

Science Progression



Science at Ark Bentworth

At Ark Bentworth, the Science curriculum is designed to ensure pupils are achieving the three key aims of the National Curriculum. This states that through science teaching, all pupils should:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- develop an understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Science at Ark Bentworth ensures our pupils gain the knowledge they need to discover, understand and begin to explain the world and phenomena around them. In addition, we ensure our pupils are equipped with the skills and knowledge of processes through which science is achieved and applied. We know that pupils need to know how science works in their own lives and in the lives of others. Our pupils have the right to be scientifically literate because science matters in the world. The units studied at Ark Bentworth are as follows:

- **Year 1:** Everyday Materials, Autumn and Winter, Amazing Animals, Spring and Summer, Plants
- **Year 2:** Animal Survival, Uses of Materials, Animals and Habitats, Protecting our Environment, Plants: Bulbs and Growth
- **Year 3:** Skeletons and Muscles, Rocks and Fossils, Light and Shadows, Plant Survival, Forces and Magnets
- **Year 4:** Teeth and Digestion, States of Matter, Classification and Environments, Sound, Electricity
- **Year 5:** Earth and Space, Forces, Material Properties and Changes, Life Cycles, Growing Old
- **Year 6:** Light and Perception, Classification, Evolution and Inheritance, Electricity and Circuits, Circulatory System and Lifestyle

The knowledge across the three disciplines of science builds sequentially with pupils often revisiting an idea or concept again in a later unit. In Biology, pupils develop their knowledge of organisms, ecosystems and genes. In Chemistry, pupils develop their knowledge of materials, uses of materials and how materials can change. In physics, pupils develop their knowledge of forces, energy and space. The pupils at Ark Bentworth work scientifically in a meaningful way. They gain the necessary knowledge first, before working scientifically to deepen and explore this knowledge further. Scientific enquiry is mapped out against the units to ensure balance and coverage.

Progression in Knowledge, Skills and Understanding

EYFS						
	Who am I?	What happens at night?	Can you make it work?	Where do animals live?	What can we do to help?	How do things change over time?
Objectives and Core Experiences	<p>Physical Development:</p> <ul style="list-style-type: none"> Use equipment that requires pushing and pulling. Use equipment that requires twisting and turning. Know when to wash hands. Take care to be clean and dry all day – wiping, flushing and washing hands after using the toilet. Try a range of foods. <p>Maths:</p> <ul style="list-style-type: none"> Discuss the weather each day during Maths Meetings. <p>Understanding the World:</p> <ul style="list-style-type: none"> Begin to notice similarities and differences between people. Talk about personal history and family. Learn body parts through songs and drawing around and building around each other. Explore faces through creating self-portraits. Explore autumn through an autumn walk and an autumn nature investigation. Grow vegetables and herbs. 	<p>Maths:</p> <ul style="list-style-type: none"> Discuss the weather each day during Maths Meetings. <p>Understanding the World:</p> <ul style="list-style-type: none"> Explore light, sound and technology. Play in a sensory tent and explore light, dark and shadows. Use torches and shadow puppets to explore shadows and how light travels. Talk about and describe the world around them. Learn about nocturnal animals. Discuss the phases of the Moon and observe the Moon each evening at home. Discuss astronauts, space travel and what it would be like in space (idea of no) <p>Expressive Arts and Design:</p> <ul style="list-style-type: none"> Draw simple and recognisable animals. Create own shadow puppets. Select materials and tools for a specific purpose based on their properties. 	<p>Communication and Language:</p> <ul style="list-style-type: none"> Plan-do-review around the story of the Three Little Pigs. Discuss materials and their suitability for construction. <p>Physical Development:</p> <ul style="list-style-type: none"> Ride and race tricycles and balance bikes. Create a moving vehicle. Build a series circuit to light up a bulb or make a motor go. Explore the ‘tinkering’ table – tools and construction materials. <p>Maths:</p> <ul style="list-style-type: none"> Discuss the weather each day during Maths Meetings. Mix and make mud pies – investigate which will last the longest in the rain. <p>Understanding the World:</p> <ul style="list-style-type: none"> Hypothesise about how things work and why things happen. Explore why things happen – with support. Investigate building a vehicle. Explore magnets in an open experiment. Explore floating and sinking. 	<p>Communication and Language:</p> <ul style="list-style-type: none"> Explore pet shop role play area. Explore jungle, grassland and polar small worlds. Explore outside biologist station <p>Maths:</p> <ul style="list-style-type: none"> Discuss weather each day – Maths Meetings. Sort and compare animals in relation to size, length, number of legs etc. Compare the height of children in the class. <p>Understanding the World:</p> <ul style="list-style-type: none"> Make observational drawings/paintings of animals. Talk about where animals live in relation to maps and climate. Find out about vertebrates and invertebrates. Build a world map of where animals live. Investigate what animals eat. Visit a farm or zoo. Grow vegetables. Explore skeletons of humans and animals. 	<p>Communication and Language:</p> <ul style="list-style-type: none"> Explore x-rays and skeletons in vet and doctor role play areas. <p>Physical Development:</p> <ul style="list-style-type: none"> Discuss health, healthy bodies, body parts, teeth and dental health, healthy food and fitness, germs and hand washing and hygiene. <p>Literacy:</p> <ul style="list-style-type: none"> Follow a recipe to bake bread. Keep a growing diary after planting something. <p>Maths:</p> <ul style="list-style-type: none"> Discuss the weather each day during Maths Meetings. <p>Understanding the World:</p> <ul style="list-style-type: none"> Grow turnip, radish, lettuce. Discuss things that pupils have done or could do to help the environment and community. Visit a nature reserve, green space, allotment or garden centre. 	<p>Communication and Language:</p> <ul style="list-style-type: none"> Discuss the changes seen outdoors – growth in plants, change in animals. Explore dinosaur small world area. <p>Literacy:</p> <ul style="list-style-type: none"> Writing provocations based on audience and purpose – letter writing to ask for a larger planting area. Look closely at fossils through reading ‘The Street Beneath My Feet’. <p>Understanding the World:</p> <ul style="list-style-type: none"> Develop scrapbook journaling around the idea of growth. Notice and watch the caterpillars/ducks - discuss growth and change.

Year 1

	Everyday Materials <i>Chemistry</i>	Autumn and Winter <i>Physics</i>	Amazing Animals <i>Biology</i>	Spring and Summer <i>Physics</i>	Plants <i>Biology</i>
National Curriculum	<p>Pupils should be taught to: Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock. Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<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.</p>	<p>Pupils should be taught to: 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. Describe and compare the structure of common animals. (fish, amphibians, reptiles, birds and mammals). Identify, name, draw and label basic parts of the human body and say which is associated with each sense.</p>	<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.</p>	<p>Pupils should be taught to: Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.</p>
Prior Knowledge	<p>Across EYFS: Pupils know how to select and develop their ideas in terms of the products they want to make using tools and materials. Pupils know words to describe materials including colour, shape, properties (e.g. smooth, rough). Pupils know that they need to wear warm coats when it is cold, woollen hats etc. Pupils know to wear wellies and use umbrellas in the rain so that you do not get wet. EYFS, Can you make it work? Pupils had a 'tinkering table' in the classroom. They have experienced using metals, nuts and bolts, screws, plastic construction and tools.</p>	<p>Across EYFS: Pupils know that they need to wear warm coats when it is cold, woollen hats etc. Pupils know to wear wellies and use umbrellas in the rain so that you do not get wet. Pupils have experienced outdoor play in all weathers and during Maths Meetings have commented on the weather each day. EYFS, Who am I? Pupils went on an autumn walk where they collected signs of autumn. They compared colours of leaves and collected other signs of autumn such as conkers. The objects collected were displayed on a nature table. EYFS, What happens at night? Children know that it gets dark at night, that the stars form constellations and can name some phases of the Moon.</p>	<p>Across EYFS: Pupils know how count confidently to 10 and manipulate numbers within 10. This will allow pupils to differentiate between animals e.g. animals with 4 legs and animals with 2 legs etc. EYFS, Who am I? Pupils inspected their own bodies and talked about their own body parts. They compared the features of their own body to the features of the bodies of others. Pupils know songs about body parts e.g. Head, Shoulders, Knees and Toes. EYFS, Where do animals live? Pupils visited the farm and identified the different animals living there. They looked at the features of living things and compared the similarities and differences. They also sorted</p>	<p>Across EYFS: Pupils know that they need to wear warm coats when it is cold, woollen hats etc. Pupils know to wear wellies and use umbrellas in the rain so that you do not get wet. Pupils have experienced outdoor play in all weathers and during Maths Meetings have commented on the weather each day. Year 1, Autumn and Winter: Pupils know that there are four different seasons and that the names of those seasons are autumn, winter, spring and summer. Pupils also know that weather symbols can be used to show what the weather is like and they have experienced recording the weather on a daily basis using a weather station.</p>	<p>Across EYFS: Pupils have experienced gardening and growing things across the year. They have also experienced multiple nature walks where the adults have pointed out different types of plants. EYFS, How do things change over time? Children know that plants grow from a seed and that they need water and light to grow. They know simple parts of a plant e.g. stem, leaf, petal. Pupils have experienced growing a plant from a seed. Year 1, Amazing Animals: Pupils know that all living things eat, grow, breathe, reproduce, move, react and get rid of waste. Year 1, Autumn and Winter and Year 1, Spring and Summer: Pupils know the names of different plants and</p>

