

Science Long Term Plan

Science

Our overarching aim is to inspire curiosity, wonder, and a lifelong interest in the world around us within all children. Through engaging, hands-on experiences and enquiry-based learning, pupils will develop a secure understanding of key scientific concepts, processes, and vocabulary. They will learn to work scientifically by asking questions, making predictions, gathering and interpreting data, and drawing conclusions based on evidence. Science helps children make sense of everyday phenomena, fosters critical thinking, and equips them with the knowledge and skills to explore, question, and appreciate the natural and man-made world. It encourages resilience, creativity, and collaboration as children investigate and solve problems together. Scientific learning also supports cross-curricular links, enhancing understanding in subjects such as maths, geography, and design and technology. Ultimately, science enables pupils to become informed, thoughtful individuals in an increasingly scientific and technological world.

Foundation Stage		
	FS1	FS2
	<p>Exploring materials: Children will observe and manipulate materials, noticing their properties (e.g., hard/soft, rough/smooth).</p> <p>Observing living things: Children will explore plants, animals, and their habitats, beginning to understand growth, change, and care for living things.</p> <p>The natural world: Children will explore the changing seasons, weather patterns, and simple changes in the environment.</p> <p>Asking questions: They will develop the ability to ask simple questions about the world around them and begin to explore ways to find answers.</p>	<p>Understanding the Natural World: Children will explore and identify different plants and animals, observing their features and habits. They will understand that living things grow, change, and have specific needs. Seasons and Weather: Children will observe the changes in seasons and how these affect the world around them, including the changes in weather, animals, and plants. Basic Animal Life Cycles: Children will learn about the basic life cycles of animals, such as frogs, butterflies, or humans.</p> <p>Exploring Materials: Children will explore a range of materials, learning to describe them by their properties and experimenting with how different materials can be used for different purposes. They will also start to understand the idea of changing states of matter in a simple, practical context.</p> <p>Asking Questions and Investigating: Children will be encouraged to ask simple scientific questions, predict possible outcomes, and observe the effects of changes, fostering their investigative and critical thinking skills. They will begin to work scientifically by exploring their own ideas through experiments, such as testing whether objects sink or float, or observing the growth of plants under different conditions.</p> <p>Developing Scientific Vocabulary: Children will begin to use basic scientific vocabulary to describe what they see, hear, and experience. They will start using words such as plant, animal, grow, change, weather, and material. They will also communicate their findings through simple drawings and spoken words.</p>
	<p>ELG:</p> <ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. 	

Foundation Stage				
Year Group Nursery	Autumn	Spring	Summer	
Learning Theme	All About Me and My Body/ Autumn and Seasonal Change	Materials	Animals and Their Babies/Growing and Plants	Minibeasts and Habitats/Water and Weather
National Curriculum Objectives	<ul style="list-style-type: none"> Begin to name basic body parts Notice differences between themselves and others Explore changes in weather Notice changes in plants and trees Talk about what they see 	<ul style="list-style-type: none"> Explore collections of materials with similar and/or different properties Talk about what they see, using a wide range of vocabulary. Explore and talk about different forces they can feel. Use all their senses in hands-on exploration of natural materials. Explore how things work. Talk about the differences between materials and the changes they notice. 	<ul style="list-style-type: none"> Know some animals and their young Begin to describe animals and how they move Begin to identify common plants Know that plants need water and light to grow 	<ul style="list-style-type: none"> Explore insects and bugs in the garden Recognise their habitats Investigate water in different forms Talk about the sun, rain, clouds
Substantive Knowledge	<ul style="list-style-type: none"> Humans have body parts like head, hands, feet, eyes, nose Everyone is unique Leaves change colour and fall Days get shorter Weather can be windy, rainy 	<ul style="list-style-type: none"> Materials are what objects are made from (e.g. wood, plastic, metal, fabric, glass). Some materials feel soft, others are hard. Some materials are smooth, others are rough or bumpy. Materials can be flexible (can bend) or rigid (stay stiff). Some materials are shiny, others are dull. Materials can be heavy or light, cold or warm to the touch. Similar materials may look or feel the same, while different materials feel or look different. A push moves something away. A pull brings something closer. Things move when we apply force. Forces can make things speed up, slow down, change direction, or stop. Some forces are gentle (like blowing on a feather), others are strong (like pushing a heavy door). Gravity pulls things down to the ground. 	<ul style="list-style-type: none"> Animals have babies Some animals walk, swim, or fly Pets live with people Plants grow from seeds Plants need care to grow Names of common flowers 	<ul style="list-style-type: none"> Minibeasts live in different places (soil, under logs) Some have wings or legs Water can be liquid, ice, or steam Rain comes from clouds Sun gives light

Disciplinary Knowledge

- Identify and name body parts
- Compare and talk about differences
- Observe and describe the environment
- Use language to describe seasonal change

