

Science Medium Term Plan



**Saint Augustine Webster**  
CATHOLIC VOLUNTARY ACADEMY



**OUR LADY OF LOURDES**

CATHOLIC MULTI-ACADEMY TRUST



	ELG	How is this achieved in EYFS?	Key Vocabulary to be developed in EYFS		Science KS1	
					Year 1	Year 2
Specific Area of Learning Understanding the World	<p>Managing Self</p> <ul style="list-style-type: none"> <li>• Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussions at snack time of the importance of healthy food choices.</li> <li>• During lunch time discussions.</li> <li>• Through stories and circle time discussions e.g., the story – Now wash your hands and Funny bones.</li> <li>• Getting coats, hats, scarfs, gloves, shoes on independently</li> <li>• Naming body parts through songs – Heads, shoulders, knees, and toes.</li> <li>• RSE link – Correct naming of body parts.</li> <li>• Talking about pets at home.</li> <li>• Exploring minibeasts and recording our observations.</li> <li>• Insect Lore – caterpillars</li> </ul>	<ul style="list-style-type: none"> <li>• Exercise</li> <li>• Healthy</li> <li>• Wash</li> <li>• Toothbrush</li> <li>• Tooth / Teeth</li> <li>• Body</li> <li>• Bones</li> <li>• Skeleton</li> <li>• Family</li> <li>• Head</li> </ul>	<ul style="list-style-type: none"> <li>• Animal</li> <li>• Human</li> <li>• Mammal</li> <li>• Bird</li> <li>• Fish</li> <li>• Amphibian</li> <li>• Insect</li> <li>• Lifecycle</li> <li>• Nocturnal</li> </ul>	Animals, including humans.	
	<p>The Natural World</p> <ul style="list-style-type: none"> <li>• Explore the natural world around them, making observations and drawing pictures of animals and plants.</li> </ul>					

	<p>The Natural World</p> <ul style="list-style-type: none"> <li>• Explore the natural world around them, making observations and drawing pictures of animals and plants.</li> </ul>	<ul style="list-style-type: none"> <li>• Going on walks to observe the local environment and to compare and learn about the seasons.</li> <li>• Taking photos to compare seasons and discuss.</li> <li>• Planting seeds and plants.</li> <li>• Cress experiment - RE</li> <li>• Looking after the early years garden.</li> <li>• Drawing/painting pictures</li> </ul>	<ul style="list-style-type: none"> <li>• Lifecycle</li> <li>• Plants</li> <li>• Seed</li> <li>• Grow</li> <li>• Roots</li> <li>• Flower</li> </ul>	<ul style="list-style-type: none"> <li>• Seasons</li> <li>• Autumn</li> <li>• Winter</li> <li>• Spring</li> <li>• Summer</li> <li>• Change</li> <li>• Weather</li> </ul>	Plants	
	<p>The Natural World</p> <ul style="list-style-type: none"> <li>• Understanding some important processes and changes in the natural world around them, including seasons and changing states of matter.</li> </ul>	<ul style="list-style-type: none"> <li>• Growing plants from bulbs and seeds.</li> <li>• Water tray activities to explore water, ice, and materials that float and sink.</li> <li>• Making pancakes and krispie buns – changing states</li> <li>• Ice experiment</li> <li>• Exploring magnets</li> </ul>	<ul style="list-style-type: none"> <li>• Material</li> <li>• Wood</li> <li>• Plastic</li> <li>• Glass</li> <li>• Float</li> <li>• Magnetic</li> </ul>	<ul style="list-style-type: none"> <li>• Sink</li> <li>• Liquid</li> <li>• Solid</li> <li>• Melt</li> </ul>	Seasonal Change	Living things and their habitats
	Scientific Vocabulary – scientist, sort, observation, identify, compare, group, investigate, test, evaluate					
<b>Year 1</b>	<b>Advent Seasonal Change</b>	<b>Advent Plants</b>	<b>Lent Animals including Humans</b>	<b>Lent Everyday Materials</b>		
<b>Core Knowledge</b>	<p>Pupils should be taught to: observe changes across the 4 seasons observe and describe weather associated with the seasons and how day length varies <b>The four seasons are Autumn, Winter, Spring and Summer</b>  <b>The weather in Autumn is , in Winter, in Spring and Summer</b></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li>• identify and describe the basic structure of a variety of common flowering plants, including trees</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>• identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• distinguish between an object and the material from which it is made</li> <li>• identify and name a variety of everyday materials, including wood, plastic, glass,</li> </ul>		

	<p>Day becomes night when the Earth rotates on its axis, once every 24 hours, resulting in day and night</p>	<ol style="list-style-type: none"> <li>1. The parts of a plant are the leaf, stem, flower and root.</li> <li>2. Wild plants grow naturally and do not need help to grow.</li> <li>3. Garden plants grow in gardens and are chosen and helped to grow I cared for to make the place look and feel pleasant</li> <li>4. To be a tree it must A tree is a plant. It is part of the plant kingdom because it has roots, stems, leaves, and some have flowers.</li> <li>5. There are many different types of trees. Some are deciduous and drop their leaves in the autumn months. Others keep their leaves all year round, such as a Scots pine tree.</li> <li>6. Trees can be ever green or deciduous.</li> </ol>	<ol style="list-style-type: none"> <li>1. An animal can move freely, eat other living things and needs water</li> <li>2. Mammals and birds are animals.</li> <li>3. Amphibians, reptiles and fish are also animals.</li> <li>4. Amphibians, reptils and fish are cold-blooded, have scaly skin, lay eggs and breathe but, Mammals and birds are warm-blooded, have skin, hair or fur, they give birth to live young or have eggs and they breathe air.</li> <li>5. The food tells us if an animal is a herbivore, carnivore or omnivore.</li> <li>6. I know I am an animal because I am warm blooded, have skin and hair, am born live and breathe air. I also have senses I can see, hear, smell, taste and touch.</li> </ol>	<p>metal, water, and rock</p> <ul style="list-style-type: none"> <li>• describe the simple physical properties of a variety of everyday materials</li> <li>• compare and group together a variety of everyday materials on the basis of their simple physical properties</li> </ul> <ol style="list-style-type: none"> <li>1. Material is the name given to anything that is real or made of matter. Wood, glass, metal, paper etc. are materials. Energy is not a material.</li> <li>2. In school tjings are made of Wood, glass, metal, paper etc. are materials.</li> <li>3. Materials can be described as hard, stretchy, stiff, soft, bendy, smooth rough, not bendy (rigid), transparent and opaque.</li> <li>4. These materials are waterproof plastic, these are</li> </ol>
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				<p>not kitchen roll, tin foil, fabric and toilet paper.</p> <p>5. Some plastics and glass are transparent and wood, metal, rock paper, cardboard and fabric are opaque.</p> <p>6. E.g. The towel needs to be absorbent so it is made from cotton.</p>
<p><b>Previous Learning</b></p>	<p><b>EYFS</b> <b>The Natural World</b> Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p><b>EYFS</b> <b>The Natural World</b> Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p><b>EYFS</b> <b>The Natural World</b> Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p><b>EYFS</b> <b>The Natural World</b> Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p> <p><b>Creating with materials</b> Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture,</p>

