



# Science Progression Document Reception

<p><b>Topic 1-Biology: Me and my body</b></p> <p><b>End point:</b> Be able to talk about and describe themselves – naming different parts of the body and talking about similarities and differences between themselves and others</p>	<p><b>Future learning:</b></p> <p><b>Year 1</b> – Children will learn more body parts and the body parts associated with each sense.</p> <p><b>Year 2</b> – Children will study animals further and learn about offspring and the basic needs that animals need to survive.</p> <p><b>Year 3</b> – Children will learn about the importance of nutrition for animals. They will then focus on muscles and the skeleton.</p> <p><b>Year 4</b> - Children will recap grouping animals in different ways based on their features, nutrition and skeleton. They will also create classification keys based on their study.</p> <p><b>Year 6</b> – Children will learn how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.</p>	<p><b>Vocabulary</b></p> <p>Touch, rough, smooth, sight, size, colour, amount, smell, nice, unpleasant, taste, sour, sweet, hearing, loud, quiet head, shoulders, back, stomach, arms, hands, fingers, wrists, legs, feet, toes, ankles hair, forehead, cheeks, nose, eyes, ears, eyebrows, chin, mouth, tongue</p>	<p><b>Cross curricular links:</b></p> <p>PSHE</p>
<p><b>Children should know:</b></p>		<p><b>Key questions</b></p>	<p><b>Working scientifically:</b></p>
<ul style="list-style-type: none"> <li>The colour of their hair, eyes and skin</li> <li>That not everyone looks the same</li> </ul>		<p>What do I look like?</p>	<p><b>Sort</b> into groups of similarities and differences</p> <p><b>Talk about</b> and <b>describe</b> themselves naming similarities and differences between themselves and others</p>
<ul style="list-style-type: none"> <li>The 5 senses – touch, sight, smell, taste and hearing</li> </ul>		<p>What are my senses?</p>	<p>Use all of the senses to <b>explore</b> the world around them</p> <p><b>Describe</b> the different senses using associated vocabulary (Touch- rough, smooth; sight- size, colour, amount; smell- nice, unpleasant; taste- sour, sweet; hearing - loud, quiet)</p>
<ul style="list-style-type: none"> <li>The name of different parts of the body (head, shoulders, back, stomach, arms, hands, fingers, wrists, legs, feet, toes, ankles)</li> </ul>		<p>What are the parts of my body called?</p>	<p><b>Label</b> body parts</p>
<ul style="list-style-type: none"> <li>The name of different parts of the face (hair, forehead, cheeks, nose, eyes, ears, eyebrows, chin, mouth, tongue)</li> </ul>		<p>What are the parts of my face called?</p>	<p><b>Label</b> parts of the face</p>

<p><b>Topic 2 – Physics: Changing seasons (Autumn)</b></p> <p><b>End point:</b> To understand some important processes and changes in the natural world around them (ELG).</p>	<p><b>Future learning:</b></p> <p><b>Year 1</b> – Children will learn more about the seasons and identify the months in which they occur, some celebrations and key dates within each season and how the hours of daylight changes throughout the seasons</p> <p><b>Year 4</b> – Children will study the water cycle and how rain is formed.</p> <p><b>Year 5</b> – Children will look at the Earth and how it rotates and tilts causing different weathers and seasons.</p> <p><b>KS3</b> – Children will study the water cycle in more detail as well as studying how the Earth’s tilt can affect seasons and length of day.</p>	<p><b>Vocabulary</b></p> <p>Autumn Leaves Trees Changes</p>	<p><b>Cross curricular links:</b></p> <p>Geography: Weather</p>
Children should know...	Key questions	Working scientifically	
<ul style="list-style-type: none"> <li>• The signs of Autumn: <ul style="list-style-type: none"> <li>- leaves on trees change colour to red, orange, yellow, brown.</li> <li>- leaves fall off the trees</li> <li>- mushrooms start to grow</li> <li>- animals collect food for winter</li> <li>- colder weather</li> </ul> </li> </ul>	<p><b>What are the signs of Autumn?</b></p> <p><b>How do I know it is Autumn?</b></p>	<p><b>Observe</b> changes in the leaves and trees</p> <p><b>Identify</b> the weather each day using a weather board</p> <p><b>Describe</b> changes in the weather</p>	
<ul style="list-style-type: none"> <li>• The appropriate clothing for Autumn weather <ul style="list-style-type: none"> <li>- coat/rain jacket</li> <li>- wellies when it rains</li> </ul> </li> </ul>	<p><b>What should I wear in Autumn?</b></p>	<p><b>Sort</b> clothing into appropriate seasons</p>	

<p><b>Topic 3-Physics: Seasonal Change (Winter)</b></p> <p><b>End point:</b> To understand some important processes and changes in the natural world around them (ELG).</p>	<p><b>Future learning:</b></p> <p><b>Year 1</b> – Children will learn more about the seasons and identify the months in which they occur, some celebrations and key dates within each season and how the hours of daylight changes throughout the seasons. Children will learn about deciduous and evergreen trees.</p> <p><b>Year 4</b> – Children will study the water cycle and how rain is formed.</p> <p><b>Year 5</b> – Children will look at the Earth and how it rotates and tilts causing different weathers and seasons.</p> <p><b>KS3</b> – Children will study the water cycle in more detail as well as studying how the Earth’s tilt can affect seasons and length of day.</p>	<p><b>Vocabulary</b></p> <p>Winter Frost Ice Snow Hibernate</p>	<p><b>Cross curricular links:</b></p> <p>Geography- weather</p>
<p><b>Children should know...</b></p>		<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>
<ul style="list-style-type: none"> <li>• The signs of winter <ul style="list-style-type: none"> <li>- Weather is much colder</li> <li>- Frost, snow and ice</li> <li>- No leaves on some trees but others keep their leaves</li> <li>- It gets darker earlier in the day</li> </ul> </li> </ul>	<p>What are the signs of Winter?</p> <p>How do I know it is Winter?</p>	<p><b>Observe</b> changes in the trees</p> <p><b>Identify</b> the weather each day using a weather board</p> <p><b>Describe</b> changes in the weather</p>	
<ul style="list-style-type: none"> <li>• How we dress in Winter? <ul style="list-style-type: none"> <li>-Wear a thick coat and jumpers/hoodies</li> <li>-hat, gloves and scarf</li> <li>-Wellies or snow boots</li> </ul> </li> </ul>	<p>What should I wear in Winter?</p>	<p><b>Sort</b> clothing into appropriate seasons</p>	
<ul style="list-style-type: none"> <li>• Some animals such as hedgehogs hibernate in winter when it gets too cold</li> </ul>	<p>What do hedgehogs do in winter?</p>	<p><b>Identify and classify</b> animals who hibernate</p>	

<p><b>Topic 4-Physics: Seasonal Change (Spring)</b></p> <p><b>End point:</b> To understand some important processes and changes in the natural world around them (ELG).</p>	<p><b>Future learning:</b>  <b>Year 1</b> – Children will label parts of a plant and name a variety of wild and garden plants  <b>Year 2</b> – Children will study how plants grow from seeds and bulbs in more detail. They will also look at what plants need to grow and stay healthy.  <b>Year 5</b> – Children will look at the life cycle of a plant including the life process of reproduction.  <b>KS3</b> – Children will study plants in much closer detail, observing the cell structure and how plants create their own food through photosynthesis.</p>	<p><b>Vocabulary</b></p> <p>Spring Caterpillar Butterfly Stem Leaf Root Flower Eggs</p>	<p><b>Cross curricular links:</b></p> <p>Geography- weather</p>
<p><b>Children should know...</b></p>	<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>• The signs of Spring – <ul style="list-style-type: none"> <li>- The weather feels warmer outside</li> <li>- Lambs begin to be born</li> <li>- Daffodils and other flowers begin to grow</li> <li>- Buds and leaves appear on trees</li> <li>- Birds make nests and their eggs begin hatching</li> </ul> </li> </ul>	<p>What are the signs of Spring?</p> <p>How do I know it is Spring?</p>	<ul style="list-style-type: none"> <li>• <b>Observe</b> changes in our environment</li> </ul>	
<ul style="list-style-type: none"> <li>• The name of animal babies in our local area</li> <li>• That a caterpillar changes into a butterfly</li> </ul>	<p>How do animals change?</p>	<ul style="list-style-type: none"> <li>• <b>Observe</b> changes to animals – caterpillar to butterfly</li> </ul>	
<ul style="list-style-type: none"> <li>• The name of some of the parts of a plant (stem, leaves, roots, flower)</li> </ul>	<p>What are the parts of a plant?</p>	<ul style="list-style-type: none"> <li>• <b>Identify</b> parts of a plant</li> </ul>	
<ul style="list-style-type: none"> <li>• What plants need in order to grow</li> </ul>	<p>What do plants need to grow?</p>	<ul style="list-style-type: none"> <li>• Planting seeds (cress) to <b>observe</b> growth</li> <li>• <b>Talk about</b> what plants need to grow – water, sunlight</li> </ul>	

<p><b>Topic 5-Physics: Seasonal Change (Summer)</b></p> <p><b>End point:</b> To understand some important processes and changes in the natural world around them (ELG).</p>	<p><b>Future learning:</b></p> <p><b>Year 1</b> – Children will learn more about the seasons and identify the months in which they occur, some celebrations and key dates within each season and how the hours of daylight changes throughout the seasons. Children will learn about deciduous and evergreen trees.</p> <p><b>Year 4</b> – Children will study the water cycle and how rain is formed.</p> <p><b>Year 5</b> – Children will look at the Earth and how it rotates and tilts causing different weathers and seasons.</p> <p><b>KS3</b> – Children will study the water cycle in more detail as well as studying how the Earth’s tilt can affect seasons and length of day.</p>	<p><b>Vocabulary</b></p> <p>Pollinate Flowering Temperature</p>	<p><b>Cross curricular links:</b></p>
<p><b>Children should know...</b></p>	<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>• To know what the signs of summer are <ul style="list-style-type: none"> <li>- Warm weather – needing to wear sun cream</li> <li>- Bees and butterflies pollinating flowers</li> <li>- Plants flowering</li> <li>- Trees full of green leaves</li> </ul> </li> </ul>	<p>What are the signs of Summer?</p> <p>How do I know it is Summer?</p>	<p><b>Observe</b> changes in the trees</p> <p><b>Identify</b> the weather each day using a weather board</p> <p><b>Describe</b> changes in the weather</p>	
<ul style="list-style-type: none"> <li>• To know how we dress in Summer and stay healthy</li> </ul>	<p>What should I wear in Summer?</p>	<p><b>Sort</b> clothing into appropriate seasons</p>	

<p><b>Topic 6-Biology:</b> <b>Animals and their habitats</b></p> <p><b>End point:</b> To understand some important processes and changes in the natural world around them (ELG).</p>	<p><b>Future learning:</b>  <b>Year 1</b> – Children will learn about different animals and group them based on their features and diet  <b>Year 2</b> – Children will describe different habitats and explain how they provide for things living there.  <b>Year 3</b> – Children will study the nutrition of animals.  <b>Year 4</b> – Children will study environment threats to habitats and construct and interpret a variety of food chains.  <b>KS3</b> – Children will study interdependence in ecosystems and how organisms can affect their environments.</p>	<p><b>Vocabulary</b>  badger, fox, owl, hedgehog   horse (foal), cow (calf), pig (piglet), duck (duckling), sheep (lamb)   hot and cold climates   habitats</p>	<p><b>Cross curricular links:</b>  Geography – hot and cold climates</p>
<p><b>Children should know...</b></p>		<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>
<ul style="list-style-type: none"> <li>Some animals that live in our country - badger, fox, owl, hedgehog</li> </ul>	<p>What animals live near me?</p>	<p><b>Identify</b> animals native to England</p>	
<ul style="list-style-type: none"> <li>Some animals and their young – horse (foal), cow (calf), pig (piglet), duck (duckling), sheep (lamb)</li> </ul>	<p>Who are their babies?</p>	<p><b>Match</b> animals to their young</p>	
<ul style="list-style-type: none"> <li>Some animals from hot and cold climates <ul style="list-style-type: none"> <li>Hot – lion, tiger, camel, elephant, crocodile</li> <li>Cold – polar bear, penguin, seal, arctic fox</li> </ul> </li> </ul>	<p>Which animals live in hot places?</p> <p>Which animals live in cold places?</p>	<p><b>Sort</b> animals into hot and cold climates</p>	
<ul style="list-style-type: none"> <li>That animals adapt to live in different habitats <ul style="list-style-type: none"> <li>– forest, desert, jungle, arctic, under the sea- hot – African animals – elephants, giraffes, lions, hippos, monkeys, zebra, ostrich – cold – polar regions – Arctic/Antarctica - polar bears, penguins, killer whale, seal, walrus, arctic fox/rabbit.</li> </ul> </li> </ul>	<p>What is a habitat?</p> <p>Where do different animals live?</p> <p>Why do animals live in different places?</p>	<p><b>Describe</b> different habitats and name the animals that live there</p> <p><b>Talk about</b> how animals’ bodies allow them to live in their habitat</p>	