			<p>animals by size and characteristics.</p> <p>EYFS, How do things change over time? Pupils watched the lifecycle of a butterfly and watched ducklings/chicks hatching.</p> <p>EYFS, What can we do to help? Pupils looked closely at x-rays of both humans and animals.</p>		<p>berries they may see outside during different months. Pupils also know that some trees lose their leaves in autumn and regrow them in the spring.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Core Knowledge</p>	<p>Core knowledge in this unit:</p> <p>There are many different types of material: wood, plastic, glass, paper, fabric, rock, metal, water. Materials can be used to make different objects.</p> <p>Some objects are made from more than one material.</p> <p>Materials can have different properties: hard, soft, dull, stretchy, rough, stiff, shiny, smooth, bendy, waterproof, not waterproof, transparent, opaque, absorbent, not absorbent.</p> <p>Some materials are more suitable for a certain purpose than others.</p> <p>We can group materials based on their properties and we can group objects based on the materials they are made from.</p>	<p>Core knowledge in this unit:</p> <p>There are four seasons: autumn, winter, spring, summer. Different months fall into different seasons.</p> <p>Weather symbols can be used to show what the weather is like. In autumn the weather gets colder, and we wear warmer clothes.</p> <p>Some animals begin to act differently in the autumn months, and we may see more of certain animals outside.</p> <p>The leaves on some of the trees change colour and begin to fall.</p> <p>There are a range of berries that we may see growing in autumn.</p> <p>From autumn to winter, the weather gets colder, and we have fewer hours of daylight.</p> <p>Some animals hibernate or stay close to their homes during the winter months.</p>	<p>Core knowledge in this unit:</p> <p>Animals are living things which eat, grow, breathe, reproduce, move, react and get rid of waste. Fish, amphibians, reptiles, birds and mammals are all types of animals. Humans are mammals. Mammals are warm blooded, have fur or hair, give birth to live young and feed them with milk.</p> <p>Reptiles are cold blooded, have dry scaly skin, lay eggs on land, live in water and on land but cannot breathe underwater.</p> <p>Amphibians and cold blooded, have soft skin, lay eggs in water, can live in water and on land, have gills when they are young and develop lungs later.</p> <p>Birds have feathers, wings and a beak. They are warm blooded, lay eggs and most can fly.</p> <p>Fish live in water, have gills, scales and fins, are cold blooded, lay eggs and do not have legs.</p> <p>Animals can be carnivores, herbivores or omnivores.</p> <p>Some animals are pets - they still need food, water, space, shelter.</p> <p>All humans have a skeleton to help them stand up, move and to protect their organs.</p>	<p>Core knowledge in this unit:</p> <p>As the season changes from winter to spring, the weather gets warmer and the hours of daylight increase.</p> <p>Spring is the season of new life – animals and plants and trees begin to grow and blossom.</p> <p>Summer is the warmest season and has the most hours of daylight.</p> <p>Many trees and plants produce fruits in the summer and we may see many insects and other animals outside.</p> <p>There are different hobbies and activities carried out by humans in the different seasons. begin to have offspring</p>	<p>Core knowledge in this unit:</p> <p>Plants are living things.</p> <p>Types of plant include: weeds, grass, moss, ferns, shrubs, flowers, trees.</p> <p>Important parts of a plant include the roots, the stem and the leaves.</p> <p>Roots keep the plant in the ground and take in water from the soil.</p> <p>The stem holds the plant up and transports water to the leaves.</p> <p>The leaves produce food for the plant.</p> <p>Some plants also have flowers.</p> <p>Plants can grow from seeds or from a bulb.</p> <p>Common garden plants include: roses, sunflowers, lavender, sweet pea and hydrangeas.</p> <p>Common wild plants include: daisies, buttercups, nettles, ivy, dandelions, clover and poppies.</p> <p>The stem of a tree is called the trunk and is covered with bark.</p> <p>A deciduous tree loses its leaves in the autumn whereas an evergreen tree keeps its leaves all year round.</p> <p>Types of tree can be identified by looking at the shape of the leaves.</p>

			<p>There are five senses: sight, hearing, touch, taste and smell. We use different body parts for each sense.</p>		<p>Plants are important because they produce some of the air we breathe, can be used in medicines and some provide us with food.</p>
Scientific Enquiry	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> Materials based on their properties Objects based on the materials they are made from. <p>Comparative Testing: Which material would make the best umbrella for Ted?</p>	<p>Identifying and Classifying: Plants and animals seen in the locality during each season.</p> <p>Observing Over Time:</p> <ul style="list-style-type: none"> Making observations of the weather each day and discussing how it is changing as we are moving from autumn to winter. Observing and discussing how the hours of daylight change. How trees change from autumn to winter. <p>Pattern Seeking: Using recordings of weather to discuss any patterns that are emerging. For example – is the weather cold each day in winter? Does it always rain in autumn?</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> Animals into groups based on their characteristics. Specific types of animals based on their characteristics Animals as carnivores, herbivores and omnivores based on what they eat. <p>Secondary Research: How do we look after pets and why is owning a pet such a big responsibility?</p>	<p>Identifying and Classifying: Plants and animals seen in the locality during each season.</p> <p>Observing Over Time:</p> <ul style="list-style-type: none"> Making observations of the weather each day and discussing how it is changing as we are moving from autumn to winter. Observing and discussing how the hours of daylight change. The difference in trees from spring through to summer. <p>Pattern Seeking: Using recordings of weather to discuss any patterns that are emerging. For example – does it always rain in spring? Is it sunny each day in summer?</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> Types of wild and garden plants. Types of tree found in the locality. <p>Pattern Seeking: Do bigger trees always have bigger leaves? Do all plants have flowers? Do plants like to grow in certain parts of the school grounds/locality?</p>
Enquiry Skills	<p>Across the different Year 1 Science units, pupils will:</p> <p>Explore the world around them and raise their own simple questions.</p> <p>Experience different types of scientific enquiries, including practical activities.</p> <p>Begin to recognise different ways in which they might answer scientific questions.</p> <p>Carry out simple tests.</p> <p>Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them.</p> <p>Ask people questions and use simple secondary sources to find answers.</p> <p>Observe closely using simple equipment and with help, observe changes over time.</p> <p>With guidance, begin to notice patterns and relationships.</p> <p>Use simple measurements and equipment (e.g. hand lenses).</p> <p>Record simple data.</p> <p>Use their observations and ideas to suggest answers to questions – talk about what they have found out and how they found it out.</p> <p>With help, record and communicate their findings in a range of ways and begin to use simple scientific language.</p>				

Year 2

Year 2					
	Animals and Survival <i>Biology</i>	Uses of Materials <i>Chemistry</i>	Living Things and Habitats <i>Biology</i>	The Environment <i>Biology/Chemistry/Physics</i>	Plants: Bulbs and Growth <i>Biology</i>
National Curriculum	<p>Pupils should be taught to: Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, for survival. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>Pupils should be taught to: Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>Pupils should be taught to: Explore and compare the differences between things that are living, dead, and have never been alive. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including microhabitats. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p>	<p>This unit goes beyond the National Curriculum – teaching pupils about the environment and what we can do to protect it. The unit prepares pupils for later content in the Year 4 Classification and Environments unit but also covers elements of materials and introduces pupils to electricity.</p>	<p>Pupils should be taught to: Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>
Prior Knowledge	<p>Across EYFS: Pupils have discussed healthy eating during daily snack times and lunch times. EYFS, Who am I? Pupils discussed what they were like when they were a baby and what are like now. They also discussed their families. EYFS, How do things change over time? Pupils watched the lifecycle of a butterfly and watched ducklings/chicks hatching. Pupils also looked closely at the life cycle of a frog. Year 1, Amazing Animals: Pupils know that animals are</p>	<p>Across EYFS: Pupils know how to select and develop their ideas in terms of the products they want to make using tools and materials. Pupils know words to describe materials including colour, shape, properties (e.g. smooth, rough). Pupils know that they need to wear warm coats when it is cold, woollen hats etc. Pupils know to wear wellies and use umbrellas in the rain so that you do not get wet. EYFS, Can you make it work? Pupils had a ‘tinkering table’ in the classroom. They have experienced using metals, nuts</p>	<p>EYFS, Where do animals live? Pupils looked at a map of the world. They identified where they have been on that map and where different animals live on that map. They then looked at the habitats of those animals e.g. sharks live in the sea and tigers live in the jungle. Pupils understand simple adaptations linked to the climate of where animals live e.g. polar bears have thick fur to keep them warm. Year 1, Amazing Animals: Pupils know that animals are living things which eat, grow, breathe, reproduce, move, react and get rid of waste. Pupils can</p>	<p>EYFS, What can we do to help? How do things change over time? Children looked at the impact they can have on the environment over time e.g. litter. They looked at positive and negative impacts they can have on the environment. Pupils know that in this school we recycle. They also read The Lorax. Year 1, Plants: Pupils know that plants (including trees) are important because they produce some of the air we breathe, can be used in medicines and some provide us with food. Year 2, Uses of Materials: Pupils know that certain</p>	<p>Across EYFS: Pupils have experienced gardening and growing things across the year. They have also experienced multiple nature walks where the adults have pointed out different types of plants. EYFS, How do things change over time? Children know that plants grow from a seed and that they need water and light to grow. They know simple parts of a plant e.g. stem, leaf, petal. Pupils have experienced growing a plant from a seed. Year 1, Plants: Pupils know that plants are living things and can name different types of plant</p>

