



Brooklands
Primary School

Brooklands Primary School Curriculum Overview

Science

"Somewhere, something incredible is waiting to be known." Dr Carl Sagan.

	Scientific Enquiry	Vocabulary	Progression	Skills
Nursery	<p>How do plants grow? What do plants need to grow?</p> <p>What do animals eat? Do all animals eat the same food?</p> <p>Is every object made out of the same material?</p> <p>What colours can we find outside? Does this change across the seasons?</p> <p>How does it work?</p> <p>How can we move objects?</p>	<p>Plants Seed, plant, flower, water, leaves, soil, root, animal, stem, garden, sunlight, air</p> <p>Animals including humans Amphibians, birds, fish, mammals, reptiles, sight, hearing, touch, taste, smell, head, neck, ear, mouth, shoulder, hand, fingers, leg, foot, thumb, eye, nose, knee, toes, teeth, elbow</p> <p>Materials rough, smooth, shiny, floating, sinking, natural, manmade, plastic, metal, wood, fabric, glass, hard, soft, stretchy, stiff, dull, rough, bendy/not bendy, waterproof/not waterproof</p> <p>Energy/ Seasons light, dark, dim, bright, shadow, seasons, autumn, winter, spring, summer, weather, polar regions, day, night, climate, temperature, hot, cold, windy, sunny, snow, rain</p> <p>Forces Push, pull, stop, start, move</p>	<p><i>This builds on birth to age 3 by encourage children to enjoy and explore the natural world. Developing children's exploration, curiosity, appreciation and respect for living things.</i></p>	<p>Understanding the World I can explore how things work. I can plant seeds and care for growing plants. I can talk about the key features of the life cycle of a plant and an animal. I can show an understanding of the need to respect and care for the natural environment and all living things. I can explore and talk about different forces they can feel. I can talk about the differences between materials and changes they notice.</p>
Reception	<p>What do plants need to grow? How do animals change as they grow? How does the environment change with the seasons? How does rainfall and temperature change over time? What does it do? What is it for? Who would use it? Where is it from? What makes something float? What happens to water when we heat or freeze it? Why do we need raincoats? Can we see colour at night?</p>	<p>Plants Seed, bulb, plant, flower, leaves, soil, compost, garden, wild, tree, trunk, stick, branch, sunlight, air</p> <p>Animals including humans Amphibians, birds, fish, mammals, reptiles, sight, hearing, touch, taste, smell, head, neck, ear, mouth, shoulder, hand, fingers, leg, foot, thumb, eye, nose, knee, toes, teeth, elbow</p> <p>Materials waterproof, thick, thin, warm, fluffy, soft, hard, texture, natural, manmade, plastic, metal, wood, fabric, glass, liquid, solid, gas, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy/not bendy, waterproof/not waterproof</p> <p>Energy / Seasons light, dark, dim, bright, shade, shadow, autumn, winter, spring, summer, weather, polar regions, day, night, climate, temperature, boiling, freezing, windy, sunny, overcast, snow, rain</p> <p>Forces</p>	<p><i>This builds on Nursery by showing awareness of the world around them and beginning to use all their senses in a hands-on exploration of natural materials.</i></p> <p><i>This leads to Y1 by developing observational skills and making comparisons between their own environments and contrasting environments. Children develop early</i></p>	<p>Understanding the World I can explore the natural world around them. I can describe what they see, hear and feel whilst outside. I can recognise some environments that are different to the one in which they live. I can show an understand of the effect of changing seasons on the natural world around them.</p>

Year	Working Scientifically	Area of Study	Key Knowledge	Skills
		Push, pull, surface, force		<i>enquiry and investigative skills.</i>
Y1	Asking simple questions and recognising that they can be answered in different ways. Observing closely, using simple equipment. Performing simple tests. Identifying and classify using observations and ideas to suggest answers to questions. Gathering and record data to help in answering questions.	Seasonal change <i>Comparative and fair testing</i> <i>Observing over time</i>	Weather can change There are lots of different types of weather: Rain, Sun, Cloud, Wind, Snow, etc Days are longer and hotter in the summer Days are shorter and colder in the winter There are four seasons: Spring, Summer, Autumn, Winter	I can observe and describe weather associated with the seasons and how day length varies I can observe changes across the 4 seasons
		Everyday materials <i>Asking questions, making predictions, performing simple tests, observing, recording results</i> <i>Comparative fair testing Identifying, classifying and grouping</i> <i>Pattern seeking</i>	There are many different materials that have different describable properties. Materials that have similar properties are grouped into metals, rocks, fabrics, wood, plastic and glass. The properties of a material determine whether they are suitable for a purpose.	I can compare and group together a variety of everyday materials on the basis of their simple physical properties I can distinguish between an object and the material from which it is made I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock I can describe the simple physical properties of a variety of everyday materials
	Working Scientifically Enquiry Questions	Plants <i>Asking questions, making predictions, performing simple tests, observing, recording results</i> <i>Research using secondary sources Comparative and Fair testing</i> <i>Observing over time</i>	Plants grow from seeds/bulbs Plants need light and water to grow and survive Plants are important We can eat lots of plants	I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees I can identify and describe the basic structure of a variety of common flowering plants, including trees
	Why do you think leaves turn brown in Winter? How does rainfall and temperature change over time in our school grounds? Which materials absorb the most water? Are all plants green? Which of our senses is the most accurate at identifying food? Do all animals hunt?	Animals, including humans <i>Asking questions, recording data</i> <i>Research using secondary sources</i> <i>Identifying, classifying and grouping</i>	There are many different animals with different characteristics. Animals have senses to help individuals survive. When animals sense things they are able to respond. Animals need food to survive. Animals need a variety of food to help them grow, repair their bodies, be active and stay healthy	I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals I can identify and name a variety of common animals that are carnivores, herbivores and omnivores I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)