- **Noticing and observing** – Children begin to look closely at materials, objects, and natural things, spotting colours, shapes, patterns, and changes.
- **Asking questions** – Children show curiosity by asking “What’s that?”, “What happens if...?”, and exploring answers through play and talk.
- **Using simple language to describe** – They use everyday vocabulary to talk about what they see, feel, hear, or smell (e.g. “It’s sticky”, “It’s cold”).
- **Exploring through hands-on play** – Children learn by doing: touching, squashing, pouring, building, and mixing to find out more about the world.
- **Sorting and classifying** – They begin grouping objects by simple features (e.g. hard vs. soft, rough vs. smooth, big vs. small).
- **Making comparisons** – Children compare things using words like same/different, more/less, faster/slower, heavier/lighter.
- **Using their senses to investigate** – They explore using touch, sight, hearing, smell, and sometimes taste, learning that different senses give different information.
- **Making simple predictions** – They start to guess what might happen (e.g. “Will it float?” or “Will it melt?”), often through trial and error.
- **Describing changes** – They begin to notice when something changes and talk about what’s different (e.g. “It melted!”, “It went hard!”).
- **Beginning to record ideas** – Though not formal recording, children may draw, sort, or use simple marks or gestures to show what they found out.

- Match animals to babies
 - Sort animals by how they move
 - Plant seeds and observe them
- Talk about plant parts (leaf, stem, flower)

- Hunt for minibeasts
 - Sort and classify by features (legs, wings, colour)
 - Explore water play
- Predict and describe changes (melting, freezing)

Year Group Reception	Autumn	Spring	Summer
Learning Theme	Ourselves and Our Bodies/ Seasonal Change: Autumn	Animals and Their Habitats/ Growing Plants	Minibeasts and Nature/ Seasonal Change: Summer
National Curriculum Objectives	<ul style="list-style-type: none"> Name and identify parts of the body Explore the five senses Understand what humans need to be healthy Notice seasonal changes in the environment Identify signs of autumn Explore weather patterns 	<ul style="list-style-type: none"> Identify and name a range of animals Understand where animals live - Explore how animals grow and change Understand what plants need to grow Name parts of a plant Observe changes over time 	<ul style="list-style-type: none"> Identify common minibeasts Explore where they live Describe how they move and what they eat Observe signs of summer Compare with other seasons Understand changes in daylight and temperature
Substantive Knowledge	<ul style="list-style-type: none"> Humans have body parts with specific functions The five senses help us explore the world We need food, water, sleep, and hygiene to stay healthy Autumn has unique features (falling leaves, cooler weather) Trees lose leaves Days get shorter 	<ul style="list-style-type: none"> Animals have different body parts and features Animals live in habitats suited to their needs Baby animals grow into adults Plants grow from seeds and bulbs They need water, light, and soil Roots, stems, leaves, and flowers have roles 	<ul style="list-style-type: none"> Insects and bugs live in microhabitats - They have features like legs, wings, shells They eat different things (e.g. leaves, other insects) Summer is warm and sunny Plants grow fully Daylight is longer
Disciplinary Knowledge	<ul style="list-style-type: none"> Observing and naming Sorting and classifying Using simple explanations and observations Making observations over time Discussing and comparing changes 	<ul style="list-style-type: none"> Observing and comparing Asking questions Grouping and identifying features Observing over time Predicting outcomes Recording growth 	<ul style="list-style-type: none"> Observing in natural environments Using simple classification Drawing conclusions Comparing and contrasting Using evidence to explain changes
ELG			

Year Group	Year 1 Theme 1	Year 1 Theme 2	Year 1 Theme 3
Learning Theme	Animals Including Humans	Plants	Everyday Materials
National Curriculum Objectives	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

	<ul style="list-style-type: none"> Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. 		<ul style="list-style-type: none"> 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
Substantive Knowledge	<ul style="list-style-type: none"> Identify common animals (e.g., mammals, birds, fish, reptiles, insects). Understand key features of animals (e.g., fur, feathers, scales, legs). Know the difference between pets and wild animals. Know the basic needs of animals: food, water, air, and shelter. Understand different types of food for animals (herbivores, carnivores, omnivores). Introduction to human body parts and their functions (e.g., eyes, ears, mouth, legs). To know stages of growth in animals and humans (e.g., baby, child, adult). Understand how humans change as they grow (e.g., children become adults). Explore the concept of life cycles in animals (e.g., egg, larvae, adult). 	<ul style="list-style-type: none"> To know the names of common plants (e.g., trees, flowers, grasses). To introduction to the basic parts of a plant: root, stem, leaf, flower. Understand differences between plants (e.g., trees vs. flowers). To know what plants need to grow: sunlight, water, air, and soil. Understand the life cycle of a plant: seed, sprout, growth, flower, seed. To recognise the different stages of plant growth. Know different places where plants grow (e.g., gardens, forests, fields). Understand the importance of plants for animals and humans (food, oxygen, shelter). Understand that plants can grow in a variety of environments. 	<ul style="list-style-type: none"> Identify and name a variety of everyday materials (wood, plastic, metal, glass, fabric) Describe the properties of everyday materials (e.g., hard, soft, rough, smooth, waterproof) Understand that materials are used for different purposes based on their properties (e.g., metal for coins, wood for furniture) Explore how different materials can be used for different purposes Understand the basic concept of recycling and reusing materials Investigate the differences between natural and man-made materials Explore a range of materials used in everyday life and understand their properties in practical contexts Identify and describe materials used for making toys, tools, and structures Understand the idea of changing materials (e.g., bending metal, melting chocolate)

