are carnivores, herbivores and omnivores?</li> <li>● Can they identify and classify things they observe?</li> <li>● Can they give a simple reason for their answers?</li> <li>● Can they compare the bodies of different animals?</li> </ul>	<p>Blindfolded senses test (smell, taste, hearing).  Show a variety of animal images and ask children to find the main body parts and compare them to humans.</p> <p>This will help children see that humans and animals share similar features as we are all animals. (Children often see humans as separate to animals).</p>	<p>Builds upon skills from EYFS framework.</p>	<p><i>Body, head, neck, arms, elbows, legs, knees, face, ears, eyes, eyebrows, eyelashes, nose, hair, mouth, teeth, tongue, feet, toes, fingers, nails, ankle, calf, thigh, hips, waist, trunk, chest, shoulders, back, hands, wrist</i></p> <p><i>Tail, wing, claw, fin, scales, feathers, fur, beak, senses, hearing, seeing, touching, smelling, tasting, smooth, bright, dim, loud, quiet, high, low</i></p>
	<p><b><u>Seasonal Changes</u></b>  <b>Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.</b></p> <ul style="list-style-type: none"> <li>● Can they observe changes across the four seasons?</li> <li>● Can they name the four seasons in order?</li> <li>● Can they observe and describe weather associated with the seasons?</li> <li>● Can they observe and describe how day length varies?</li> <li>● Can they talk about what they: see, touch, smell, hear or taste?</li> <li>● Can they use simple equipment to help them make observations?</li> </ul>	<p>Gather and record data about the weather (rainfall, temperature).</p>	<p>Builds upon skills from EYFS framework.</p>	<p><i>Season, spring, summer, autumn, winter, weather, hot, warm, cool, cold, sunny, cloudy, windy, rainy, snowing, hailing, sleet, frost, fog, mist, icy, rainbow, thunder, lightning, storm, light, dark, day, night</i></p>

<p><b>Everyday Materials</b>  <b>Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties.</b></p> <ul style="list-style-type: none"> <li>● Can they distinguish between an object and the material from which it is made?</li> <li>● Can they describe materials using their senses, using specific scientific words?</li> <li>● Can they explain what material objects are made from?</li> <li>● Can they explain why a material might be useful for a specific job?</li> <li>● Can they name some different everyday materials? e.g. wood, plastic, metal, water and rock.</li> <li>● Can they sort materials into groups by a given criteria?</li> <li>● Can they explain how solid shapes can be changed by squashing, bending, twisting and stretching?</li> <li>● Can they perform a simple test?</li> <li>● Can they tell other people about what they have done?</li> <li>● Can they talk about what they have done?</li> <li>● Can they use simple equipment to help them make observations?</li> <li>● Can they identify and classify things they observe?</li> </ul>	<p>Test materials to find out which material is best for an umbrella.</p>	<p>National Curriculum requirement.</p>	<p><i>Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, waterproof, absorbent, tear, rough, smooth, shiny, dull, see through, not see through</i></p>
<p><b>Plants</b>  <b>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</b></p> <ul style="list-style-type: none"> <li>● Can they identify and name a range of common plants and trees?</li> <li>● Can they name the trunk, branches and root of a tree? <ul style="list-style-type: none"> <li>● Can they describe the difference between a deciduous and evergreen tree?</li> </ul> </li> </ul> <p><b>Identify and describe the basic structure of a variety of common flowering plants, including trees.</b></p> <ul style="list-style-type: none"> <li>● Can they describe and name the petals, stem, leaf, bulb, flower (blossom), fruit, seed, stem and root of a plant?</li> </ul>	<p>Gather and record data about what plants need to grow (grow a bean plant).</p>	<p>Builds upon skills from EYFS framework.</p>	<p><i>Names of: wild plants, garden plants, flowering plants, trees, leaf, flower, blossom, petal, fruit, berry, root, bulb, seed, trunk, branch, stem, bark, stalk, vegetable, deciduous, evergreen</i></p>