		Vocabulary	Progression	
		Seasonal changes	Seasons, spring, summer, autumn, winter, windy, sunny, overcast, snow, rain, temperature	<p><i>This builds on EYFS by developing their observational skills, learning to record their findings and improve their scientific vocabulary about the world around us and the local area.</i></p> <p><i>They will use their previous knowledge to make predictions and perform simple experiments.</i></p> <p><i>They continue to compare the environment by looking at physical and human features. They will identify, classify and group a variety of animals.</i></p> <p><i>This leads to Y2 by securing their knowledge of identifying and grouping materials and describing their basic properties. Comparing wild flowers to garden plants and understanding that every flower has their own seed or bulb. Using their knowledge of animals they are able to sort animals into different groups and habitats, this will aid them in learning why animals live in certain places and how they have adapted to them.</i></p>
		Everyday materials	Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy/not bendy, waterproof/not waterproof, absorbent, opaque	
		Plants	Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, deciduous, evergreen	
		Animals, including humans	Amphibians, birds, fish, mammals, reptiles, carnivores, herbivore, omnivore, sight, hearing, touch, taste, smell, head, neck, ear, mouth, shoulder, hand, fingers, leg, foot, thumb, eye, nose, knee, toes, teeth, elbow	
Year	Working Scientifically	Area of Study	Key Knowledge	Skills
Y2	<p>Asking simple questions and recognising that they can be answered in different ways.</p> <p>Observing closely, using simple equipment.</p> <p>Performing simple tests.</p> <p>Identifying and classify using observations and ideas to suggest answers to questions.</p>	<p>Use of everyday Materials <i>Asking questions, performing simple tests, observing recording results, communicating results, making predictions Comparative and fair testing</i> <i>Pattern Seeking</i> <i>Identifying, classifying and grouping</i></p>	<p>The properties of a material determine whether they are suitable for a purpose. If an object was made out of a different material it would not fit the purpose. Materials can be changed by physical force such as twisting, bending, squashing and stretching.</p>	<p>I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>
	<p>Gathering and record data to help in answering questions.</p>	<p>Plants <i>Asking questions, observing, performing simple tests, observing and recording data, recording results</i> <i>Observing over time</i> <i>Pattern seeking</i> <i>Comparative and fair testing</i></p>	<p>Plants grow from seeds/bulbs. Plants need light, water, air and warmth to grow and survive.</p> <p>Flowers make seeds to make more plants (reproduce). We need plants to survive (to clean air, to eat). Name the different parts of a plant.</p> <p>Describe how seeds and bulbs grow.</p>	<p>I can observe and describe how seeds and bulbs grow into mature plants.</p> <p>I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>
	<p>Working Scientifically Enquiry Questions</p>	<p>Living things and their habitats <i>Asking questions, performing simple tests, observing and measuring, recording data</i></p>		<p>I can explore and compare the differences between things that are living, dead, and things that have never been alive.</p>