	<p>living things which eat, grow, breathe, reproduce, move, react and get rid of waste. They can identify and name a variety of fish, amphibians, reptiles, birds and mammals. They can also group animals as carnivores, herbivores and omnivores based on what the animals eat. Pupils can describe and compare the structure of common animals. They can also identify, name, draw and label basic parts of the human body and say which is associated with each sense.</p>	<p>and bolts, screws, plastic construction and tools.</p> <p>Year 1, Everyday Materials: Pupils are able to name and identify a range of different everyday materials. They have investigated some simple properties of materials and the suitability of materials for a certain purpose (an umbrella) based on those properties. Pupils can group materials based on their properties and group objects based on the materials they are made from.</p>	<p>also define what carnivores, herbivores omnivores are – identifying animals through what they eat.</p> <p>Year 1, Autumn and Winter and Year 1, Spring and Summer: Pupils know the names of different plants and animals they may see in the locality during different months.</p> <p>Year 1, Plants: Pupils recognise that plants are living things and can name a variety of wild and garden plants.</p>	<p>materials are chosen to make objects because of their properties. Pupils also know that recycling is where objects are reused or remade into new objects.</p> <p>Year 2, Living Things and Habitats: Pupils know that a habitat is the natural place a plant or animal can be found. They know that a natural habitat meets the needs of the living things found there.</p>	<p>(weeds, grass, trees etc). Pupils know that plants have roots, a stem and leaves and they can explain the basic function of each of these parts. In addition, pupils know that some, but not all plants have flowers and that plants can grow from bulbs or seeds. They can also name and identify specific types of tree and specific types of common wild and garden plants.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Core Knowledge</p>	<p>Core knowledge in this unit:</p> <p>To survive, it is essential that all animals have access to food, water and air. Shelter is also important.</p> <p>Anything an animal wants but does not need is non-essential.</p> <p>Animals produce offspring which grow into adults. They look similar, but not identical to the parents.</p> <p>Animals change and develop as they grow into adults.</p> <p>Exercise is an important way in which humans can keep themselves healthy.</p> <p>Eating a balanced diet of different food groups is another way that humans can keep themselves healthy.</p> <p>Different food groups are: fruit and vegetables; bread potatoes, pasta and rice; milk, cheese and yoghurt; fats, oils and sugars; beans, pulses, fish, eggs and meat.</p> <p>Good personal hygiene is important as germs can spread easily and cause us to feel unwell.</p>	<p>Core knowledge in this unit:</p> <p>The same material can be used to make a range of different objects and some objects might be made from different materials.</p> <p>Materials are chosen for a certain purpose because of their properties.</p> <p>Some materials are more suitable than others for certain situations.</p> <p>The shape of some objects can be changed if they are made from a flexible material. They can be squashed, bent, twisted or stretched.</p> <p>Recycling is where objects are reused or remade into new objects.</p> <p>New materials have been discovered throughout history and have changed people's lives.</p> <p>George Washington Carver, Stephanie Kwolek and Charles Macintosh all invented new materials or invented further uses for already existing ones.</p>	<p>Core knowledge in this unit:</p> <p>All objects are either living, dead, or have never lived.</p> <p>Something is alive if it displays the 7 life processes: movement, respiration, sensitivity, growth, nutrition, reproduction and excretion.</p> <p>All living things live in a habitat – the natural habitat meets their needs.</p> <p>Habitats in the UK include: urban, woodland, farmland and coasts.</p> <p>A very small habitat is known as a microhabitat. We can find minibeasts in microhabitats.</p> <p>Worms are suited to living in dark, damp habitats which is why they mostly live underground.</p> <p>The Arctic is a polar habitat – it is cold and windy with lots of snow and ice.</p> <p>The Sahara is a desert habitat – it is hot during the day and not much rain.</p> <p>Plants make energy from light – they are at the beginning of a food chain.</p>	<p>Core knowledge in this unit:</p> <p>Different habitats and environments are faced with different threats.</p> <p>Pollution is when something harmful gets into the environment and hurts animals, plants and people.</p> <p>Both air pollution and water pollution are a threat to the environment.</p> <p>Littering and landfills are a threat to the environment.</p> <p>Recycling is the process of turning waste materials into new materials.</p> <p>Recycling can reduce the amount of waste materials in an environment.</p> <p>Water is very important to the world but a lot of water is wasted.</p> <p>Electricity is used every day but making electricity can damage the environment.</p> <p>To help with this, we can and should be more energy efficient at home.</p> <p>Trees are important as they produce the oxygen we need to breathe.</p>	<p>Core knowledge in this unit:</p> <p>Most plants come from seeds or bulbs – seeds and bulbs come in many different shapes, sizes and colours.</p> <p>Seeds are living things but are in a dormant state before they grow. Seeds have different parts.</p> <p>Germination is the stage where a plant begins to grow from the seed.</p> <p>The conditions need to be right for a seed to germinate successfully.</p> <p>After germination, a plant needs certain conditions to survive – water, light and a suitable temperature.</p> <p>The stages in the life cycle of a plant are: seed, germination, growth, reproduction and dispersal.</p>

			<p>Food chains show how living things in an environment are linked together – they show who eats who.</p> <p>Animals which hunt animals are predators and animals which are hunted are prey.</p>	<p>Trees are used to make many different objects, but this means that trees are cut down.</p> <p>There are many ways in which we can make a difference to the environment.</p>	
Working Scientifically	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> Needs as essential or non-essential. Animals and their offspring (including the similarities and differences between them). Foods as healthy and unhealthy. Foods into the different food groups. <p>Pattern Seeking:</p> <ul style="list-style-type: none"> How does exercise impact our heart rate? Pupils measure their resting heart rate and their heart rate after exercise. Are some types of foods more popular than others? <p>Observing Over Time: How do germs spread from one place to another? Do they spread quickly?</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> Materials and objects. The different properties of a range of materials. The different materials used in the locality and how those materials are used. Materials as flexible or rigid. <p>Comparative Testing: Which material would be the best to absorb spills in the kitchen? Pupils test materials and record their results.</p> <p>Pattern Seeking: Do certain materials change shape when we squash, bend, twist and stretch them?</p> <p>Secondary Research: Pupils discover a range of scientists who have invented new materials or discovered new uses for existing materials.</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> Objects as living, dead or never alive. Animals as carnivores, herbivores or omnivores and predators or prey. Animals and plants within a food chain within a certain habitat. <p>Observing Over Time:</p> <ul style="list-style-type: none"> How does our wormery change over time? How does a habitat change over time? Do the plants and animals in the habitat change over time? <p>Secondary Research: Pupils find out about the habitats of the Arctic and the Sahara (polar and desert habitats). They also discover the animals living in those habitats and how they are suited to life there.</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> Different threats to the environment and whether they impact plants/animals/humans. Materials as recyclable or non-recyclable. Objects that are made from trees and those that are not. Appliances as those which use electricity and those which do not use electricity. <p>Pattern Seeking: Do some classes produce more waste than others?</p> <p>Comparative Testing: How much more water do we waste when we brush our teeth with the tap on?</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> Various seeds – looking at the similarities and differences. The different parts of a seedling. The different parts of a dissected bean seed. Different stages in the life cycle of a plant. <p>Comparative Testing:</p> <ul style="list-style-type: none"> What conditions does a seed need to germinate? What are the conditions for successful plant growth? (after germination) <p>Observing Over Time: How does a plant grow over time? (observing a plant across the unit as a whole class)</p>
Enquiry Skills	<p>Across the different Year 2 Science units, pupils will:</p> <p>Explore the world around them and raise their own simple questions.</p> <p>Experience different types of scientific enquiries, including practical activities.</p> <p>Begin to recognise different ways in which they might answer scientific questions.</p> <p>Carry out simple tests.</p> <p>Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them.</p> <p>Ask people questions and use simple secondary sources to find answers.</p> <p>Observe closely using simple equipment and with help, observe changes over time.</p> <p>With guidance, begin to notice patterns and relationships.</p> <p>Use simple measurements and equipment (e.g. hand lenses).</p> <p>Record simple data.</p> <p>Use their observations and ideas to suggest answers to questions – talk about what they have found out and how they found it out.</p> <p>With help, record and communicate their findings in a range of ways and begin to use simple scientific language.</p>				

Year 3

Year 3					
	Skeletons and Muscles <i>Biology</i>	Rocks and Fossils <i>Chemistry</i>	Light and Shadows <i>Physics</i>	Plants and Survival <i>Biology</i>	Forces and Magnets <i>Physics</i>
National Curriculum	<p>Pupils should be taught to: Identify that animals, need the right types/amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>Pupils should be taught to: 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 lived are trapped in rock. Recognise that soils are made from rocks and organic matter.</p>	<p>Pupils should be taught to: 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 light from a source is blocked by an opaque object. Find patterns in the way that the size of shadows change.</p>	<p>Pupils should be taught to: 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 across plants. Investigate the way in which water is transported in plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>Pupils should be taught to: Compare how things move on different surfaces. Notice that some forces need contact between 2 objects, but magnetic forces act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together everyday materials on the basis of whether they are attracted to a magnet and identify some magnetic materials. Describe magnets as having 2 poles and predict if magnets will attract/repel each other.</p>
Prior Knowledge	<p>EYFS, What can we do to help? Pupils looked closely at x-rays of both humans and animals. Year 1, Amazing Animals: Pupils can name some basic parts of the human body linked to senses. They know animals can be carnivores, herbivores or omnivores. Year 2, Animals and Survival: Pupils know that eating a balanced diet of different food groups is part of how humans can keep themselves healthy. They know that different food groups are: fruit and vegetables; bread potatoes, pasta and rice; milk, cheese and yoghurt; fats, oils and sugars; beans, pulses, fish, eggs and meat. Year 2, Living Things and Habitats: Pupils know that plants can make their own food</p>	<p>EYFS, How do things change over time? Pupils looked closely at fossils using the text ‘The Street Beneath my Feet’. Year 1, Everyday Materials: Pupils know that different materials have different properties. Pupils are also able to group materials based on their physical properties. Year 2, Uses of Materials: Pupils know that materials are chosen for certain purposes based on their physical properties. Pupils also know that materials can be changed i.e., if they are squashed.</p>	<p>EYFS, What happens at night? Pupils explored shadows using torches in a sensory den. They made their own shadow puppets and have explored their own shadows on a sunny day. Pupils know the difference between day and night. They know that the stars create constellations and adults have talked about the phases of the Moon and how they change. Year 1, Amazing Animals: Pupils known that sight is one of the senses and associate it with the eyes. Year 1, Autumn and Winter and Year 1, Spring and Summer: Pupils know that the hours of daylight change throughout the year. They know that summer has the most hours of daylight and winter has the least hours of daylight.</p>	<p>Across EYFS: Pupils have experienced gardening and growing things across the year. They have also experienced multiple nature walks where the adults have pointed out different types of plants. EYFS, How do things change over time? Children know that plants grow from a seed and that they need water and light to grow. They know simple parts of a plant e.g. stem, leaf, petal. Pupils have experienced growing a plant from a seed. Year 1, Plants: Pupils know that plants are living things. They know that plants have roots, a stem and leaves and they can explain the basic function of each of these parts. In addition, pupils know that some, but not all plants have flowers and that plants can grow from bulbs or seeds. They</p>	<p>Across EYFS: Pupils have explored with wheeled toys – both toys you ride on and toy vehicles. Pupils have experienced putting vehicles down ramps and explored what they can do to make them travel faster/ compared which travels faster. EYFS, What happens at night? Pupils have discussed astronauts and travelling to the Moon. They have also discussed that there is no gravity in space. Year 1, Everyday Materials and Year 2, Uses of Materials: Pupils can name some of the basic properties of a range of different materials. Pupils have experienced investigating the properties of different materials.</p>

