

BEDS Science Long Term Plan

Reception EYFS							
<u>Reception</u>	<i>Unit</i>	Term 1 - All about me	Term 2 - celebrations	Term 3 - animals	Term 4 - materials	Term 5 - traditional tales	Term 6 - seasons
	Core Knowledge	<p>I know that... I hear with my ears. I taste with my tongue. I see with my eyes. I touch with my hands and feet. I smell with my nose.</p> <p>I know where to point to my.... head, nose, eyes, ears, hands, feet, legs, arms, toes, shoulders, knees, neck, tummy, chest.</p>	<p>I know that a.... spider has legs, eyes and fangs.</p> <p>I know that... water can freeze and turn into ice.</p> <p>I know that... ice can melt and turn into water.</p>	<p>I know that... hedgehogs and bears hibernate.</p> <p>I know that... not all animals hibernate over winter.</p>	<p>I know there are different materials other than fabric.</p> <p>I know what the properties are of some materials.</p> <p>I know that plastic, metal, rock, fabric and wood are materials</p>	<p>I know what materials you would need to build a strong house.</p> <p>I know what waterproof, heavy, light, float, wet and dry means.</p> <p>I know what happens to some materials when they get wet.</p> <p>I know some materials do not absorb water.</p>	<p>I know the 4 seasons: Spring, Summer, Autumn and Winter.</p> <p>I know some words to describe what each season is like.</p>
	Knowledge	<p>I know the names of some of my body parts. I know that a baby grows into a toddler then a child then a teenager then adult.</p>	<p>I can talk about and point out a spiders web. I can talk about changes I can see happening to a solid.</p>	<p>I can say why habitats are important to animals. I know what hibernation means and why animals hibernate.</p>	<p>I can name different materials not just fabric. Such as wood, metal, plastic and fabric and rock. I can describe the properties of some materials.</p>	<p>I know what absorption means. I can talk about what materials are waterproof and why. I can talk about the materials needed to build a house.</p>	<p>I can talk about the changes in the environment around me. I can talk about the different colours of the leaves of the trees. I can talk about how I</p>

				I can name some animals that hibernate.		I say what happens to materials such as cardboard and paper when they get wet.	feel (temperature) in different seasons.
Vocab	Head, nose, ears, neck, leg, knee, foot, toes, arm, hands, fingers, chest, tummy. Baby, toddler, teenager, adult, elderly. Sight, sound, taste, smell, touch.	Spider, Halloween, head, body, fangs, legs, eyes. Creepy crawlies, Christmas, snow, units, chocolate, cold, freezing, melting, soft.	Animal, seasons, hibernation, habitat, warm, cold, rest, fat, movement, Earth, live, weather, food, shelter.	Materials, properties, dull, shiny, stiff, stretchy, malleable, hard, soft, flexible, rough, smooth, scientist.	Hard Wet, dry, absorption, waterproof, wind, liquid, float, blow, strong, hard, light, heavy, material	Summer, autumn, winter, spring, gripped, dew, trees, wise, shiver, bowers, shimmering, scamper, chill, blossom, melting, flit, cold, frosty, windy.	
EYFS Framework ELG + Development Matters Statements	<p>ELG: Explore the world around them, making observations and drawing pictures of themselves and others.</p> <p>ELG: Know similarities and differences between the natural world around them</p> <p>ELG: Work and play cooperatively</p>	<p>ELG: I can explore the world around me, making observations of colour.</p> <p>ELG: I can participate in discussions and offer my own ideas using scientific words.</p> <p>ELG: I understand some important processes and changes in the</p>	<p>Development Matters: I can understand the similarities and differences of animals in this country and in other countries.</p> <p>I can recognise some environments that are different to the one in which they live.</p> <p>I can understand the effect of changing</p>	<p>Development Matters:</p> <p>UTW 3-4 Year Olds - Use all their senses in hands-on exploration of natural materials.</p> <p>UTW 3-4 Year Olds - Explore collections of materials with similar and/or different properties.</p> <p>UTW 3-4 Year Olds - Talk about the differences between</p>	<p>ELG: Speaking - Offer explanations for why things might happen, making use of recently introduced vocabulary from stories.</p> <p>ELG: Natural World - Understand some important processes and changes in the natural world around them, drawing on their experiences of what has been read in class.</p>	<p>ELG: I can explore the world around me, making observations of colour.</p> <p>ELG: I can participate in discussions and offer my own ideas using scientific words.</p> <p>ELG: I understand some important processes and changes in the world, including colour and how they change by mixing.</p>	

		and take turns with others.	world, including colour and how they change by mixing.	seasons on the natural world. I can engage in non-fiction books. I can revise and refine my fundamental movement skills.	materials and changes they notice. C&L Reception - Learn new vocabulary	ELG: Speaking – offer explanations for why things might happen, making use of recently introduced vocabulary from stories when appropriate.		
	Working Scientifically /Scientific Enquiry	<ul style="list-style-type: none"> • Ask how and why questions (Asking questions). • To Show curiosity and question why things happen (Prediction) • Observe and describe what they see using everyday language (Observation) • WS: I can make careful observations • SE: I can identify different liquids. • WS: I can ask and answer simple questions linked to my test. • SE: I can carry out a simple test. • WS: I Can plan simple tests • SE: I can carry out simple tests 						
							ELG: Speaking – offer explanations for why things might happen, making use of recently introduced vocabulary from stories when appropriate	
Year 1								
		Term 1	Term 2 + 3		Term 4 + 5		Term 6	