<p>Do plants flower all year round?</p> <p>Do all animals grow and live the same way?</p> <p>How have animals and plants adapted to live in their habitats?</p> <p>Would a chocolate teapot really be so bad?</p> <p>Is plastic the best material for a window?</p>	<p>Research using secondary sources Observing over time</p> <p>Pattern seeking</p> <p>Comparative and Fair testing</p>	<p>Some things are living, some were once living but now dead and some things never lived.</p> <p>There is variation between living things. Different animals and plants live in different places. Living things are adapted to survive in different habitats.</p> <p>Environmental change can affect plants and animals that live there.</p>	<p>I can 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.</p> <p>I can identify and name a variety of plants and animals in their habitats, including microhabitats</p> <p>I can 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>Animals including humans</p> <p>Asking questions, performing simple tests, observing and measuring, recording data, communicating data</p> <p>Research using a secondary source Observing over time</p> <p>Identifying, classifying and grouping</p>	<p>Animals move in order to survive.</p> <p>Different animals move in different ways to help them survive.</p> <p>Exercise keeps animal's bodies in good condition and increases survival chances.</p> <p>All animals eventually die.</p> <p>Animals reproduce new animals when they reach maturity.</p> <p>Animals grow until maturity and then do not grow any larger.</p> <p>We need to eat a balanced diet and keep our bodies clean.</p>	<p>I can notice that animals, including humans, have offspring which grow into adults.</p> <p>I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>
Vocabulary		Progression	
Materials	Transparent, translucent, opaque, squash, bend, twist, stretch, reflective, flexible, rigid, absorbent, waterproof.		<p><i>This builds on Year 1 by increasing their understanding of materials and how they can be manipulated by physical force.</i></p> <p>Observing how a bulb grows over time and recording their findings. To learn about why animals live in their habitats and how they have changed to survive.</p> <p><i>This leads to Y3 by giving the children an understanding of the meaning of transparent, translucent and opaque which they will then apply to light. By giving them some knowledge of the part flowers play in their life cycle including pollination and seed dispersal. By learning that all animals need a healthy diet children learn the importance of keeping your body healthy, including your muscles and bones.</i></p>
Plants	Flower bud, scales, tunic, basal stem, roots, germinate.		
Living things and their habitats	Urban, woodland, coastal, pond, microhabitats, desert, ocean, tropical, arctic.		
Animals, including humans	Food chains, sources of food, predator, consumer, extinct, inanimate, MRS GREN (movement, respiration, sensitivity, growth, reproduction, excretion and nutrition)		

Year	Working Scientifically	Area of Study	Key Knowledge	Skills
Y3	<p>Ask relevant questions and using different types of scientific enquiries to answer them Set up simple practical enquiries, comparative and fair tests.</p> <p>Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Gather, record, classify and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Identify differences, similarities or changes related to simple scientific ideas and processes. Use straightforward scientific evidence to answer questions or to support findings.</p>	<p>Light</p> <p>Asking questions, performing simple tests, observing, measuring, recording results, communicating results, making predictions</p> <p>Research using secondary source Identifying, classifying and grouping Comparative and fair testing Pattern Seeking</p>	<p>Transparent materials let light travel through them, and opaque materials don't let light through.</p> <p>Beams of light bounce off some materials (reflection).</p> <p>Shiny materials reflect light beams better than non-shiny materials.</p> <p>Light comes from a source</p>	<p>I can 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.</p> <p>I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>I can recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p> <p>I can find patterns in the way that the size of shadows change.</p>
		<p>Rocks</p> <p>Asking questions, performing simple tests, observing, measuring, recording results, communicating results, making predictions, communicating results</p> <p>Research using secondary source Identifying, classifying and grouping Comparative and fair testing</p>	<p>There are different types of rock.</p> <p>There are different types of soil.</p> <p>Soils change over time.</p> <p>Different plants grow in different soils.</p> <p>Fossils tell us what has happened before.</p> <p>Fossils provide evidence.</p> <p>Palaeontologists use Fossils to find out about the past.</p> <p>Fossils provide evidence that living things have changed over time.</p>	<p>I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>I can describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>I can recognise that soils are made from rocks and organic matter.</p>
		<p>Working Scientifically Enquiry Questions</p>	<p>Forces and Magnets</p>	<p>Magnets exert attractive and repulsive forces on each other.</p> <p>Magnets exert non-contact forces, which work through some materials.</p>