<p><b>Topic 7-Chemistry: Materials (Floating and Sinking)</b></p> <p><b>End point:</b> To understand some important processes and changes in the natural world around them (ELG).</p>	<p><b>Future learning:</b>  <b>Year 1</b> – Children will identify different objects and the materials they are used from and describe materials based on their properties  <b>Year 2</b> – Children will look at the suitability of a variety of everyday materials.  <b>Year 3</b> – Children will study rocks in more detail looking at the properties of different types of rock.  <b>Year 4</b> – Children will study ‘States of Matter’ where they will look at a variety of solids, liquids and gases.  <b>Year 5</b> – Children will study ‘Properties and Changes of Materials’ where they will explore deeper into states of matter and reversible and irreversible changes.  <b>KS3</b> – Children will study 'States of Matter and Changes'</p>	<p><b>Vocabulary</b> Heavy, light, sink, float, objects, materials</p>	<p><b>Cross curricular links:</b></p>
<p><b>Children should know...</b></p>	<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>• That heavy objects sink and light objects float</li> </ul>	<p><b>Does it sink or float?</b></p>	<ul style="list-style-type: none"> <li>• <b>Ask questions</b> about floating and sinking – such as why heavy boats float?</li> <li>• <b>Experiment</b> with a range of objects and materials to see which ones float and sink</li> <li>• <b>Explore</b> floating and sinking with a range of materials and objects to make boats</li> </ul>	





# Science Progression Document

## Year 1

<p><b>Topic 1-Physics – Seasonal Changes</b></p> <p><b>End point:</b> To understand the changes through the seasons.</p>	<p><b>Prior learning</b></p> <p><b>EYFS</b> - Children have explored different seasons during EYFS. They have learnt the different characteristics and weather associated with each season.</p> <p><b>Future learning:</b></p> <p><b>Year 4</b> – Children will study the water cycle and how rain is formed.</p> <p><b>Year 5</b> – Children will look at the Earth and how it rotates and tilts causing different weathers and seasons.</p> <p><b>KS3</b> – Children will study the water cycle in more detail as well as studying how the Earth’s tilt can affect seasons and length of day.</p>	<p><b>Vocabulary</b></p> <p>Season Summer Winter Autumn Spring Day Daytime Rain Sun Change</p>	<p><b>Cross curricular links:</b> Geography: Weather</p>
<p><b>Note: This topic will be taught across the year to coincide with each of the seasons.</b> Autumn 1 – Lesson 1; Autumn 2 – Lesson 2; Spring 2 – Lesson 3; Summer 1 – Lesson 4</p>			
<p><b>Children should know:</b></p>	<p><b>Key questions</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>Autumn occurs during the months of September, October and November</li> <li>In autumn the amount of time it is light becomes less which means it gets darker earlier.</li> <li>The leaves start to change colour and fall off the trees.</li> <li>In autumn there is a time called ‘harvest.’ This is when farmers dig up and gather all the crops that have been growing over the summer months.</li> </ul>	<p>What is Autumn?</p>	<p><b>Observe and talk about changes</b> in the weather and the seasons.</p> <p><b>Make tables and charts</b> about the weather</p> <p><b>Make displays</b> of what happens in the world around them, including day length, as the seasons change.</p>	
<ul style="list-style-type: none"> <li>Winter is usually within the months of December, January and February.</li> <li>In winter we have colder weather, sometimes snow and frost</li> <li>The trees have no leaves and the amount of time it is light during the day is at its shortest.</li> <li>It doesn’t always snow in winter but it can be very cold.</li> <li>Christmas is a big event that happens in winter.</li> </ul>	<p>What is Winter?</p>	<p><b>Observe and talk about changes</b> in the weather and the seasons.</p> <p><b>Make tables and charts</b> about the weather</p> <p><b>Make displays</b> of what happens in the world around them, including day length, as the seasons change.</p>	
<ul style="list-style-type: none"> <li>Spring is usually within March, April and May.</li> <li>In spring, the days get longer and a bit warmer.</li> <li>New plants grow, and the trees grow their leaves back.</li> <li>In Spring, many animals have babies, such as birds, cows, sheep and ducks.</li> <li>Pancake day, Lent and Easter all usually happen in the spring months</li> </ul>	<p>What is Spring?</p>	<p><b>Observe and talk about changes</b> in the weather and the seasons.</p> <p><b>Make tables and charts</b> about the weather</p> <p><b>Make displays</b> of what happens in the world around them, including day length, as the seasons change.</p>	
<ul style="list-style-type: none"> <li>Summer is usually within the months of June, July and August.</li> <li>In summer the days are at their longest and the weather is the warmest.</li> <li>The trees are full of leaves.</li> <li>In Britain, schools close for a lot of the summer for the ‘6-week summer holidays’.</li> <li>It is important that we look after ourselves in the sun</li> </ul>	<p>What is Summer?</p>	<p><b>Observe and talk about changes</b> in the weather and the seasons.</p> <p><b>Make tables and charts</b> about the weather</p> <p><b>Make displays</b> of what happens in the world around them, including day length, as the seasons change.</p>	

<p><b>Topic 2 - Animals, including humans</b></p> <p><b>End point:</b> To group animals according to their animal group and what they eat</p>	<p><b>Prior learning:</b> EYFS - Children have learnt the names of different animals and their habitats (woodland, farm, hot climate, cold climate). They have also looked at the similarities and differences between themselves and their classmates.</p> <p><b>Future learning:</b> <b>Year 2</b> – Children will study animals further and learn about offspring and the basic needs that animals need to survive. <b>Year 3</b> – Children will learn about the importance of nutrition for animals. They will then focus on muscles and the skeleton. <b>Year 4</b> - Children will recap grouping animals in different ways based on their features, nutrition and skeleton. They will also create classification keys based on their study. <b>Year 6</b> – Children will learn how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.</p>	<p><b>Vocabulary</b> Amphibians Birds Fish Mammals reptiles carnivore, herbivore omnivore senses: sight, hearing, touch, taste, smell</p>	<p><b>Cross curricular links:</b> PSHE – similarities and differences of each other and how to look after our bodies.</p>
Children should know...	Key questions	Working scientifically	
The name of the basic parts of the human body (head, neck, shoulder, arms, elbows, legs, knees, ankle, face, ears, eyes, hair, mouth, teeth)	What are our body parts called?	<b>Produce labelled diagrams</b> of the human body	
<p>The five human senses and the body parts that are used for each one.</p> <p>How humans use their senses to make sense of the world around them.</p> <p>How humans adapt when one of their senses is impaired.</p>	What are senses?	<p><b>Perform simple tests</b> to explore how different senses are used.</p> <p><b>Observe closely, using simple equipment,</b> what happens when one of the senses is taken away.</p>	
The names of a variety of common animals including fish, amphibians, reptiles, birds and mammals.	What are the different animal groups?	<p><b>Identify and classify</b> animals from different groups</p> <p><b>Describe</b> how they identify and group different animals</p>	
The characteristics, similarities and differences between a variety of common animals including fish, amphibians, reptiles, birds and mammals	How are animals different?	<b>Use observations to compare and contrast</b> animals and <b>explain</b> similarities and differences	
<p>That carnivores are animals that eat meat.</p> <p>That herbivores are animals that eat plants.</p> <p>That omnivores are animals that eat meat and plants.</p> <p>Which animals are in each of the three groups.</p>	Do all animals eat the same thing?	<b>Identify and classify</b> animals based on what they eat and <b>gather data</b> to identify which group different animals belong to.	

<p><b>Topic 3-Biology: Plants</b></p> <p><b>End point:</b> To identify parts of a plant</p>	<p><b>Prior learning:</b> EYFS – Children learnt about growing plants during Signs of Spring topic. They planted cress seeds and watched them grow.</p> <p><b>Future learning:</b> Year 2 – Children will study how plants grow from seeds and bulbs in more detail. They will also look at what plants need to grow and stay healthy. Year 5 – Children will look at the life cycle of a plant including the life process of reproduction. KS3 – Children will study plants in much closer detail, observing the cell structure and how plants create their own food through photosynthesis.</p>	<p><b>Vocabulary</b> Wild plants Garden plants deciduous and evergreen cedar, horse chestnut, oak roots nutrients stem leaves flowers petals fruit seed bulb blossom</p>	<p><b>Cross curricular links:</b></p>
<p><b>Children should know...</b></p>	<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>That plants start from seeds or bulbs.</li> </ul>	<p>How does a plant begin?</p>	<ul style="list-style-type: none"> <li><b>Plan and carry out an investigation</b> to <b>observe</b> how plants grow.</li> <li><b>Observe</b> what happens to seeds and bulbs when they are planted in soil</li> </ul>	
<ul style="list-style-type: none"> <li>The basic structure and parts of a flowering plant.</li> </ul>	<p>What are the parts of a plant?</p>	<ul style="list-style-type: none"> <li><b>Observe</b> real life plants and <b>label</b> the different parts</li> <li><b>Label a diagram</b> of a plant</li> </ul>	
<ul style="list-style-type: none"> <li>The names and appearance of a variety of wild plants</li> </ul>	<p>What are wild plants?</p>	<ul style="list-style-type: none"> <li><b>Observe</b> different wild plants in the local environment</li> </ul>	
<ul style="list-style-type: none"> <li>The names and appearance of a variety of garden plants</li> </ul>	<p>What are garden plants?</p>	<ul style="list-style-type: none"> <li><b>Observe closely</b> different garden plants</li> <li><b>Compare and contrast</b> familiar plants and <b>describe</b> how they were able to identify and group them</li> </ul>	
<ul style="list-style-type: none"> <li>The difference between deciduous and evergreen trees and how they each change or remain the same through the changing seasons.</li> </ul>	<p>How do trees change through the year?</p>	<ul style="list-style-type: none"> <li><b>Identify and classify</b> trees as evergreen or deciduous</li> <li><b>Keep records</b> of how plants have changed over time</li> </ul>	
<ul style="list-style-type: none"> <li>The basic structure and parts of a tree.</li> </ul>	<p>What are the parts of a tree?</p>	<ul style="list-style-type: none"> <li><b>Observe</b> real life trees and <b>label</b> the different parts</li> <li><b>Label a diagram</b> of a tree</li> </ul>	

<p><b>Topic 4 - Chemistry: Materials</b></p> <p><b>End point:</b> To identify everyday materials and their properties</p>	<p><b>Prior learning:</b> <b>EYFS</b> - Children have explored different materials in continuous provision. They have discussed the textures of different materials and used different materials during model making activities.</p> <p><b>Future Learning:</b> <b>Year 2</b> – Children will look at the suitability of a variety of everyday materials. <b>Year 3</b> – Children will study rocks in more detail looking at the properties of different types of rock. <b>Year 4</b> – Children will study ‘States of Matter’ where they will look at a variety of solids, liquids and gases. <b>Year 5</b> – Children will study ‘Properties and Changes of Materials’ where they will explore deeper into states of matter and reversible and irreversible changes. <b>KS3</b> – Children will study 'States of Matter and Changes'</p>	<p><b>Vocabulary</b> material plastic, wood, metal, water, glass stretchy shiny, dull rough, smooth, bendy, not bendy, waterproof, not waterproof, absorbent, not absorbent, transparent, opaque, see through</p>	<p><b>Cross curricular links:</b></p>
<p><b>Children should know...</b></p>	<p><b>Key questions</b></p>	<p><b>Working scientifically</b></p>	
<ul style="list-style-type: none"> <li>The name of a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</li> </ul>	<p>What are materials?</p>	<ul style="list-style-type: none"> <li><b>Identify</b> different materials by <b>observing closely</b></li> </ul>	
<ul style="list-style-type: none"> <li>The difference between an object and the material from which it is made</li> </ul>	<p>What are objects made from?</p>	<ul style="list-style-type: none"> <li><b>Identify and compare</b> a material and the object it is made from</li> </ul>	
<ul style="list-style-type: none"> <li>The simple physical properties of a variety of everyday materials</li> </ul>	<p>How are materials different?</p>	<ul style="list-style-type: none"> <li><b>Observe and describe</b> the properties of different materials</li> </ul>	
<ul style="list-style-type: none"> <li>How materials can be grouped based on their properties.</li> </ul>	<p>How can we sort materials?</p>	<ul style="list-style-type: none"> <li><b>Compare and group together</b> a variety of everyday materials on the basis of their simple physical properties.</li> </ul>	
<ul style="list-style-type: none"> <li>That materials are chosen and used for different purposes based on their properties</li> </ul>	<p>Which material would be best for an umbrella?</p>	<ul style="list-style-type: none"> <li><b>Perform a simple test to explore a question</b></li> </ul>	
<ul style="list-style-type: none"> <li>The life and work of William Addis</li> </ul>	<p>Who is William Addis?</p>	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of William Addis</li> </ul>	