<p>Disciplinary Knowledge</p>	<ul style="list-style-type: none"> • Observing and naming animals in the environment (e.g., at school or in a park). • Sorting animals into groups based on their characteristics. • Drawing and labelling animals based on their features. • Investigating how animals get their food and what they need to live. • Observing and recording how animals eat or find shelter (e.g., in the garden or at home). • Asking simple questions about how animals and humans use their body parts. • Investigating and comparing the growth of animals (e.g., observing a caterpillar to butterfly). • Measuring and recording growth (e.g., how tall a child is over time). • Using evidence to talk about how animals grow and change. 	<ul style="list-style-type: none"> • Observe and naming common plants found around the school or home. • Draw and labelling the parts of a plant. • Sort and classifying plants by their characteristics (size, shape, colour). • Investigate how plants grow by planting seeds and observing their development. • Predict and observing how seeds change over time. • Measure and recording plant growth (e.g., height of plants). • Observe and comparing the types of plants found in different environments. • Investigating how plants provide food for animals and humans. • Discuss and recording how plants adapt to different environments (e.g., growing in shade, sun, or water). 	<ul style="list-style-type: none"> • Use simple observations to identify materials by their properties (texture, flexibility, hardness) • Sort materials by properties (grouping based on similarities) • Begin to ask questions and explore what happens when materials are combined or tested in different conditions • Conduct simple tests to explore the suitability of materials for specific purposes (e.g., waterproofing fabric) • Record and discuss results of simple investigations (using pictures, labels, or sentences) • Begin to use vocabulary related to materials in discussions and investigations (e.g., absorbent, transparent) • Use materials to create simple models and objects (e.g., building with plastic, wood, and fabric) • Use simple tools to manipulate materials (e.g., cutting, bending, folding) • Reflect on the results of making or testing objects, discussing changes to materials (e.g., shape, state)
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Year Group	Year 2 Theme 1	Year 2 Theme 2	Year 2 Theme 3	Year 2 Theme 4
Learning Theme	Living things and their habitats	Plants	Animals including humans	Every day materials
National Curriculum Objectives	<ul style="list-style-type: none"> Explore and compare the differences between things that are living, dead, and things that have never been alive Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including micro-habitats Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Notice that animals, including humans, have offspring which grow into adults Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene 	<ul style="list-style-type: none"> 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 materials can be changed by squashing, bending, twisting and stretching
Substantive Knowledge	<ul style="list-style-type: none"> To understand the definition of living, dead, and non-living things. To know characteristics of living things (growth, movement, reproduction, sensitivity, breathing, excretion, and nutrition). To know examples of living things in different environments (e.g., animals and plants). To understand different types of habitats (e.g., woodland, pond, ocean, desert). To understand that animals live in habitats that provide their basic needs (food, water, shelter, air). Explore simple adaptations of animals and plants in different habitats (e.g., thick fur in cold climates, long legs for running in the desert). Understand the idea of a simple food chain (e.g., plant → herbivore → carnivore). To know how animals, obtain food from plants and other animals. Understand the concept of producers, consumers, and decomposers. Know micro-habitats (e.g., under logs, in a pond) and the organisms that live there. 	<ul style="list-style-type: none"> Identify and name a variety of common plants (e.g., trees, flowers, shrubs). Understand the basic parts of plants: roots, stem, leaves, and flowers. Understand the role of each plant part in the plant's life (e.g., roots absorb water, leaves make food). To know what plants need to grow: light, water, air, and nutrients from soil. To understand the life cycle of a plant (seed, germination, growth, flowering, seed production). To know the importance of pollination for plant reproduction (basic concept). Understand Different habitats where plants grow (e.g., forests, gardens, fields). To know how plants depend on animals (e.g., bees pollinate flowers). Understand the importance of plants for life on Earth (providing oxygen, food, shelter). Introduction to trees and their life cycle (germination, growth, shedding leaves, and regrowth). 	<ul style="list-style-type: none"> To know different types of animals (mammals, birds, reptiles, etc.). To understand basic needs of animals (food, water, shelter, and air). To know different habitats and the animals that live there. To know stages of growth in animals, including humans. Understand basic needs for growth (nutrition, exercise, sleep). To Compare the growth of different animals. To understand Parts of the human body (e.g., head, arms, legs) and their functions. To know the five senses and their role in our lives. To know ways to stay healthy: hygiene, exercise, nutrition, and rest. 	<ul style="list-style-type: none"> Identify and name a range of everyday materials (e.g., wood, plastic, paper, fabric, glass, metal) Understand and describe the properties of materials (e.g., hard, soft, waterproof, absorbent, flexible) Recognise that materials have different uses based on their properties (e.g., waterproof materials for coats) Explore how materials can be used for different purposes and why certain materials are chosen (e.g., materials for a chair, umbrella, etc.) Understand the basic principles of joining materials (e.g., gluing, stapling, folding) Identify how materials can be changed or adapted (e.g., bending, stretching, cutting) Recognise the importance of recycling and reusing materials to help the environment Understand that some materials can be easily changed (e.g., melting, freezing, bending) Investigate different materials used in everyday products (e.g., clothes, food packaging, toys)