	<p>but animals, including humans, cannot.</p>		<p>Year 1, Everyday Materials and Year 2, Uses of Materials: Pupils can name some of the basic properties of a range of different materials. Pupils have experienced investigating the properties of different materials.</p>	<p>can also name and identify specific types of tree and types of common wild/garden plants.</p> <p>Year 2, Plants - Bulbs and Growth: Pupils know that plants grow from seeds or bulbs. They also know the basic needs of a plant and can name the basic stages in the life cycle of a plant.</p>	
<p>Core Knowledge</p>	<p>Core knowledge in this unit:</p> <p>There are different names for the different bones in the human body.</p> <p>The human skeleton has three main functions: to protect vital organs; to support the body; to allow movement.</p> <p>Bones connect at joints to allow movement. There are different types of joint in the human body.</p> <p>There are different types of muscle in the human body: cardiac, smooth and skeletal muscle.</p> <p>Muscles and bones work together to allow movement. Tendons join muscles to bones.</p> <p>Animals can be classed as vertebrate or invertebrate.</p> <p>There are three types of skeleton: exoskeleton, endoskeleton, hydrostatic skeleton.</p> <p>Nutrition provides our bodies with what they need to function/stay healthy.</p> <p>The different food groups provide a balanced diet: fruits/vegetables; starchy carbohydrates, oils and spreads, dairy and protein.</p> <p>Food chains can be used to represent how animals provide their bodies with nutrition.</p> <p>Animals are carnivores, herbivores or omnivores.</p>	<p>Core knowledge in this unit:</p> <p>Rocks can be natural or man-made.</p> <p>The three types of natural rock are: sedimentary, igneous and metamorphic.</p> <p>Sedimentary rocks are formed when layers of sediment are squashed together and hardened.</p> <p>Igneous rocks are formed when molten rock inside the Earth cools down and becomes solid.</p> <p>Metamorphic rocks are formed when sedimentary or igneous rocks are changed by heat or pressure.</p> <p>Different types of rocks have different properties – we can investigate the durability and permeability of rocks.</p> <p>The properties of rocks mean they have different uses.</p> <p>A fossil is the preserved remains or traces of a dead plant or animal.</p> <p>Fossils teach us what animals and plants looked like in the past.</p> <p>Mary Anning is considered significant because of her discoveries of fossils.</p> <p>The process of remains becoming a fossil is known as fossilisation.</p> <p>There are different types of fossil.</p> <p>There are different types of soil – each with different properties.</p>	<p>Core knowledge in this unit:</p> <p>A light source is an object which gives out light. Light sources can be natural or man-made.</p> <p>The Sun is a natural source of light and the rotation of the Earth towards and away from the Sun is why we have night and day.</p> <p>The Sun is important for life, but we should protect ourselves from it too.</p> <p>Light travels in straight lines from the light source.</p> <p>We see things when the light from a source is reflected from an object into our eyes.</p> <p>Some materials are more reflective than other materials.</p> <p>Mirrors reflect light – creating an exact copy of an image.</p> <p>There are different types of mirror.</p> <p>Materials are classed as either opaque, transparent or translucent depending on whether no, all or some light can pass through them.</p> <p>Shadows are formed when light is blocked by an object or material.</p> <p>Shadows formed by an object can change depending on the height and position of the light source.</p> <p>Thomas Eddison is a significant individual linked to the light bulb.</p>	<p>Core knowledge in this unit:</p> <p>All plants need light, water, nutrients, air and room to grow.</p> <p>Roots anchor a plant into the ground and absorb water and nutrients from the soil.</p> <p>Roots are different depending on the habitat of the plant.</p> <p>The stem transports water and supports the plant.</p> <p>The leaves of a plant can produce energy using light from the sun. This process is called photosynthesis.</p> <p>Flowers have both male and female parts and are an important part of plant reproduction.</p> <p>The process of pollination is an important part of flowering plant reproduction.</p> <p>There are five stages in the life cycle of a plant: germination, growing and flowering, pollination, fertilisation and seed formation and seed dispersal.</p> <p>There are six main ways of dispersing seeds: wind, water, carried by animals, eaten by animals, explosive, drop and roll.</p> <p>Seeds are moved to new locations so as not to compete with the parent plant for light, nutrients and water.</p>	<p>Core knowledge in this unit:</p> <p>A force can cause a change in speed, direction or shape.</p> <p>Forces can be pushes or pulls.</p> <p>Most forces need contact between two objects.</p> <p>Friction is a pushing force which slows moving objects down.</p> <p>Gravity is a pulling force which speeds objects up.</p> <p>Different surfaces create different amounts of friction – the rougher the surface, the greater the amount of friction.</p> <p>All magnets have a north pole and a south pole.</p> <p>Magnets can be different shapes and sizes.</p> <p>Opposite poles of magnets attract each other and like poles of magnets repel each other.</p> <p>Materials attracted to magnets are called magnetic. Materials attracted to magnets are often metals but not all metals are magnetic.</p> <p>Magnets have many uses in real-life situations. Examples are inside a compass; keeping a fridge door closed; separating materials for recycling.</p>

Working Scientifically	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Human bones and their main function – for support, protection or movement. • Types of joint found in the human body. • Animals are vertebrate or invertebrate. • Animals as having an endoskeleton, exoskeleton or hydrostatic skeleton. • Foods into different food groups. • Animals as carnivores, herbivores or omnivores. <p>Comparative and Fair Testing: Are the muscles in one of our arms stronger than those in the other?</p> <p>Secondary Research: What foods do different animals eat to get the nutrition they need?</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Rocks as natural or anthropic. • Rocks as sedimentary, metamorphic or igneous. • The properties of different rocks and their uses. • Different types of fossil. <p>Comparative and Fair Testing:</p> <ul style="list-style-type: none"> • Which rocks are the most durable? • Which rocks are the most permeable? • Which soil is the most permeable? <p>Pattern Seeking: Is there a pattern between the type of rock (sedimentary, metamorphic, igneous) and the durability and permeability of the rock?</p> <p>Secondary Research: Who was Mary Anning and what did she discover?</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Sources of light as natural or man-made. • The different light sources found in school. • Materials as transparent, translucent or opaque. <p>Comparative and Fair Testing:</p> <ul style="list-style-type: none"> • Which sun cream is the most effective? • Which material will make the most reflective backpack? • How does the height of the light source change the length of the shadow produced? • How does the distance between the object and the light source change the size of the shadow? <p>Pattern Seeking: What is the relationship between an object and the shadow it produces?</p> <p>Observing Over Time: How does a shadow change?</p> <p>Secondary Research: Who was Thomas Eddison?</p>	<p>Comparative and Fair Testing: How does changing the conditions a seed is placed in affect how it germinates and grows?</p> <p>Observing Over Time:</p> <ul style="list-style-type: none"> • What happens to a white flower when the stem is placed in coloured water? • What happens to a plant when it is placed in the dark? <p>Pattern Seeking:</p> <ul style="list-style-type: none"> • Do all flowers have the same parts? • Is there a relationship between the shape of the seed and how the seed is dispersed? <p>Secondary Research: How do different plants disperse their seeds?</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Forces in everyday scenarios as pushes or pulls. • Materials as magnetic or non-magnetic. <p>Comparative and Fair Testing:</p> <ul style="list-style-type: none"> • How does the surface of a ramp affect the distance a car travels? • Which magnet is the strongest? <p>Pattern Seeking: How do magnets behave towards each other?</p> <p>Secondary Research: How are magnets used in real life situations?</p>
Enquiry Skills	<p>Across a range of Year 3 Science units, pupils will:</p> <p>Raise their own relevant questions about the world around them.</p> <p>Be given a range of scientific experiences including different types of science enquiries to answer questions.</p> <p>Start to make their own decisions about the most appropriate type of science enquiry they might use to answer questions.</p> <p>Set up simple practical enquiries and comparative and fair tests – recognise when a simple fair test is necessary and help to decide how to set it up.</p> <p>Talk about criteria for grouping, sorting and classifying; and use simple keys.</p> <p>Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.</p> <p>Make systematic and careful observations, help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.</p> <p>Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them.</p> <p>Take accurate measurements using standard unit and learn how to use some equipment appropriately to do so.</p> <p>Collect and record data from their observations and measurements in variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data.</p> <p>With help, look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions.</p> <p>Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations or presentations of results and conclusions.</p> <p>With support, identify new questions arising from data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.</p>				

Year 4

	Teeth and Digestion <i>Biology</i>	States of Matter <i>Chemistry</i>	Classification and Environments <i>Biology</i>	Sound <i>Physics</i>	Electricity <i>Physics</i>
National Curriculum	<p>Pupils should be taught to: Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions.</p>	<p>Pupils should be taught to: Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p>Pupils should be taught to: Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things. Construct and interpret a variety of food chains, identifying producers, predators and prey. (from Animals inc. Humans strand of NC).</p>	<p>Pupils should be taught to: Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between 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.</p>	<p>Pupils should be taught to: Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.</p>
Prior Knowledge	<p>Year 1, Amazing Animals: Pupils can name some basic parts of the human body linked to senses. Pupils can sort animals based on whether they are carnivores, herbivores or omnivores. Year 2, Animals and Survival: Pupils know that eating a balanced diet of different food groups is an important part of how humans can keep themselves healthy. Year 2, Living Things and Habitats: Pupils know that plants can make their own food but animals, including humans, cannot.</p>	<p>Year 1, Everyday Materials: Pupils know that different materials have different properties. Pupils are also able to group materials based on their physical properties. Year 2, Uses of Materials: Pupils know that materials are chosen for certain purposes based on their physical properties. Pupils also know that materials can be changed i.e., if they are squashed. Year 3, Rocks and Fossils: Pupils know that rock and fossils are an example of an object changing state. They know igneous rocks are formed when liquid rock cools and hardens.</p>	<p>Year 1, Amazing Animals: Pupils know that animals can be grouped as mammals, birds, fish, amphibians or reptiles. Pupils can describe the characteristics of each group. Year 1, Plants: Pupils can name and identify different plants. Year 2, Living Things and Habitats: Pupils know that all living things live in a habitat. They know that the natural habitat or a plant or animals meets their needs and that animals are suited to life there. Pupils can use food chains to show the feeding relationships within a habitat and can use the words predator and prey. They</p>	<p>Year 1, Amazing Animals: Pupils know that hearing is one of the senses and associate it with the ears. Year 3, Light: Pupils know that light is a form of energy. They know that light is produced by a source and travels in straight lines. Pupils also know that light cannot travel through certain objects (the light is blocked). Year 4, States of Matter: Pupils know the difference between solids, liquids and gases. They can describe how the particles are structured within each state.</p>	<p>Year 2, Protecting our Environment: Pupils know electricity is produced to power appliances we use in our everyday lives. They know electricity can be produced in different ways. Year 3, Light: Pupils know that light is a form of energy which travels in straight lines. Pupils know that a light bulb is a man-made source of light. Year 4, Sound: Pupils know that sound is a form of energy which travels in waves.</p>