# Science Progression Document

## Year 2

<p><b>Topic 1- Biology – Animals, Including Humans</b></p> <p><b>End point:</b> To understand how animals, including humans, grow and change</p>	<p><b>Prior learning</b> Year 1 – Children will have looked at different parts of the human body and the related sense.</p> <p><b>Future learning:</b> <b>Year 3</b> – Children will study the importance of nutrition in humans and other animals. <b>Year 4</b> – Children will study the seven life processes again and explore digestion in humans. <b>Year 5</b> – Children will study life cycles and reproduction. Year 6 – Children will study healthy and unhealthy habits. <b>KS3</b> – Children will study reproduction in more detail.</p>	<p><b>Vocabulary</b> Diet, exercise hygiene illness, disease, medicine off-spring seven basic needs movement, respiration sensitivity, growth reproduction, excretion nutrition, survive</p>	<p><b>Cross curricular links:</b> PSHE – Healthy lifestyles and looking after our bodies</p>
Children should know:	Key questions	Working scientifically:	
<ul style="list-style-type: none"> <li>The basic needs of animals, including humans, for survival (water, food and air)</li> </ul>	<p>What do humans need?</p>	<ul style="list-style-type: none"> <li><b>Explain</b> the difference between needs and wants</li> <li><b>Identify</b> the basic needs of animals</li> </ul>	
<ul style="list-style-type: none"> <li>That animals, including humans, have offspring which grow into adults</li> <li>The basic stages in a life cycle of animals (humans, butterflies, frogs)</li> </ul>	<p>What are offspring? How do animals change as they grow into adults?</p>	<ul style="list-style-type: none"> <li><b>Observe</b> the changes in animals and their offspring</li> <li><b>Identify</b> the offspring that comes from different animals</li> <li><b>Sort and label</b> a diagram to show the life cycle of a butterfly, frog, human</li> <li><b>Explain</b> how humans change as they grow into adults.</li> </ul>	
<ul style="list-style-type: none"> <li>That our bodies change in different ways as we grow</li> </ul>	<p>Do we all grow the same?</p>	<ul style="list-style-type: none"> <li><b>Gather and record data</b> to answer the question, 'Do our feet get bigger as we get older?'</li> </ul>	
<ul style="list-style-type: none"> <li>Why exercise is important for humans.</li> </ul>	<p>Do we need to exercise?</p>	<ul style="list-style-type: none"> <li><b>Observe</b> the effect exercise has on the human body</li> <li><b>Perform simple tests.</b></li> <li><b>Gather and record data</b> to help in answering questions</li> </ul>	
<ul style="list-style-type: none"> <li>Why a balanced diet is important for humans.</li> </ul>	<p>What is a healthy diet?</p>	<ul style="list-style-type: none"> <li><b>Explain</b> what a balanced diet is and why it is important</li> <li><b>Label</b> a balanced plate</li> </ul>	
<ul style="list-style-type: none"> <li>Why good hygiene is important</li> </ul>	<p>Why do we need to have good hygiene?</p>	<ul style="list-style-type: none"> <li><b>Identify</b> ways of maintaining good hygiene</li> <li><b>Explain</b> why we need to have good hygiene.</li> </ul>	
<ul style="list-style-type: none"> <li>Medicines can come in all different shapes, sizes and colours but they're all used for the same purpose — to make you feel better when you're ill.</li> <li>Medicines can cause harm if they are not used properly.</li> <li>Too much of a medicine can be harmful, and old or outdated medicines may not work or can make people sick.</li> <li>Taking the wrong medicine or medicine prescribed for someone else is dangerous</li> </ul>	<p>How can we feel better when we are ill?</p>	<ul style="list-style-type: none"> <li><b>Identify</b> some medicines</li> <li><b>Explain</b> how medicines can be used</li> <li><b>Explain</b> how medicines can cause harm</li> </ul>	

<p><b>Topic 2- Chemistry: Materials</b></p> <p><b>End point:</b> To know some properties of materials and how they can be changed</p>	<p><b>Prior learning:</b>  <b>Year 1</b> – Children will have looked at different objects and the material from which they are made. They will have identified a variety of everyday materials and described their properties such as wood, plastic, glass, metal, water and rock. Children will also have compared and grouped together a variety of objects made from different materials.</p> <p><b>Future learning:</b>  <b>Year 3</b> – Children will study rocks in more detail looking at the properties of different types of rock.  <b>Year 4</b> – Children will study ‘States of Matter’ where they will look at a variety of solids, liquids and gases.  <b>Year 5</b> – Children will study ‘Properties and Changes of materials’ where they will explore deeper into states of matter and reversible and irreversible changes.  <b>KS3</b> – Children will study states of matter and changes in more depth as well as focusing the use of different metals, polymers, ceramics and composites.</p>	<p><b>Vocabulary</b></p> <p>Material  wood, metal, plastic, glass, rubber, rock, fabric, paper and brick</p> <p>hard, soft, rough, bumpy, smooth, fragile, strong, heavy, light</p> <p>squashing, bending, twisting and stretching</p>	<p><b>Cross curricular links:</b></p>
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Children should know...	Key questions	Working scientifically
<ul style="list-style-type: none"> <li>That materials are chosen for particular uses based on their properties</li> </ul>	Why are materials chosen for certain uses?	<ul style="list-style-type: none"> <li><b>Identify and compare</b> which materials are chosen for certain uses</li> <li><b>Compare</b> the use of different materials</li> <li><b>Classify</b> or group things according to their uses</li> <li><b>Explain</b> why a material has been chosen for a particular use and why it wouldn't be suitable</li> </ul>
<ul style="list-style-type: none"> <li>Why a material might or might not be used for a specific job</li> </ul>	Which material will protect Humpty Dumpty?	<ul style="list-style-type: none"> <li><b>Perform a test to explore a question</b></li> <li><b>Investigate</b> a material that will be good to wrap around Humpty Dumpty</li> <li><b>Test</b> the materials to answer questions (Would it protect an egg? Would it be comfortable to wear? Is it heavy?)</li> </ul>
<ul style="list-style-type: none"> <li>That materials can be changed by squashing, bending, twisting and stretching.</li> </ul>	How can we change materials?	<ul style="list-style-type: none"> <li><b>Find out</b> how the shapes of solid objects made from some materials can be changed</li> <li><b>Perform simple tests</b> to find out how materials can be changed</li> <li><b>Observe</b> how materials can be changed</li> </ul>
<ul style="list-style-type: none"> <li>That the type of surface affects how things move</li> </ul>	Which surface makes the car travel the furthest?	<ul style="list-style-type: none"> <li><b>Compare</b> movement on different surfaces</li> <li>Set up a <b>fair test</b></li> <li>Gather and record data to help in answering questions</li> <li><b>Draw conclusions</b> from fair tests and explain what has been found out.</li> </ul>
<ul style="list-style-type: none"> <li>The life and work of Charles Macintosh –</li> <li>That Charles Macintosh invented waterproof material</li> </ul>	Who was Charles Macintosh?	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Charles Macintosh</li> </ul>



<p><b>Topic 3-Biology: Plants</b></p> <p><b>End point:</b> To understand how plants grow and stay healthy</p>	<p><b>Prior learning:</b>  <b>Year 1</b> – Children learnt about different plants and trees and described the basic structure.  <b>Future learning:</b>  <b>Year 2</b> – Children will study how plants grow from seeds and bulbs in more detail. They will also look at what plants need to grow and stay healthy.  <b>Year 3</b> – Children will learn about the functions of the different parts of the plant, find out how flowers play a part in the life cycle of the plant and investigate how water is transported in plants.  <b>Year 5</b> - Children will look at the life cycle of a plant including the life process of reproduction.  <b>KS3</b> - Children will study plants in much closer detail, observing the cell structure and how plants create their own food through photosynthesis.</p>	<p><b>Vocabulary</b></p> <p>plant  tree  flower  roots  stem  leaf  seed  bulb  germination  sprouts  shoot  seed dispersal  temperature  nutrition</p>	<p><b>Cross curricular links:</b></p>
<p><b>Children should know...</b></p>	<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>That fruit, vegetables and herbs are a type of plant that we eat.</li> </ul>	<p>Which plants can we eat?</p>	<ul style="list-style-type: none"> <li><b>Identify and classify</b> different plants into groups to show which ones can be eaten</li> <li><b>Label</b> a diagram of a plant to show which parts can be eaten</li> </ul>	
<ul style="list-style-type: none"> <li>That there are similarities and differences between different seeds</li> </ul>	<p>Are all seeds the same?</p>	<ul style="list-style-type: none"> <li><b>Observe and describe</b> how seeds and bulbs grow into mature plants</li> <li><b>Observe closely with magnifying glasses</b> what different seeds look like</li> <li><b>Compare similarities and differences</b> between different seeds</li> </ul>	
<ul style="list-style-type: none"> <li>That plants need water, light and a suitable temperature to grow and stay healthy</li> </ul>	<p>What do plants need?</p>	<ul style="list-style-type: none"> <li><b>Describe</b> how plants need water, light and a suitable temperature to grow and stay healthy.</li> <li><b>Explain</b> how to look after a plant</li> </ul>	
<ul style="list-style-type: none"> <li>How to plan a fair investigation to find out where the best place to grow a seed is.</li> </ul>	<p>Where will they grow?</p>	<ul style="list-style-type: none"> <li><b>Set up a comparative test</b> to show that plants need light and water to stay healthy</li> <li><b>Observe and record</b>, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb</li> <li><b>Gather and record data</b> to help in answering questions</li> </ul>	
<ul style="list-style-type: none"> <li>How plants grow and change throughout their life cycle</li> </ul>	<p>How do plants grow and change?</p>	<ul style="list-style-type: none"> <li><b>Observe and describe</b> how seeds and bulbs grow into mature plants</li> <li><b>Order and label</b> a diagram showing the life cycle of a plant</li> </ul>	
<ul style="list-style-type: none"> <li>The life and work of George Washington Carver</li> <li>That George Washington Carver discovered over 300 uses for peanuts</li> </ul>	<p>Who is George Washington Carver?</p>	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of George Washington Carver</li> </ul>	

<p><b>Topic 4 – Biology: Living things and their habitats</b></p> <p><b>End point</b> To describe different habitats and explain how they provide for things living there.</p>	<p><b>Prior learning:</b> <b>Year 1</b> – Children studied different animals and grouped them based on their features and diet</p> <p><b>Future Learning:</b> <b>Year 3</b> – Children will study the nutrition of animals. <b>Year 4</b> – Children will study environment threats to habitats and construct and interpret a variety of food chains. <b>KS3</b> – Children will study interdependence in ecosystems and how organisms can affect their environments.</p>	<p><b>Vocabulary</b> alive dead living Life processes Depend Survive Habitat, microhabitat conditions, adapted food chain, omnivore herbivore, carnivore</p>	<p><b>Cross curricular links:</b></p>
Children should know...	Key questions	Working scientifically	
<ul style="list-style-type: none"> <li>The difference between living, dead or never lived.</li> </ul>	<p>Is it living, dead or never been alive?</p>	<ul style="list-style-type: none"> <li><b>Identify and classify</b> a range of pictures to show if they are living, dead or never alive</li> <li><b>Compare the differences</b> between things that are living, dead and have never lived.</li> </ul>	
<ul style="list-style-type: none"> <li>Different microhabitats in their local area and identify living things that might live there (flower beds, under logs/rocks, bushes, in the grass, pond)</li> </ul>	<p>What is a microhabitat?</p>	<ul style="list-style-type: none"> <li><b>Identify and classify</b> different microhabitats.</li> <li><b>Observe closely</b> different microhabitats to see the living things that live there</li> <li><b>Use simple equipment</b> such as magnifying glasses and pooters</li> </ul>	
<ul style="list-style-type: none"> <li>Some large habitats around the world (mountain, polar, jungle, sea, desert, savannah)</li> <li>Differences between habitats around the world</li> <li>Some living things that might live in different habitats</li> </ul>	<p>How are habitats different around the world?</p>	<ul style="list-style-type: none"> <li><b>Identify and classify</b> different habitats around the world</li> <li><b>Compare the differences and similarities</b> between different habitats</li> <li><b>Identify</b> animals that live in different habitats</li> </ul>	
<ul style="list-style-type: none"> <li>How to plan and carry out an investigation to find out which conditions woodlice prefer.</li> </ul>	<p>What conditions do woodlice prefer?</p>	<ul style="list-style-type: none"> <li><b>Predict</b> which area the most woodlice will go to</li> <li><b>Investigate</b> which condition woodlice prefer (Dark and dry – cover this with black sugar paper 2. Dark and damp – cover this with a piece of damp black sugar paper 3. Bright and dry – cover this with a piece of white paper 4. Bright and damp – cover this with a piece of damp white paper)</li> <li><b>Observe closely</b> and use my observations to <b>answer questions</b>.</li> <li>Use their observations and ideas to <b>suggest answers to questions</b></li> </ul>	
<ul style="list-style-type: none"> <li>Some animals are better suited to the habitat they live in because they have special features</li> <li>That most living things live in a habitat to which they are suited.</li> <li>That a specific habitat provides for the basic needs of things living there (camel, polar bear and giraffe)</li> </ul>	<p>How are living things adapted to their habitat?</p>	<ul style="list-style-type: none"> <li><b>Label</b> animals to show how they have adapted to their habitat</li> <li><b>Explain</b> how a specific habitat provides for the things living there</li> </ul>	
<ul style="list-style-type: none"> <li>Some different sources of food for animals</li> <li>What a simple food chain looks like and how it works.</li> </ul>	<p>What is a food chain?</p>	<ul style="list-style-type: none"> <li><b>Draw simple diagrams</b> to show a food chain</li> </ul>	
<ul style="list-style-type: none"> <li>The life and work of Charles H. Turner</li> <li>That Charles H. Turner discovered that insects can hear</li> </ul>	<p>Who is Charles H. Turner?</p>	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Charles H. Turner</li> </ul>	