<p>The nearer the object is to the light source the bigger the shadow. Use a comparative test to exemplify this statement.</p> <p>How can scientists sort rocks? Use a comparative test to classify rocks based on their properties.</p> <p>How does soil affect how plants grow? Use secondary sources to explain your answer.</p> <p>Can you classify food into different groups? Can you classify animals based on the type of skeleton they have?</p> <p>Can you find patterns in different people's diets to draw conclusions about how to eat healthily?</p> <p>Are all metals magnetic? Do all magnets have the same strength?</p> <p>All plants require the same amount of light, air, water, nutrients and space. Research and discuss.</p> <p>Plants in warm conditions transport water quicker than in cooler conditions. Set up a test to observe over time and draw a conclusion.</p> <p>Pollinators are imperative in the life processes of a plant. Research and discuss.</p>	<p>Asking questions, performing simple tests, observing, measuring, recording results, communicating results, making predictions, communicating results</p> <p>Research using secondary source</p> <p>Identifying, classifying and grouping</p> <p>Comparative and fair testing</p>	<p>Magnets exert attractive forces on some materials.</p> <p>Magnet forces are affected by magnet strength, object mass, distance from object and object material.</p>	<p>I can notice that some forces need contact between 2 objects, but magnetic forces can act at a distance.</p> <p>I can observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.</p> <p>I can describe magnets as having 2 poles.</p> <p>I can predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</p>
	<p>Animals including humans</p> <p>Asking questions, recording data, observing and measuring</p> <p>Research using secondary source</p> <p>Identifying, classifying and grouping</p>	<p>Different animals are adapted to eat different foods.</p> <p>Many animals have skeletons to support their bodies and protect vital organs.</p> <p>Muscles are connected to bones and move them when they contract.</p> <p>Movable joints connect bones.</p>	<p>I can identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</p> <p>I can identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>
	<p>Plants</p> <p>Asking questions, performing simple tests, observing, measuring, recording results, communicating results, making predictions, communicating results</p>	<p>Plants are producers, they make their own food.</p> <p>Their leaves absorb sunlight and carbon dioxide.</p> <p>Plants have roots, which provide support and draw water from the soil.</p> <p>Flowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed production.</p> <p>Seed dispersal improves a plants chances of successful reproduction.</p> <p>Seeds/bulbs require the right conditions to germinate and grow.</p> <p>Seeds contain enough food for the plant's initial growth</p>	<p>I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>I can explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</p>

			<p>Research using secondary source</p> <p>Identifying, classifying and grouping</p> <p>Comparative and fair testing</p> <p>Pattern Seeking</p> <p>Observing over time</p>		<p>I can investigate the way in which water is transported within plants.</p> <p>I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>
Vocabulary					Progression
Light	Light, darkness, shadow, light source, reflection, reflective, opaque, translucent, transparent, mirror, energy, absorb, ultraviolet light.			<p><i>This builds on Year 2 by observing and describing how seeds and bulbs grow into mature plants. By giving them an understanding of basic stages of an animal's life cycle. By describing the basic needs of animals including humans for survival.</i></p> <p><i>This leads to Year 4 by giving the children an understanding of what animals eat and why they would need certain teeth. By understanding that light comes from a source the children can build on this knowledge by learning to make a source of light.</i></p>	
Rocks	Igneous rocks, intrusive igneous rocks, extrusive igneous rocks, metamorphic rocks, sedimentary rocks, sedimentation, compaction, cementation, density, fossilisation, paleontology, durability, permeability, chemical fossils, trace fossils, body fossils.				
Forces and magnets	Force, magnet, magnetic, non-magnetic, poles, attract, repel, magnetic field, friction.				
Animals including humans	Animal, human, bone, nutrients, balanced diet, food groups, skeleton, vertebrate, invertebrate, exoskeleton, endoskeleton, hydrostatic skeleton, muscle, voluntary, involuntary.				
Plants	Plants, nutrients, roots, stem/trunk, flowers, leaves, nectar, pollen, petals, ovary, stamen, anther, filament, stigma, style, pollination, seed dispersal, fertilisation.				
Year	Working Scientifically	Area of Study		Key Knowledge	Skills

Y4

Ask relevant questions and using different types of scientific enquiries to answer them
 Set up simple practical enquiries, comparative and fair tests.
 Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
 Gather, record, classify and present data in a variety of ways to help in answering questions.
 Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
 Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
 Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
 Identify differences, similarities or changes related to simple scientific ideas and processes.
 Use straightforward scientific evidence to answer questions or to support findings.

Animals including Humans

Asking questions, interpreting results
 Research using secondary source
 Identifying, classifying and grouping
 Comparative and fair testing

Food enters the body through the mouth.
 Digestion starts when the teeth start to break the food down. Saliva is added & the tongue rolls the food into a ball.
 The food is swallowed & passes down the oesophagus to the stomach. Here the food is broken down further by being churned around & other chemicals are added.
 The food passes into the small intestine. Here nutrients are removed from the food & leave the digestive system to be used elsewhere in the body.
 The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet.
 Humans have 4 types of teeth: incisors (cut); canines (tear); molars & premolars (grind/chew).
 Living things can be classified as producers, predators & prey according to their place in food chains.

I can describe the simple functions of the basic parts of the digestive system in humans.
 I can sequence the main parts of the digestive system.
 I can identify the different types of teeth in humans and their simple functions.
 I can construct and interpret a variety of food chains, identifying producers, predators and prey.
 I can name producers, predators & prey within a habitat

Materials / states of matter

Asking questions, performing simple tests, observing, measuring, recording results, communicating results, making predictions, communicating results
 Research using secondary source
 Identifying, classifying and grouping
 Observing over time

A solid keeps its shape and has a fixed volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured form a heap and they do not keep a level surface when tipped. Each individual grain has the properties of a solid.
 A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface.
 A gas fills all available space; it has no fixed shape or volume.
 Melting is a state change from solid to liquid.
 Freezing is a state change from liquid to solid. The freezing point of water is 0oC.
 Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC.
 Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy.
 Condensation is the change back from a gas to a liquid caused by cooling.