							form and function; Share their creations, explaining the process they have used;	
							Make use of props and materials when role playing characters in narratives and stories.	
<b>Substantive concept</b>	Physics The study of energy forces mechanics waves structure of atoms physical universe - Earth in Space	Biology The study of living things, including: Common plants and trees in a local environment	Biology The study of living things, including: Types of animals Food animals eat Senses	Chemistry The study of the composition, behaviour and properties of matter				
<b>Scientific Enquiry</b>	<ul style="list-style-type: none"> <li>Observe changes across the four seasons</li> <li>Observe and describe weather associated with the seasons and how day length varies.</li> <li>Make tables and charts about the weather</li> <li>Make displays of what happens in the world around them, including day length, as the seasons change.</li> </ul>	<ul style="list-style-type: none"> <li>Make observations, using equipment such as magnifying glasses.</li> <li>Compare and contrast familiar plants.</li> <li>Observe closely, and compare and contrast familiar plants</li> <li>Describe how they were able to identify and group different plants</li> <li>Draw diagrams showing the parts of different plants including trees.</li> <li>Record how plants have changed over time and compare and contrast what they have found out about different plants.</li> </ul>	<ul style="list-style-type: none"> <li>Use their observations to compare and contrast animals at first hand or through videos and photographs</li> <li>Describe how they identify and group them</li> <li>Group animals according to what they eat; and using their senses to compare different textures, sounds and smells.</li> </ul>	<ul style="list-style-type: none"> <li>Perform simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'</li> </ul>				
<b>Vocabulary</b>	<u>Tier 2</u>	<u>Tier 3</u>	<u>Tier 2</u>	<u>Tier 3</u>	<u>Tier 2</u>	<u>Tier 3</u>	<u>Tier 2</u>	<u>Tier 3</u>

	dawn dusk mild rotate soaked weather	month season spring summer autumn winter	bud trunk branch bark seed wild	nutrients stem deciduous evergreen	blood senses young feathers fur scales	mammal amphibian reptile herbivore carnivore omnivore	absorb rough smooth waterproof metal plastic	materials properties flexible transparent opaque physical
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Year 2	Advent Living Things in their Habitats	Advent Animals including Humans	Lent Use of everyday materials	Pentecost Plants
<b>Core Knowledge</b>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</li> <li>identify and name a variety of plants and animals in their habitats, including microhabitats</li> <li>describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>notice that animals, including humans, have offspring which grow into adults</li> <li>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> </ul> <p>1. What is an animal? Animals with backbones are called vertebrate. Animals with NO backbones are called invertebrates. The characteristics animals have are Movemen, Respiration, Sensitivity, Nutrition, Growth, Reproduction and Excretion.</p> <p>2. How do animals change as they mature?</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</li> </ul> <p>1. What are materials used for? Wood is used for Being strong and most are light and not too heavy. Plastic and glass can be transparent, opaque and translucent.</p> <p>2. What are materials used for?</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>observe and describe how seeds and bulbs grow into mature plants</li> <li>find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</li> </ul> <p>1. How do seeds germinate and what happens? A seed needs these to stat gemination or growing water and warmth. A seed is tiny food store that the plant can use when growing Germination is when a seed stats to grow. Letter A shows germination. The name of a young plant is a seedling.</p>

	<p>and name different sources of food</p> <ol style="list-style-type: none"> <li>1. What is alive and what is not?</li> <li>2. What do all living things have in common?</li> </ol> <p>All living things have these things in common Movement, Respiration, Sensitivity., Growth, Reproduction, Excretion and Nutrition Respiration means breathing. When living things get bigger and bigger it is called growth. Sensitivity is a feature of all living things. Plants require sunlight, air, water and nutrients. To thrive animals need food - air - water – shelter.</p> <ol style="list-style-type: none"> <li>3. Where do plants and animals live?</li> <li>4. What plants and animals live in our local environment?</li> </ol> <p>A habitat is the home of plants and animals. The tree stump is an example of a microhabitat. Examples of habitats are deserts, Oceans, Mountains and Woodland.</p> <ol style="list-style-type: none"> <li>5. What are food chains? How are they connected?</li> </ol>	<p>Animals do not always look like their parents. Metamorphosis means to change form or shape. The life cycle of a chicken goes from egg, hatching, chick and adult.</p> <ol style="list-style-type: none"> <li>3. How do we change as we mature? Stage A in the diagram is toddler. Stage B in the diagram is teenager. Stage C is adult. Stage D is child.</li> <li>4. What do all animals need to stay alive? To survive animals need air water and food. To breathe amphibians and fish absorbing air through their skin. Animals cannot make their own food. The amount of water in an animals body is A half to three quarters .</li> <li>5. Keeping healthy: why do we exercise? We exercise our bodies because It keeps the heat strong, It keeps the lungs healthy and it keeps muscles strong.</li> </ol>	<p>Ceramics are not thin, versatile and flexible. Fabric is versatile and made of natural or artificial materials. Rocks are hard, inflexible and versatile.</p> <ol style="list-style-type: none"> <li>3. What happens when we squash, bend, twist or stretch a material? Wood cannot be squashed. Fabric can be twisted, squashed and stretched.</li> <li>4. What's the right material for the job? The fabric the T-shirt is made from is soft. The metal the spoon is made from is hard.</li> <li>5. What's the most absorbent material? Absorbent means To suck up liquid.</li> <li>6. Who invented waterproofing? Waterproofing means water cannot get through a material Repel means to stop water entering. Image A shows water being repelled.</li> </ol>	<ol style="list-style-type: none"> <li>2. What happens when bulbs sprout? Bulbs are not the same as seeds. The image shows a bulb Bulbs are like seeds because they store food for the plant to use and they grow roots and shoots.</li> <li>3. What do plants need to thrive and be healthy?</li> <li>4. What can happen if plants don't get the things they need?</li> <li>5. What do I notice about plants around the school? How are they healthy? How are they unhealthy? To be healthy a plant needs soil, water, light, air and warmth. You can tell a plant is unhealthy or needs something because it will have Wilting leaves, A few leaves that look different to others or a drooping stem. To become healthy again the plant needs Sunlight and Water</li> <li>6. How do seeds and bulbs grow? What do plants need to be healthy?</li> </ol>
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	<p>The images show grass – rabbit and fox it is a food chain. A food chain shows the way food energy travels. the correct travel of energy in a food chain is grass to rabbit to fox.</p> <p>Plants help animals because animals eat plants and breathe the oxygen they produce and they provide food and oxygen.</p> <p>6. Why do plants and animals need each other?</p> <p>A producer makes its own food A consumer eats plants and animals. Prey is an animal that is hunted to be eaten as food. A predator is an animal that hunts other animals for its food.</p>	<p>If we don't exercise our bodies are LIKE a broken bike.</p> <p>6. Why do we eat different types of food? We must drink water to replace water that has gone from us. (sweating and going to the toilet) and Water takes away all the nasty things from inside us. Eating healthy is good for us because it is tasty, it gives us energy and It helps us grow. Eating fat does not make you fat. Vegetables keep us healthy. Meat, fish, milk, cheese and eggs help us grow. Carbohydrates and sugar give us energy. Eating too much fat and sugar can make you overweight.</p>		<p>B shows a seeding. C is mature plant. Yes plants can move plants move their leaves and stems towards sunlight.</p>
<b>Previous Learning</b>	<p>EYFS – Natural World Y1 Plants Y1 Animals including humans Y1 Revisit Animals, including humans Y1 Second revisit of Animals, including human and plants</p>	<p>EYFS - Understanding the world. EYFS - Physical development: Health and selfcare Y1 Animals including humans Y1 Revisit Animals, including humans Y1 Second revisit of Animals, including human and plants</p>	<p>EYFS Natural world Y1 Everyday materials</p>	<p>Y1 Animals, including humans Y1 Plants Y2 Living things and their habitats Y2 Uses of everyday materials</p>
<b>Substantive concept</b>	<p>Biology   The study of living</p>	<p>Biology  </p>	<p>Chemistry*  </p>	<p>Biology   The study of living things, including Growth</p>