# Science Progression Document

## Year 3

<p><b>Topic 1-Chemistry: Rocks</b></p> <p><b>End point:</b> To identify the different rock types and understand how a fossil is formed</p>	<p><b>Prior learning</b> <b>KS1</b> – Rocks and soils are only covered briefly in other topics in KS1. Children will have learnt about soil during plant topics. Children will have also learnt some of the properties of rocks during topics about different materials.</p> <p><b>Future learning:</b> <b>UKS2</b> – Rocks and soils are not studied again in KS2. <b>KS3</b> – Children will study rocks in more detail. They will look at the rock cycle and how the different rocks are formed</p>	<p><b>Vocabulary</b> Rock Soil Fossil Appearance Property Igneous Sedimentary Metamorphic</p>	<p><b>Cross curricular links:</b> Geography: the Earth's crust</p>
Children should know:	Key questions	Working scientifically:	
<ul style="list-style-type: none"> <li>Rock is a naturally occurring material found in the ground.</li> <li>Rocks can be different shapes and sizes</li> </ul>	What are rocks?	<ul style="list-style-type: none"> <li><b>Make comparisons</b> between different rock types</li> <li><b>Observe</b> a selection of rocks and <b>compare</b></li> </ul>	
<ul style="list-style-type: none"> <li>There are different types of rock in each groups e.g. sandstone, slate, marble etc. which all have different properties e.g. hard, soft, grain/crystal size, absorbent</li> </ul>	Are all rocks the same?	<ul style="list-style-type: none"> <li><b>Use tables</b> to record and compare the properties of different rocks</li> <li><b>Plan, make predictions and carry out fair tests</b> into the properties of rocks</li> <li></li> </ul>	
<ul style="list-style-type: none"> <li>Rocks can be organised into 3 groups: igneous, metamorphic, sedimentary (this is dependent on how they were formed)</li> </ul>	How are rocks formed?	<ul style="list-style-type: none"> <li><b>Explain</b> how different rocks are formed using models and diagrams to support</li> </ul>	
<ul style="list-style-type: none"> <li>Soil is made from rocks and organic matter; there are different types of soils.</li> </ul>	What's in soil?	<ul style="list-style-type: none"> <li><b>Observe and identify</b> components of soil samples</li> <li><b>Choose the most suitable method</b> to explore the water retention of soils and <b>present findings using a bar chart</b></li> </ul>	
<ul style="list-style-type: none"> <li>Fossils are formed when things that have lived are trapped within rock.</li> </ul>	What is a fossil?	<ul style="list-style-type: none"> <li><b>Use labelled diagrams</b> to explain how fossils are formed</li> </ul>	
<ul style="list-style-type: none"> <li>The life and work of Mary Anning (fossilist)</li> </ul>	Who is Mary Anning?	<ul style="list-style-type: none"> <li><b>Carry out research</b> into the life of Mary Anning</li> </ul>	

<p><b>Topic 2-Physics: Light</b></p> <p><b>End point:</b> To understand how the eye works To understand how light travels and forms shadows</p>	<p><b>Prior learning:</b> Year 1- Seasonal changes- how the amount of daylight varies throughout the year Year 2- Plants need light to grow</p> <p><b>Future learning:</b> Year 6 - children will consolidate previous learning by exploring the way that light behaves, including light sources, reflection and shadows. Pupils will make predictions and investigate the relationship between light sources, objects and shadows and understand how the eye works.</p>	<p><b>Vocabulary</b> Light source Dark Reflect Shadow Opaque Translucent Transparent Luminous</p>	<p><b>Cross curricular links:</b> PSHE- Road safety awareness (wear reflective clothing)</p>
Children should know...	Key questions	Working scientifically	
<ul style="list-style-type: none"> <li>Light is needed to see things and dark is the absence of light</li> <li>There are natural and man made light sources</li> </ul>	<p>What is a light source?</p>	<ul style="list-style-type: none"> <li><b>Provide examples</b> to match scientific definitions i.e. light source, light, dark</li> </ul>	
<ul style="list-style-type: none"> <li>Light is reflected from surfaces and some materials are more reflective than others</li> </ul>	<p>Why are some materials shiny?</p>	<ul style="list-style-type: none"> <li><b>Investigate</b> the visibility of different materials (shiny/matt) in darker environments and <b>draw conclusions</b></li> </ul>	
<ul style="list-style-type: none"> <li>Light from the sun can be dangerous and there are ways to protect our eyes and skin from sun damage</li> </ul>	<p>Is the Sun dangerous?</p>	<ul style="list-style-type: none"> <li><b>Research</b> the dangers of the sun and how to stay safe and <b>present findings</b></li> </ul>	
<ul style="list-style-type: none"> <li>A shadow is formed when the light from a light source is blocked by an opaque object</li> <li>Shadows take on the shape of an opaque object</li> <li>Some reasons why the size of shadows changes (proximity and angle of light source)</li> </ul>	<p>What is a shadow? Can you change your own shadow?</p>	<ul style="list-style-type: none"> <li><b>Use diagrams and models</b> to explain how shadows are formed and why their appearance can change</li> <li><b>Observe and describe</b> what happens to shadows when the angle of proximity of the light source changes</li> </ul>	
<ul style="list-style-type: none"> <li>The shadows of transparent, opaque and translucent materials vary</li> </ul>	<p>Do transparent objects have shadows?</p>	<ul style="list-style-type: none"> <li><b>Classify</b> materials according to opaque, translucent, transparent</li> <li><b>Observe and identify</b> the difference in shadows of translucent, transparent and opaque objects</li> </ul>	
<ul style="list-style-type: none"> <li>The life and work of Ibn Al-Haytham - Astronomer</li> </ul>	<p>Who is Ibn Al-Haytham?</p>	<ul style="list-style-type: none"> <li><b>Carry out research</b> into the life of Ibn Al-Haytham</li> </ul>	

<p><b>Topic 3-Biology: Plants</b>  <b>End point:</b>          To understand the life cycle and the function of plants/flowers</p>	<p><b>Prior learning:</b>          Year 1 – Children learnt about different plants and trees and described the basic structure.          Year 2 – Children studied how plants grow from seeds and bulbs in more detail. They will also look at what plants need to grow and stay healthy.  <b>Future learning:</b>          Year 5 – Children will look at the life cycle of a plant including the life process of reproduction.          KS3 – Children will study plants in much closer detail, observing the cell structure and how plants create their own food through photosynthesis.</p>	<p><b>Vocabulary</b>          Plant          Tree          Flower          Roots          Stem          Leaf          Seed          Bulb          Nutrients          Pollination          Formation          Dispersal</p>	<p><b>Cross curricular links:</b></p>
<p><b>Children should know...</b></p>	<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>The functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> </ul>	<p>What do the different parts of a plant do?</p>	<ul style="list-style-type: none"> <li><b>Observe</b> a variety of real life plants and look closely at the different parts</li> <li><b>Produce labelled diagrams</b> of flowering plants and use <b>scientific vocabulary</b> to describe function</li> </ul>	
<ul style="list-style-type: none"> <li>Healthy plants need air, light, water, nutrients from soil and room to grow</li> </ul>	<p>What do plants need to survive?</p>	<ul style="list-style-type: none"> <li><b>Plan and carry out a fair test</b> with different variables e.g. the best conditions for a plant to grow</li> <li><b>Observe and describe</b> what happens to plants over time when they are deprived of light/water/air</li> </ul>	
<ul style="list-style-type: none"> <li>How water is transported within plants</li> </ul>	<p>Why are the roots important?</p>	<ul style="list-style-type: none"> <li><b>Use diagrams</b> to support an explanation of the purpose of roots</li> </ul>	
<ul style="list-style-type: none"> <li>the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul>	<p>How do plants reproduce?</p>	<ul style="list-style-type: none"> <li><b>Observe</b> flowers carefully (look at reproductive parts) and produce <b>labelled diagrams</b></li> <li><b>Explain</b> how a flowering plant reproduces <b>using demonstrations and models</b></li> <li><b>Research and explain</b> the different ways seeds are dispersed using different presentation techniques</li> </ul>	
<ul style="list-style-type: none"> <li>The life and works of Ahmed Mumin Warfa – Somali (Botanist)</li> </ul>	<p>Who is Ahmed Mumin Warfa?</p>	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Ahmed Mumin Warfa</li> </ul>	

<p><b>Topic 4-Physics: Forces</b>  <b>End point</b>          To understand what friction is and how it works on different surfaces          To understand how magnets attract or repel</p>	<p><b>Prior learning:</b>          Year 2 - Children have explored different forces before, during the 'Uses of everyday materials' topic in Year 2 whilst investigating how some materials can be changed by bending, squashing, twisting and stretching. They may be able to link those movements to simple pushes and pulls. Magnets are not studied at all in Key Stage 1.</p> <p><b>Future Learning:</b>  <b>Year 5</b> - Children will build upon their knowledge of simple pushes and pulls from Y3 by exploring more difficult concepts such as gravity, friction and air resistance. They will also create different size forces using mechanisms such as levers and pulleys. Magnets are briefly looked at again in Y5 'Properties and changes of materials', where they compare and group materials based on their response to magnets.</p>	<p><b>Vocabulary</b>          Force          Friction          Magnet          Contact          Non-contact          Attract          Repel          Magnetic          Non-magnetic          Iron</p>	<p><b>Cross curricular links:</b></p>
Children should know...	Key questions	Working scientifically	
<ul style="list-style-type: none"> <li>A force can be a push or a pull. A force can change the motion or shape of an object.</li> </ul>	What is a force?	<ul style="list-style-type: none"> <li><b>Make observations</b> of a variety of forces in action</li> <li><b>Use diagrams</b> to label forces and to support a <b>scientific definition</b></li> </ul>	
<ul style="list-style-type: none"> <li>Friction affects the way things move on different surfaces</li> </ul>	What is friction?	<ul style="list-style-type: none"> <li><b>Plan and carry out a fair test</b> into the effect of different materials on a moving object</li> </ul>	
<ul style="list-style-type: none"> <li>Magnetic forces can act at a distance and do not need to make contact unlike some other forces</li> </ul>	What is a magnet?	<ul style="list-style-type: none"> <li><b>Use diagrams</b> to explain what a magnetic force is</li> <li><b>Demonstrate</b> magnetic attraction</li> </ul>	
<ul style="list-style-type: none"> <li>Magnets attract or repel each other and attract some metals but not others</li> </ul>	Which materials are magnetic?	<ul style="list-style-type: none"> <li><b>Investigate and observe</b> how different materials respond to a magnet. <b>Draw conclusions</b> about magnetic materials</li> </ul>	
<ul style="list-style-type: none"> <li>Magnets have a North pole and a South pole</li> </ul>	Do magnets attract each other?	<ul style="list-style-type: none"> <li><b>Investigate and report</b> what happens when different poles of a magnet face each other</li> </ul>	
<ul style="list-style-type: none"> <li>The life and work of William Gilbert (Magnetism and electricity)</li> </ul>	Who is William Gilbert?	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of William Gilbert</li> </ul>	