I can compare and group materials together, according to whether they are solids, liquids or gases.
 I can observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).
 I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.
 I can use a thermometer to measure temperatures e.g. icy water (melting), tap water, hot water, boiling water (demonstration).
 I can set up investigations to explore changing the rate of evaporation e.g. washing, puddles, handprints on paper towels, liquids in containers.

			I can explore making gases visible e.g. squeezing sponges under water to see bubbles, and showing their effect e.g. using straws to blow objects, trees moving in the wind.
	Working Scientifically Enquiry Questions		I can identify common appliances that run on electricity.
<p>What happens to the food we eat?</p> <p>What effect does the food we eat and drink have on our teeth?</p> <p>Which materials make the best conductors or insulators? How can we find out?</p> <p>How can we test if a circuit works? What happens if we add multiple components to a circuit?</p> <p>What happens if there is a break in a circuit? How does a switch work?</p> <p>How can living things be classified?</p> <p>What impact do humans have on habitats?</p> <p>What is a habitat and what habitats can I identify in my local area?</p> <p>How is the environment changing?</p> <p>How can you tell the difference between a vertebrate and an invertebrate?</p> <p>How can we identify solids, liquids and gases? Can matter change state? Do gases weigh anything? What is the relationship between temperature and evaporation?</p> <p>How do we hear sounds?</p> <p>How are sounds made?</p> <p>How can sounds be changed?</p> <p>How does sound travel?</p> <p>Can sound travel through different states of matter?</p> <p>How can we change the pitch or volume of a sound?</p>	<p>Electricity</p> <p>Asking questions, performing simple tests, observing, measuring, recording results, communicating results, making predictions, communicating results</p> <p>Comparative and fair testing</p> <p>Pattern seeking</p> <p>Identifying and classifying</p>	<p>Common appliances</p> <p>What is electricity?</p> <p>Electrical dangers</p> <p>Electrical circuits, including simple series circuits, open and closed circuits</p> <p>Circuit components, including cell, wires, buzzer, motor, switches and bulbs</p> <p>Electrical conductors and insulators</p>	<p>I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>I can 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.</p> <p>I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>I can recognise some common conductors and insulators, and associate metals with being good conductors.</p>
		<p>Habitats</p> <p>Asking questions, communicating and interpreting results, evaluating</p> <p>Observing over time</p> <p>Research using secondary source</p> <p>Identifying, classifying and grouping</p>	<p>I can recognise that living things can be grouped in a variety of ways.</p> <p>I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>I can recognise that environments can change and that this can sometimes pose dangers to living things.</p>

			<p>These environments also change with the seasons; different living things can be found in a habitat at different times of the year. Living things can be classified as producers, predators and prey according to their place in the food chain.</p>	<p>I can compare and contrast the living things observed.</p> <p>I can use fieldwork to explore human impact on the local environment e.g. litter, tree planting.</p> <p>I can use secondary sources to find out about how environments may naturally change.</p> <p>I can use secondary sources to find out about human impact, positive and negative, on environments.</p>
		<p>Sound</p> <p>Asking questions, performing simple tests, observing, measuring, recording results, communicating results, making predictions, communicating results</p> <p>Comparative and fair testing</p> <p>Pattern seeking</p> <p>Identifying and classifying</p>	<p>A sound produces vibrations which travel through a medium from the source to our ears.</p> <p>Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter).</p> <p>The vibrations cause parts inside our ears to vibrate, allowing us to hear (sense) sound.</p> <p>The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source.</p> <p>A sound insulator is a material which blocks sound effectively.</p> <p>Pitch is the highness / lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.</p>	<p>I can identify how sounds are made, associating some of them with something vibrating.</p> <p>I can recognise that vibrations from sounds travel through a medium to the ear.</p> <p>I can find patterns between the pitch of a sound and features of the object that produced it</p> <p>I can explore altering the pitch or volume of objects, such as the length of a guitar string, amount of water in bottles, size of tuning forks.</p> <p>I can find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>I can recognise that sounds get fainter as the distance from the sound source increases.</p> <p>I can measure sounds through different insulation materials.</p>