	things, including Characteristics of living things Relationship of living things and their environment.	The study of living things, including Reproduction Basic needs Diet and exercise for humans.	the study of the composition, behaviour and properties of matter	Health Relationship of living things and their environment				
<b>Scientific Enquiry</b>	Sort and classify things according to whether they are living, dead or were never alive, and recording their findings using charts. Describe how they decided where to place things, exploring questions Construct a simple food chain that includes humans (e.g. grass, cow, human). Describe the conditions in different habitats and micro-habitats and find out how the conditions affect the number and type(s) of plants and animals that live there.	Observe, through video or first-hand observation and measurement, how different animals, including humans, grow Ask questions about what things animals need for survival and what humans need to stay healthy Suggest ways to find answers to their questions.	Compare the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs) Observe closely, identify and classify the uses of different materials, and recording their observations.	Observe and record, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb Observe similar plants at different stages of growth Set up a comparative test to show that plants need light and water to stay healthy.				
<b>Vocabulary</b>	<b>Tier 2</b> thrive depend producer consume prey predator	<b>Tier 3</b> oxygen nutrition respiration sensitivity reproduction excretion	<b>Tier 2</b> healthy survive exercise heart lungs muscles	<b>Tier 3</b> Hygiene Larva pupa vertebrates' invertebrate's metamorphosis	<b>Tier 2</b> artificial brittle extracted fabric manufactured natural	<b>Tier 3</b> ceramic durable inflexible reflective rigid translucent	<b>Tier 2</b> wither dormant mature bulb anchor sustain	<b>Tier 3</b> germination perennial carbon dioxide glucose clone

<b>Year 3</b>	<b>Advent Rocks</b>	<b>Advent Animals including Humans</b>	<b>Lent Forces and Magnets</b>	<b>Lent Plants</b>	<b>Pentecost Light</b>
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<p><b>Core Knowledge</b></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>• describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>• recognise that soils are made from rocks and organic matter</li> </ul> <p>1. How are rocks formed? Lava is outside of the volcano and Magma is inside the volcano. Lava and magma are made of the same material. Concrete is not a rock. The rock formed when Lava cools is igneous.</p> <p>2. What types of rocks are there? Sedimentary rocks are broken down by weathering and deposited in layers in the sea or over oceans.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</li> <li>• identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul> <p>1. What effect does the food we eat have? We need water because most of our body is made from it and needs it and it helps flush out the nasty things inside us. The food pyramid tells us what types of foods to eat and how much of a food to eat is healthy. Carbohydrates give us energy Proteins help us with growth and repair. Fats help us with absorbing vitamins and storing energy.</p>	<p>Pupils should be taught to</p> <ul style="list-style-type: none"> <li>• compare how things move on different surfaces</li> <li>• notice that some forces need contact between 2 objects, but magnetic forces can act at a distance</li> <li>• observe how magnets attract or repel each other and attract some materials and not others</li> <li>• compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials</li> <li>• describe magnets as having 2 poles</li> <li>• predict whether 2 magnets will attract or repel each other, depending on which poles are facing</li> </ul> <p>1. What are contact forces? Contact forces are push and pull resistance is a force.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>• explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</li> <li>• investigate the way in which water is transported within plants</li> <li>• explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul> <p>1. What are the parts of a flowering plant? What do they do? The four major parts of a flowering plant are roots, stem, leaves and flower. The roots are like a straw pulling up water. Leaves are like a sugar factory. The stem is like a motorway.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• recognise that they need light in order to see things and that dark is the absence of light</li> <li>• notice that light is reflected from surfaces</li> <li>• recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>• recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>• find patterns in the way that the size of shadows change</li> </ul> <p>1. Do we need light to see things? Remember: what are light sources and what are not light sources? Sources of light are the sun, torch and a burning match. We can see when Light reflects off an object and enters our eyes. we can't see objects easily when they are placed in a box with very little light because we need light to see objects and Darkness is the absence of light.</p>
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	<p>Metamorphic rocks are sedimentary or igneous rocks changed by heat and pressure Pumice and Granite are igneous rocks. Mudstone and chalk are sedimentary rocks.</p> <p>3 Can rocks change? Metamorphic means to change form. Marble and Slate are metamorphic rocks.</p> <p>4. How can we test a rock to see if it is limestone or chalk? Calcium carbonate, in sedimentary rocks, is mostly made from the shells of dead sea creatures. When calcium carbonate reacts with vinegar. The acid reacts with the calcium carbonate and fizzes and froths.</p> <p>5. Is soil just dirt? What makes soil? The top layer of soil is called hummus. The second layer is Topsoil. The third layer is Weathered rock The fourth layer is Solid rock - (bedrock).</p>	<p>Vitamins, minerals and fibre helps to keep us healthy.</p> <p>2. Where is my skeleton and what does it do? Not All animals have a backbone. The skeleton is not the only system our body has. Skeletons help us support our bodies, protect our insides and move about. Bones help us protect organs inside us, give us support, move by our joints and produce red blood cells. The bones children need to know are skull, ribcage, pelvis, femurs and humerus.</p> <p>3. Where are my muscles and what do they do? We do not only have muscles in our arms. Our main muscles are Muscles joined to our skeletons. Heat muscles and muscles that help move food. To lower the arm our biceps relax. To lower the arm our triceps contract.</p>	<p>2. How do surfaces affect the motion of an object? A rough surface slows an object down or stop it. Resistance is a force that slows down an object.</p> <p>3. How does friction affect moving objects? Friction is the force that stops things moving Fiction opposes the movement of an object The diagram of friction is A - fiction opposes the movement of the object.</p> <p>4. What is a non-contact force? How is this different to a contact force? Non contact forces are magnetism and gravity. A contact force is the same as a non-contact force.</p> <p>5. How do magnets attract and repel?</p>	<p>2. Do all plants need the same things to thrive and grow? Trees are not plants. A mushroom is a plant. To survive plants need Sunlight, Air - carbon dioxide, water and soil to get nutrients from. Plants don't eat soil.</p> <p>3. How do leaves make food for the plant? To make food plants need sunlight, air and water. Leaves don't hold the stems up Leaves make a sugar and are like a factory for the plant Plants excrete water and oxygen. Plants don't excrete glucose and carbon dioxide.</p> <p>4. How does water move through a plant? Transpiration is the movement of water through a plant. the name of the tiny hole that lets water out of a leaf is stomata.</p> <p>5. What do flowers do? 6. What is pollination?</p>	<p>Shiny objects are not light sources Darkness is the absence of light. We do not see things because light travels from our eyes</p> <p>2. How are shadows formed? Shadows are formed when An object totally blocks the light and causes a shadow. You can't see your eyes or smile on your shadow.</p> <p>3. What happens to the size of a shadow when the object moves closer to, or away from, the light source? If the object moves away from the torch the shadow will get smaller. Shadows get bigger when the object gets closer to the light source. Shadows get smaller when the object gets further away from the light source. We can't see in the dark and carrots won't help either!</p>
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	<p>6. How are fossils formed?  you most likely find fossils in sedimentary rocks.  Fossils are not JUST dinosaur bones</p>	<p>Arrows pointing towards each other means contract.  Arrows pointing away from each other means relax.  Bicep is not a word biologists use.</p>	<p>A magnet must have north pole + south pole.  The image shows magnets repelling south and south.  The image shows magnets attracting north and south.</p> <p>6. Which materials are magnetic?  The image shows a magnetic field.  Iron and steel are materials that are attracted to magnets  Plastic, wood and paper are not magnetic.</p>	<p>Flowers Attract insects, Help pollination and Make seeds for the plant.  The male parts of the flower are the anther and filament.  The female parts are sigma, style and ovary.  Pollination is When pollen is transfered and a seed is made.  Two causes of pollination are insects and wind.  Insects are vital for pollination.</p>	
<b>Previous Learning</b>	<p>EYFS – Natural World  Y1 Plants  Y1 Animals, including humans  Y2 Animals, including humans  Y2 Living things and their habitats  Y2 Revisit Living things and their habitats</p>	<p>EYFS Natural world  Y1 Animals, including humans  Y2 Animals, including humans  Y2 Living things and their habitats</p>	<p>Y1 Seasonal changes  Y1 Everyday materials  Y2 Uses of everyday materials</p>	<p>Y1 Plants  Y1 Animals, including humans  Y2 Living things and their habitats  Y2 Plants</p>	<p>Y1 Seasonal changes  Y1 Everyday materials  Y2 Uses of everyday materials  Y3 Forces and magnets</p>
<b>Substantive concept</b>	<p>Biology     The study of living things, including Growth Health Relationship of</p>	<p>Biology     The study of living things, including Amount and type of nutrition</p>	<p>Physics*     The study of energy forces mechanics waves structure of</p>	<p>Biology     The study of living things, including Structure and function Food and</p>	<p>Physics*     The study of energy forces mechanics waves structure</p>