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<p><b>Year 1&amp;2</b></p> <p><b>Year B</b></p>	<p><b><u>Animals (inc. humans)</u></b>  <b>Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</b></p> <ul style="list-style-type: none"> <li>● Can they describe what animals need to survive? Can they explain that animals grow and reproduce?</li> <li>● Can they explain why animals have offspring which grow into adults?</li> <li>● Can they describe the life cycle of some living things? (e.g. egg, chick, chicken).</li> <li>● Can they explain the basic needs of animals, including humans for survival? (water, food, air).</li> <li>● Can they describe why exercise, balanced diet and hygiene are important for humans? Can they suggest how to find things out?</li> </ul>	<p>Humans - the effect of exercise on the body.  ‘How active am I?’  Or  ‘Investigate reaction times’.</p>	<p>Builds on learning from previous years.</p>	<p><i>Offspring, life cycles, grow, change, adults, basic needs, water, food, air, survival, exercise, food types (fruit and veg, bread, rice, pasta, milk, dairy, foods high in fat and sugar, meat, fish, eggs, beans), hygiene</i></p>
	<p><b><u>Uses of Everyday Materials</u></b>  <b>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</b>  <b><u>Classifying and grouping materials</u></b></p> <ul style="list-style-type: none"> <li>● Can they describe the simple physical properties of a variety of everyday materials?</li> <li>● Can they compare and group together a variety of materials based on their simple physical properties?</li> <li>● Can they use - see, touch, smell, hear or taste - to help them answer questions?</li> <li>● Can they use some scientific words to describe what they have seen and measured?</li> </ul> <p><b><u>Greater Depth</u></b></p> <ul style="list-style-type: none"> <li>● Can they describe the properties of different materials using words like, transparent or opaque, flexible, etc?</li> <li>● Can they sort materials into groups and say why they have sorted them in that way?</li> <li>● Can they say which materials are natural and which are manmade?</li> </ul> <p><b>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</b></p>	<p>Investigate ways to test materials for elasticity and flexibility and find out which paper is the strongest and which fabric is the stretchiest.</p>	<p>Builds on learning from previous years.</p>	<p><i>Suitable/unsuitable, use, object, material, property, wood, plastic, glass, metal water, rock, fabrics, hard, soft, stretchy, flexible, waterproof, absorbent, transparent, translucent, opaque, shape, change, twist, squash, bend, stretch, roll, squeeze</i></p>

<p><b>Changing materials</b></p> <ul style="list-style-type: none"> <li>● Can they explore how the shapes of solid objects can be changed? (squashing, bending, twisting, stretching).</li> <li>● Can they identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses?</li> <li>● Can they organise things into groups?</li> <li>● Can they say whether things happened as they expected?</li> </ul>			
<p><b>Living Things and their Habitats</b></p> <p><b>Explore and compare the differences between things that are living, dead, and things that have never been alive. 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. Identify and name a variety of plants and animals in their habitats, including micro-habitats. Describe how animals obtain their food from plants and other animals using the idea of a simple food chain, and identify and name different sources of food.</b></p> <ul style="list-style-type: none"> <li>● Can they match certain living things to the habitats they are found in?</li> <li>● Can they explain the differences between living and non-living things?</li> <li>● Can they describe some of the life processes common to plants and animals, including humans?</li> <li>● Can they describe how a habitat provides for the basic needs of things living there?</li> <li>● Can they describe how some animals get their food using basic food chains?</li> <li>● Can they describe how plants and animals are suited to their habitat?</li> <li>● Finding things out using secondary sources of information.</li> <li>● Can they organise things into groups?</li> </ul>	<p>Investigate which animals are suited to a particular habitat and choose the reasons from different options.</p> <p>For example,</p> <ul style="list-style-type: none"> <li>● Antarctic</li> <li>● Desert</li> <li>● Savannah grassland</li> <li>● Temperate farmland</li> <li>● Temperate forest</li> <li>● Temperate pond</li> <li>● Sea</li> <li>● Tropical rainforest.</li> </ul>	<p>Builds on learning from previous years.</p>	<p><i>Living, dead, never been alive, names of local habitats, land, woodland, meadow, name micro habitats, under log, stony path, under bushes suited, basic needs, depend, food, food chain, shelter</i></p>
<p><b>Plants</b></p> <p><b>Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</b></p> <ul style="list-style-type: none"> <li>● Can they describe what plants need to survive?</li> <li>● Can they observe and describe how seeds and bulbs grow into mature plants?</li> <li>● Can they investigate and describe the impact of removing light, soil or water from a growing or germinating plant.</li> <li>● Observing changes over time.</li> <li>● Can they suggest how to find things out?</li> <li>● Can they use prompts to find things out?</li> </ul>	<p>Find out what conditions plants need to grow and how they compete for resources. Children observe and compare plants sown close together and far apart making notes and drawings of their observations.</p>	<p>Builds on learning from previous years.</p>	<p><i>Seeds, bulbs, water, light, growth, healthy, shoot, seedling</i></p>