<p><b>Topic 5 -Biology: Animals including humans</b></p> <p><b>End point:</b></p> <p>To understand a balanced diet and how it can effect the muscular system</p>	<p><b>Prior learning:</b></p> <p>Year 1 – Children looked at how to group animals including based on their diet.</p> <p>Year 2 – Children studied animals and their offspring and the basic needs that animals need to survive.</p> <p><b>Future learning:</b></p> <p>Year 4 – Children will recap grouping animals in different ways based on their features, nutrition and skeleton. They will also create classification keys based on their study.</p> <p>Year 5 – Children will explore how humans change over time.</p> <p>Year 6 – Children will learn about the impact exercise, diet, drugs and lifestyle have on the human body as well as learning about how water and nutrients are transported around the body.</p>	<p><b>Vocabulary</b></p> <p>Nutrition</p> <p>Skeleton</p> <p>Muscles</p> <p>Healthy</p> <p>Unhealthy</p> <p>Diet</p> <p>Bones</p> <p>Vertebrate</p> <p>Invertebrate</p>	<p><b>Cross Curricular links:</b></p> <p>PSHE- the importance of a balanced diet and exercise for maintaining a healthy body</p>
<p><b>Children should know...</b></p>	<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need.</li> <li>Food contains a range of different nutrients that are needed by the body to stay healthy – carbohydrates including sugars, protein, vitamins, minerals, fibre, fat, sugars, water</li> </ul>	<p>What is a balanced diet?</p>	<ul style="list-style-type: none"> <li><b>Classify</b> foods in a range of ways</li> <li><b>Pose a line of enquiry</b> and then use food labels to find results and then present findings</li> </ul>	
<ul style="list-style-type: none"> <li>Humans (and all other vertebrates) have skeletons (made up of a variety of bones) which help them move and provide protection and support</li> </ul>	<p>What is a skeleton?</p>	<ul style="list-style-type: none"> <li><b>Identify</b> some of the main bones of the human skeleton</li> <li><b>Explain</b> why we need bones and the function of some of the main bones e.g. skull, ribs</li> <li><b>Investigate</b> the size of different bones by posing a question.</li> </ul>	
<ul style="list-style-type: none"> <li>Different animals have different skeletons and some animals have no skeleton at all</li> </ul>	<p>Can you identify an animal from its skeleton?</p>	<ul style="list-style-type: none"> <li><b>Compare and contrast</b> the skeletons of different animals</li> </ul>	
<ul style="list-style-type: none"> <li>Humans have a variety of different muscles that they need for support, protection and movement</li> </ul>	<p>Why do we need muscles?</p>	<ul style="list-style-type: none"> <li><b>Use a model/diagram to demonstrate</b> how muscles in the arm work</li> <li><b>Use reference books and the internet</b> to find the names of some of the main muscles in the body</li> </ul>	
<ul style="list-style-type: none"> <li>The life and work of Willhelm Rontgen – invented the X-Ray</li> </ul>	<p>Who is Willhelm Rontgen?</p>	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Willhelm Rontgen</li> </ul>	





# Science Progression Document

## Year 4

<p><b>Topic 1-</b> <b>Biology: animals including humans (The digestive system; Teeth; Food chains)</b></p> <p><b>End point:</b> To know why we need food and how the body digests it.</p>	<p><b>Prior learning</b> Class F – Name parts of the body Year 1 - Identify and name a variety of common animals that are carnivores, herbivores and omnivores Year 2 - Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Show an understanding as to why exercise, balanced diet are important for humans. Year 3 - Understand the importance of a nutritious, balanced diet</p> <p><b>Future learning</b> Year 6 – In the Y6 topic on electricity, children will learn to associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. They will 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. They will use recognised symbols when representing a simple circuit in a diagram.</p>	<p><b>Vocabulary</b> Canines Carnivore Digestion Herbivore Incisor Large intestine Molars Oesophagus Omnivore Peristalsis Predator Prey Producer Saliva Small intestines Stomach</p>	<p><b>Cross curricular links:</b>  PSHE – healthy lifestyle DT – healthy food  English – explanation text – how the digestive system works.</p>
<p><b>Children should know:</b></p>	<p><b>Key questions</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>the names and functions of different types of human teeth: incisors, canines, molars, pre-molars and wisdom teeth. e.g. incisors cut and bite food</li> <li>the different parts of the tooth and how to describe them. e.g. enamel is the smooth, shiny outer layer of the tooth</li> </ul>	<p>Why are teeth different shapes?</p>	<ul style="list-style-type: none"> <li><b>Use labelled diagrams</b> to explain the different parts of a tooth</li> <li><b>Use scientific vocabulary</b> to describe functions of the teeth</li> </ul>	
<ul style="list-style-type: none"> <li>that foods and drinks can damage teeth (decay) and how to look after them</li> </ul>	<p>Which drink causes the most tooth decay?</p>	<ul style="list-style-type: none"> <li><b>Observe and present findings about</b> what happens when ‘teeth’ are exposed to different materials</li> <li><b>Explain</b> what happens when ‘teeth’ are exposed to different materials and <b>draw conclusions</b></li> </ul>	
<ul style="list-style-type: none"> <li>the names of the parts of the digestive system; oesophagus, stomach, small intestine, large intestine, rectum, anus, gall bladder, pancreas, liver, salivary glands.</li> <li>the functions of the organs in the digestive system. e.g. the large intestine removes excess water and salt from the material that has not been digested</li> <li>how long it takes to digest most of our food</li> </ul>	<p>What happens to the food we eat?</p>	<ul style="list-style-type: none"> <li><b>Label</b> the different parts of the digestive system using <b>scientific vocabulary to describe</b> the function</li> </ul>	
<ul style="list-style-type: none"> <li>how to use and construct food chains and identify producers, predators and prey in a food chain</li> </ul>	<p>What does a food chain tell us?</p>	<ul style="list-style-type: none"> <li><b>Research</b> producers, predators and prey to construct food chains</li> <li><b>Use diagrams</b> to present different food chains and orally explain them</li> </ul>	
<ul style="list-style-type: none"> <li>that William Beaumont was the first person to observe and study human digestion and be able to talk about his work.</li> </ul>	<p>Who is William Beaumont?</p>	<ul style="list-style-type: none"> <li><b>Carry out research</b> into the work of William Beaumont</li> </ul>	

<p><b>Topic 2- Biology: all living things and their habitats (Classification)</b></p> <p><b>End point:</b> To know how to classify living things in different ways.</p>	<p><b>Prior learning:</b> Year 1- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals; Identify and name a variety of common animals that are carnivores, herbivores and omnivores Year 2- Show an understanding of how a specific habitat provides for the basic needs of things living there (plants and animals); Match living things to their habitats. Year 3- Set up a fair test with different variables e.g. the best conditions for a plant to grow</p> <p><b>Future learning:</b> <b>UKS2</b> – Children will have studied life cycles of plants and animals and looked at how reproduction plays a vital part of those life cycles.</p>	<p><b>Vocabulary</b> Environment Classify Vertebrate Invertebrate Exoskeleton Key Adaptation Pollution</p>	<p><b>Cross curricular links:</b> Geography- human impact on the environment</p>
<p><b>Children should know...</b></p>	<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>the 7 characteristics of living things (MRS GREN)</li> <li>that living things can be grouped in a variety of ways e.g. land/sea animal, number of legs</li> </ul>	<p>How can you tell if something is a living thing?</p>	<ul style="list-style-type: none"> <li><b>Observe</b> a range of different living things in their natural environments</li> <li><b>Classify</b> animals according to observable differences</li> </ul>	
<ul style="list-style-type: none"> <li>There are 5 main animal groups: birds, fish, mammals, reptiles and amphibians and they are grouped according to certain characteristics</li> <li>The terms herbivore, omnivore and carnivore and that animals can be sorted according to their diet</li> </ul>	<p>How can we group animals?</p>	<ul style="list-style-type: none"> <li><b>Use labelled diagrams and scientific language</b> to present findings about living things</li> <li><b>Use tables to compare and contrast</b> animals from different groups</li> </ul>	
<ul style="list-style-type: none"> <li>The difference between an invertebrate and an invertebrate and name some of the common invertebrate groups</li> </ul>	<p>What is the difference between a vertebrate and an invertebrate?</p>	<ul style="list-style-type: none"> <li><b>Use scientific vocabulary</b> to define vertebrates and invertebrates</li> <li><b>Classify</b> a range of animals into these two groups</li> </ul>	
<ul style="list-style-type: none"> <li>how to use identification keys to help group, identify and name a variety of living things found in their local environment (including minibeasts)</li> </ul>	<p>What can we find living/growing in Esh?</p>	<ul style="list-style-type: none"> <li><b>Observe</b> plants and animals in local area and <b>record and present findings</b></li> </ul>	
<ul style="list-style-type: none"> <li>How to use a classification key to identify living things and how to construct their own key to identify living things in the local area.</li> </ul>	<p>How can we identify a living thing we don't recognise?</p>	<ul style="list-style-type: none"> <li><b>Use secondary sources</b> (reference books, apps, websites) to construct classification keys</li> </ul>	
<ul style="list-style-type: none"> <li>how an environment may change both naturally and due to human impact and the affect this has on living things</li> </ul>	<p>How are humans changing the environment?</p>	<ul style="list-style-type: none"> <li><b>Explain why</b> environments change over time</li> <li><b>Report and present findings from research and observations</b></li> </ul>	
<ul style="list-style-type: none"> <li>David Attenborough is a British naturalist know for his many documentaries about the planet's wildlife and plants.</li> </ul>	<p>Who is Gladys West?</p>	<ul style="list-style-type: none"> <li><b>Carry out research</b> into the life and work of David Attenborough</li> </ul>	

<p><b>Topic 3- Chemistry: States of matter</b></p> <p><b>End point:</b> To identify solids, liquids and gases and explain how materials can change state</p>	<p><b>Prior learning:</b> Year 1- Compare and group together a variety of everyday materials on the basis of their simple physical properties. Year 2- identify and compare everyday materials based on their properties</p> <p><b>Future learning:</b> Year 5 – Children will use their knowledge of solids, liquids and gases by deciding how materials might be separated, including filtering, sieving and evaporation. They will extend their knowledge and learn about dissolving and mixing and consider if these changes of state are reversible or irreversible.</p>	<p><b>Vocabulary</b> Change Condensation Evaporation Freeze Gas Heat Liquid Precipitation Property Solid Temperature Thermometer Viscous</p>	<p><b>Cross curricular links:</b> Geography- the water cycle; the ice caps melting Maths- reading the scale on a thermometer; positive and negative numbers</p>
Children should know...	Key questions	Working scientifically:	
<ul style="list-style-type: none"> <li>How to distinguish between a solid, liquid and a gas (by identifying key characteristics including how particles are organised)</li> </ul>	What are solids, liquids and gases?	<ul style="list-style-type: none"> <li><b>Create scientific models/diagrams</b> to explain the difference between a solid, liquid and gas</li> </ul>	
<ul style="list-style-type: none"> <li>How some materials can change state when they are heated or cooled</li> </ul>	How do materials change state?	<ul style="list-style-type: none"> <li><b>Observe carefully and describe</b> how materials can change when heated or cooled</li> <li><b>Explain what happens when a material is heated or cooled using demonstrations</b></li> </ul>	
<ul style="list-style-type: none"> <li>The temperatures at which ice, water and water vapour change state</li> <li>How to use a thermometer to measure temperature and know there are two main scales used to measure temperature (Celsius and Fahrenheit)</li> <li>How to use a data logger to check on the time it takes ice to melt to water in different temperatures</li> </ul>	What is a thermometer used for?	<ul style="list-style-type: none"> <li><b>Use a thermometer and data logger</b> to take accurate measurements of a liquid</li> <li><b>Draw graphs</b> to show how temperature of water changes over time</li> <li><b>Plan, make predictions and carry out fair tests</b> into the melting point of different chocolate bars</li> </ul>	
<ul style="list-style-type: none"> <li>That evaporation is process of turning from a liquid to a vapour and condensation is the reverse of this</li> </ul>	Does temperature affect the rate of evaporation?	<ul style="list-style-type: none"> <li><b>Plan, make predictions and carry out fair tests</b> into relationship between temperature and the rate of evaporation</li> <li><b>Use results to draw simple conclusions</b></li> </ul>	
<ul style="list-style-type: none"> <li>the part played by evaporation and condensation in the water cycle</li> </ul>	What is the water cycle?	<ul style="list-style-type: none"> <li><b>Use labelled diagrams and scientific language</b> to explain the water cycle</li> </ul>	
<ul style="list-style-type: none"> <li>Daniel Fahrenheit invented the mercury thermometer and Fahrenheit scale.</li> </ul>	Who is Daniel Fahrenheit?	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Daniel Fahrenheit</li> </ul>	