	living things and their environment Reproduction Basic needs Diet and exercise for humans		Structure of humans and animals		atoms physical universe   Earth in Space		survival Life systems. Reproduction		of atoms and the physical universe   Earth in Space	
<b>Scientific Enquiry</b>	<p>Prior learning: Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter.</p>		<p>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p>		<p>Compare how things move on different surfaces Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing</p>		<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant Investigate the way in which water is transported within plants Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>		<p>Recognise that they need light in order to see things and that dark is the absence of light Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows changes.</p>	
<b>Vocabulary</b>	<u>Tier 2</u> cemented compact decay	<u>Tier 3</u> fossil igneous magma	<u>Tier 2</u> minerals skeleton skull	<u>Tier 2</u> adapt essential glucose	<u>Tier 2</u> absence cast (shadow)	<u>Tier 2</u> absence cast (shadow)	<u>Tier 2</u> absence cast (shadow)	<u>Tier 3</u> constant dependent independen	<u>Tier 2</u> adapt essential glucose	<u>Tier 3</u> transpiration stoma

	prehistoric soil transform	metamorphic minerals sedimentary	voluntary involuntary nerves	transport variety vital	impenetrable reflect shadow source (light)	) impenetrable reflect shadow source (light)	impenetrable reflect shadow source (light)	t illuminate translucent variable	transport variety vital	pollination stamen pistil photosynthesis
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Year 4	Advent Living things and their habitats	Advent States of Matter	Lent Animals including Humans	Pentecost Electricity	Pentecost Sound
Core Knowledge	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• recognise that living things can be grouped in a variety of ways</li> <li>• explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>• recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul> <p>1. What are the characteristics of living things? All living things have these things in common Movement, Respiration, Sensitivity,, Growth, Reproduction, Excretion and Nutrition An organism is a single living thing. Biodiversity is the enormous variety of life on earth.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• compare and group materials together, according to whether they are solids, liquids or gases</li> <li>• observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</li> <li>• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul> <p>1. What is matter? What does 'state' mean?</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>identify the different types of teeth in humans and their simple functions</li> <li>describe the simple functions of the basic parts of the digestive system in humans</li> <li>construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul> <p>1. What teeth do humans have? What do they do? The four teeth are incisor, molar, canine and pre-molar.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>identify common appliances that run on electricity</li> <li>construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</li> <li>recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>identify how sounds are made, associating some of them with something vibrating</li> <li>recognise that vibrations from sounds travel through a medium to the ear</li> <li>find patterns between the pitch of a sound and features of the object that produced it</li> <li>find patterns between the volume of a sound and the strength of the vibrations that produced it</li> </ul>