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Year 3&4  Year A	<p><b>Rocks</b>  <b>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.</b></p> <ul style="list-style-type: none"> <li>● Can they compare and group together different rocks on the basis of their appearance and simple physical properties?</li> <li>● Can they describe and explain how different rocks can be useful to us?</li> <li>● Can they describe in simple terms how fossils are formed when things that have lived are trapped within rock?</li> <li>● Can they describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed?</li> <li>● Can they recognise that soils are made from rocks and organic matter?</li> <li>● Can they describe what they have found using scientific language?</li> <li>● Can they classify objects in different ways?</li> <li>● Can they describe what they have found using scientific language?</li> <li>● Can they use different ideas and suggest how to find something out?</li> </ul>	<p>Properties of rocks: Test rocks to see how durable, permeable, or dense they are. Children conduct observations of what happens to different rock types when they are tested in different ways. To test permeability, add a small amount of water to rocks and observe whether the water is absorbed. To test durability, rub the rocks against sandpaper and observe what happens. To test density, put the rocks in a container of water and observe whether they float or sink. Children then group rocks by properties of their choice.</p> <p>OR</p> <p>Soil permeability: What is the permeability of different types of soil? Children make a prediction about which soil they think will be most permeable then set up the experiment with the equipment they need. They make observations and record initial findings then again after 5 minutes. They then rate the soil on its permeability.</p>	<p>National Curriculum requirement.</p>	<p><i>Rock, stone, pebble, boulder, soil, fossils, grains, crystals, texture, absorb water, let water through, marble, chalk, granite, sandstone, slate, sandy soil, clay soil, chalky soil, peat</i></p>
	<p><b>Light</b>  <b>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 eyes.</b></p>	<p>Reflection: Test materials to decide what would be best to include on a book bag so it would be seen in the dark mornings walking to school.</p>	<p>National Curriculum requirement.</p>	<p><i>Light, light source, darkness, reflect, reflective, mirror, shadow, block, direction, transparent, opaque, translucent</i></p>

<p><b>Recognise that shadows are formed when the light from a light source is blocked by a solid object. Find patterns in the way that the size of shadows change.</b></p> <ul style="list-style-type: none"> <li>● Can they recognise that they need light in order to see things?</li> <li>● Can they recognise that dark is the absence of light?</li> <li>● Can they notice that light is reflected from surfaces?</li> <li>● Can they recognise that light from the sun can be dangerous and that there are ways to protect their eyes?</li> <li>● Can they recognise that shadows are formed when the light from a light source is blocked by a solid object?</li> <li>● Can they find patterns in the way that the size of shadows change?</li> <li>● Can they explain the difference between transparent, translucent and opaque?</li> <li>● Can they set up a simple fair test to make comparisons?</li> <li>● Can they describe what they have found using scientific language?</li> <li>● Can they record their observations in different ways? - labelled diagrams, charts etc.</li> </ul>	<p>The children predict which materials they think will be most reflective then test this out using the torches. They then design the book bag based on their findings.</p> <p>OR</p> <p>Shadows: Test materials to decide which would make the best curtains by seeing which cast the biggest shadow. The children test the materials by shining a torch at them observing the darkness of the shadow. Then they sort materials into categories 'opaque', 'transparent' or 'translucent' and come up with a conclusion for which would be most effective for curtains.</p> <p>OR</p> <p>Changing shadows: 'How do shadows change when the distance between the light source and the object changes?' Children set up the investigation by recording what equipment is needed, how to measure distance and size of the object, how to record their results and make a prediction. They carry out the investigation and make a conclusion at the end.</p>		
<p><b><u>Animals (inc.humans)</u></b></p> <p><b>Identify that animals and humans need the right types / 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.</b></p>	<p>Muscles: Why do we need muscles to move? The children investigate which muscles they use in different situations. They make a prediction</p>	<p>Builds on learning from <a href="#">Tom Robson: My brilliant body KS1</a></p>	<p><i>Nutrition, food types, carbohydrates, protein, vitamins and minerals, fat, sugar, fruits and veg, dietary fibre, water, balanced diet, skeleton, muscles, support, protection,</i></p>