<p><b>Topic 4- Physics: Electricity</b></p> <p><b>End point</b> To know the components of a circuit and how electricity flows through a circuit.</p>	<p><b>Prior learning</b> <b>KS1</b> – Electricity is not taught as a discrete topic in KS1 however children have looked at which items use electricity in other curriculum areas (e.g. Toys topic in history)</p> <p><b>Future learning</b> <b>Y6</b> – In the Y6 topic on electricity, children will learn to associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. They will 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. They will use recognised symbols when representing a simple circuit in a diagram.</p>	<p><b>Vocabulary</b> Appliance Battery Circuit Components Conductor Current Electrical Insulator Mains power Portable Pylon Switch</p>	<p><b>Cross curricular links:</b> English- write a set of instructions on how to build a circuit. English - Explanation text on how circuits work. History – Invention and development of electricity.</p>
<p><b>Children should know...</b></p>	<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>that electrical appliances either require batteries or mains power to work and how to identify both e.g. battery power – mobile phone; mains power – fridge freezer</li> </ul>	<p>Which appliances use electricity?</p>	<ul style="list-style-type: none"> <li><b>Use scientific vocabulary</b> to describe how electrical items work</li> <li><b>Sort</b> objects into battery powered and mains powered</li> </ul>	
<ul style="list-style-type: none"> <li>the name and functions of the components in a series circuit (including cells, wires, bulbs, switches, motors and buzzers)</li> <li>how to scientifically draw and construct a working simple series circuit</li> </ul>	<p>How can I make a simple circuit?</p>	<ul style="list-style-type: none"> <li><b>Use scientific symbols</b> to draw a working series circuit</li> <li><b>Construct</b> a variety of circuits using different components</li> </ul>	
<ul style="list-style-type: none"> <li>how to predict and test whether a circuit will work</li> </ul>	<p>Why don't some circuits work?</p>	<ul style="list-style-type: none"> <li><b>Make accurate predictions</b> about whether a circuit will work</li> <li><b>Investigate</b> the uses of a lamp in a series circuit</li> </ul>	
<ul style="list-style-type: none"> <li>that a switch controls the flow of electricity and how to use it in a circuit</li> </ul>	<p>How do switches affect a circuit?</p>	<ul style="list-style-type: none"> <li><b>Investigate and make predictions into</b> how switches affect a circuit; <b>record findings</b></li> </ul>	
<ul style="list-style-type: none"> <li>that a conductor allows electricity to flow through it and an insulator prevents electricity from flowing through it; giving examples of each</li> <li>that most conductors of electricity are metals but not all metals conduct electricity well e.g. copper is a conductor</li> <li>which materials make effective conductors and insulators of electricity</li> </ul>	<p>What is a conductor?</p> <p>What is an insulator?</p>	<ul style="list-style-type: none"> <li><b>Plan, make predictions and carry out fair tests</b> into which materials are conductors and insulators within a series circuit</li> <li><b>Make comparisons</b> between the properties of materials that are insulators and conductors</li> <li><b>Explain</b> how conductors and insulators are used in everyday life</li> </ul>	
<ul style="list-style-type: none"> <li>that Michael Faraday invented the first electric motor and how he contributed to the development of electricity</li> </ul>	<p>Who is Michael Faraday?</p>	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Michael Faraday</li> </ul>	

<p><b>Topic 5</b> <b>Physics: Sound</b></p> <p><b>End point:</b> To know how sounds are made and how they travel</p>	<p><b>Prior learning</b> Class F – name different parts of the body Year 1 – say which part of the body is associated with each sense Sound is not taught as a separate topic in KS1 science however children may have some knowledge of pitch and volume through their music lessons. KS2 – children continue to explore sound through music (in their music lessons) and in the topic on light, children may compare how fast sound travels compared to light.</p> <p><b>Future learning:</b> KS3- children will extend their understanding of sound by exploring frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound. They will build upon knowledge of how sound travels through a medium and explore the auditory range of humans and animals</p>	<p><b>Vocabulary</b> Vibrate Vibrations Volume Pitch Pinna Cochlea Ear drum</p>	<p><b>Cross Curricular links:</b> English – newspaper article about the invention of the cochlea implant Music-pitch, tempo, volume</p>
Children should know...		Key questions	Working scientifically:
<ul style="list-style-type: none"> <li>that sound is made by vibrations</li> <li>that stronger vibrations create louder sounds and weaker vibrations create quieter sounds.</li> </ul>	How are sounds made?	<ul style="list-style-type: none"> <li><b>Explain</b> how sound is made using model, diagrams and oral explanations</li> </ul>	
<ul style="list-style-type: none"> <li>that a sound source vibrates which then vibrates gas/liquid/solid particles until they reach the ear.</li> <li>Sounds travel more quickly through solids than gases</li> <li>that as the sound travels away from its source the vibrations get weaker and the sound becomes fainter</li> </ul>	What is a sound vibration?	<ul style="list-style-type: none"> <li><b>Make observations</b> of the different sounds produced by different objects/instruments</li> <li><b>Use labelled diagrams to explain</b> how sound travels</li> </ul>	
<ul style="list-style-type: none"> <li>the names of the different parts of our ear(outer, middle and inner), and how they work in order for us to hear. e.g. the cochlea turns the vibrations into electrical impulses which are sent to our brain</li> </ul>	How does the ear work?	<ul style="list-style-type: none"> <li><b>Use diagrams and scientific vocabulary</b> to label the different parts of the ear and their functions</li> </ul>	
<ul style="list-style-type: none"> <li>how to identify a high pitch or low pitch sound</li> <li>the correlation between pitch and the object producing the sound e.g. a triangle created a high-pitched sound, a drum creates a low-pitched sound.</li> </ul>	What is pitch?	<ul style="list-style-type: none"> <li><b>Make predictions and observe/record</b> the sounds made by different instruments</li> <li><b>Make comparisons</b> between the properties of instruments that create high and low pitches</li> </ul>	
<ul style="list-style-type: none"> <li>The relationship between volume and strength of vibrations (the bigger the vibrations, the larger the sound waves transmitted)</li> </ul>	What is volume?	<ul style="list-style-type: none"> <li><b>Plan, predict and carry out a fair test</b> to find relationship between volume and strength of vibrations</li> <li><b>Use a data logger</b> to record volume in decibels</li> <li><b>Investigate</b> how the volume of a sound is affected by the size of the pinna and <b>draw conclusions</b></li> </ul>	
<ul style="list-style-type: none"> <li>that William. F. House invented the cochlea implant and that this enabled deaf people to hear</li> </ul>	Who is William F. House?	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of William. F. House- present findings in different ways</li> </ul>	



# Science Progression Document

## Year 5

**Topic 1-  
Chemistry: Properties and  
changes in materials**

**End point:**

To know the properties of everyday materials.

To know the difference between reversible and irreversible reactions.

**Prior learning**

Year 1- 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.

Year 2- Identify and compare the suitability of a variety of everyday different materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses based on their properties; Compare movement on different surfaces

Year 3- Compare and group materials together, according to whether they are solids, liquids or gases; Explore how some materials can change state when they are heated or cooled; Know the part played by evaporation and condensation in the water cycle

**Future learning:**

KS3- Children will learn the particulate nature of matter, atoms, elements and compounds. They will learn what pure and impure substances are, including simple techniques for separating materials (filtration, evaporation, distillation and chromatology. They will learn about chemical reactions (catalyses, combustion, etc.) and represent them using formulae and equations

**Vocabulary**

evaporation  
condensation  
conductivity  
flexibility,  
hardness,  
insulators,  
magnetism,  
soluble  
insoluble  
saturation  
solution  
filtration  
dissolving,  
reversible,  
irreversible,  
chemical  
change  
physical  
change  
carbon  
dioxide

**Cross curricular links:**

Maths- measuring liquids using ml

Children should know:	Key questions:	Working scientifically:
<ul style="list-style-type: none"> <li>Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, flexibility, transparency, electrical and thermal conductivity and attraction to magnets. These properties can be tested fairly.</li> </ul>	<p>What is a material?</p>	<ul style="list-style-type: none"> <li><b>Use tables</b> to record and compare different materials and state their uses</li> <li><b>Make comparisons</b> between different materials</li> <li><b>Plan, make predictions and carry out fair tests</b> into properties of materials e.g. magnetism, flexibility</li> </ul>
<ul style="list-style-type: none"> <li>Some materials are soluble and so will dissolve in a liquid to form a solution while others are insoluble and form sediment.</li> </ul>	<p>What happens when a material dissolves?</p>	<ul style="list-style-type: none"> <li><b>Investigate</b> soluble and insoluble materials and <b>record findings</b></li> <li><b>Plan, make predictions and carry out fair tests</b> into the variables that affect the rate of dissolving</li> </ul>
<ul style="list-style-type: none"> <li>Mixtures can be separated by filtering, sieving, using magnets and evaporation.</li> </ul>	<p>How do we separate materials?</p>	<ul style="list-style-type: none"> <li><b>Choose the most suitable method</b> to separate different materials</li> </ul>
<ul style="list-style-type: none"> <li>Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.</li> </ul>	<p>What makes a reaction irreversible?</p>	<ul style="list-style-type: none"> <li><b>Observe and explain</b> what happens when different materials are mixed together</li> <li><b>Use diagrams</b> to record what happens when materials are mixed, heated or burned</li> </ul>
<ul style="list-style-type: none"> <li>Stephanie Kwolek invented the material Kevlar that is used in bullet proof vests worn by police officers</li> </ul>	<p>Who is Stephanie Kwolek?</p>	<ul style="list-style-type: none"> <li><b>Carry out research</b> into the work of Stephanie Kwolek</li> </ul>



<p><b>Topic 2- Physics: Forces</b></p> <p><b>End point:</b> To understand the forces around us and how they affect us.</p>	<p><b>Prior learning:</b> Year 2-Compare movement of objects on different surfaces Year 3- To understand what friction is and how it works on different surfaces; To understand how magnets, attract or repel</p> <p><b>Future learning:</b> KS3 – Children will extend their understanding of forces by describing motion (speed = distance ÷ time) and use time and distance graphs. They will use force arrows in diagrams, adding forces in one dimension. They will further explore balanced and unbalanced force; opposing forces and equilibrium e.g. weight held by stretched spring or supported on a compressed surface. They will also extend their understanding of the difference between weight and mass and how gravity affects weight.</p>	<p><b>Vocabulary:</b> Force gravity, weight mass Newton (N) friction, air resistance, water resistance, upthrust, buoyancy, streamlined, mechanism, pulley gears cog lever</p>	<p><b>Cross curricular links:</b> Maths- reading scales</p>
Children should know...		Key questions:	Working scientifically:
<ul style="list-style-type: none"> <li>Unsupported objects fall to Earth because of the force of gravity acting between the earth and the falling object</li> <li>The role Isaac Newton played in the discovery of gravity</li> </ul>	What is gravity?	<ul style="list-style-type: none"> <li><b>Observe</b> what happens when objects are dropped from a height (including inside a vacuum)</li> <li><b>Carry out research</b> into the life of Isaac Newton</li> </ul>	
<ul style="list-style-type: none"> <li>The difference between weight and mass (1 Newton = 100g)</li> </ul>	What's the link between weight and mass?	<ul style="list-style-type: none"> <li><b>Investigate</b> the weight and mass of different objects and find a <b>causal relationship</b></li> <li><b>Use scientific equipment</b> (Newton metres, scales)</li> </ul>	
<ul style="list-style-type: none"> <li>Friction is a force that occurs when one object moves over another</li> </ul>	What is friction?	<ul style="list-style-type: none"> <li><b>Choose the most suitable method</b> to investigate friction caused by different materials</li> <li><b>Use scientific equipment</b> (Newton metres)</li> <li><b>Use diagrams</b> to describe the forces acting on an object</li> </ul>	
<ul style="list-style-type: none"> <li>Air resistance is a type of frictional force that slows an object down when travelling through air</li> </ul>	What is air resistance?	<ul style="list-style-type: none"> <li><b>Plan, make predictions and carry out fair tests</b> into air resistance (dropping parachutes)</li> <li><b>Use diagrams</b> to describe the forces acting on an object</li> </ul>	
<ul style="list-style-type: none"> <li>Water resistance is a type of frictional force that slows down an object moving through or over a liquid</li> </ul>	What is water resistance?	<ul style="list-style-type: none"> <li><b>Plan, make predictions and carry out fair tests</b> into resistance (dropping 3D shapes in water)</li> <li><b>Use diagrams</b> to describe the forces acting on an object</li> </ul>	
<ul style="list-style-type: none"> <li>Knows that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li> </ul>	How do levers, pulleys and gears help us?	<ul style="list-style-type: none"> <li><b>Explore</b> how levers, pulleys and gears work <b>using models</b></li> </ul>	