Vocabulary				Progression
Animals including humans	Energy, waste, digestion, producer, enamel, consumer, predator, prey, Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Herbivore, Carnivore, Canine, Incisor, Molar			<p><i>This builds on Year 3 by further developing the children's understanding of what animals, including humans, eat and how they are adapted to their environments. The children learn how to build classification keys and how to construct and interpret food chains. The children will also continue to develop their investigative skills through observation and fair testing.</i></p> <p><i>This leads to Year 5 by exploring different states of matter in readiness to explore deeper the properties of materials, including changes in more depth. This will include comparing materials by properties: hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. Children will also be expected to apply their knowledge of animals to explore the differences in the life cycles of a mammal, an amphibian, an insect and a bird as well as describe the life process of reproduction in some plants and animals. They will further develop their skills of comparative and fair testing.</i></p>
Materials/states of matter	Evaporation, condensation, transpiration, freeze, volume, temperature, precipitation, Celsius, boiling, Solid, Liquid, Gas, Evaporation, Condensation, Particles, Temperature, Freezing, Heating			
Electricity	Generator, component, circuit, connector, Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators			
Habitats	Organism, gills, fins, scales, lungs, body temperature, deciduous, coniferous, algae, producer, consumer, herbivore, population, deforestation, development, litter, Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats			
Sound	material, matter, Volume, Vibration, Wave, Pitch, Tone, Speaker			
Year	Working Scientifically	Area of Study	Key Knowledge	Skills

Y5

Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
 Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
 Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
 Use test results to make predictions to set up further comparative and fair tests.
 Report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
 Identifying scientific evidence that has been used to support or refute ideas or arguments.

Earth and Space
 Asking questions
 Communicating results
 Observing and measuring results
 Recording results
 Research using secondary sources
 Comparative and fair testing
 Observing over time

The Sun is a star. It is at the centre of our solar system.
 There are 8 planets (can choose to name them, but not essential).
 These travel around the Sun in fixed orbits.
 Earth takes 365¼ days to complete its orbit around the Sun.
 The Earth rotates (spins) on its axis every 24 hours.
 As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky.
 The Moon orbits the Earth. It takes about 28 days to complete its orbit.
 The Sun, Earth and Moon are approximately spherical.

I can describe the movement of the Earth and other planets relative to the sun in the solar system.
 I can describe the movement of the moon relative to the Earth.
 I can show using diagrams the rotation of the Earth and how this causes day and night
 I can explain what causes day and night
 I can describe the sun, Earth and moon as approximately spherical bodies.
 I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Forces
 Asking questions, performing simple tests, observing, measuring, recording results, communicating results, making predictions, communicating results
 Comparative and fair testing
 Pattern seeking

A force causes an object to start moving, stop moving, speed up, slow down or change direction.
 Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.
 Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.
 A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover.
 Pulleys, levers and gears are all mechanisms, also known as simple machines.

I can demonstrate the effect of gravity acting on an unsupported object
 I can give examples of friction, water resistance and air resistance
 I can give examples of when it is beneficial to have high or low friction, water resistance and air resistance
 I can demonstrate how pulleys, levers and gears work
 I can investigate the effect of friction in a range of contexts.
 I can investigate effects of water resistance in a range of contexts
 I can investigate the effects of air resistance in a range of contexts
 I can explore how levers, pulleys and gears work.

Working Scientifically Enquiry Questions

How do forces affect the speed of an object?
 Why do shadows appear to move position over the course of the day?
 Why does the moon have phases?

Materials
 Asking questions, performing simple tests, observing, measuring, recording results,

Materials have different uses depending on properties and state (liquid, solid, gas).
 Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets.
 Mixtures can be separated by filtering, sieving and evaporation.
 Use understanding of properties to explain everyday uses of materials, for example, how bricks, wood, glass and metals are used in building.

I can compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.

	<p>It is possible to separate all mixtures. Discuss.</p> <p>All changes of state are reversible. Discuss.</p> <p>Explain why materials have been chosen for a particular purpose.</p> <p>Are the life cycles of plants and animals in the local environment the same as in other habitats around the world?</p> <p>How do plants and animals change over time?</p> <p>How important is the work of naturalists such as David Attenborough and Jane Goodall?</p>	<p>communicating results, making predictions, communicating results</p> <p>Comparative and fair testing</p> <p>Identifying, classifying and grouping</p> <p>Pattern seeking</p> <p>Observing over time</p>	<p>Materials have different uses depending on properties and state (liquid, solid, gas).</p> <p>Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment.</p> <p>Mixtures can be separated by filtering, sieving and evaporation. Some changes to materials such as dissolving, mixing & changes of state are reversible, but changes such as burning wood, rusting & mixing vinegar with bicarbonate of soda result in the formation of new materials à not reversible.</p>	<p>I can know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>I can demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>I can carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced?</p> <p>I can 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>Living things and their habitats</p> <p>Asking questions</p> <p>Communicating results</p> <p>Observing and measuring results</p> <p>Recording results</p> <p>Research using secondary sources</p> <p>Identifying, classifying and grouping</p> <p>Observing over time</p>	<p>As part of their life cycle, plants and animals reproduce.</p> <p>Most animals reproduce involving two parents, a male and a female. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, and then grow into adults.</p> <p>In other animals, there may be eggs laid that hatch too young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis.</p> <p>Plant reproduction occurs through pollination, usually involving wind or insects.</p> <p>Plants reproduce</p>	<p>I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>I can describe the life process of reproduction in some plants and animals.</p> <p>I can use secondary sources, & where possible, first-hand observations to find out about the life cycle of a range of animals.</p> <p>I can compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth.</p>