<ul style="list-style-type: none"> <li>● Can they explain the importance of a nutritionally balanced diet?</li> <li>● Can they describe how nutrients, water and oxygen are transported within animals and humans?</li> <li>● Can they identify that animals, including humans, cannot make their own food: they get nutrition from what they eat?</li> <li>● Can they describe and explain the skeletal system of a human?</li> <li>● Can they describe and explain the muscular system of a human?</li> <li>● Can they describe what they have found using scientific language?</li> <li>● Can they describe what they have found out using secondary sources?</li> </ul>		<p>first about the muscles they will use in different activities e.g. reading a book, jumping in the air etc. They then get a partner to do this activity while they observe the muscles moving. They record the results after the activity.</p>		<p><i>movement, names of bones, vertebrate, invertebrate</i></p>
<p><b><u>Forces and Magnets</u></b>  <b>Compare how things move on a different surface. Notice that some forces need contact between two 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 two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing.</b></p> <ul style="list-style-type: none"> <li>● Can they compare how things move on different surfaces?</li> <li>● Can they observe that magnetic forces can be transmitted without direct contact?</li> <li>● Can they observe how some magnets attract or repel each other?</li> <li>● Can they identify and classify which everyday materials are attracted to magnets and which are not?</li> <li>● Can they notice that some forces need contact between two objects, but magnetic forces can act at a distance?</li> <li>● Can they describe magnets have having two poles (N &amp; S) and predict whether two magnets will attract or repel each other depending on which poles are facing?</li> <li>● Can they make and record a prediction before testing?</li> <li>● Can they take accurate measurements using different equipment and units of measure?</li> <li>● Can they set up a simple fair test to make comparisons?</li> <li>● Can they explain what they have found out and use their measurements to say whether it helps to answer their question?</li> <li>● Can they record their observations in different ways? - labelled diagrams, charts etc?</li> </ul>		<p>Investigating friction: Test different surfaces to explore the effect friction has on a travelling object. The children have a number of different sloped surfaces such as carpet, wood, sand paper etc. They make a prediction as to which surface a toy car would travel the furthest from when released at the top of the slope. They discuss how to keep this a fair test each time e.g. height of slope, car used etc. Then carry out the investigation, recording results as they go. They make a conclusion at the end.</p> <p>Magnets: Test materials first to see which are magnetic and which aren't. Then children carry out an investigation to test magnet strength. They use different magnets e.g. horse shoe, bar etc and see how many paper clips they can hang from the magnet before no more will stay attached. They record which magnets they will</p>	<p>National Curriculum requirement.</p>	<p><i>Force, contact force, non-contact force, magnetic force, magnet, strength, bar/ring/button/horseshoe magnets, attract, repel, magnetic material, metal, iron, steel, non-magnetic, poles, north/south pole</i></p>

		<p>test, a prediction and their results. Then they draw a bar graph to show the results and write a conclusion.</p>		
	<p><b>Plants</b>  <b>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.</b></p> <ul style="list-style-type: none"> <li>● Can they identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers)? Range of plants.</li> <li>● Can they explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow)?</li> <li>● Can they investigate the way in which water is transported within plants?</li> <li>● Can they explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal?</li> <li>● Can they record their observations in different ways? (Labelled diagrams, charts etc.) Use secondary sources.</li> <li>● Can they plan and set up a fair test and explain why it was fair?</li> <li>● Can they explain what they have found out and use their measurements to say whether it helps to answer their question?</li> <li>● Can they set up a simple test to make comparisons?</li> </ul>	<p>Investigate if plants grow better with fertilisation.</p>	<p>Builds on learning from  Tom Robson: Green plants and habitats  KS1</p>	<p><i>Leaf, flower, blossom, petal, fruit, root, bulb, seed trunk, branch, stem, water, light, air, nutrients, soil, fertiliser, grow, healthy, transported, life cycle, pollination, seed formation, seed dispersal</i></p>