	<p>Animals with a backbone are called vertebrates. Animals without a backbone are called invertebrates. Animals are unable to make their own food so have to hunt and eat other animals and plants.</p> <p>2. What animals are vertebrates? Animals that are vertebrates are Fish. Amphibians Mammals. Birds and Reptiles. Warm blooded means keeping the body at about the same temperature even though the air may be hotter or cooler The animals in the image are cold-blooded vertebrates. Almost all mammals are warm-blooded and have a backbone, breathe air with lungs, give birth to live young and have a single lower jaw bone. Reptiles are cold-blooded and have a backbone, breathe air with lungs, have dry thick scaly skin and hatch from eggs. Fish hatch from eggs, are cold-blooded and have a backbone., breathe oxygen through gills and have scales on their skin. Amphibians hatch from eggs, cold-blooded and have a backbone, young amphibians</p>	<p>Matter is something that takes up space, regardless of its size All matter is made from atoms. The three distinct states of matter are solid, liquid and gas. 2. What are solids, liquids and gases? A solid can't flow, has a fixed volume and has Particles very close together and fixed. A liquid takes the shape of the container, can flow and has Particles close together, but not fixed. A gas can escape from a container, Can flow and has Particles that move apart quickly 3. Melting: how do materials change state? If you find you need to consolidate or focus pupil learning, you can select one or two of these working scientifically lessons. Materials are not permanently solid. When a liquid starts to melt the particles are very close, but not fixed.</p>	<p>This diamond-shaped tooth is for gripping and tearing. It is a canine. Molars Grind and crush food.</p> <p>2. How does our mouth and teeth help digestion? What's the process? Saliva starts to break food down with enzymes, Helps us taste food and Makes food slip down more easily. Our teeth help us digest food by making it easier to swallow and They start to break food down so that the saliva can get to work on it. Enzymes in our saliva do not help our teeth break up the food We make up to 1.5 litres of saliva a day. The tongue helps move food into the oesophagus and helps us taste food. 3. Can teeth tell us what animals eat? Yes carnivores have incisors but herbivores do not.</p>	<p>series circuit • recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>1. What appliances use electricity? What sort of power makes them work? Notice it – what are the everyday appliances that run on electricity - battery or mains Mains electricity is not battery powered Not All electrical appliances need mains electricity. An electrical appliance uses electricity to power it to perform its job.</p> <p>2. Name it - what are the components in a simple series circuit? Test it – what happens when a circuit is open or closed? The flow of electricity is called the current Batteries have these terminals (ends) positive and negative</p>	<p>• recognise that sounds get fainter as the distance from the sound source increases.</p> <p>1. What is sound? Sound waves travel quicker than cars Sound waves can travel through gases like air, Liquids, like water. and Solids, like wood or brick 2. How does sound travel? Sound moves as vibrating waves and like waves on a slinky spring You can't hear explosions in space In air sound travels at 340 metres per second. 3. What is the pitch and loudness of sound? Sound gets fainter when further away because Sound is spread out in the surrounding area.</p>
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	<p>live their life in water and breathe through gills and have moist scaleless skin. Birds hatch from eggs, are warm-blooded and have a backbone, breathe air through lungs and are covered in feathers and have a beak.</p> <p>3. What animals are invertebrates? Insects, Molluscs, Arachnids and Annelida are part of a group called invertebrates. Worms belong to Annelida. Snails are Molluscs. Ants are insects. Spiders are arachnids.</p> <p>Insects and crustaceans are invertebrates. 4. What groups are plants classified in? Plants can be non flowering or flowering. An oak tree is a flowering plant. Plants are organisms that are green and able to make their own food. Non flowering plants include moss, Conifers and Ferns. Spores are very small organisms that are ready to grow into new individuals. 5. What is classification? How do I use a key?</p>	<p>Butter melts at 30 degrees Celsius.</p> <p>4. Evaporating: how do materials change state? Evaporation means to disperse in vapour the action of. When water evaporates it does not totally disappear. Heat and a larger surface area increases the speed of evaporation 5. Condensing: how do materials change state? Condensing means to change from a gas or vapour to liquid drops Cold cans get water droplets on the outside because Water vapour in the air condenses when it touches the cold can and turns to water droplets. Condensation is an important part of the water cycle.</p>	<p>1. What are the parts of the digestive system? The tube that takes the food from our mouth is called the oesophagus. A bolus is a ball of crushed up food that you swallow The small intestine is the organ which helps absorb food into the bloodstream. The stomach collects food and breaks it down with gastric juices The large intestine removes most of the water and materials we can't digest</p> <p>2. How does digestion work? What's the process?  The oesophagus is the tube that helps food move from the mouth to the stomach</p> <p>The stomach has strong acid to break down food and has enzymes to help speed up food digestion.</p>	<p>An electrical circuit is a connected set of wires with a power source. Circuits have components, batteries, wires, switch, bulbs, buzzers and motors. Wires Conduct electricity. A simple series circuit a single loop connecting a battery and components like a bulb, motor or switch An insulator stops the flow of electricity A conductor allows the flow of electricity A = insulator B = conductor Copper, salt and tap water and steel conduct electricity Copper is not an insulator Glass, rubber and wood are insulators. Paper is not a conductor.</p> <p>3. Diagnose it – what are the effects of changing circuit components and batteries?</p>	<p>Pitch is Sounds that are high or low Lower pitch sounds look Less frequent sound waves produced every second. Higher pitch sounds look More frequent sound waves produced every second</p> <p>You can change the pitch of a sound by Changing the tightness of the object that is vibrating. Changing the length of the object that is vibrating. Changing the size of the size of the thing that is vibrating. You can change the loudness by Increase the force you blow, strum or hit the object harder. Increase the size of the things vibrating.</p>
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	<p>The image shows a classification chart. scientists explain and sot animals and plants using classification and keys.</p> <p>6. What happens if the environment in a habitat change?  A habitat is A natural place where an organism lives. If a habitat changes Animals and plants may be affected by change in food, water and shelter. This can be both dangerous or beneficial for them</p>		<p>The stomach moves food around to get it coated in gastic juices</p> <p>Defacation is to Pass waste out of our bodies as faeces</p> <p>The order for digestion is  mouth - oesophagus - stomach - small intestine - large intestine</p> <p>Digestion means To carry apart</p> <p>1. What are food chains? How do they work?  Grass is a producer. Animals and plants cannot produce their own food. Rabbits are prey. A fox is a predator.</p> <p>2. How do I construct and interpret a food chain?  The arrows on a food chain Show us the direction the food energy flows</p>	<p>The circuit will work if there is no break in the circuit.  The bulbs are dimmer because there are two of them each receiving less power.  Cars can be powered by electricity.</p>	<p>(bigger or smaller sound box)</p>
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			Predators hunt naturally for food Producers are living things that produce their own food Prey can also be a predator		
<b>Previous Learning</b>	Y1 Plants Y1 Animals, including humans Y2 Living things and their habitats Y2 Plants Y3 Plants	Y1 Everyday materials Y2 Use of everyday materials Y3 Forces and magnets	Y1 Plants Y1 Animals, including humans Y2 Living things and their habitats Y2 Plants Y3 Plants Y4 Living things and their habitats	Y1 Seasonal changes Y1 Everyday materials Y2 Uses of everyday materials Y3 Forces and magnets	Y1 Seasonal changes Y1 Everyday materials Y2 Uses of everyday materials Y3 Forces and magnets Y4 Electricity
<b>Substantive concept</b>	Biology   The study of living things, including Grouping Classification Environmental change and impact.	Chemistry*   the study of the composition, behaviour and properties of matter	Biology   The study of living things, including Structure of digestive system Function of digestive system Relationship food chains	Physics*   The study of energy forces mechanics waves structure of atoms physical universe   Earth in Space	Physics*   The study of energy forces mechanics waves structure of atoms physical universe   Earth in Space
<b>Scientific Enquiry</b>	Recognise that living things can be grouped in a variety of ways Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment Recognise that environments can change and that this can	Compare and group materials together, according to whether they are solids, liquids or gases Observe that some materials change state when they are heated or cooled, and measure or research the temperature	Compare the teeth of carnivores and herbivores, and suggest reasons for differences Find out what damages teeth and how to look after them. Draw and discuss their ideas about the digestive system and compare	Identify common appliances that run on electricity Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.	Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel

	sometimes pose dangers to living things.	at which this happens in degrees Celsius (°C) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		them with models or images.		Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.		through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases		
<b>Vocabulary</b>	<b>Tier 2</b> classification environment interdependence interact beneficial hierarchy	<b>Tier 3</b> vertebrate invertebrate biotic ecosystem species niche	<b>Tier 2</b> permanent particle solid liquid gas vapour	<b>Tier 3</b> evaporate condense melt matter state volume	<b>Tier 2</b> expel compact digestion acid stomach intestines	<b>Tier 3</b> incisor canine molar enzyme saliva peristalsis	<b>Tier 2</b> associate identify portable effect appliance series	<b>Tier 3</b> component electrical insulator electrical conductor circuit hypothesis variable	<b>Tier 2</b> produce property source frequent regular affect	<b>Tier 3</b> vibrate pitch volume medium vacuum sound wave

Year 5	Advent Properties and changes of materials	Advent Animals including humans	Lent Living things and their habitats	Lent Earth and space	Pentecost Forces and Magnets
<b>Core Knowledge</b>	Pupils should be taught to:	Pupils should be taught to: describe the changes	Pupils should be taught to: • describe the differences in the life cycles of a mammal, an	Pupils should be taught to: describe the movement of the Earth and other planets	Pupils should be taught to:

	<ul style="list-style-type: none"> <li>• compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</li> <li>• know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>• use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>• demonstrate that dissolving, mixing and changes of state are reversible changes</li> </ul>	<p>as humans develop to old age</p> <ul style="list-style-type: none"> <li>• Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty.</li> <li>• Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.</li> </ul> <p>1. What is the human timeline? Humans are animals. As we grow humans go from child - teenager – adult Then teenager - adult - old person. Adolescence is changing from a child to an adult. The Latin origin for the word adolescence is growing and youthful.</p> <p>2. How do we change into adults? Gestation is Growing in the womb</p>	<p>amphibian, an insect and a bird</p> <ul style="list-style-type: none"> <li>• describe the life process of reproduction in some plants and animals.</li> </ul> <p>1. Life cycle differences – what's the difference between a mammal and an amphibian? Mammals are vertebrates, Give birth to live babies, have Embryos develop inside the mother's womb, reproduce sexually and feed their young with milk. Amphibians are vertebrates, lay soft eggs, have Embryos that develop in eggs outside of the mother, Undergo metamorphosis and Sexual reproduction.</p> <p>2. Life cycle differences – what's the difference between an insect and a bird? Insects undergo metamorphosis, are Invertebrates, Sexual reproduction, have Embryos develop in eggs outside of the mother and Transform into a pupa before metamorphosis. Birds are vertebrates, lay hard shelled eggs, Sexual reproduction., have embryos that develop in eggs outside of the mother, have Chicks</p>	<p>relative to the Sun in the solar system</p> <ul style="list-style-type: none"> <li>• describe the movement of the moon relative to the Earth</li> <li>• describe the Sun, the Earth and the Moon as approximately spherical bodies</li> <li>• use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.</li> </ul> <p>1. What are the planets in our solar system? The four rocky planets in our solar system are venus, mars, earth and mercury. Gas planets are Jupiter, Neptune, Saturn and Uranus. Orbit means a curved path around a star or planet. It takes the earth 365 and 1/4 days to orbit the sun. It takes pluto 284 Earth years to orbit the sun once. Pluto is a small dwarf planet.</p> <p>2. How does our view of the Moon change in a lunar month?</p>	<ul style="list-style-type: none"> <li>• explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>• identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>• recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect</li> </ul> <p>1 When is friction helpful and when is it not? Friction is not only unhelpful. Friction is a force that opposes the direction of an object's movement</p> <p>2 What's the effect of air resistance? Air resistance is a force.</p>
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	<ul style="list-style-type: none"> <li>• explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</li> </ul> <p>1. What properties do materials have? How do we use them?  Everything is made from atoms and molecules.  An atom is the smallest known part of any material.  A molecule is two or more atoms, joined by a bond.  Particles are atoms and molecules  A material that is magnetic is attracted by the force of magnetism  A material that is a conductor allows electricity and heat to travel through it.  Hardness describes the toughness of a material</p>	<p>The stage of an unborn human for the first 7 weeks is called an embryo.  At 8 weeks this unborn human is called a foetus.  The female organ that an unborn human grows inside is called a womb.  The average human gestation period is 40 weeks.  Puberty means start to physically and emotionally change from a child into an adult</p> <p>3. How does human and animal lifespan compare?  Yes - a pregnant cow has a gestation period The animal with the longest gestation period is elephant.  Which is 660 days. 22 months)  Orangutans have a similar gestation period to humans.  Life expectancy is The estimated length of time a living thing will be alive.</p>	<p>hatch and mature; growing in size with more feathers.</p> <p>3. What is similar and what is different between the life cycles of a mammal, an insect, an amphibian and a bird?  Insects biochemically transform from a larva to an adult.  Amphibians don't go through metamorphosis exactly the same as insects.</p> <p>Most mammals reproduce sexually  Birds don't give birth to live young.</p> <p>4. Summer birds – who was Maria Merion and what did she do?  Maria merion Lived over 300 years ago, drew and recorded very detailed studies of butterfly life cycles and Challenged the belief that insects were evil and born from mud.  . Sir David Attenborough described Maria Merion as one of the most important</p>	<p>3. Why does the rotation of Earth result in night and day?  The Moon doesn't change size as it orbits the Earth.  Waxing means getting larger.  Gibbous means inbetween a half and full moon.  After a full moon it is called waning gibbous.  After a NEW moon the next phase is waxing crescent.  The diagram shows the Moon's phases.</p> <p>4. Why is the Earth's tilt (axis) responsible for the seasons?  It takes 24 hours for the Earth to make one complete rotation or spin.  Not all places on Earth get sunlight at the same time of day.  Daylight is when our part of the Earth is turned towards the Sun.  The earth moves not the sun.  The Earth has rotated anti-clockwise and is facing the sun more directly.  Night and day is caused by The Earth's single spin (rotation) in 24 hours.</p>	<p>The surface area and speed of an object affect air resistance.  If you increase the surface area It will fall more slowly as the air resistance is increased.</p> <p>3 What's the effect of water resistance?  Water resistance is the force opposing you as you swim through the water.  Up thrust is the force of water pushing upwards against an object</p> <p>4 Who was Galileo Galilei?  Galileo Galilei is a famous scientist.  They improved the telescope.  He discovered that objects fall at the same speed regardless of weight  He was a great scientist because he always tested his</p>
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	<p>Solubility describes how well a substance mixes into a liquid.          Transparency describes how well you can see through a material.          A material that is an insulator does not allow electricity and heat through it.          Transparency means you can see all the way through the material.          Opaque means you can't see through the material.          Translucent means you can slightly see through the material.          Iron and steel are materials that are attracted by the force of magnetism.          Glass is a good insulator.          School tables are designed for their hardness.          Salt is a material with good solubility.          Clay bricks are not transparent.          Copper is a good conductor.</p>		<p>contributors to the field of Entomology          The etymology of entomology is insect study of.          5. The science of life - how do living things reproduce? 6.          Plants and animals: what's the life process of reproduction?          Sexual reproduction is when male and female reproductive cells combine to create an embryo.          Sexual reproduction does not only happen in the animal kingdom.          An advantage of sexual reproduction is It adds slight variation and diversity to the species as non-identical copies of the organism are produced.          Advantages of asexual reproduction are It means identical copies can be produced and It speeds up the population of an area.          Animals that sexually reproduce are Komodo dragon. Jellyfish and Some snakes - pythons.          Plants can reproduce sexually and asexually.          Flowers help plants with reproduction.</p>	<p>The earth's rotation is how the seasons are caused.          The seasons occur because the Earth orbits the Sun and spins on its axis and a part of the Earth is tilted towards the Sun more directly for half a year</p>	<p>ideas to prove if they were right or wrong.          5 How do levers help us?          All levers have a fulcrum, load and arm.          Levers are force multipliers          Scissors are a lever.          6 How do pulleys and gears help us?          Pulleys are used for moving heavy objects with less force.          A simple pulley has a rope, grooved wheel and axel.          The two types of gears are driver and follower.          Gears are useful for decreasing the effort needed to move something.          Isaac Newton discovered a force in physics called gravity.</p>
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	<p>2. What is a solution and what is a mixture? A solution is when a material is dissolved into a liquid. A mixture is when two or more materials are combined. A solution is always a mixture, but a mixture is not always a solution. Sand + water is a mixture. Sugar and water is a solution. Salt is a solute. Water is a solvent.</p> <p>3. How can we separate materials from a mixture? Dissolving is when a solid, liquid or gas breaks down into tiny particles and mixes with the liquid so they can't be seen separately in the solution.</p> <p>4. How can we separate materials from a solution?</p>		<p>Plants produce by Extending runners called stolon above the ground. Using Tubers, like potatoes, grow into new plants. Their Bulbs - food stores underground. Rhizomes - extended roots underground</p>		
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	<p>You would use a magnet to separate iron filings from sand.  You would use evaporation to separate salt from water in a solution.  To separate water from soil in a mixture use a sieve/filter.  To separate to separate stones from soil you would use a sieve.</p> <p>5. What changes are reversible?  dissolving and freezing are reversible  Melting ice is reversible</p> <p>6. What changes are irreversible?  Cooking an egg and burning are irreversible.  Burning wood is irreversible.  A physical change is not usually irreversible, like melting an ice cube.  A chemical change is irreversible, like cooking an egg</p>				
<b>revious Learning</b>	Y1 Everyday materials Y2 Uses of everyday materials	Y1 Animals, including humans	Y1 Plants Y2 Plants Y3 Plants	Y3 Forces and magnetism Y3 Light Y4 States of matter	Y3 Forces