		<p>Animals including humans</p> <p>Asking questions Communicating results Observing and measuring results Recording results</p> <p>Research using secondary sources Identifying, classifying and grouping</p>	<p>Puberty is when a child's body begins to grow, change and develop as they become an adult.</p> <p>In humans, puberty normally begins around age 11-12, however it can take place anytime from age 8-14. Puberty happens when the pituitary glands begin to release hormones.</p> <p>Muscle mass decreases and muscles lose strength</p> <p>Wrinkles develop on the skin, and it loses its elasticity.</p> <p>Hair begins to turn grey/ white.</p> <p>Many people begin to lose the hair on their heads (mainly men). - Fertility decreases (more quickly for women).</p> <p>People begin to shrink in height as bones and cartilage become worn down.</p> <p>Organs begin to lose their effectiveness, and the senses (e.g. sight, hearing, etc.) become weaker.</p> <p>The gestation and life expectancy period varies with different animals.</p>	<p>I can describe the changes as humans develop to old age.</p> <p>I can research using secondary resources.</p> <p>I can ask questions to improve my understanding and develop a line of enquiry.</p> <p>I can record my findings in different ways.</p>
Vocabulary				Progression
Earth and space	Planet, orbit, sun, rotation, solar system, star, moon, day, night, constellation			<p><i>This builds on Year 4 by using knowledge gained during studies of animals, including humans, to describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</i></p> <p><i>They will also further develop their understanding of life processes by exploring the life process of reproduction in some plants and animals. Children will also use their knowledge of the states of matter to compare materials by properties: hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets; Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution; Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</i></p> <p><i>They will give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic, and demonstrate that dissolving,</i></p>
Forces	Force, forcemeter, push, pull, gravity, air resistance, water resistance, friction, effort, load, gear, level, pulley.			
Materials	Reversible, irreversible, insulator, conductor, dissolve, evaporation, flexible, gas, liquid, solid, transparent, Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing			
Living things and their habitats	Reproduction, Sexual, Asexual, Pollination, Dispersal, reproduction, cell, fertilisation, pollination, male, female, pregnancy, young, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant.			
Animals including humans	Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, Hormone, Physical, Emotional,			

			<p><i>mixing and changes of state are reversible changes.</i></p> <p><i>This leads to Year 6 by exploring the changes as humans develop to old age and researching using secondary resources. This prepares children for studying what the impact of diet, exercise, drugs & lifestyle on the way their bodies function. As well as Identifying & naming the main parts of the human circulatory system, & describe the functions of the heart, blood vessels & blood.</i></p> <p><i>Children will also be able to record my findings in different ways and suggest lines of enquiry to follow.</i></p>	
Year	Working Scientifically	Area of Study	Key Knowledge	Skills
Y6	<p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Use test results to make predictions to set up further comparative and fair tests.</p> <p>Report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>	<p>Animals including humans</p> <p>Asking questions Communicating results Observing and measuring results Recording results</p> <p>Comparative and fair testing</p>	<p>The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body.</p> <p>Nutrients, water & oxygen are transported in blood to the muscles & other parts of the body where they are needed. As they are used, they produce carbon dioxide & other waste products.</p> <p>Carbon dioxide is carried by blood back to the heart & then the cycle starts again. It is transported back to lungs to be removed from the body. This is the human circulatory system.</p> <p>Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel.</p> <p>Some conditions are caused by deficiencies in our diet e.g. lack of vitamins.</p>	<p>I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>I can describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>I can carry out a fair test and pattern seeking investigation.</p> <p>I can observe over time - how long does it take my pulse rate to return to my resting pulse rate (recovery rate)</p>
		<p>Electricity</p> <p>Asking questions, performing simple tests, observing, measuring, recording results, communicating results, making predictions, communicating results</p> <p>Comparative and fair testing Identifying, classifying and grouping Pattern seeking</p>	<p>Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound.</p> <p>If you use a battery with a higher voltage, the same thing happens.</p> <ul style="list-style-type: none"> •Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. <p>Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well.</p> <p>You can use recognised circuit symbols to draw simple circuit diagrams.</p>	<p>I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>I can 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>I can use recognised symbols when representing a simple circuit in a diagram.</p>