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Year 3&4 Year B	<p><b><u>Living Things and their Habitats</u></b>  <b>Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things.</b></p> <ul style="list-style-type: none"> <li>● Can they recognise that living things can be grouped in a variety of ways?</li> <li>● Can they classify and identify into broad groups?</li> <li>● Can they explore and use a classification key to group, identify and name a variety of living things? (plants, vertebrates, invertebrates).</li> <li>● Do they recognise that environments can change and this can sometimes pose a danger to living things?</li> <li>● Can they explain how environmental changes have an impact on living things?</li> <li>● Can they record data using diagrams, labels, classification keys, tables, scatter graphs, bar graphs and line graphs?</li> <li>● Can they explain their findings in different ways (display, presentation, writing)?</li> </ul>	<p>Which type of minibeasts live in our wildlife area? -prediction and use of classification keys.</p> <p>Collect and observe minibeasts, including looking at mouthparts and feeding.</p>	<p>Builds on learning from  Tom Robson: Green plants and habitats KS1</p>	<p><i>Classification keys, environment, fish, amphibians, reptiles, birds, mammals, vertebrates, invertebrates, names of them, human impact, positive, negative (impact)</i></p>
	<p><b><u>Animals (inc. humans)</u></b>  <b>Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey.</b></p> <ul style="list-style-type: none"> <li>● Can they identify, name and describe the functions of the basic parts of the digestive system in humans?</li> <li>● Can they identify the simple function of different types of teeth in humans?</li> <li>● Can they compare the teeth of herbivores and carnivores?</li> <li>● Can they identify, construct and interpret a variety of food chains, identifying producers, predators and prey?</li> <li>● Can they identify differences, similarities or changes related to simple scientific ideas or processes?</li> </ul>	<p>Which liquid affects egg (tooth enamel) the most? Results and conclusion.</p>	<p>Builds on learning from previous years  Tom Robson: My brilliant body. KS1</p>	<p><i>Digestive system, nutrition, mouth, teeth, canine, incisor, molar, pre-molar, saliva, tongue, rip, tear, chew, grind, cut, oesophagus (gullet), stomach, small intestine, large intestine, rectum, anus, carnivore, herbivore, omnivore, producer, consumer, predator, prey, food chains</i></p>
	<p><b><u>States of Matter</u></b>  <b>Compare and group materials together, according to whether they are solids, liquids or gases. 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). Identify the part played by evaporation and</b></p>	<p>What is the melting point of chocolate? - using equipment to measure accurately.</p>	<p>Builds on learning from  Tom Robson: Marvellous materials KS1</p>	<p><i>States of matter, solid, liquid, gas, air, oxygen, powder, granular/grain, crystals, change state, ice/water/steam, water vapour, heating, cooling, temperature, degrees Celsius, melt, freeze, solidify,</i></p>

<p><b>condensation in the water cycle and associate the rate of evaporation with temperature.</b></p> <ul style="list-style-type: none"> <li>● Can they compare and group materials together, according to whether they are solids, liquids or gases?</li> <li>● Can they explain what happens to materials when they are heated or cooled?</li> <li>● Can they measure or research the temperature at which different materials change state in degrees Celsius?</li> <li>● Can they describe how materials change state at different temperatures?</li> <li>● Can they use measurements to explain changes to the state of water?</li> <li>● Can they explain everyday phenomena including the water cycle?</li> <li>● Can they record data using diagrams, labels, classification keys, tables, scatter graphs, bar graphs and line graphs?</li> <li>● Can they evaluate and communicate their methods and findings?</li> <li>● Can they use a range scientific equipment to take accurate measurements or readings?</li> </ul>			<p><i>melting point, boil, boiling point, evaporation, condensation, water cycle, precipitation, transpiration</i></p>
<p><b>Electricity</b>  <b>Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. 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. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.</b></p> <ul style="list-style-type: none"> <li>● Can they identify common appliances that run on electricity?</li> <li>● Can they construct a simple series electric circuit?</li> <li>● Can they identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers?</li> <li>● Can they recognise symbols to represent simple series circuit diagrams?</li> <li>● Can they 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>● Can they recognise that a switch opens and closes a circuit?</li> <li>● Can they associate a switch opening with whether or not a lamp lights in a simple series circuit?</li> <li>● Can they recognise some common conductors and insulators?</li> <li>● Can they associate metals with being good conductors?</li> <li>● Can they plan and set up a fair test and isolate variables, explaining why it was fair and which variables have been isolated?</li> <li>● Can they suggest improvements and predictions?</li> </ul>	<p>Which materials conduct electricity? Planning an investigation.</p>	<p>National Curriculum requirement.</p>	<p><i>Electricity, appliance, device, mains, plug, electrical circuit, complete circuit, circuit diagram, circuit symbol, components, cell, battery, positive/negative, connect, connection, short circuit, wire, crocodile clip, bulb, bright/dim, switch, buzzer, motor, faster/slower, conductor, insulator, metal/non-metal</i></p>