	<p>Year 3, Skeletons and Muscles: Pupils know that the different food groups provide a balanced diet: fruits and vegetables; starchy carbohydrates, oils and spreads, dairy and protein. They also know that different animals eat different foods. In addition, pupils know that humans have a skeleton to support and protect the body and that the skeleton works with the muscles to allow movement.</p>	<p>They know that applying pressure and heat to igneous or sedimentary rocks can form metamorphic rocks.</p>	<p>also know that plants are at the beginning of a food chain.</p> <p>Year 2, Protecting Our Environment: Pupils know that environments and the living things within them are often threatened by human activity (pollution, littering etc). They can explain some ways in which we can reduce those threats.</p> <p>Year 3, Plants and Survival: Pupils know that photosynthesis is the process through which a plant produces its own energy.</p>		
<p>Core Knowledge</p>	<p>Core knowledge in this unit: Teeth are important as they help us to eat the food we need.</p> <p>The four different types of teeth are: incisors, canines, premolars, molars.</p> <p>Incisors are at the front of the mouth, there are 8 in total. They are used for holding, cutting and shearing food.</p> <p>Canines are next to the incisors, there are 4 in total. They are used for tearing and gripping food.</p> <p>Premolars are towards the back of the mouth. There are 8 in total. They are used for tearing and crushing food.</p> <p>Molars are furthest towards the back of the mouth. There are 12 in total. They are used for chewing, crushing and grinding food.</p> <p>Human teeth are formed of enamel, dentine and pulp.</p> <p>Not looking after our teeth can cause decay. If we lose our adult teeth, they will not grow back.</p> <p>Some foods and drinks harm our teeth more than others.</p>	<p>Core knowledge in this unit: The different states of matter are solids, liquids and gases.</p> <p>Solids keep their shape and have a fixed volume.</p> <p>Liquids have a fixed volume but change their shape to fit a container.</p> <p>Gases have no fixed shape or volume.</p> <p>Freezing is the change of state from liquid to solid.</p> <p>Water freezes at zero degrees C but different liquids have different freezing points.</p> <p>Melting is the change of state from solid to liquid.</p> <p>Ice changes to water when the temperature is above 0 degrees C.</p> <p>Solids have different melting points but not all solids melt.</p> <p>Evaporation is the change of state from liquid to gas.</p> <p>Water boils at 100 degrees C.</p> <p>The greater the temperature, the quicker the process of evaporation.</p> <p>Condensation is the change of state from gas to liquid.</p>	<p>Core knowledge in this unit: A habitat is the natural home of an organism.</p> <p>Several smaller habitats or microhabitats can be found within a single larger habitat.</p> <p>Organisms are suited to their natural habitats in specific ways.</p> <p>Food chains show the connections and movement of energy within a single ecosystem – how the organisms depend on each other for survival.</p> <p>Multiple food chains can be shown together in a food web.</p> <p>Vertebrate can be classified as mammals, fish, birds, reptiles or amphibians.</p> <p>Invertebrate can be classified as insects, crustaceans, echinoderms, annelids, arachnids, molluscs or protozoa.</p> <p>Characteristics make animals similar or different and can help us to classify them into a class and a species.</p> <p>Classification keys can support us in classifying plants and animals.</p> <p>Plants can be classified as flowering (including grasses) or non-flowering.</p>	<p>Core knowledge in this unit: Sound is a form of energy caused by vibrating particles.</p> <p>Sound travels in waves from a source to our ears.</p> <p>Sound can travel through solids, liquids and gases.</p> <p>Different instruments make sounds in different ways but each way is causing a vibration.</p> <p>Our ears allow us to hear but we must protect our hearing.</p> <p>The ear is made up of the outer ear, middle ear and inner ear.</p> <p>Volume means how loud or quiet a sound is.</p> <p>The larger the vibrations, the louder the sound.</p> <p>How high or low a sound is can be described as the pitch.</p> <p>The faster or more frequent the vibrations, the higher the pitch of the sound.</p> <p>As we move further away from a sound, the sound appears quieter to us even though the sound at the source will not be quieter.</p>	<p>Core knowledge in this unit: Electricity is a form of energy which is used to power many different things we use each day.</p> <p>An appliance is a piece of equipment we use to perform a task – some appliances use electricity.</p> <p>Electrical appliances can be mains powered or battery powered.</p> <p>It is important to stay safe and be sensible around electricity.</p> <p>A circuit allows electricity to flow.</p> <p>A circuit needs a power source and wires.</p> <p>The parts of a circuit are called components and can include items such as batteries, wires, a bulb, a buzzer or a motor.</p> <p>A complete circuit allows electricity to power components but an incomplete circuit does not.</p> <p>Adding more batteries to a circuit would make the bulbs in a circuit brighter. Adding more bulbs to a circuit would make all of the bulbs in the circuit dimmer.</p> <p>A switch can be used to complete or break a circuit – to power something on or off.</p>

	<p>Animals have different combinations and shapes of teeth depending on what they eat.</p> <p>We can often tell if an animal is a carnivore, a herbivore or an omnivore based on their teeth.</p> <p>The digestive system breaks down food so that nutrients can be absorbed by our bodies.</p> <p>Main parts of the digestive system are: oesophagus, liver, stomach, large intestine, small intestine, gall bladder, pancreas, rectum.</p> <p>Each part of the digestive system has a specific function.</p>	<p>Water vapour condenses when it comes into contact with a cold surface.</p> <p>The water cycle is the continuous journey that water takes from the sea (or a river etc) to the sky, to the land and back again.</p> <p>The main stages of the water cycle are evaporation, condensation and precipitation.</p>	<p>Non-flowering plants include ferns, mosses and conifers.</p> <p>Libbie Hyman and Carl Linnaeus are significant in classification.</p> <p>Environments can change naturally or because of human interaction with the environment.</p> <p>Some environmental changes are positive, others are negative.</p> <p>There are different organisms living in our local environment and we may be having an impact on them.</p>		<p>Materials which allow electricity to pass through them are conductors and those which do not are insulators.</p>
<p>Working Scientifically</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Human teeth as incisors, canines, premolars and molars. • Animals as carnivores, herbivores or omnivores based on their teeth. • The function of each part of the human digestive system. <p>Secondary Research: How can we look after our teeth?</p> <p>Observing Over Time: How does an egg shell change when it is left in a range of different drinks/liquids?</p> <p>Pattern Seeking: Is there a relationship between the teeth an animal has and whether the animal is a carnivore, herbivore or omnivore?</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Objects/materials as solids, liquids or gases. • Materials as suitable or not suitable for different purposes based on their freezing and melting properties. <p>Comparative and Fair Testing:</p> <ul style="list-style-type: none"> • Do all frozen liquids take the same time to melt? • Do all solids take the same amount of time to melt? • How does the surface area of water in a container affect how long it takes to evaporate? <p>Pattern Seeking: Is there a pattern in how long different sized ice lollies take to melt?</p> <p>Observing Over Time:</p> <ul style="list-style-type: none"> • How does an ice cube change over time in the classroom/in our hands? • What do we see when water condenses? 	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • A range of different organisms within different food webs. • Vertebrates as mammals, birds, fish, amphibians or reptiles based on given characteristics. • Invertebrate as insects, crustaceans, echinoderms, annelids, arachnids, molluscs or protozoa based on given characteristics. • Vertebrate and invertebrate using a given key. • Vertebrate and invertebrate using own key. • Plants as flowering or non-flowering. Non-flowering plants as mosses, ferns, conifers. • Environmental changes as natural or man-made and positive or negative. • Organisms found in the locality using own classification keys. <p>Secondary Research:</p> <ul style="list-style-type: none"> • Which habitat do different organisms belong to and how are they suited to life there? 	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Sounds heard around school and whether those sounds have travelled through solids, liquids and/or gases. • Different sounds and how loud or quiet the volume is. • Different sounds and how high or low the pitch is. <p>Pattern Seeking: Do all instruments make sounds in the same way?</p> <p>Comparative and Fair Testing:</p> <ul style="list-style-type: none"> • Which material would make the best ear defenders? • How does the force used affect the volume of the sound produced? • How does the size/length of an instrument affect the pitch of the sound produced? • How does the volume of a sound change as the distance from the source increases? 	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Appliances around school as mains powered, battery powered or non-electric. • Components within a circuit and their function. <p>Pattern Seeking:</p> <ul style="list-style-type: none"> • Does a bulb light up in every circuit? • What is the relationship between more bulbs/batteries and the brightness of the bulbs in a circuit? <p>Comparative and Fair Testing:</p> <ul style="list-style-type: none"> • Does it matter where a switch is placed in a circuit? • Which materials are conductors or insulators of electricity?