				<p>I can make electric circuits and demonstrate how variation in the working of particular components, such as the brightness of bulbs, can be changed by increasing or decreasing the number of cells or using cells of different voltages</p> <p>I can draw circuit diagrams of a range of simple series circuits using recognised symbols</p> <p>I can carry out fair tests exploring changes in circuits.</p>
Working Scientifically Enquiry Questions		<p>Evolution and Inheritance</p> <p>recording results, communicating results, making predictions, communicating results</p> <p>Research using secondary sources</p> <p>Comparative and fair testing</p> <p>Pattern seeking</p> <p>Observing over time</p>	<p>All living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other.</p> <p>Plants & animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly, some variations of species may not suit the new environment and will die.</p> <p>If the environment changes slowly, animals /plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young.</p> <p>Over time, these inherited characteristics become more dominant within the population. Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. This is evolution.</p> <p>Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics.</p>	<p>I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p>I can give examples of how an animal or plant has evolved over time.</p> <p>I can give examples of fossil evidence that can be used to support the theory of evolution</p>
<p>To what extent has Charles Linnaeus' theory of classification impacted how people define animals and plants today.</p> <p>Once a human is born, they can't change the function of their circulatory system. Discuss.</p> <p>Explain how diffusion and osmosis supports the transportation of water and nutrients around the body.</p> <p>How can fossil evidence be used to support the theory of evolution?</p> <p>Darwin's theory of evolution explains why some creatures survive in the wild. Discuss.</p> <p>How do different circuit components affect the function of a buzzer game.</p> <p>A book is placed in a dark room, it is possible to read it. Discuss.</p> <p>A book is placed round a corner, it is possible to read it. Discuss.</p>		<p>Living things and their habitats</p> <p>recording results, communicating results, making predictions, communicating results</p> <p>Research using secondary sources</p> <p>Identifying, classifying and grouping</p>	<p>Living things can be formally grouped according to characteristics.</p> <p>Plants and animals are two main groups but there are other living things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms.</p> <p>Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants.</p> <p>Plants can make their own food whereas animals cannot.</p> <p>Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates).</p> <p>Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics. Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms.</p>	<p>I can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.</p> <p>I can give reasons for classifying plants and animals based on specific characteristics.</p> <p>I can compare the characteristics of animals in different groups</p> <p>I can give examples of flowering and non-flowering plants</p>

			I can classify plants and animals, presenting this in a range of ways e.g. Venn diagrams, Carroll diagrams and keys.
		<p>Light</p> <p>Asking questions, performing simple tests, observing, measuring, recording results, communicating results, making predictions, communicating results</p> <p>Comparative and fair testing</p> <p>Identifying, classifying and grouping</p> <p>Pattern seeking</p>	<p>Light appears to travel in straight lines, and we see objects when light from them goes into our eyes.</p> <p>The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen.</p> <p>Objects that block light (are not fully transparent) will cause shadows.</p> <p>Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object.</p>
			<p>I can recognise that light appears to travel in straight lines.</p> <p>I can use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</p> <p>I can 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>I can 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>I can explore different ways to demonstrate that light travels in straight lines e.g. shining a torch down a bent and straight hose pipe, shining a torch through different shaped holes in card.</p>
Vocabulary			Progression
Animals including humans	Arteries, blood, blood vessel, bones, circulatory systems, heart, lungs, muscles, nutrients, organs, veins, vitamins,		<p><i>This builds on Year 5 by building on the children's knowledge of the differences in the life cycles and reproductive processes of a mammal, an amphibian, an insect and a bird through exploring further how living things can be classified, including plants.</i></p> <p><i>This leads to Year 7 by exploring the differences in species.</i></p>
Electricity	Conductor, insulate, battery, buzzer, wire, bulb, appliances, cell, circuit, switch, current, electricity, filament, motor, voltage.		
Evolution and inheritance	Adaptation, body fossil, breeding, environment, evolution, fossil, inherit, offspring, reproduction, selective breeding, trace fossil.		
Living things and their habitats	Amphibian, annelid, arachnid, bird, crustaceans, habitat, insects, invertebrate, mammal, microorganism, reptile, vertebrate.		

	Light	Eyes, filter, light, light source, periscope, rainbow, reflection, refraction, spectrum, shadow, translucent, transparent, opaque.	<i>Beginning to explore how variation between species can drive natural selection and how changes in the environment may lead to extinction. Children will also be aware of the consequences of poor lifestyle choices and imbalances in diet and exercise. They will also have an understanding of how light travels and objects can be seen ready to explore these ideas further in KS3. They will be able to construct circuits and use a range of components ready to further explore electricity as a form of energy.</i>
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