<p style="text-align: center;">Disciplinary Knowledge</p>	<ul style="list-style-type: none"> • Sorting and classifying objects as living, dead, or non-living. • Asking simple questions to explore the differences between living, dead, and non-living things. • Observing and recording findings through pictures and notes. • Identifying how different plants and animals are suited to their habitats. • Comparing and contrasting different habitats through investigations. • Investigating how animals and plants adapt to survive in their environments. • Drawing and explaining simple food chains. • Using resources such as books or videos to identify and explain sources of food for different animals. • Using investigation skills to find examples of food chains in the natural world. • Identifying and naming plants and animals in a micro-habitat. 	<ul style="list-style-type: none"> • Observing and identifying different types of plants in the local environment. • Classifying and sorting plants based on features such as size, shape, or color. • Asking questions about plant parts and their functions. • Conducting simple investigations to observe how plants grow under different conditions (e.g., with/without light). • Making predictions and observations about how plants change over time. • Measuring plant growth (height, number of leaves, etc.) and recording observations. • Exploring the types of plants that grow in different habitats (e.g., cacti in deserts, mosses in shady places). • Investigating the relationship between plants and their environment, including how plants adapt to different conditions. • Identifying and naming plants and understanding their role in the ecosystem. • Comparing and contrasting different types of plants, including trees and flowers. 	<ul style="list-style-type: none"> • Observing and comparing animals in their habitats. • Recording observations (e.g., through drawings or photos). • Asking simple questions about how animals survive in different environments. • Investigating life cycles (e.g., butterfly or frog). • Measuring growth over time (e.g., plant or animal growth). • Using evidence to discuss why living things grow and change. • Asking questions about how the body works (e.g., why we need to eat healthy). • Investigating how different foods or activities affect our bodies. • Recording data and making conclusions from simple experiments (e.g., how exercise affects heart rate). 	<ul style="list-style-type: none"> • Use observation skills to identify materials based on their properties • Sort and group materials by properties (e.g., by texture, strength) • Make simple comparisons between different materials' properties and their uses • Conduct simple experiments to test material properties for specific purposes (e.g., testing which material is the most waterproof) • Plan and design a simple object or model using appropriate materials (e.g., building a structure) • Observe and record changes to materials when they are manipulated or tested • Investigate how materials can be reused or recycled (e.g., sorting materials, exploring what can be recycled) • Use tools to manipulate and experiment with materials (e.g., cutting, heating, bending) • Discuss and record the results of experiments and investigations (using simple charts or drawings)
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Year Group	Year 3 Theme 1	Year 3 Theme 2	Year 3 Theme 3	Year 3 Theme 4	Year 3 Theme 4
Learning Theme	Animals including humans	Plants	Rocks	Light	Forces and magnets
National Curriculum Objectives	<ul style="list-style-type: none"> Identify that animals, including humans, need the right types and amounts 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 	<ul style="list-style-type: none"> 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 they vary from plant to plant Investigate the way in which water is transported through plants Explore the part that flowers play in life cycles of flowering plants, including pollination, seed transformation and seed dispersal 	<ul style="list-style-type: none"> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter 	<ul style="list-style-type: none"> Recognise that they need light in order to see things and that dark is the absence of light Notice that light is reflected from surfaces Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Recognise that shadows are formed when the light source is blocked by an opaque object Find patterns in the way that the size of shadows changes 	<ul style="list-style-type: none"> Compare how things move on different surfaces Notice that some forces need contact between two objects, but magnetic forces can act at a distance Observe how magnets attract or repel each other and attract some materials and not others Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials Describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing
Substantive Knowledge	<ul style="list-style-type: none"> To know that animals (including humans) need the right types and amounts of nutrition. Understand that animals cannot make their own food and get nutrition from what they eat. Introduction to food groups and balanced diet. Identify that humans and some animals have skeletons and muscles. Know the functions of the skeleton: support, protection, and movement. Understand how muscles work in pairs to move bones. Know the basic needs of humans and animals for survival. Understand how diet, exercise, and hygiene affect health. Recognise changes in the human body over time (e.g. growing, strengthening). 	<ul style="list-style-type: none"> Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves, and flowers Understand the role of each part in supporting the plant's growth and life processes. Explore what plants need to grow and stay healthy: water, light, and a suitable temperature. Know that different plants have different needs. Investigate how water is transported within plants. Understand the life cycle of a flowering plant, including pollination, seed formation, and seed dispersal. 	<ul style="list-style-type: none"> Identify and name a variety of common rocks (e.g. granite, limestone, sandstone). Describe key properties: hardness, texture (grain size), permeability. Know everyday uses of different rocks (building, sculpting, gravel). Understand how fossils form when plants or animals are buried in sedimentary rock. Recognise and describe basic fossil types (e.g. ammonites, leaf imprints). Appreciate fossils as evidence of past life and environments. Know that soil is composed of weathered rock particles and organic matter. Identify different soil types (sandy, clay, loam) and their properties (drainage, texture). Understand the processes of weathering and erosion in breaking down rock. 	<ul style="list-style-type: none"> To know light is needed to see and darkness is the absence of light. Understand that the sun is a natural light source and that some objects reflect light. Recognise that light travels in straight lines. Shadows are formed when light is blocked by an opaque object. Shadows can change in size and shape depending on the light source position. Recognise that some surfaces reflect light better than others. Understand how reflective materials help with visibility and safety. Understand that looking directly at the sun can be dangerous. 	<ul style="list-style-type: none"> Know that forces are pushes and pulls. Understand that objects move differently on different surfaces. Compare how things move depending on whether they are pushed or pulled. Understand that magnets attract some materials and not others. Know that magnets have two poles (north and south). Predict whether two magnets will attract or repel based on their poles. Know that magnetic force can act at a distance. Identify magnetic materials. Explore real-life uses of magnets