		<ul style="list-style-type: none"> Who is Libbie Hyman and how is she linked to classification? How is the environment impacted by _____? <p>Observing Over Time: What impact are we having on our local environment?</p>		
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Enquiry Skills	<p>Across a range of Year 4 Science units, pupils will:</p> <p>Raise their own relevant questions about the world around them. Be given a range of scientific experiences including different types of science enquiries to answer questions. Start to make their own decisions about the most appropriate type of science enquiry they might use to answer questions. Set up simple practical enquiries and comparative and fair tests – recognise when a simple fair test is necessary and help to decide how to set it up. Talk about criteria for grouping, sorting and classifying; and use simple keys. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Make systematic and careful observations, help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. Take accurate measurements using standard unit and learn how to use some equipment appropriately to do so. Collect and record data from their observations and measurements in variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data. With help, look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations or presentations of results and conclusions. With support, identify new questions arising from data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.</p>

Year 5

	Earth and Space <i>Physics</i>	Forces <i>Physics</i>	Material Properties and Changes <i>Chemistry</i>	Life Cycles <i>Biology</i>	Getting Older <i>Biology</i>
National Curriculum	<p>Pupils should be taught to:</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>Pupils should be taught to:</p> <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect on an object.</p>	<p>Pupils should be taught to:</p> <p>Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity, 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.</p>	<p>Pupils should be taught to:</p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals.</p>	<p>Pupils should be taught to:</p> <p>Describe the changes as humans develop to old age.</p>

	<p>Identify the position and significance of time zones (Geography National Curriculum).</p>		<p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the uses of everyday materials, including metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible.</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p>		
<p>Prior Knowledge</p>	<p>Year 1, Autumn and Winter and Year 1, Spring and Summer: Pupils know that the hours of daylight change throughout the year. They know that summer has the most hours of daylight and winter has the least hours of daylight.</p> <p>Year 3, Light: Pupils know that the Sun is a natural source of light and the rotation of the Earth towards and away from the Sun is why we have night and day. Pupils also know that shadows change across the day as the Sun appears to move across the sky.</p>	<p>Year 3, Forces: Pupils know that a force is a push or pull which can cause a change in speed, direction or shape. Pupils also know that most forces require contact between two objects. They can describe friction as a pushing force which slows moving objects down and can describe gravity as a pulling force which speeds objects up. In addition, pupils know that magnets have a magnetic force which can push and pull and which does not require contact between objects.</p> <p>Year 5, Earth and Space: Pupils know that gravity is the force acting in space. They know that gravity holds the planets etc. in position and is the reason why the Moon orbits Earth rather than 'floating' away.</p>	<p>Year 1, Everyday Materials: Pupils know that different materials have different properties. Pupils are also able to group materials based on their physical properties.</p> <p>Year 2, Uses of Materials: Pupils know that materials are chosen for certain purposes based on their physical properties. They know that materials can be changed i.e., if they are squashed. Pupils also know that some scientists discover new materials or find new uses for existing materials.</p> <p>Year 3, Rocks and Fossils: Pupils know that rock and fossils are an example of an object changing state. Pupils also know that some rocks are more durable than others.</p> <p>Year 3, Light: Pupils know that materials can be classified as opaque, transparent or translucent.</p>	<p>Year 2, Animals and Survival: Pupils know that reproduction is a key life process. They know that animals produce offspring which are similar to be not identical to the parent.</p> <p>Year 3, Plants – Bulbs and Growth: Pupils know that there are five stages in the life cycle of a plant: germination, growing and flowering, pollination, fertilisation and seed formation and seed dispersal.</p> <p>Year 4, Classification and Environments: Pupils know that vertebrate can be classified as mammals, fish, birds, reptiles or amphibians. They know that invertebrate can be classified as insects, crustaceans, echinoderms, annelids, arachnids, molluscs or protozoa. Pupils also know that plants can be classified as flowering (including grasses) and non-flowering and that non-flowering plants include conifers, ferns and mosses.</p>	<p>Year 2, Animals and Survival: Pupils know that reproduction is a key life process. They know that animals produce offspring which are similar to be not identical to the parent.</p> <p>Year 3, Skeletons and Muscles: Pupils know that humans have a skeleton for support, protection and movement. They know that skeletons and muscles allow movement by working together.</p> <p>Year 4, Teeth and Digestion: Pupils can describe how the human digestive system works and know the functions of different organs within the system.</p> <p>Year 5, Life Cycles: Pupils know that life cycles differ between animals. They are able to describe the life cycle of other mammals.</p>

			<p>Year 3, Forces and Magnets: Magnetic materials are attracted to magnets. Metals are often magnetic but not all metals are magnetic.</p> <p>Year 4, States of Matter: Pupils know that materials can be classified as solids, liquids or gases. They know that some materials can change state.</p> <p>Year 4, Electricity: Pupils know that some materials can be classified as conductors of electricity and others as insulators of electricity.</p>		
Core Knowledge	<p>Core knowledge in this unit:</p> <p>The Sun is at the centre of our Solar System.</p> <p>The planets in the solar system are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Each of the planets is different in many ways.</p> <p>The Earth, the Sun and the Moon can be described as approximately spherical bodies. It takes the Earth 365 days to orbit the Sun – one year.</p> <p>The Earth rotates on an axis – one rotation takes 24 hours.</p> <p>The rotation of Earth on its axis gives us day and night.</p> <p>We have different time zones because different parts of Earth are facing towards or away from the Sun at different times.</p> <p>We have different seasons because the Earth orbits the Sun whilst rotating on an axis.</p> <p>We have four seasons in the UK but not all places on Earth are the same. This is because the Earth is spherical.</p>	<p>Core knowledge in this unit:</p> <p>Forces are pushes and pulls which can change the speed, direction or shape of an object.</p> <p>There are contact forces and non-contact forces.</p> <p>Different forces are: gravity, friction, water resistance, air resistance and magnetism.</p> <p>If forces are balanced an object will not move, if forces are unbalanced an object will move.</p> <p>Gravity is a non-contact pulling force.</p> <p>Isaac Newton officially described gravity for the first time.</p> <p>Mass is the amount of matter inside an object and is measure in Kg and g.</p> <p>Weight is the force of gravity on an object and is measured in Newtons.</p> <p>Friction is a contact pushing force.</p> <p>Friction acts differently on different surfaces and on a slope.</p> <p>Air resistance is a contact pushing force – it is friction in the air.</p>	<p>Core knowledge in this unit:</p> <p>Materials can be natural or man-made.</p> <p>Materials have different properties including hardness and transparency.</p> <p>Materials can be conductors or insulators of electricity but also conductors or insulators of heat.</p> <p>Magnets affect materials in different ways, and their response to a magnet can reveal useful properties.</p> <p>Some substances dissolve in other substances – dissolved substances have not disappeared.</p> <p>The substance that dissolves is called the solute; it dissolves in a solvent and forms a solution.</p> <p>Some substances do not dissolve; they are insoluble.</p> <p>We can recover a solute from a solution – we can use evaporation.</p> <p>Temperature impacts how quickly a substance dissolves.</p> <p>A mixture is a substance comprised of more than one material, where those materials are not chemically joined.</p>	<p>Core knowledge in this unit:</p> <p>Life cycles differ drastically between different classes of vertebrate.</p> <p>Kangaroos are mammals who give birth to a neonate which continues to develop in the mother’s pouch.</p> <p>Birds such as the bee hummingbird lay eggs which hatch into chicks.</p> <p>The lifecycle of a frog starts with an egg before developing into a tadpole, a froglet and then a frog.</p> <p>Snakes can lay eggs (oviparous), give birth to live young (viviparous) or have eggs inside them which hatch inside before the snake gives birth to live young (ovoviviparous).</p> <p>Life cycles of vertebrates are very different to those of invertebrates.</p> <p>Earthworms are hermaphrodites meaning they have both male and female reproductive organs.</p> <p>Butterflies undergo complete metamorphosis whilst dragonflies undergo incomplete metamorphosis.</p>	<p>Core knowledge in this unit:</p> <p>The stages in the human life cycle are: fetus, baby, childhood, adolescence, adulthood and old age.</p> <p>Human babies develop in the womb over a period of approximately 40 weeks.</p> <p>Once born, babies are tracked against milestones to ensure they are healthy and developing at a normal pace. However, not all babies develop in exactly the same way.</p> <p>Animal gestation periods differ greatly between species – larger animals often have a longer gestation period.</p> <p>Puberty is when the body of a child develops into the body of an adult.</p> <p>There are physical changes to the body and some of these changes are different for boys and girls.</p> <p>During puberty there are also hormonal and emotional changes.</p> <p>Signs of aging beyond puberty include grey hair, wrinkled skin and worsening eyesight and hearing.</p>