<p><b>Topic 3-</b> <b>Physics: Earth and Space</b></p> <p><b>End point:</b> To know about the different bodies of the Solar System and their movements relative to the Sun</p>	<p><b>Prior learning:</b> Year 1- Observe changes across the four seasons Year 3- To understand how light travels and forms shadows Year 5- Explain what gravity is</p> <p><b>Future learning:</b> Children extend their knowledge of gravity as a force (learning formulae) and that gravity is different on other planets and stars. They consolidate knowledge that the Sun is a star, and that there are other stars in our galaxy and other galaxies. They will extend their knowledge of seasons and the Earth's tilt, day length at different times of year, in different hemispheres and learn that a light year is a unit of astronomical distance.</p>	<p><b>Vocabulary:</b> spherical satellite planet orbit axis rotate Northern hemisphere Southern hemisphere time zone Solar System</p>	<p><b>Cross curricular links:</b> Geography- time zones; Northern and Southern hemisphere History- what ancient civilisations believed about the Earth, Moon and Sun</p>
Children should know...	Key questions:	Working scientifically:	
<ul style="list-style-type: none"> <li>The Sun is a star. It is at the centre of our solar system. There are 8 planets of which some have moons. The planets travel around the Sun in fixed orbits.</li> </ul>	What is the Solar System?	<ul style="list-style-type: none"> <li><b>Create scientific models/diagrams</b> to represent the composition of the Solar System</li> <li><b>Research</b> the 8 planets and <b>make comparisons</b></li> </ul>	
<ul style="list-style-type: none"> <li>The Sun, Earth and Moon are approximately spherical.</li> </ul>	How do we know what shape the Earth, Moon and Sun are?	<ul style="list-style-type: none"> <li><b>Consider the views of scientists in the past and how evidence was used to deduce</b> the shapes and movements of the Earth, Moon and planets before space travel.</li> <li><b>Use diagrams</b> to show how the Earth, Moon and Sun move relative to each other</li> </ul>	
<ul style="list-style-type: none"> <li>How night and day are created: The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (here it is day) and half is facing away from the Sun (night). As the Earth rotates the Sun appears to move across the sky. (Link to timezones)</li> </ul>	Why do we have night and day?	<ul style="list-style-type: none"> <li><b>Explain</b> how night and day are created <b>using demonstrations</b></li> <li><b>Draw graphs</b> to show how hours of sunlight varies throughout the year.</li> </ul>	
<ul style="list-style-type: none"> <li>Why we have seasons: Earth takes 365¼ days to complete its orbit around the Sun. The Earth is tilted on its axis. The Earth has a northern hemisphere and southern hemisphere.</li> </ul>	Why do we have seasons?	<ul style="list-style-type: none"> <li><b>Explain why</b> we have seasons using diagrams to support explanations</li> </ul>	
<ul style="list-style-type: none"> <li>The Moon orbits the Earth. It takes about 28 days to complete its orbit and appears to change shape as it orbits (phases of the Moon).</li> </ul>	Why does the Moon change shape?	<ul style="list-style-type: none"> <li><b>Observe and describe</b> how the appearance of the moon changes over times- present using models and IT</li> </ul>	
<ul style="list-style-type: none"> <li>Mai Jemison was the first black woman to go into space.</li> </ul>	Who is Mai Jemison?	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Mai Jemison</li> </ul>	

<p><b>Topic 4- Biology: All Living Things and their Habitat (lifecycles)</b></p> <p><b>End point</b> To know how animals and plants reproduce</p>	<p><b>Prior learning</b> KS1 – during the topic on plants, children will have learnt to describe the basic structure of a variety of common flowering plants. They will have compared differences between living and non-living things. LKS2 – children will have learnt to identify and describe the function of various parts of a plant. They will have explored the part flowers play in the life cycle including pollination, seed fertilisation and seed dispersal</p> <p><b>Future Learning:</b> Children extend their knowledge of reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta. They extend their knowledge of reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.</p>	<p><b>Vocabulary:</b> reproduction, gestation, life cycle, metamorphosis, pollination, fertilisation, germination, womb, offspring, mammal, stamen, pistil</p>	<p><b>Cross curricular links:</b> English- write a non-chronological report on Emperor penguins</p>
Children should know...	Key questions:	Working scientifically:	
<ul style="list-style-type: none"> <li>the names of the reproductive parts of a flowering plant e.g. anther, filament, ovary</li> </ul>	What's inside a flower?	<ul style="list-style-type: none"> <li><b>Make observations</b> of real-life plants/flowers</li> <li><b>Use diagrams</b> to label the reproductive parts of a flowering plant</li> </ul>	
<ul style="list-style-type: none"> <li>each stage of a flowering plants lifecycle: pollination, fertilisation, seed dispersal, germination, growth and flowering (this is sexual reproduction)</li> </ul>	How do flowering plants reproduce?	<ul style="list-style-type: none"> <li><b>Explain</b> the life cycle of flowering plants using <b>diagrams</b> to support</li> </ul>	
<ul style="list-style-type: none"> <li>some plants reproduce asexually by growing bulbs, tubers or runners</li> <li>the differences between asexual and sexual reproduction of plants</li> </ul>	What is cloning?	<ul style="list-style-type: none"> <li><b>Grow and observe</b> plants that reproduce asexually</li> <li><b>Make comparisons</b> between plants that reproduce sexually and asexually</li> </ul>	
<ul style="list-style-type: none"> <li>Different animal groups (Birds, Fish, Reptiles, Amphibians, mammals) reproduce in different ways (either internally in the womb or externally i.e. lay eggs)</li> <li>How each animal group reproduces and cares for their young (abandon or nurture)</li> </ul>	Do all animals reproduce in the same way?	<ul style="list-style-type: none"> <li><b>Observe and present findings</b> about how different animal groups reproduce and care for their young</li> </ul>	
<ul style="list-style-type: none"> <li>Different mammals have different gestation periods (also look at different types of mammals- sea, land, marsupials)</li> </ul>	Are all mammals pregnant for the same amount of time?	<ul style="list-style-type: none"> <li><b>Use graphs</b> to compare data on gestation periods and <b>draw conclusions</b></li> </ul>	
<ul style="list-style-type: none"> <li>Metamorphosis is a transformation from an immature form to an adult form that occurs in some insects and amphibians (e.g. butterfly and frog)</li> <li>the differences between life cycles of animals from different groups (e.g. compare a penguin with a rattlesnake)</li> </ul>	How do the life cycles of different animals compare?	<ul style="list-style-type: none"> <li><b>Research</b> into life cycles to investigate a scientific concept</li> <li><b>Make comparisons</b> between different lifecycles and animal groups using drawings and descriptions</li> </ul>	
<ul style="list-style-type: none"> <li>Malaika Vaz is a National Geographic explorer and environmental conservationist</li> </ul>	What does a naturalist do?	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Malaika Vaz and present findings visually and orally</li> </ul>	

<p><b>Topic 5</b> <b>Biology: Animals including humans</b></p> <p><b>End point:</b> To know how the human body changes from conception to death</p>	<p><b>Prior learning</b> Year 1- Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Year 2- Identify the basic stages in a life cycle of animals (including humans) Year 3- Understand the skeletal and muscular system of a human Year 4- Identify and name the parts of the human digestive system; Identify the different types of human teeth</p> <p><b>Future learning:</b> KS3 – Children will study reproduction in more detail in humans and other animals.</p>	<p><b>Vocabulary:</b> Conception Foetus Prenatal Gestation Reproduce womb infancy adolescence puberty hormones</p>	<p><b>Cross Curricular links:</b>  RHE- Puberty PSHE- healthy bodies</p>
Children should know...	Key questions:	Working scientifically:	
<ul style="list-style-type: none"> <li>The different stages of the human lifecycle: gestation, infancy, childhood, adolescence, adulthood, old age</li> </ul>	<p>What are the stages of human development?</p>	<ul style="list-style-type: none"> <li><b>Use diagrams</b> to show the different stages of the human lifecycle</li> <li><b>Use tables</b> to document key features of different stages</li> <li><b>Make observations</b> of humans at different stages</li> </ul>	
<ul style="list-style-type: none"> <li>An embryo becomes a foetus inside the womb and the gestation period is 9 months</li> <li>The changes that occur from new-born to the toddler phase (focus on skills and abilities acquired e.g. crawling, learning to walk, first words, eating solids, grow teeth)</li> </ul>	<p>What can you do now that you couldn't do when you were a baby?</p>	<ul style="list-style-type: none"> <li><b>Use graphs</b> to compare data relating to growth of babies</li> <li><b>Make comparisons</b> between the different stages (baby and toddler)</li> </ul>	
<ul style="list-style-type: none"> <li>The changes that occur during childhood and the key features of an adult human</li> <li>Puberty happens during adolescence and is the process of a child's body turning into an adult's body in preparation for reproduction</li> </ul>	<p>What is puberty?</p>	<ul style="list-style-type: none"> <li><b>Use scientific vocabulary</b> to describe the changes that take place from childhood to adulthood</li> </ul>	
<ul style="list-style-type: none"> <li>The changes that occur during old age</li> </ul>	<p>How might the body change during old age?</p>	<ul style="list-style-type: none"> <li><b>Explain and evaluate</b> why the human body changes over time</li> <li><b>Use labelled diagrams</b> to describe the changes that occur</li> </ul>	
<ul style="list-style-type: none"> <li>The key work carried out by Professor Robert Winston (reproduction and child development)</li> </ul>	<p>What is a biologist?</p>	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Robert Winston</li> </ul>	



# Science Progression Document

## Year 6

<p><b>Topic 1- Biology: Classification</b></p> <p><b>End point:</b> Understand and demonstrate how to classify living things into broad groups according to observable characteristics and based on similarities and differences</p>	<p><b>Prior learning</b> Year 1- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) Identify and name a variety of common animals that are carnivores, herbivores and omnivores Year 2 - Classify things by living, dead or never lived. Year 3 - Compare and group rocks based on their appearance and physical appearance and physical properties, giving reasons. Group information according to common factors e.g. plants that grow in woodlands or plants that grow in gardens Year 4 - Identify the characteristics of living things. Recognise that living things can be grouped in a variety of ways. Use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p><b>Future learning:</b> KS3 – Children will study cell structure and organisation and learn relationships within an ecosystem.</p>	<p><b>Vocabulary:</b> Classify Vertebrate Invertebrate Exoskeleton Vascular Non-vascular Taxonomy Bacteria Virus Protozoa Algae Fungi Carnivore Herbivore Omnivore</p>	<p><b>Cross curricular links:</b> Maths- measuring liquids using ml</p>
<p><b>Children should know:</b></p>	<p><b>Key questions</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>How to sort animals into different groups using different criteria: omnivore/herbivore/carnivore or vertebrate/invertebrate or into one of the ten main animal groups (mammals, birds, fish, amphibians, reptiles, arachnids, annelids, crustaceans, insects and molluscs)</li> </ul>	<p>How are animals classified?</p>	<ul style="list-style-type: none"> <li><b>Use scientific criteria and definitions to sort a range of animals into various groups according to observable characteristics</b></li> </ul>	
<ul style="list-style-type: none"> <li>how to use and create classification keys to identify living things by asking yes/no questions linked to its characteristics e.g. does it lay eggs?</li> </ul>	<p>What is a classification key?</p>	<ul style="list-style-type: none"> <li><b>Give reasons and explain</b> the characteristics of different classification groups</li> <li><b>Choose the most suitable questions</b> to classify animals into more specific groups</li> </ul>	
<ul style="list-style-type: none"> <li>How to sort plants into groups according to their key characteristics</li> </ul>	<p>How can we classify plants?</p>	<ul style="list-style-type: none"> <li><b>Use classification keys</b> to group and identify a range of plants using scientific terminology correctly</li> </ul>	
<ul style="list-style-type: none"> <li>that micro-organisms are an organism of microscopic size, which may exist in its single-celled form or as a colony of cells.</li> <li>that the five main micro-organism groups are: bacteria, fungi, protozoa, viruses and algae</li> </ul>	<p>What are micro-organisms?</p>	<ul style="list-style-type: none"> <li><b>Give examples and characteristics</b> of the 5 main micro-organism groups and <b>present results from enquiries in both written and oral form.</b></li> </ul>	
<ul style="list-style-type: none"> <li>that yeasts optimum growth conditions is moist, warm, and with nutrients that it can feed on</li> </ul>	<p>How does yeast grow?</p>	<ul style="list-style-type: none"> <li><b>Observe and report</b> what happens when yeast is given different environments to feed off. <b>Draw conclusions.</b></li> <li><b>Use scientific equipment</b> such as measuring cylinders, funnels, and measuring equipment.</li> </ul>	
<ul style="list-style-type: none"> <li>that Carl Linnaeus is a Swedish botanist that developed a classification system</li> </ul>	<p>Who is Carl Linnaeus?</p>	<ul style="list-style-type: none"> <li>Carry out <b>research</b> into the work of Carl Linnaeus and <b>present findings using IT</b></li> </ul>	