Disciplinary Knowledge	<ul style="list-style-type: none"> • Ask relevant questions about diet and nutrition. • Use secondary sources to research food groups. • Record findings using diagrams, tables and labels • Set up simple comparative tests (e.g. strength with and without support). • Use models to explore how muscles and skeletons work. • Make systematic observations and measurements. • Gather and record data (e.g., effect of exercise on heart rate). • Report on findings using simple scientific language. • Use results to draw conclusions about healthy lifestyles. 	<ul style="list-style-type: none"> • Use scientific vocabulary to describe plant parts. • Make careful observations using magnifying glasses. • Label diagrams and record findings clearly. • Set up simple investigations to test what plants need to grow (e.g., no light, no water). # • Make predictions and use results to draw conclusions. • Observe and describe how water moves through a plant (e.g., celery experiment). • Record changes over time using drawings, charts or time-lapse photography. • Ask and answer questions based on evidence gathered. 	<ul style="list-style-type: none"> • Carry out simple tests to compare rock hardness (scratch tests) and permeability (water drip tests). Sort and group rocks by observable properties. • Record observations with annotated drawings and simple data tables. • Use secondary sources (books, videos) to investigate how fossils form. • Create a model “fossil” using clay/plaster and a leaf or shell • Sequence the steps of fossil formation and present findings in a timeline. • Collect and compare soil samples from different locations. • Use sieves and water tests to separate and observe soil components • Measure and chart soil drainage rates; draw conclusions about suitability for plant growth. 	<ul style="list-style-type: none"> • Make predictions and observations about light and dark. • Sort objects into light sources and reflectors. • Record observations in drawings, tables or short descriptions. • Set up and carry out simple shadow experiments. • Measure shadow length over time and record results. • Use simple equipment (e.g. torch, ruler, objects) to test ideas. • Compare reflectivity of different materials using torches. • Draw conclusions about the best materials for safety clothing. • Ask and answer scientific questions based on evidence. 	<ul style="list-style-type: none"> • Ask questions and set up comparative tests (e.g., which surface allows objects to slide the furthest). • Make systematic observations and measurements (e.g., distance travelled). • Record results using tables or bar charts. • Test different objects to see if they are magnetic. • Use magnets to explore attraction and repulsion. • Make predictions based on previous tests. • Investigate how magnets are used in everyday life. • Use models and explanations to show how magnetic force works. • Draw conclusions from evidence gathered and explain reasoning.
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Year Group	Year 4 Theme 1	Year 4 Theme 2	Year 4 Theme 3	Year 4 Theme 4	Year 4 Theme 5
Learning Theme	Living things and their habitats	Animals including humans	States of matter	Sound	Electricity
National Curriculum Objectives	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Describe the simple functions of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions Construct and interpret a variety of food chains, identifying producers, predators and prey 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
Substantive Knowledge	<ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. Understand classification using observable features. Use classification keys to help group, identify and name living things in local and wider environments. Know what different habitats provide for living things. Recognise that environments can change and that this can pose dangers to living things Understand the impact of natural and human changes (e.g., flooding, pollution, deforestation). 	<ul style="list-style-type: none"> Identify different types of human teeth and their functions (incisors, canines, molars). Describe the basic functions of the digestive system (mouth, stomach, intestines). Understand the role of diet and nutrients in keeping animals (including humans) healthy. Construct and describe simple food chains (producers, predators, prey). Know the impact of exercise, hygiene and nutrition on the human body. Understand how muscles and skeletons support movement and protect the body. 	<ul style="list-style-type: none"> Identify and classify solids, liquids, and gases. Understand that materials can exist in different states depending on temperature. Know the properties of solids (fixed shape), liquids (fixed volume), and gases (no fixed shape or volume). Understand how heating and cooling can change the state of a material (e.g., melting, freezing, condensation, evaporation). Observe and explain how water changes state. Know how the states of matter are used in real-life applications (e.g., cooking, freezing, energy production). Identify materials that are typically solid, liquid, or gas at room temperature. 	<ul style="list-style-type: none"> Know sound is produced by vibrating objects and travels through a medium (solid, liquid, gas). Understand sound travels at different speeds through different materials. To know the pitch of a sound is linked to the frequency of vibration. Understand the volume of sound is determined by the amplitude of the vibrations. Understand the pitch and volume can be changed by adjusting the vibration (e.g., tightness of a string, force of a blow). Investigate how sound travels through different materials (e.g., air, water, solid). Recognise that sound is used in many aspects of daily life, including music and communication. Understand how musical instruments make sound (e.g., strings, air, percussion). Explore soundproofing materials and their properties. 	<ul style="list-style-type: none"> Identify and name the basic components of a simple electrical circuit (battery, wire, bulb, switch) Understand how a circuit works and what it needs to function. Investigate the role of switches in circuits and how they control the flow of electricity. Understand the function of different components (e.g., bulbs, buzzers) in a circuit. Recognise the importance of electrical safety. Investigate how electricity can be conserved in homes and schools. Understand renewable and non-renewable energy sources.