	<p>A moon is a body which orbits another body which is orbiting the Sun.</p> <p>The Moon appears to change shape in the sky, but it is our view of the Moon that is changing.</p> <p>We call the changes we see the phases of the Moon – the cycle of phases takes approximately 28 days.</p> <p>Our views of Earth and the Solar System have changed over time – we used to believe the Earth was flat.</p> <p>We used to have a geocentric view of the Solar System. We now have a heliocentric view.</p>	<p>Galileo Galilei experimented with gravity, mass and air resistance.</p> <p>A larger surface area creates a greater amount of air resistance.</p> <p>Water resistance is a contact pushing force – it is friction in water.</p> <p>Streamlined objects and animals reduce the effects of water resistance.</p> <p>Upthrust also acts in water and is the force which allows objects to float.</p> <p>Lever, pulleys and gears are simple machines which can turn a smaller force into a larger force.</p> <p>There are different types of lever – class 1, class 2 and class 3.</p>	<p>We can use sieving and filtering to separate a mixture.</p> <p>Creating mixtures and solutions are examples of reversible changes.</p> <p>If you are unable to recover the original materials after a change, the change is irreversible.</p> <p>Burning and cooking are examples of irreversible changes.</p> <p>Irreversible changes often produce new materials.</p> <p>Scientists such as Ruth Benerito, Spencer Silver, Roy J Plunkett, Wallace Carothers and Charles Fritts have created new materials.</p> <p>Some scientists, such as Lewis Latimer, improve existing materials.</p>	<p>Plants can reproduce either sexually or asexually.</p> <p>Flowering plants use their petals to attract insects to help in their reproduction process.</p> <p>Non-flowering plants create spores or seeds and disperse them with the help of the wind.</p> <p>In asexual plant reproduction, the single parent plant produces identical offspring.</p> <p>Asexual plant reproduction can happen naturally with plants creating bulbs, tubers or sending out runners.</p> <p>Asexual plant reproduction can also happen with human help through propagating, grafting or budding.</p> <p>Jane Goodall and David Attenborough are significant in the world of plants and animals.</p>	<p>Old age often impacts bone strength, bone density and height.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Working Scientifically</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Objects within the Solar System. • The phases of the Moon in the correct order. <p>Secondary Research:</p> <ul style="list-style-type: none"> • What are the similarities and differences between the planets in the solar system? • Is it the same time everywhere on Earth? • How have our theories about Earth and space changed over time? <p>Pattern Seeking: Is there a relationship between the same of a planet and the time it takes to orbit the Sun?</p> <p>Observing Over Time: How does the Moon change each night? (over course of the unit)</p> <p>Comparative and Fair Testing: How do daylight hours</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Forces as pushes/pulls, balanced/unbalanced, contact/non-contacted. • Forces acting in given scenarios. • Types of lever based on the position of the fulcrum, load and effort. <p>Secondary Research:</p> <ul style="list-style-type: none"> • Who was Isaac Newton and why is he significant in the world of forces? • Who was Galileo Galilei and why is he significant in the world of forces? <p>Pattern Seeking:</p> <ul style="list-style-type: none"> • Do all objects fall through water in the same way? • Do all objects sink in water? • What is the relationship between the mass and the weight of an object? 	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Materials in the classroom and their properties. • Various thicknesses of paper as translucent, transparent, opaque. • Materials as magnetic or non-magnetic. • Materials as soluble or insoluble. • Changes as reversible or irreversible. <p>Comparative and Fair Testing:</p> <ul style="list-style-type: none"> • Which material would be the best choice for a teapot? • What is the impact of temperature on how quickly a solute dissolves? • What is the impact of stirring on how quickly a solute dissolves? 	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • Animals as vertebrate or invertebrate. • Comparing vertebrate based on their lifecycles – looking for similarities and differences. • Comparing invertebrate based on their lifecycles – looking for similarities and differences. • Comparing sexual reproduction in flowering and non-flowering plants – looking for similarities and differences. <p>Observing Over Time: What happens when we propagate a plant in different liquids?</p> <p>Secondary Research: Who are David Attenborough and Jane Goodall and why are they considered significant?</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> • The different stages in the lifecycle of a human. • The stages in the development of a foetus. • The stages/milestones in child development. • The changes in puberty as changes for boys, girls or both. • The signs of/consequences of aging in humans. <p>Observing Over Time: How are children developing in each year group in our school? What similarities and differences can we see between the different year groups?</p> <p>Pattern Seeking:</p> <ul style="list-style-type: none"> • Do all children grow in height at the same rate? • What is the relationship between the size of an animal and the length of the

	change across year in different parts of the world?	Comparative and Fair Testing: <ul style="list-style-type: none"> • How does the material of a surface (friction) affect the force need to move an object? • How does the angle of a slope affect the force needed to move an object? • How does the surface area of a parachute affect the time taken for it to fall? 	<ul style="list-style-type: none"> • How can we use sieving and filtering to separate mixtures? Secondary Research: <ul style="list-style-type: none"> • What role do magnets play in these common objects/appliances? • Why is _____ significant in the world of materials? Observing Over Time: <ul style="list-style-type: none"> • How does a coin change when placed in a solution of salt, water and weak acid? • What happens to a solution of salt/sugar and water when left on a windowsill? 		gestation period/size of the litter? Secondary Research: <ul style="list-style-type: none"> • How long is the gestation period for a _____? • Why do the peoples of Hong Kong and Japan have the longest average life spans in the world?
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Enquiry Skills	<p>Across a range of Year 5 Science units, pupils will:</p> <p>Use their scientific experiences to explore ideas and raise different kinds of questions. Talk about how scientific ideas have developed over time. Select and plan appropriate types of scientific enquiry to use to answer scientific questions. Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. Recognise when secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Make their own decisions about what observations to make, what measurements to use and how long to make them for. Look for different casual relationships in their data and identify evidence that refutes or supports their ideas. Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately – take repeat measurements where appropriate. Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Identify scientific evidence that has been used to support or refute ideas or argument. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas, use oral and written forms such as displays and other presentations to report conclusions, casual relationships and explanations of degree of trust in results. Use their results to make predictions and identify when further observations, comparative and fair tests might be needed.</p>
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Year 6

	Light and Perception <i>Physics</i>	Classification <i>Biology</i>	Evolution and Inheritance <i>Biology</i>	Electricity and Circuits <i>Physics</i>	Circulation and Lifestyle <i>Biology</i>
National Curriculum	Pupils should be taught to: Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that	Pupils should be taught to: Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences,	Pupils should be taught to: Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	Pupils should be taught to: Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.	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>objects are seen because they give out or reflect light into the eye.</p> <p>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.</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>	<p>including micro-organisms, plants and animals.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p>	<p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>	<p>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.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	<p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Prior Knowledge</p>	<p>Year 1, Amazing Animals: Pupils know that sight is one of the senses and associate it with the eyes.</p> <p>Year 1, Autumn and Winter and Year 1, Spring and Summer: Pupils know that the hours of daylight change throughout the year. They know that summer has the most hours of daylight and winter has the least hours of daylight.</p> <p>Year 3, Light and Shadows: Pupils know that a light source is an object which gives out light. Light sources can be natural or man-made. They know that light travels in straight lines from the light source and that we see things when the light from a source is reflected from an object into our eyes. Pupils also know that some materials are more reflective than others and that materials can be classified as opaque, translucent or transparent. In addition, pupils know that shadows are formed when light is blocked by an object or material and that the shadows formed by an object can change depending on the height and position of the light source.</p> <p>Year 4, Sound: Pupils know that sound is a form of energy which travels in waves. They</p>	<p>Year 1, Amazing Animals: Pupils know that animals can be grouped as mammals, birds, fish, amphibians or reptiles. Pupils can describe characteristics of each.</p> <p>Year 1, Plants: Pupils can name and identify different plants.</p> <p>Year 2, Living Things and Habitats: Pupils know that all living things live in a habitat. They know that the natural habitat of a plant or animals meets their needs and that animals are suited to life there. Pupils can use food chains to show the feeding relationships within a habitat and can use the words predator and prey. They also know that plants are at the beginning of a food chain.</p> <p>Year 2, Protecting Our Environment: Pupils know that environments and the living things within them are often threatened by human activity (pollution, littering etc). They can explain some ways in which we can reduce those threats.</p> <p>Year 4, Classification and Environments: Pupils know that vertebrate can be classified as mammals, fish, birds, reptiles or amphibians and that invertebrate can be classified as insects, crustaceans, echinoderms, annelids, arachnids, molluscs or</p>	<p>Year 2, Animals and Survival: Pupils know that reproduction is a key life process. They know that animals produce offspring which are similar to be not identical to the parent.</p> <p>Year 2, Protecting Our Environment: Pupils know that environments and the living things within them are often threatened by human activity (pollution, littering etc). They can explain some ways in which we can reduce those threats.</p> <p>Year 3, Rocks and Fossils: Pupils know that a fossil is the preserved remains or traces of a dead plant or animal. They know that fossils teach us about what animals and plants looked like in the past and that Mary Anning is considered significant because of her discoveries of fossils. Pupils know that the process of remains becoming a fossil is known as fossilisation and they can describe this process in simple terms. Pupils also know that there are different types of fossil – each created through a different process.</p> <p>Year 4, Classification and Environments: Pupils know that environments can change naturally or because of human interaction with the environment.</p>	<p>Year 2, Protecting our Environment: Pupils know electricity is produced to power appliances we use in our everyday lives. They know electricity can be produced in different ways.</p> <p>Year 3, Light: Pupils know that light is a form of energy which travels in straight lines. Pupils know that a light bulb is a man-made source of light.</p> <p>Year 4, Sound: Pupils know that sound is a form of energy which travels in waves.</p> <p>Year 4, Electricity: Pupils know that electricity is a form of energy which is used to power many different things we use each day. They know that an appliance is a piece of equipment we use to perform a task and that some appliances use electricity. They also know that those electrical appliances can be mains powered or battery powered and that we should always be safe and sensible around electricity. Pupils know that a circuit allows electricity to flow and that a circuit needs a power source and wires. They know that the parts of a circuit are called components and can include items such as batteries, wires, a bulb, a buzzer or a motor. They also know that a complete circuit allows electricity</p>	<p>Year 2, Animals and Survival: Pupils know that exercise is an important way in which humans can keep themselves healthy. They also know that humans can keep themselves healthy by eating a balanced diet and by having good personal hygiene.</p> <p>Year 3, Skeletons and Muscles: Pupils know that nutrition is the process of providing our bodies with what they need to function and stay healthy. They can also describe the human skeletal system.</p> <p>Year 4, Teeth and Digestion: Pupils can describe how the human digestive system works and know the functions of different organs within the system. Pupils know that once digested food reaches the small intestine, nutrients are absorbed into the blood stream.</p> <p>Year 5, Getting Older: Pupils can explain how humans develop and age over their lifetime.</p>