<ul style="list-style-type: none"> <li>● Can they ask their own questions?</li> <li>● Can they explain their findings in different ways (display, presentation, writing)?</li> </ul>			
<p><b>Sound</b>  <b>Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between pitch and features of the object that produced it. Find patterns between volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases.</b></p> <ul style="list-style-type: none"> <li>● Can they describe a range of sounds and explain how they are made?</li> <li>● Can they associate some sounds with something vibrating?</li> <li>● Can they compare sources of sound and explain how the sounds differ?</li> <li>● Can they explain how to change a sound (louder/softer)?</li> <li>● Can they recognise how vibrations from sound travel through a medium to an ear?</li> <li>● Can they describe the relationship between the pitch of the sound and the features of its source/object that produces it?</li> <li>● Can they find patterns between the volume of the sound and the strength of the vibrations that produced it, and the distance of the source?</li> <li>● Can they investigate how different materials can affect the pitch and volume of sounds?</li> <li>● Can they plan and set up a fair test and isolate variables, explaining why it was fair and which variables have been isolated?</li> <li>● Can they decide which information needs to be collected and decide the best way for collecting it?</li> <li>● Can they evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables?</li> </ul>	<p>How does the thickness of an elastic band affect the pitch? Spotting patterns and conclusion. Which material is the best at absorbing sound? Fair tests.</p>	<p>National Curriculum requirement.</p>	<p><i>Sound, sound source, noise, vibration, travel, solid, liquid, gas, pitch, tune, high, low, volume, loud, quiet, fainter, muffle, strength of vibrations, insulation, instrument, percussion, strings, bass, woodwind, tuned instrument</i></p>

Year Group	Scientific content – sequence of learning	Working Scientifically Investigation (Suggested Investigations)	Why now	Vocabulary
Year 5&6 Year A	<p><b><u>Living Things and their Habitats</u></b> Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals.</p> <ul style="list-style-type: none"> <li>● Can they describe the differences in the life cycles of a mammal, amphibians, an insect and a bird?</li> <li>● Can they identify the reproductive processes of some animals?</li> <li>● Can they describe the life cycles of common plants?</li> <li>● Can they present a report of their findings through writing, display and presentation?</li> </ul>	<p><b>Investigating asexual reproduction of plants:</b> Take parts of variety of plants and leave in water/soil to see which grow and which don't (Geranium/African violet work).</p>	<p>Builds on learning from Tom Robson: Exploring the world of animals and plants LKS2</p>	<p><i>Life cycle, reproduction, sexual, asexual, germination, pollination, seed formation, seed dispersal, pollen, stamen, stigma, plantlets, runners, mammal, amphibian, insect, bird, fish, reptile, eggs, live young</i></p>
	<p><b><u>Animals (inc. humans)</u></b> Describe the changes as humans develop to old age.</p> <ul style="list-style-type: none"> <li>● Can they describe the changes as humans develop to old age?</li> <li>● Can they use basic ideas of inheritance, variation and adaptation to describe how living things have changed over time?</li> </ul> <p>Can they use a branching key?</p> <ul style="list-style-type: none"> <li>● Can they use a graph to answer scientific questions?</li> <li>● Can they present a report of their findings through writing, display and presentation?</li> </ul>	<p><b>Investigate changes as we age.</b> Order stages of humans. Notice what people at each age struggle with/find easier/harder to draw conclusions about the physical effects of ageing.</p>	<p>Builds on learning from Tom Robson: What goes in must come out LKS2</p>	
	<p><b><u>Properties and Changes of Materials</u></b> 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. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. 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.</p>	<p><b>Investigating thermal conductors and insulators:</b> Keeping a liquid warm inside a paper cup using a variety of materials, thermometer and timer.</p> <p><b>Investigating electrical conductors:</b> Create a simple circuit with bulb. Include variety of materials to see which conducts and which insulates electricity.</p>	<p>Builds on learning from Tom Robson: States of matter LKS2</p>	<p><i>Y4 plus rigid, hard, soft, stretchy, flexible, waterproof, absorbent, electrical/thermal conductivity, melting, dissolve, solution, insoluble, solute, solvent, particle, mixture, filtering, sieving, residue, reversible/non reversible changes, new material, burning, rusting</i></p>