<p>Disciplinary Knowledge</p>	<ul style="list-style-type: none"> • Use Venn diagrams and tables to classify and group organisms. • Make careful observations and use standard scientific vocabulary. • Use and create simple classification keys. • Carry out fieldwork to investigate habitats (school grounds, pond, woodland). • Use secondary sources to research unfamiliar habitats. • Ask and answer questions based on real-world environmental issues. • Present findings using charts, posters or digital media. • Suggest actions to protect habitats based on evidence gathered. 	<ul style="list-style-type: none"> • Observe and compare the teeth of different animals. • Use models or diagrams to describe the digestive system. • Record observations using labelled drawings and scientific vocabulary. • Group foods by nutritional value. Set up simple enquiries about balanced diets. • Create and explain food chains using arrows to show energy transfer. • Measure pulse rate before and after exercise. • Record data using charts and graphs. • Make predictions, draw conclusions and evaluate effects of lifestyle choices. 	<ul style="list-style-type: none"> • Observe and sort different materials based on their state (solid, liquid, gas). • Use diagrams or models to represent the particles in each state. • Record observations and sort objects in tables. • Investigate how temperature changes the state of water (e.g., freezing and boiling). • Use thermometers and record temperatures during experiments. • Design and carry out investigations to compare different materials' melting and freezing points. • Investigate how changes in state affect everyday processes (e.g., ice melting, water boiling). • Collect and present data about the time it takes for substances to change state. • Apply knowledge of states to create solutions or recommendations (e.g., materials for insulating). 	<ul style="list-style-type: none"> • Set up experiments to observe how sound travels through different materials (e.g., string, air, water). • Use models or diagrams to show how sound is produced (vibration) and how it travels. • Record and interpret data on sound travel and volume. • Investigate how changing the strength or frequency of vibrations affects pitch and volume. • Make predictions about how materials affect sound transmission and test using experiments. • Record results systematically and make observations about different sounds and their characteristics. • Design and carry out investigations to explore how different instruments produce sound. • Measure and compare the volume and pitch of different sounds. • Use different materials to explore soundproofing and identify which materials absorb or reflect sound. 	<ul style="list-style-type: none"> • Build simple circuits and test them. • Investigate what happens when components are added or removed from a circuit. • Record findings using circuit diagrams. • Use switches to control the flow of electricity in circuits. • Predict and test how changes in components (e.g., bulbs, wires) affect the circuit. • Present findings using models or labelled diagrams. • Conduct experiments to test materials that conduct or insulate electricity. • Design and create simple electrical projects (e.g., a buzzer, light-up card). • Use evidence to recommend energy-saving ideas or devices.
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Year Group	Year 5 Theme 1	Year 5 Theme 2	Year 5 Theme 3	Year 5 Theme 4	Year 5 Theme 5
Learning Theme	Living things and their habitats	Animals including humans	Properties and changes of materials	Earth and space	Forces
National Curriculum Objectives	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Describe the changes as humans develop to old age 	<ul style="list-style-type: none"> Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Use knowledge of solids, liquids and gases to describe how mixtures might be separated, including through filtering, sieving and evaporating Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Demonstrate that dissolving, mixing and changes of state are reversible changes Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