	Y3 Rocks Y3 Light Y4 States of matter	Y2 Animals, including humans Y3 Animals, including humans Y4 Animals, including humans	Y3 Living things and their habitats Year 4 Living things and their habitats	Y4 Electricity Y4 Sound	Y4 Electricity States of matter Sound Y5 Earth and space Y5 Properties and changes of materials
<b>Substantive concept</b>	Chemistry*   the study of the composition, behaviour properties of matter	Biology   The study of living things Lifespan and life cycle Change and growth	Biology   The study of living things, including Structure, Order Life cycles Reproduction	Physics   Matter Forces and motion Sound, light and waves Electricity and magnetism Earth in Space	Physics   Matter Forces and motion Sound, light and waves Electricity and magnetism Earth in Space Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
<b>Scientific Enquiry</b>	Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical	Describe the changes as humans develop to old age.	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals.	Prior learning: see forces Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.	Identify the effects of air resistance water resistance and friction, that act between moving surfaces Recognise that

	<p>and thermal), and response to magnets.          Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.          Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.          Demonstrate that dissolving, mixing and changes of state are reversible changes          Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with</p>			<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.          Describe the movement of the Moon relative to the Earth.          Describe the Sun, Earth and Moon as approximately spherical bodies.          Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>	<p>some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>
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	burning and the action of acid on bicarbonate of soda.									
<b>Vocabulary</b>	<b>Tier 2</b> property particle separate combine recover comparative	<b>Tier 3</b> Atom molecule chemical (changes) physical (changes) reversible reaction	<b>Tier 2</b> development diverse unique generation mature equipped	<b>Tier 3</b> adolescence puberty gestation embryo foetus womb	Tier 2 deduce process re-form transform adolescence contrast	Tier 3 embryo sexual metamorphosis incubate biochemical fertilisation	<b>Tier 2</b> luminous phenomenon attraction approximately relative apparent	<b>Tier 3</b> Orbit axis crescent gravitational waxing waning	<b>Tier 2</b> opposite reaction advantage displace weight mass	<b>Tier 3</b> pulley gear pivot fulcrum lever upthrust