<ul style="list-style-type: none"> <li>● Can they compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets?</li> <li>● Can they explain how some materials dissolve in liquid to form a solution?</li> <li>● Can they explain what happens when dissolving occurs?</li> <li>● Can they use their knowledge of solids, liquids and gases to decide and describe how mixtures might be separated, including through filtering, sieving, evaporating?</li> <li>● Can they give reasons, based on evidence for comparative and fair tests for the particular uses of everyday materials, including metals wood and plastic?</li> <li>● Can they describe changes using scientific words? (evaporation, condensation) (Covered in Geography unit).</li> <li>● Can they demonstrate that dissolving, mixing and changes of state are reversible changes? Can they 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> <li>● Can they use the terms 'reversible' and 'irreversible'?</li> <li>● Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary?</li> <li>● Can they make a prediction with reasons?</li> <li>● Can they use test results to make predictions to set up comparative and fair tests?</li> <li>● Can they take repeat readings when appropriate?</li> <li>● Can they record more complex data and results using scientific diagrams, labels, classification keys, table, scatter graphs, bar and line graphs?</li> </ul>	<p><b>Investigating dissolving.</b> Variety of solids to dissolve in hot and cold water.</p> <p><b>Investigating separating different mixtures.</b> Given mixture. Explore processes to separate mixture.</p> <p><b>Identifying and observing irreversible chemical changes.</b> Bicarb and vinegar producing carbon dioxide (collected in balloon over bottle).</p>		
<p><b>Earth and Space</b>  <b>Describe the movement of the Earth, and other planets, relative to the sun in the solar system. Describe the movement of the moon relative to the Earth. Describe the sun, Earth and moon as approximately spherical bodies. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</b></p> <ul style="list-style-type: none"> <li>● Can they identify and explain the movement of the Earth and other planets relative to the sun in the solar system?</li> <li>● Can they explain how seasons and the associated weather is created?</li> <li>● Can they describe and explain the movement of the moon relative to the Earth?</li> <li>● Can they describe the sun, Earth and moon as approximately spherical bodies?</li> </ul>	<p><b>Investigate night and day in different places on the Earth.</b> Use internet and atlases with time zones marked.</p> <p>Investigate changing shape of the moon. Observations over time. Recreate with Oreos.</p>	<p>National Curriculum requirement.</p>	<p><i>Earth, planets, sun, solar system, moon, celestial body, spherical, rotation, spin, night and day, names of planets, dwarf planet, orbit, geocentric model, heliocentric model, shadow clocks, sundials, astronomical clocks</i></p>

<ul style="list-style-type: none"> <li>● Can they use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky?</li> <li>● Can they present a report of their findings through writing, display and presentation using appropriate scientific vocabulary?</li> <li>● Can they use evidence from secondary sources to explore their own and other people’s ideas?</li> </ul>				
<p><b>Forces</b>  <b>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction that act between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</b></p> <ul style="list-style-type: none"> <li>● Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object?</li> <li>● Can they identify the effects of air resistance, water resistance and friction that act between moving surfaces?</li> <li>● Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect?</li> <li>● Can they present a report of their findings through writing, display and presentation using appropriate scientific vocabulary?</li> <li>● Can they use a graph to answer scientific questions?</li> <li>● Can they use test results to make predictions to set up comparative and fair tests?</li> </ul>	<p><b>Investigating the best shaped parachute to slow the fall of an object.</b> Use plastic bag and string to create parachute. Consistent piece of play-doh/an egg dropped from height and timed.</p> <p><b>Investigating best shape for a boat to float.</b> Given same sized ball of plasticine each from which to create a boat that can carry cm cubes. Boats placed in water to see which shape works best.</p> <p>Investigating friction as a form of braking. Variety of surfaces with same toy car let go down consistent slope to see which enables the car to go furthest – has least friction.</p>	<p>Builds on learning from  Tom Robson:  Contact forces and forces that work at a distance LKS2</p>		<p><i>Fall, Earth, gravity, weight, mass, air resistance, water resistance, friction, moving surfaces, mechanisms, levers, pulleys, gears, force, transfers</i></p>