Substantive Knowledge	<ul style="list-style-type: none"> • Learn about the classification of living things into kingdoms (animals, plants, fungi, etc.) • Understand the features of different groups (e.g., mammals, birds, insects) • Investigate the structure and function of different parts of organisms. • Understand how species are adapted to their environments (e.g., camouflage, migration). • Recognise how environmental factors drive evolutionary changes. • Explore how animals and plants are adapted to survive in extreme conditions (e.g., deserts, arctic). • Investigate the impact of human activities on habitats (e.g., deforestation, pollution). • Understand how species are affected by habitat loss and climate change. • Explore conservation efforts to protect endangered species. 	<ul style="list-style-type: none"> • Identify the main parts of the human body and their functions. • Understand the skeletal, muscular, and digestive systems. • Recognise the importance of a healthy lifestyle (e.g., exercise, diet). • Investigate the heart, blood, and blood vessels in the circulatory system. • Understand the role of the circulatory system in transporting nutrients and oxygen. • Recognise the importance of blood circulation for overall health. • Understand human growth from infancy to adulthood. • Learn about the stages of human development and the reproductive system. • Explore the role of nutrition, exercise, and lifestyle in growth. 	<ul style="list-style-type: none"> • Identify and describe the properties of materials (e.g., hardness, solubility, conductivity). • Understand how materials are chosen for different purposes based on their properties (e.g., glass for windows, rubber for tyres). • Recognise that materials can change in different ways (e.g., heating, cooling, dissolving). • Investigate the process of melting, freezing, dissolving, and evaporating. • Understand how some changes are temporary and others permanent. • Understand the difference between reversible (e.g., melting, freezing) and irreversible changes (e.g., burning, rusting) • Investigate how substances can be changed permanently (e.g., cooking, burning). • Explore changes in materials and how they affect the environment. 	<ul style="list-style-type: none"> • Identify the names and order of the planets in the solar system. • Understand the characteristics of each planet (e.g., size, composition). • Know about other celestial bodies (e.g., moons, asteroids, comets). • Understand that the Earth rotates on its axis and revolves around the Sun. • Recognise the impact of the Earth's movements on day and night and the seasons. • Explore the concept of the tilt of the Earth and how it affects the seasons. • Investigate the history and progress of space exploration (e.g., space missions, the moon landing). • Learn about space technology and how humans explore space (e.g., satellites, space stations). • Understand the size and scale of the universe and the role of telescopes. 	<ul style="list-style-type: none"> • Recognise and describe different types of forces (e.g., push, pull, friction). • Understand how forces can change the movement of an object (e.g., stopping, starting, changing direction). • Investigate the role of friction in everyday life (e.g., brakes, walking). • Investigate how different forces act on objects, such as gravity and friction. • Understand how forces can cause objects to move faster or slower. • Learn about balanced and unbalanced forces and their effects on motion. • Investigate the effect of gravity on different objects and how it pulls objects towards Earth. • Understand the role of air resistance in motion and how it slows down objects • Explore how the force of gravity affects different objects in space
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Disciplinary Knowledge	<ul style="list-style-type: none"> • Use classification keys to identify organisms. • Observe, compare, and contrast features of different species. • Organise and record data on groups of living things using charts, diagrams, and tables. • Compare adaptations of species in different habitats. • Use models to demonstrate how adaptations help organisms survive. • Carry out investigations to explore how physical changes affect an organism's survival. • Collect and analyse data on human impacts in local environments. • Investigate conservation strategies (e.g., recycling, sustainable farming) • Discuss ethical issues related to environmental protection and species conservation. 	<ul style="list-style-type: none"> • Use diagrams and models to label and explain the different systems of the body. • Conduct investigations to explore the effects of exercise on the body. • Record and analyse data on healthy habits (e.g., heart rate). • Model the circulatory system using diagrams or physical models. • Investigate the effects of physical activity on heart rate • Record and present data on how the heart works and how it can be affected by lifestyle choices. • Observe and compare the growth and development of humans and other animals. • Conduct experiments on nutrition and its effects on growth. • Use charts or graphs to present data on human development stages. 	<ul style="list-style-type: none"> • Conduct experiments to test the properties of different materials (e.g., which materials are waterproof, flexible, or conductive?). • Use observation and classification to group materials based on their properties. • Record and communicate findings using tables and charts. • Design and carry out investigations to observe how materials change when heated or cooled. • Use models to demonstrate how changes like dissolving or evaporating occur. • Measure and observe the effects of changes in materials through experiments. • Conduct experiments to demonstrate reversible and irreversible changes (e.g., freezing and boiling water, burning paper). • Observe and document the physical and chemical changes that occur in different materials. • Record and interpret findings using graphs or scientific reports. 	<ul style="list-style-type: none"> • Use models (e.g., orrery, diagrams) to represent the solar system. • Create a scale model to compare the sizes and distances of planets. • Investigate the movement of the planets and how they orbit the Sun. • Record and describe the Earth's movements using observational tools. • Use globes and models to demonstrate how the Earth rotates and orbits. • Calculate and measure the length of a day, using time and shadow observations. • Research and present information on space missions and significant discoveries. • Create and interpret diagrams of the solar system, the Earth's movement, and lunar phases. • Use digital tools and space websites to explore the universe 	<ul style="list-style-type: none"> • Conduct simple experiments to explore the effect of forces on objects • Measure and record the distance, speed, or time affected by forces. • Use force meters and other tools to measure and compare forces. • Use diagrams and models to demonstrate how forces act on objects. • Investigate the relationship between mass, force, and motion using practical experiments • Observe and measure how forces cause movement (e.g., using toy cars, springs, or pulleys). • Conduct experiments to investigate how gravity affects different objects • Test air resistance using simple objects • Use tools such as timers and measuring tapes to collect data on motion and resistance.
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Year Group	Year 6 Theme 1	Year 6 Theme 2	Year 6 Theme 3	Year 6 Theme 4	Year 6 Theme 5
Learning Theme	Living things and their habitats	Animals including humans	Evolution and inheritance	Light	Electricity
National Curriculum Objectives	<ul style="list-style-type: none"> Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals Give reasons for classifying plants and animals based on scientific characteristics 	<ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Recognise the impact of diet, drugs and lifestyle on the way their bodies function Describe the ways in which nutrients and water are transported within animals, including humans 	<ul style="list-style-type: none"> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution 	<ul style="list-style-type: none"> Recognise that light appears to travel in straight lines Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them 	<ul style="list-style-type: none"> Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches Use recognised symbols when representing a simple circuit in a diagram
Substantive Knowledge	<ul style="list-style-type: none"> Recognise and classify living things into broad groups (plants, animals, microorganisms). Understand key features of vertebrates and invertebrates. Use classification keys to sort living things based on characteristics. Understand that micro-organisms are living things. Identify the roles of bacteria, fungi, and viruses (both helpful and harmful). Explore how living things exist in microhabitats and how this affect survival. Describe how living things are adapted to environments (e.g., desert, polar, aquatic). Understand natural selection and its role in evolution. Explore examples of how animals and plants have evolved over time. 	<ul style="list-style-type: none"> Identify and describe the main parts and functions of the human body (organs, skeleton, muscles). Understand how different body systems work together (e.g., digestive and respiratory). Know the key parts of the circulatory system: heart, blood, blood vessels. Understand how blood circulates and the functions of different blood component Explore how oxygen and nutrients are transported in the body. Understand the impact of a healthy lifestyle on the human body. Identify the effects of diet, exercise, drugs and alcohol on health. Explore how lifestyle choices affect long-term health and wellbeing 	<ul style="list-style-type: none"> Understand the difference between inherited and environmental characteristics. Recognise that offspring vary and are not identical to their parents. Explore examples of inheritance in humans, animals, and plants. Understand how fossils are formed and what they can tell us about the past. Learn that fossils provide evidence for how living things have changed over time. Know that living things have evolved from earlier forms. Explore how adaptation helps living things survive in their environments. Understand that adaptation can lead to evolution. Know that over long periods, small changes can result in new species 	<ul style="list-style-type: none"> Understand light travels in straight lines. Know objects are seen because they give out or reflect light into the eye. Understand the eye receives light, which enables us to see Understand shadows are formed when an opaque object blocks light. Know the size and shape of shadows change depending on the angle of the light source. Know light reflects off surfaces at the same angle it hits them Know refraction occurs when light passes through transparent materials (e.g. water, glass). To know light can be dispersed into different colours (spectrum). Understand optical tools (periscopes, prisms, magnifiers) use light in different ways. 	<ul style="list-style-type: none"> Recognise symbols for components (bulb, buzzer, motor, switch, cell, battery). Understand how electricity powers devices and travels in a circuit. Know the differences between series and parallel circuits Understand that the brightness of a bulb or volume of a buzzer depends on voltage and number of components. Know how changing one component can affect others. Recognise the function of switches and variable resistors Understand how electrical systems are applied in real-world contexts (alarms, lighting systems, control systems). Link learning to DT projects (e.g., designing a product using circuits). Revise key symbols and circuit design
Disciplinary Knowledge	<ul style="list-style-type: none"> Use and create branching keys to classify living organisms. Make detailed observations to group organisms accurately. 	<ul style="list-style-type: none"> Label diagrams of the body and organs accurately. Use models and visual aids to explore how body systems are connected. 	<ul style="list-style-type: none"> Observe and compare inherited traits in plants and animals. Group living things based on characteristics. 	<ul style="list-style-type: none"> Use models to explain how light travels. Create simple diagrams showing how we see objects. 	<ul style="list-style-type: none"> Construct series circuits using correct symbols and components. Record observations using drawings and labelled diagrams.