<b>Year 6</b>	<b>Advent Electricity</b>	<b>Advent Animals including humans</b>	<b>Lent Light</b>	<b>Lent Classification</b>	<b>Pentecost Evolution and Inheritance</b>
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<p><b>Core Knowledge</b></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li>• compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram.</li> </ul> <p>1. What is electricity? How does it work? How do we build and represent a series circuit? An atom is the smallest part an element. Atoms contain protons +, neutrons, a nucleus and electrons. (-) Protons are not negatively charged. (-)</p>	<p>Pupils should be taught to:</p> <p>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <ul style="list-style-type: none"> <li>• recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>• describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul> <p>1. What is blood made of and why do we need it? The main components of blood are Red blood cells, Plasma, platelets and white blood cells. Blood is not blue on the inside of our veins. Blood does not have equal amounts of red cells, white cells and platelets.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• recognise that light appears to travel in straight lines</li> <li>• use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</li> <li>• explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</li> <li>• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul> <p>1. How does light travel? Light travels in a straight line from its source When light hits a mirror, it reflects. Light travels at 300,000,000 metres per second. A shadow is not a reflection.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals</li> <li>• give reasons for classifying plants and animals based on specific characteristics.</li> </ul> <p>1. Who was the scientist Carl Linnaeus and what did he do? Carl Linnaeus invented the simple system for ordering living things in 1737. The name of the system that classifies living things is taxonomy. The etymology of taxonomy is arranged method. The kingdom identifies Plant; Animal, Fungi; Algae and Slime; Bacteria. The Phylum identifies Vetebrates, Athropods, Molluscs The class identifies the group below phylum. Under vetebrates, the class would be mammals, reptiles.</p> <p>2. How do we classify vertebrates?</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>• recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>• identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</li> </ul> <p>1. How have living things changed over time? How do we know? Fossils and imprints tell us about things living millions of years ago. The first living things lived in the oceans because there was no oxygen in the air at that time.</p>
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	<p>In the nucleus of an atom you would find Neutrons and Protons (+). Electrons orbit the nucleus of an atom. The energy a power source gives to move electrons around the circuit is the potential difference. Large and small batteries with the same voltage both give the same energy to electrons. Electricity does not come out of both ends of a battery. Electricity flows from the positive to negative terminal. A simple series circuit is a circuit that is a single loop with a battery, bulb or other components. If you took one of the batteries out of this circuit the light would become dimmer.</p> <p>2. What are the components in a series circuit?</p>	<p>Red blood cells carry oxygen.</p> <p>Pupils should be taught to: identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <ul style="list-style-type: none"> <li>• recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>• describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul> <p>1. What is blood made of and why do we need it? The main components of blood are Red blood cells, Plasma, platelets and white blood cells. Blood is not blue on the inside of our veins.</p>	<p>If the object was moved closer to the light source the shadow would get larger because light travels in straight lines and has a larger angle to make it past the object.</p> <p>2. What colour is light made of? The diagram shows White light being split in the visible spectrum White light is colourless light that contains the colours of the visible spectrum. The colours visible in the spectrum are Red - Orange - Yellow - Green - Blue - Indigo - Violet. Isaac Newton invented the colour wheel to show how white light is made up of colours within the visible spectrum.</p> <p>3. Reflection - how does light help us to see objects? We see light when it is reflected off an object and it enters our eye. The angle of incidence equals the angle of reflection</p>	<p>Vetebrates all have backbones. Vertebrates are mammals, fish, birds, reptiles and amphibians.</p> <p>3. How do we classify invertebrates we know? animals that are classed as invertebrates do not have a back bone. These animals are classed as invertebrates arachnids, mollusc, Annelida and insects. An Annelida is a worm</p> <p>4. How do we classify invertebrates we don't know? (Sponges, Jellyfish and Flatworms) Sponges, Jellyfish and flatworms are all invertebrates. A Jellyfish is an invetebrate.</p> <p>5. How do we classify invertebrates we don't know? (Starfish and Sea urchins, Crustacea and Myriapoda) Starfish and Sea Urchins, Crustaceans - crabs and woodlice and Myriapods - centipedes and millipedes are invertebrates. Crabs and Woodlice belong in the same classification group - Crustaceans</p>	<p>A cast fossil is number 3. A trace fossil is number 4. We don't know as much about early life in the oceans (before 600 million years ago) because creatures didn't have shells or skeletons and soft bodies don't preserve well.</p> <p>2. How has life evolved over time? Fish evolved before amphibians. Birds did not evolve before mammals. Dinosaurs evolved 230 million years ago. We think modern humans evolved 200,000 years ago.</p> <p>3. What is DNA and what does it do? Working scientifically DNA is a long coiled molecule that carries genetic information (genes). DNA carries biological information that is inherited. DNA carries our genetic code that gives</p>
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	<p>The battery is symbol c. The bulb is symbol A. The Motor is symbol B. The switch is symbol E. The buzzer is symbol D. This is an open switch - the electricity cannot pass through. Series circuit B would have a brighter bulb.</p> <p>Test it - How does the number of cells and voltage affect components in a circuit? 3. Diagnose it – what are the effects and consequences of changing circuit components and batteries? To power the 3volt bulb you would need Two x 1.5 V batteries. The switch is open and the circuit is not complete this is stopping the conventional current from flowing. The 3VOLT motor powered by a 1.5 volt</p>	<p>Blood does not have equal amounts of red cells, white cells and platelets. Red blood cells carry oxygen. Blood is mostly water (plasma) In the diagram Platelets are sealing a cut by activating fibrin and plugging the hole.</p> <p>2. Why do our bodies need nutrients and how are they transported? The job of our blood is too Transport nutrients and oxygen , Clean waste and help our body with healing and protection. Cells need Nutrients and Oxygen.</p> <p>3. What is our circulatory system? The main parts of our circulatory system are Lungs, Heart, Arteries and Veins.</p>	<p>4. Which surfaces make the best reflectors? When light hits a shiny surface it is reflected of the surface you need to stand at point B to see the object in the mirror. Smooth and shiny materials reflect all the light beams in the same direction so that a clear image is formed. Object A is shiny Object B is smooth. When a light beam reflects from a rough surface it scatters the light beams in different directions so no clear image can be seen.</p> <p>5. Why do we see objects as a particular colour? A pigment is the colour of a material. The diagram shows the green pigment of the material absorbing all other colours in the visible spectrum and reflecting only the colour green to the eye</p>	<p>6. Apply it: what animals can I classify? What animals and plants exist in my local environment? Number one shows Single celled organisms. 2 Shows sponge. 3 shows starfish. 4 shows flatworm 5 shows Starfish and Sea urchins 6 shows Annelida 7 shows mollusc 8 shows Arthropods: crabs; spiders; insects; centipedes and millipedes 9 shows fish 10 shows amphibians 11 shows birds 12 is reptiles 13 is mammals</p> <p>ADDING FOR 2024</p> <p>1. What are microorganisms?</p> <p>2. How do I classify plants?</p>	<p>characteristics such as eye colour and hair colour.</p> <p>4. Are all offspring identical to their parents? Asexual reproduction produces offspring that are genetically identical. Sexual reproduction with two parents (plants and animals) gives a species the best chance of long-term survival. Acquired characteristics happen as a result of events happening in a species lifetime - stronger arms or coloured hair. These are not passed on through DNA. A giraffe does not have a long neck because the leaves are on the top of tall trees. The image of different dog breeds shows Variation. We can alter inherited characteristics of living things.</p>
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	<p>battery would spin slower.</p>	<p>the right order for blood circulation is heart - lungs - heart – body. The diagram shows the circulatory system. Oxygenated blood is bright red. deoxygenated blood is blue.</p> <p>4. What is our heart like inside? How does it work? The bottom chambers of a mammal's heart are called ventricles. Arteries do not only carry oxygenated blood. The LEFT side of the heart sends blood to the body. The RIGHT side of the heart sends blood to the lungs.</p> <p>5. Who influenced what we know about our circulatory system? The first scientists to discover the circulatory system</p>	<p>6. What happens to the appearance of objects when placed in water? A filter will let only its colour through. The image shows refraction. Refraction is when light changes direction as it moves from one medium to another.</p>		<p>The giraffes inherited characteristics is it's long neck.</p> <p>5. Darwin and Wallace – what evidence did they share to argue the case for evolution? Charles Darwin wrote the book on the origin of species.</p> <p>6. Survival of the fittest - how have animals adapted and evolved to suit their environment?  Polar bears have thick white fur because an ancestor had thicker, white fur and was more successful than brown bears. Natural selection is the main idea that drives the theory of evolution proposed by Charles Darwin. Natural selection is when inherited characteristics enable the living thing to be more successful. The child of a bodybuilder will not have big muscles</p>
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		<p>were Galen and Harvey.</p> <p>6. What can we do to keep healthy?</p> <p>We need to eat and drink healthily to help our blood, heat and lungs do their jobs well.</p> <p>Proteins are important in our diet to help us grow and repair.</p> <p>To be more healthy we could drink more water, Eat more salads and vegetables, Exercise and walk a little more and Only have really fatty and sugary food as a treat.</p> <p>Remember circulation and digestion: how are these two systems connected?</p> <p>The systems shown are digestive, respiratory and circulatory.</p>			<p>because their parent works out.</p> <p>Charles Wallace and Isaac Newton had the same idea about evolution.</p> <p>Survival of the fittest means that well-adapted living things will survive and pass on the successful characteristics.</p>
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		<p>Where are the kidneys and what do they do? The organ responsible for cleaning the blood is the kidneys. Kidneys are found either side of your vertebrae.</p> <p>How do kidneys keep us healthy?</p> <p>Your kidneys can clean 180 litres of blood each day.</p> <p>In the kidneys the toxins are turned into Urine for excretion.</p> <p>The kidneys can regulate How much water the body needs in the blood.</p> <p>If your urine is dark yellow or orange it is telling you that You are dehydrated and You need to dink more water.</p>			
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<b>Previous Learning</b>	<p>Y1 Everyday materials (chem)  Y2 Uses of everyday materials (chem)  Y3 Light  Y4 States of matter Y4 Sound  Y4 Electricity  Y5 Forces  Y5 Earth in Space</p>	<p>Y1 Animals, including humans identify animals – mammal, reptile, bird, amphibian, fish  Y2 Animals, including humans Reproduction and basic needs Y3 Animals, including humans Nutrition Structure of humans and animals  Y4 Animals, including humans - Human digestion</p>	<p>Y1 Everyday materials  Y2 Uses of everyday materials Y3 Light  Y4 States of matter  Y4 Sound  Y4 Electricity  Y5 Forces  Y5 Earth in Space</p>	<p>Y1 Plants  Y2 Plants  Y3 Plants  Y3 Living things and their habitats  Year 4 Living things and their habitats  Y5 Living thing and their habitats</p>	<p>Y3 Plants  Y4 Living things and their habitats Y5 Living things and their habitats Y6 Living things and their habitats</p>

		Y5 Animals, including humans Lifespans and life cycles, g			
<b>Substantive concept</b>	Physics   Matter Forces and motion Sound, light and waves Electricity and magnetism	Biology   The study of living things Structure and function of the circulatory system Health and exercise.	Physics   Matter Forces and motion Sound, light and waves Electricity and magnetism   Earth in Space Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.	Biology   The study of living things, including Pioneering scientists and Classification	Biology   The study of living things Change Evolution Adaption Environment
<b>Scientific Enquiry</b>	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Use recognised symbols when representing a	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported	Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.

	simple circuit in a diagram.		within animals, including humans.						Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	
<b>Vocabulary</b>	<u><b>Tier 2</b></u> Component Consequence Systematic Represent Source Generate	<u><b>Tier 3</b></u> Proton Neutron Electron Terminal Series Voltage	<u><b>Tier 2</b></u> Cell Chamber System Circulation Vessel Clot Filter Expel Substance Function Regulate Transform	<u><b>Tier 3</b></u> Plasma Platelet Artery Capillary Vein Ventricle Kidney Bladder Urine Excretion Toxin Nutrient	<u><b>Tier 2</b></u> Impurity Emit Absorb Constituent Filter Artificial	<u><b>Tier 3</b></u> Refraction Incidence Spectrum Prism Lux Piment	<u><b>Tier 2</b></u> Characteristic Interdependence Specific Categorise Primitive Hierarchy	<u><b>Tier 3</b></u> Fungus Arthropod Taxonomy Kingdom Phylum Genus	<u><b>Tier 2</b></u> Characteristic Adaptation Acquire Theory Modify Generation	<u><b>Tier 3</b></u> Evolve Survival Species Clone Inherit Fossil