	<p>know that sound travels from a source (which is vibrating) to our ears.</p> <p>Year 4, Electricity: Pupils know that electricity is a form of energy which I generated to power a range of electrical appliances.</p>	<p>protozoa. They know that plants can be classified as flowering (including grasses) or non-flowering and that non-flowering plants include ferns, mosses and conifers. In addition, pupils know that characteristics make animals similar or different and can help us to classify them into a class and a species. They know that classification keys can support us in classifying organisms. Pupils have explored the work of Libbie Hyman and know why she is significant in the world of classification. They also know that environments can change naturally or because of human actions.</p>	<p>They know that some environmental changes are positive whereas other as negative but that all changes can influence the organisms living in a place.</p>	<p>to power components, but an incomplete circuit does not. Pupils have explored how adding more batteries to a circuit makes the bulbs brighter and how adding more bulbs to a circuit makes all of the bulbs dimmer. They know that a switch can be used to complete or break a circuit – to power something on or off and that materials which allow electricity to pass through them are conductors and those which do not are insulators.</p>	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Core Knowledge</p>	<p>Core knowledge in this unit:</p> <p>Light enters through the pupil and passes through to the retina. The rods and cones of the retina change the light into electrical signals.</p> <p>The optic nerve takes the electrical signals from the eye to the brain.</p> <p>Light bounces off a surface and changes direction – shiny surfaces reflect light at the same angle but rough surfaces reflect scattered light.</p> <p>The law of reflection means the angle of incidence is always equal to the angle of reflection.</p> <p>Light moves more slowly through materials that are denser than air (such as water).</p> <p>Refraction is when light slows down and changes direction causing objects to appear bent or distorted.</p> <p>Isaac Newton discovered the clear white light is made up of seven different colours.</p>	<p>Core knowledge in this unit:</p> <p>Classification is the process of arranging organisms, both living and extinct, into groups based on similar characteristics.</p> <p>The Linnaean System is the classification method introduced in 1758 by Carl Linnaeus.</p> <p>The Linnaean System classifies living things into kingdom, then phylum, class, order, family genus, species.</p> <p>Family - a group of living things which all have very similar features.</p> <p>Genus - living things are grouped together based on similar features and being closely related.</p> <p>Species – each living thing is names after its individual features and characteristics.</p> <p>A dichotomous key can help us to specify a species.</p> <p>Angiosperms is the scientific name for flowering plants.</p>	<p>Core knowledge in this unit:</p> <p>Fossils are the preserved remains or impressions of once living things in the past.</p> <p>Many living things have adapted, or changed, over time.</p> <p>Some adaptations help the living thing survive the climate whilst others enable the living thing to get the nutrition it needs.</p> <p>Natural selection is a term that refer to the process where an organism is better adapted and survives longer.</p> <p>Living things that are better adapted have a greater chance of survival and are able to produce more offspring.</p> <p>‘Survival of the fittest’ is s term used to describe those that survive.</p> <p>Living things do not choose to evolve – it takes a very long time to happen.</p> <p>Charles Darwin and Alfred Wallace both studied evolution.</p>	<p>Core knowledge in this unit:</p> <p>Electricity is a type of energy used to power electrical appliances. Electric current is the electricity which flows along wires and cables.</p> <p>We create electricity by using a generator which can be powered by fossil fuels, wind, water or solar energy from the Sun.</p> <p>A circuit will only work if it is a complete circuit.</p> <p>Rather than drawing detailed electrical circuits, they are represented in simple diagrams drawn with straight lines.</p> <p>In a series circuit, electricity flows along one pathway and passes through every component.</p> <p>In a series circuit, if one component breaks, the rest stops working.</p> <p>Electricity can flow around a parallel circuit along multiple pathways and does not need to flow through every component.</p>	<p>Core knowledge in this unit:</p> <p>Blood is formed of red blood cells, white blood cells, plasma and platelets.</p> <p>Red blood cells carry oxygen around the body.</p> <p>White blood cells fight off disease and infection.</p> <p>Plasma carries different types of cells around the body.</p> <p>Platelets clot blood if you graze or cut yourself.</p> <p>The heart plays a major role in the circulatory system – it pumps blood around the body.</p> <p>The heart has four main chambers: left atrium, right atrium, left ventricle and right ventricle.</p> <p>Arteries carry blood away from the heart and veins carry blood towards the heart.</p> <p>Lungs play a large part in the circulatory system, infusing blood with oxygen and exhaling the waste product carbon dioxide.</p>

	<p>Light waves are absorbed, transmitted or reflected to create colour.</p> <p>Objects that absorb all wavelengths of light and reflect no colours create black.</p> <p>Some objects do not absorb any visible wavelengths of light and reflect all the colours to create white.</p> <p>Shadows are formed by blocking light - a brighter light source forms a clearer, more defined shadow.</p> <p>The size and shape of a shadow depend on the position and size of the light source compared to the object.</p> <p>Light pollution is the unnecessary use of light.</p> <p>Ecosystems are disrupted by light pollution.</p>	<p>Gymnosperms is the scientific name for non-flowering plants. Non-vascular plants do not have roots or a stem.</p> <p>The five different types of living microorganisms are bacteria, viruses, fungi, protozoa and algae.</p> <p>Many microorganisms can be harmful – most diseases are caused by certain microorganisms.</p> <p>There are many microorganisms that can be helpful.</p> <p>Biological diversity (biodiversity) is the variety of life on Earth.</p> <p>Earth's biodiversity is in decline due to activities such as deforestation, land-use change and pollution.</p>	<p>Genes contain the information that gives a living thing its characteristics.</p> <p>Genes are found inside every cell of a living thing and are hereditary.</p> <p>Some genes are dominant and other genes are recessive.</p> <p>We have 46 chromosomes, half from each of our parents.</p> <p>Artificial selection sees humans choosing which organisms to breed in order to select particular traits.</p> <p>Dogs today are a result of years of artificial selection (selective breeding).</p> <p>Organisms become extinct when they can no longer reproduce - the species dies out.</p> <p>There are both natural and human causes of extinction.</p>	<p>In a parallel circuit, if a component on one branch breaks, components on the other branches will still work.</p> <p>Voltage measures the power of an electrical current in volts (V).</p> <p>The higher the voltage, the more powerful the electrical current will be.</p> <p>The voltage in a circuit can be increased by adding more batteries.</p> <p>Materials that allow electricity to travel through them are conductors.</p> <p>Materials that do not allow electricity to travel through them are insulators.</p>	<p>Blood transports three key nutrients from the digestive system: amino acids, fatty acids and glucose.</p> <p>Regular exercise strengthens the cardiovascular system – keeping our bodies fit and healthy.</p> <p>Drugs can be legal or illegal but all types of drugs can be addictive.</p> <p>Different drugs have different impacts on the body and mind.</p> <p>There are different types of drugs: stimulants, depressants, analgesics and hallucinogens.</p>
Working Scientifically	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> Light sources in a room and how they allow objects to be seen. The different colours of light that make white light when mixed together. <p>Pattern Seeking: What is the relationship between the angle of incidence and the angle of reflection?</p> <p>Comparative and Fair Testing:</p> <ul style="list-style-type: none"> Do objects appear the same in water as they do out of water? Are shadows always the same shape as an object? <p>Observing Over Time: What colours can we observe on soap bubbles?</p> <p>Secondary Research: What impact has light pollution had/is</p>	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> A range of different vertebrate using the Linnean system. Bears and penguins using a dichotomous key. A range of different invertebrate using the Linnaean system. Creating a dichotomous key for different species of bee. Leaves in the locality by creating a dichotomous key. <p>Secondary Research:</p> <ul style="list-style-type: none"> Who is Carl Linnaeus and why is he considered significant in the world of classification? How is a platypus classified? Why are bees important? What is the smallpox virus? 	<p>Secondary Research:</p> <ul style="list-style-type: none"> Should Mary Anning be known as 'the greatest fossil hunter of all time'? (with evidence supporting both sides) How has a camel adapted to survive in its natural environment? How has artificial selection resulted in different breeds of dog today? Possible extinction case study – what is happening to the Great Barrier Reef? Habitats at risk case study: what is happening to the Serengeti? <p>Identifying and Classifying:</p> <ul style="list-style-type: none"> Stages in a scenario of 'survival of the fittest'. Possible offspring based on the genetic features of the parents. 	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> The types of energy electricity is converted into in different situations. Alternatives that do not require electricity to work. Simple circuits in which a bulb will or will not light (from images). The correct symbol to use for each component in a range of different circuits. <p>Comparative and Fair Testing:</p> <ul style="list-style-type: none"> What is the impact of a broken component in a series circuit? What is the impact of a broken component in a parallel circuit? How does increasing the voltage impact the components in a circuit? 	<p>Identifying and Classifying:</p> <ul style="list-style-type: none"> The different materials found within blood. The position of and function of the arteries and veins within the heart. <p>Secondary Research:</p> <ul style="list-style-type: none"> What is sickle cell disease? What is the circulatory system? What are the positive and negative effects of different drugs and medicines on the mind and the body? <p>Comparative and Fair Testing:</p> <ul style="list-style-type: none"> At what temperature does diffusion take place the quickest? Which exercise is best for reaching our target heart rate?

	<p>light pollution having on sea turtles?</p>	<ul style="list-style-type: none"> • What role do microorganisms play in each of these foods? • Tiger case study: how can protecting a habitat support with the conservation of a species? <p>Pattern Seeking: Are the same types of leaves found in two different locations?</p> <p>Observing Over Time: What happens to a piece of bread if we leave it on a windowsill?</p>	<ul style="list-style-type: none"> • Possible outcomes from recessive genes. <p>Pattern Seeking: Is there a pattern between the size and shape of a Finch's beak and the food it eats?</p>	<ul style="list-style-type: none"> • What impact do we see when we increase the number of components in a circuit? • Which materials would be best to make a safe night light? 	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Enquiry Skills</p>	<p>Across a range of Year 6 Science units, pupils will:</p> <p>Use their scientific experiences to explore ideas and raise different kinds of questions.</p> <p>Talk about how scientific ideas have developed over time.</p> <p>Select and plan appropriate types of scientific enquiry to use to answer scientific questions.</p> <p>Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.</p> <p>Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.</p> <p>Recognise when secondary sources will be most useful to research their ideas and begin to separate opinion from fact.</p> <p>Make their own decisions about what observations to make, what measurements to use and how long to make them for.</p> <p>Look for different casual relationships in their data and identify evidence that refutes or supports their ideas.</p> <p>Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately – take repeat measurements where appropriate.</p> <p>Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Identify scientific evidence that has been used to support or refute ideas or argument.</p> <p>Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas, use oral and written forms such as displays and other presentations to report conclusions, casual relationships and explanations of degree of trust in results.</p> <p>Use their results to make predictions and identify when further observations, comparative and fair tests might be needed.</p>				