	<ul style="list-style-type: none"> Record and report using scientific diagrams and tables. Plan and carry out fair tests (e.g., mould growth under different conditions). Observe and record growth of micro-organisms (e.g., yeast, mould) Interpret data and identify patterns between habitat and organism success. 	<ul style="list-style-type: none"> Record findings using drawings, labelled diagrams and written explanations Design and carry out investigations on pulse rate and heart function. Record and analyse data using tables and graphs. Interpret scientific diagrams and explain how the circulatory system works. Plan and carry out fair tests (e.g. effects of exercise on heart rate). Record data on physical changes over time. Draw conclusions and explain findings using scientific evidence and vocabulary. 	<ul style="list-style-type: none"> Use scientific vocabulary to describe variation and inheritance Examine fossil samples/images and interpret evidence. Construct timelines to show changes over time. Research famous scientists such as Darwin and Wallace Investigate how animals/plants are adapted to their environments. Use models to demonstrate how natural selection works. Present findings on how adaptation influences survival. 	<ul style="list-style-type: none"> Record findings using labelled diagrams and explanations Set up fair tests to explore how different materials affect shadow size and clarity. Measure angles and shadow lengths using light sources. Record and interpret results using graphs and charts. Plan and carry out investigations (e.g., how lenses bend light). Use scientific vocabulary to explain findings. Apply knowledge to solve problems (e.g., designing a periscope or sundial). 	<ul style="list-style-type: none"> Predict and explain what happens if parts are changed or removed. Investigate the effects of changing variables (voltage, number of bulbs). Use circuit diagrams to record investigations. Interpret results and suggest improvements to circuits Apply knowledge to solve real-world problems through design. Collaborate on building and evaluating a working model. Justify design choices using scientific understanding
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