<p><b>Topic 2- Physics: Electricity</b></p> <p><b>End point:</b> Understand and draw the key components in a circuit</p>	<p><b>Prior learning:</b> Year 1: discusses properties of materials and uses Year 2: discusses properties of materials and explains suitability for different purposes Year 4: To know the components of a circuit and how electricity flows through a circuit.</p> <p><b>Future learning:</b> KS3 – Children will study electricity in more depth, including; current and static electricity, parallel and series circuits. They will learn how current is measured and work out potential differences; calculate differences in resistance between conducting and insulating components (quantitative).</p>	<p><b>Vocabulary:</b> Appliance Battery Circuit Components Conductor Electrical Insulator Mains power Pylon Renewable energy Non-renewable energy</p>	<p><b>Cross curricular links:</b> Geography-sustainability</p>
Children should know...	Key questions	Working scientifically	
<ul style="list-style-type: none"> <li>How to construct and draw a variety of circuits using symbols to represent each component</li> <li>How to recognise if a circuit will work or not</li> </ul>	<p>How do you draw a circuit diagram?</p>	<ul style="list-style-type: none"> <li><b>Draw scientific diagrams</b> to represent a circuit using symbols</li> <li><b>Explain using scientific vocabulary</b> why some circuits work and some don't</li> </ul>	
<ul style="list-style-type: none"> <li>how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer</li> </ul>	<p>How does voltage in a circuit affect the brightness of a bulb?</p>	<ul style="list-style-type: none"> <li><b>Report</b> and present findings from fair tests into voltage and output</li> <li><b>Record results</b> from an experiment <b>using tables and graphs</b></li> </ul>	
<ul style="list-style-type: none"> <li>reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</li> </ul>	<p>How can I investigate variations in how components function?</p>	<ul style="list-style-type: none"> <li><b>Plan, make predictions and carry out fair tests</b> into the function of various components</li> <li><b>Use scientific equipment</b> to demonstrate how variation in the working of particular components can be changed.</li> </ul>	
<ul style="list-style-type: none"> <li>Names of renewable and non-renewable forms of energy and their corresponding advantages and disadvantages</li> </ul>	<p>What is renewable and non-renewable energy?</p>	<ul style="list-style-type: none"> <li><b>Report and present findings</b> from enquiries into renewable and non-renewable energy sources in oral and written forms such as displays and other presentations</li> </ul>	
<ul style="list-style-type: none"> <li>the work of Nikola Tesla – inventor/electrical engineer</li> </ul>	<p>Who is Nikola Tesla?</p>	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Nikola Tesla and present findings using IT</li> </ul>	

<p><b>Topic 3- Biology: Animals including humans The circulatory system</b></p> <p><b>End point:</b> Understand and explain the function of the heart</p>	<p><b>Prior learning:</b> Class F - Name different parts of the body and face Class 1 – Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Class 2 – Show an understanding as to why exercise, balanced diet are important for humans. Class 3 – Understand the importance of a nutritious, balanced diet; Understand the skeletal and muscular system of a human Class 4 – Identify and name the parts of the human digestive system Class 5 – Understand the process of reproduction in animals including humans</p> <p><b>Future learning:</b> KS3 – Children will learn more about the importance of a healthy diet and how different foods are absorbed and used in the human body. They will learn more about gas exchange systems in the lungs of the human body. They will also look at the effects of recreational drugs including substance misuse.</p>	<p><b>Vocabulary:</b> Heart Lungs Blood Vessels Veins Arteries Heart rate Oxygenated Deoxygenated Blood cells Ventricle Atrium Valve</p>	<p><b>Cross curricular links:</b> PE – heart rate activity</p>
Children should know...	Key questions:	Working scientifically:	
<ul style="list-style-type: none"> <li>that the main parts of the circulatory system are the lungs, heart, arteries and veins.</li> <li>that the circulatory system is a continuous cycle, which transports nutrients, oxygen and water via the blood to all the parts of the body.</li> </ul>	<p>What is the circulatory system?</p>	<ul style="list-style-type: none"> <li><b>Create/label scientific diagrams</b> to represent the main parts of the circulatory system</li> <li><b>Explain</b> how the circulatory system works</li> </ul>	
<ul style="list-style-type: none"> <li>The main parts of the heart (chamber, atrium, ventricle, aorta, valve, vein, artery) and can explain how the heart pumps blood around the body</li> </ul>	<p>How does our heart work?</p>	<ul style="list-style-type: none"> <li><b>Identify and name</b> the main components of the heart in pictures and 3D models</li> <li><b>Use scientific vocabulary to explain</b> how the heart pumps blood around the body</li> </ul>	
<ul style="list-style-type: none"> <li>that a well-balanced diet provides all of the energy you need to keep active throughout the day</li> <li>Which nutrients you need for growth and repair, helping you to stay strong and healthy and help to prevent illness.</li> </ul>	<p>Why do you need a balanced diet?</p>	<ul style="list-style-type: none"> <li><b>Explain</b> the impacts of diet, exercise and lifestyle on the body</li> <li><b>Plan and conduct a scientific enquiry</b> into different food groups</li> </ul>	
<ul style="list-style-type: none"> <li>that all exercise is good for the body. That there are two main types of exercise: aerobic and strengthening.</li> <li>that aerobic exercise increases your heartrate more than strengthening exercises.</li> </ul>	<p>Why do we need to exercise?</p>	<ul style="list-style-type: none"> <li><b>Plan, make predictions and carry out fair tests</b> into the changes in heart rate after different types of aerobic exercise</li> <li><b>Draw graphs</b> to show the difference between heart-rate and exercises</li> </ul>	
<ul style="list-style-type: none"> <li>that the misuse of drugs and alcohol can have an adverse effect on your body</li> </ul>	<p>Are all drugs bad for you?</p>	<ul style="list-style-type: none"> <li><b>Report and present findings from research and enquiries</b> into the effects of drugs on the body using written and oral forms</li> </ul>	
<ul style="list-style-type: none"> <li>Marie Maynard Daly helped to discover the link between high cholesterol and clogged arteries, essential for our understanding of heart disease.</li> </ul>	<p>Who is Marie Maynard Daly?</p>	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Marie Daly using IT, displays and presentations.</li> </ul>	



<p><b>Topic 4- Biology: Evolution and inheritance</b></p> <p><b>End point</b> Show a clear understanding about evolution and explain what it is. To know that the earth and living things have changed over time</p>	<p><b>Prior learning:</b> Year 2 – Show an understanding of how a specific habitat provides for the basic needs of things living there (plants and animals) Year 3 - Rocks - Explain how fossils are formed. Year 4 – Digestive system - Understand the functions of the organs in the human digestive system Year 4 - Understand how changes to an environment could endanger living things</p> <p><b>Future learning:</b> KS3 – Children will learn about inheritance, chromosomes, DNA and genes. They will learn that heredity is the process by which genetic information is transmitted from one generation to the next and that there are differences between species. They will also learn that there is variation between species and between individuals of the same species. This means some organisms compete more successfully, which can drive natural selection. Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.</p>	<p><b>Vocabulary:</b> evolution offspring inheritance variations adaptation environment adaptive traits inherited gene species natural selection</p>	<p><b>Cross curricular links:</b> English- write a biography about the life of Charles Darwin</p>
Children should know...	Key questions:	Working scientifically	
<ul style="list-style-type: none"> <li>adaptation is how animals and plants are specialised to suit their environments.</li> <li>how plants such as Cacti and Ash tree have adapted to their environments</li> </ul>	What is adaptation?	<ul style="list-style-type: none"> <li><b>Demonstrate an understanding</b>, with specific examples, of how animals and plants has evolved over time</li> <li><b>Identify</b> characteristics that will make a plant suited to its environment</li> </ul>	
<ul style="list-style-type: none"> <li>how animals such as dolphins, toucans and coral have adapted to their environments</li> </ul>	How do animals adapt to their environments?	<ul style="list-style-type: none"> <li><b>Use a wide range of secondary sources</b> to find out how certain animals have adapted to their environments</li> </ul>	
<ul style="list-style-type: none"> <li>Evolution is the process of living things changing over time.</li> <li>the process of advantageous adaptations being passed on to future generations is known as natural selection and links to evolution of a species (use peppered moths as an example)</li> </ul>	What is evolution?	<ul style="list-style-type: none"> <li><b>Explain</b> evolution is the process of living things changing over time</li> <li><b>Make comparisons</b> between the Galapagos island finches</li> </ul>	
<ul style="list-style-type: none"> <li>Inheritance is the process of parents passing on features to their offspring (recognising that offspring normally vary and are not identical to their parents)</li> </ul>	What have I inherited from my parents?	<ul style="list-style-type: none"> <li><b>Use scientific evidence and observations</b> to explain and demonstrate the term inheritance</li> </ul>	
<ul style="list-style-type: none"> <li>a fossil is the preserved remains of a dead animal usually found within rocks and can tell us about what animals were like in the past.</li> </ul>	What can fossils tell us?	<ul style="list-style-type: none"> <li><b>Identify scientific evidence</b> about fossils that help support the theory of evolution</li> </ul>	
<ul style="list-style-type: none"> <li>To know about the key works of Charles Darwin with regards to his theory of evolution and work in the Galapagos Islands.</li> </ul>	Who is Charles Darwin?	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Charles Darwin and present findings in various ways</li> </ul>	

<p><b>Topic 5</b> <b>Physics: light</b></p> <p><b>End point:</b> Explain how light travels and how refraction occurs</p>	<p><b>Prior learning:</b> Class F – Name different parts of the body and face Year 1 – Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Year 3 - To understand how the eye works; To understand how light travels and forms shadows</p> <p><b>Future learning:</b> KS3 – Children will learn that human sight is based on the ability to see red, blue and green light and that the colour of an object depends on the colours of light that it absorbs and scatters. Light travels at 300 million metres per second in a vacuum and different colours of light have different frequencies. The path that light takes can be bent (refracted) and that transparent materials can be shaped into lenses and prisms to alter the path of light by refraction (convex and concave lens). The ray model can describe the formation of an image in a mirror and how objects appear different colours.</p>	<p><b>Vocabulary:</b> Dark Reflect Shadow Opaque Translucent Transparent Luminous Scattering Absorption Refraction</p>	<p><b>Cross Curricular links:</b> Maths - measurement</p>
<p><b>Children should know...</b></p>	<p><b>Key questions:</b></p>	<p><b>Working scientifically:</b></p>	
<ul style="list-style-type: none"> <li>that light travels as a wave, it does not bend while travelling. It follows the shortest path between the starting point and the endpoint, which is always a straight line.</li> <li>Different light sources that are natural or man-made</li> </ul>	<p>How does light travel?</p>	<ul style="list-style-type: none"> <li><b>Plan and conduct a test to investigate</b> how light travels and explain/present the findings</li> <li><b>Use labelled diagrams and models</b> to explain scientific concepts</li> </ul>	
<ul style="list-style-type: none"> <li>A reflective object reflects light in all possible directions. The reflected light from the object reaches our eyes. Our brain receives the information from the eyes making us see the object.</li> <li>Which materials are the best reflectors of light.</li> </ul>	<p>Which materials make the best reflectors?</p>	<ul style="list-style-type: none"> <li><b>Plan enquiries to answer questions about</b> how mirrors reflect light and record using straight line diagrams to indicate the direction of light.</li> </ul>	
<ul style="list-style-type: none"> <li>how the eye works. That Light enters the eye through the cornea. the pupil adjusts in response to the light, the lens focuses the light onto the retina, the light is focused onto the retina, the optic nerve transmits visual information to the brain.</li> </ul>	<p>How does the eye work?</p>	<ul style="list-style-type: none"> <li><b>Label the eye using scientific vocabulary and explain</b> how we see</li> </ul>	
<ul style="list-style-type: none"> <li>that shadows are formed when an opaque object or material is placed in the path of rays of light.</li> <li>That the shape of the shadow will be the same as the outline shape of the object and the size of the shadow is larger when the light source and object move closer to each other as more of the light is blocked. The further away from the light source an object is, the smaller the shadow will be.</li> </ul>	<p>Why do shadows change during the day?</p>	<ul style="list-style-type: none"> <li><b>Explain and demonstrate</b> how a shadow is the same shape as the object that casts them</li> <li><b>Investigate</b> how a shadow changes throughout the day. <b>Record the data using scientific diagrams and graphs. Present findings and draw conclusions.</b></li> </ul>	
<ul style="list-style-type: none"> <li>Why objects appear to be bent when in water (refraction)</li> <li>The difference between reflection and refraction.</li> </ul>	<p>What is refraction?</p>	<ul style="list-style-type: none"> <li><b>Make observations and use scientific findings</b> to explain refractions and make comparisons with reflection</li> </ul>	
<ul style="list-style-type: none"> <li>that Sir Isaac Newton explained how a rainbow is formed (refraction)</li> </ul>	<p>What did Sir Isaac Newton discover?</p>	<ul style="list-style-type: none"> <li><b>Research</b> the life and work of Isaac Newton and present using various methods</li> </ul>	