Year Group	Scientific content – sequence of learning	Working Scientifically Investigation (Suggested Investigations)	Why now	Vocabulary
Year 5&6  Year B	<p><b><u>Evolution and Inheritance</u></b>  <b>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</b></p> <ul style="list-style-type: none"> <li>● Can they 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>● Can they recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents?</li> <li>● Can they give reasons why offspring are not identical to each other or to their parents?</li> <li>● Can they explain the process of evolution and describe the evidence for this?</li> <li>● Can they identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution?</li> <li>● Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?</li> </ul>	<p>Different birds eat different kinds of food. Children predict which ‘beak’ will be best for each ‘food’ type. Children use different objects such as chopsticks, tweezers, spoons etc to simulate different beak types.</p> <p>Children observe the similarities and differences between the children in the class, such as eye colour, skin colour, tongue rolling, taste preferences and finger print pattern.</p>	<p>National Curriculum requirement.</p>	
	<p><b><u>Humans</u></b>  <b>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans.</b></p> <ul style="list-style-type: none"> <li>● Can they identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood?</li> <li>● Can they recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function?</li> <li>● Can they describe the ways in which nutrients and water are transported within animals and plants, including humans?</li> <li>● Can they explain, in simple terms, a scientific idea and the evidence which supports it?</li> </ul>	<p>How does exercise affect heart rate?</p> <p>In PE, the children investigate the change in heart rate when completing an exercise. They would measure their resting heart rate and how it changes after completing a chosen exercise up to 3 times.</p> <p>OR</p> <p>The children also measure their heart rate throughout the day, and discuss why it changes/is different.</p>	<p>Builds on learning from          .Tom Robson: What goes in must come out LKS2</p>	<p><i>Circulatory system, heart, blood, blood vessels, pumps, oxygen, carbon dioxide, lungs, nutrients, water, diet, exercise, drugs, lifestyle, evolution, suited/suitable, adapted, adaptation, offspring, reproduction, variation, inherit, inheritance, fossils</i></p>

		(E.g. higher heart rate after break times and lunch times).		
	<p><b><u>Living Things and their Habitats</u></b>  <b>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. Give reasons for classifying plants and animals based on specific characteristics.</b></p> <ul style="list-style-type: none"> <li>● Can they describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences including microorganisms, plants and animals?</li> <li>● Can they give reasons for classifying plants and animals based on specific characteristics?</li> <li>● Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?</li> </ul>	Mould investigation. Children decide how to investigate the growth of mould. E.g. Does temperature effect how mould develops? Does cleanliness effect how mould develops? Does mould grow differently on different types of bread?	Builds on learning from Tom Robson: Exploring the world of animals and plants LKS2	<i>Organism, micro-organism, fungus, mushrooms, classification keys, environment, fish, amphibians, reptiles, birds, mammals, vertebrates, invertebrates, name some of these, arachnid, mollusc, insect, crustacean</i>
	<p><b><u>Electricity</u></b>  <b>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. 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. Use recognised symbols when representing a simple circuit in a diagram.</b></p> <ul style="list-style-type: none"> <li>● Can they identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers).</li> <li>● Can they compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches?</li> <li>● Can they use recognised symbols when representing a simple circuit in a diagram?</li> <li>● Can they explore different ways to test an idea, choose the best way, and give reasons?</li> <li>● Can they identify the key factors when planning a fair test?</li> <li>● Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this?</li> <li>● Can they use information to make a prediction and give reasons for it?</li> <li>● Can they use test results to make further predictions and set up further comparative tests?</li> <li>● Can they suggest how to improve their work and say why they think this?</li> <li>● Can they make a parallel circuit?</li> </ul>	The children plan an investigation linked to circuits. E.g. Does wire length effect how components in a circuit work? Does wire length effect the brightness of a bulb? Does wire length effect the volume of a buzzer?	Builds on learning from Tom Robson: Electricity LKS2	<i>Electricity, appliance, device, electrical circuit, complete circuit, circuit diagram, circuit symbol, components, cell, battery, positive, negative, terminal, connection, short circuit, wire, crocodile clip, bulb, bright/dim, switch, buzzer, volume, motor, conductor, insulator, voltage, current, resistance</i>

	<p><b>Light</b>  <b>Recognise that light appears to travel in straight lines. 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. 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. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</b></p> <ul style="list-style-type: none"> <li>● Can they recognise that light appears to travel in straight lines?</li> <li>● Can they 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>● Can they 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>● Can they use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them?</li> <li>● Can they use a graph to answer scientific questions?</li> <li>● Can they link what they have found out to other science?</li> <li>● Can they suggest how to improve their work and say why they think this?</li> <li>● Can they record more complex data and results?</li> <li>● Can they draw conclusions from their work?</li> <li>● Can they report findings from investigations through written explanations and conclusions using appropriate scientific language?</li> </ul>	<p>Refraction. Putting a straw or arrow into a glass of water and describing the observations, drawing an image and placing a glass over the top, then filling the glass with water and then covering the glass with a saucer. At each stage, children would note down what they observe.</p> <p>Filters in light. Investigating what colour is light, how we can see different colours and understanding the visible spectrum. Children to test using different coloured filters/tissue in front of a light and seeing the result.</p>	<p>Builds on previous learning from <a href="#">Tom Robson: Light</a></p>	<p><i>Light, light source, darkness, reflect, reflective, shadow, block, absorb, direction, transparent, opaque, translucent</i></p>
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