<u>Year 1</u>	Unit	Seasonal Changes Needs to be taught all year	Animals including Humans (Ext Unit)	Materials – Science Week + (Ext Unit)	Plants
	Core Knowledge <i>I will know that...</i>	<ul style="list-style-type: none"> • There are 4 Seasons. • Spring, summer, autumn and winter. • It feels colder in the Winter and Warmer in the Summer. 	<ul style="list-style-type: none"> • Humans have 5 senses • Sight, touch, taste, smell, hear • You can touch with your hands. • You can taste with your mouth. • You can see with your eyes. • You can hear with your ears. • You can smell with your nose. 	<ul style="list-style-type: none"> • Wood, Metal, Water, plastic and glass are materials and have different properties. • Wood and metal are hard. • Plastic is waterproof. • Some metals are magnetic. 	<ul style="list-style-type: none"> • A tree has a trunk, branches and leaves. • Trees that lose their leaves in Autumn/Winter are deciduous trees. • Trees that keep their leaves all year round are Evergreen Trees. • Seeds can be found in fruit and vegetables. • Parts of a flower include: roots, leaves, petal flower
	Knowledge	<ul style="list-style-type: none"> • There are 4 seasons: • Spring (March, April and May) 	<ul style="list-style-type: none"> • We have 5 senses. These are sight, touch, taste, smell, hear. There are names for the different parts of 	<ul style="list-style-type: none"> • Wood is a strong material 	<ul style="list-style-type: none"> • Seeds come in all shapes and sizes and

		<ul style="list-style-type: none"> • Summer (June, July, August) • Autumn (September, October, November) • Winter (December, January, February) • Days are longer in the Summer and shorter in the Winter. • Weather is colder in the Winter and warmer in the Summer. • The weather describes how warm, cold, dry, windy, cloudy or wet it is at a time and place. 	<p>our body including: head, mouth, teeth, skin, eyes, legs and hands.</p> <ul style="list-style-type: none"> • Mammals have hair or fur and give birth to live young. • Birds have 2 legs, wings and feathers. Birds lay eggs. • Amphibians live on land and water and lay many eggs. They are cold-blooded and have webbed feet. • Reptiles are cold blooded, they have dry skin or scales. • Fish live in water breathing through gills not lungs. They have scales and fins and are cold blooded. 	<ul style="list-style-type: none"> • Wood is hard and strong • Metal can be hard, strong and shiny. • Water is runny, wet and clear. • Plastic can be strong, shiny and bendy. • Glass is transparent, smooth and brittle. • Rock is hard, strong and rigid. • Waterproof is something that keeps water out. Plastic is a waterproof material. An umbrella is waterproof. • Some materials sink and some float. If materials are heavy (dense) they sink, if they are light (less dense) they float. 	<p>can be found in fruits and vegetables.</p> <ul style="list-style-type: none"> • Evergreen trees: keeps leaves all year round e.g. pine, cedar, Holly, fir. • Deciduous trees: shed their leaves annually e.g. Oak, Maple, Hawthorn, Sycamore, Beech and Elm. • Parts of a flower include: roots, leaves, petal flower • Structure of a tree include: roots, trunk, branches, leaves, flowers.
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	Skills	<ul style="list-style-type: none"> • Can name four seasons and identify when in the year they occur. • Can observe and describe weather in different seasons. • Can describe days being longer in summer and shorter in winter. • Present data in tables charts and compare seasons. 	<ul style="list-style-type: none"> • Can name a range of animals which includes animals from each of the vertebrate groups. • Can describe the key features of named animals. • Can label key features on a picture/diagram. • Can describe what a range of animals eat. • Can compare and classify animals. 	<ul style="list-style-type: none"> • Can label a picture/diagram of an object made from different materials. • Can describe the properties of materials. • Can sort materials using their properties. • Can test evidence to answer a question. 	<ul style="list-style-type: none"> • Can name trees and other plants they see regularly. • Can describe key features of the trees and plants e.g. shapes of leaves/colour of the flower/blossom. • Can point out trees which lost their leaves and those who keep them all year. • Can point to and name parts of a plant.

					<ul style="list-style-type: none"> • Can use simple charts to sort. • Can use photos to talk about how plants change.
Vocab	Weather (sunny, rainy, windy, snowy etc) Seasons (winter, summer, spring, autumn) sun, sunrise, sunset, Day length	Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, reptile, amphibian, mammal, omnivore, carnivore, herbivore, all senses.	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through.	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Names of trees in local area, garden and wild flowering plants. Daisy Buttercup Dandelion Stinging nettle Primrose Snowdrop Bluebell	
NC links Statutory Requirements Pupils should be taught to:	<ul style="list-style-type: none"> • Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies. 	<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"> • Distinguish between an object and the material from which it is made. Identify and name a variety of everyday 	<ul style="list-style-type: none"> • Identify and name a variety of common wild and garden plants, including deciduous 	

			<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. 	<p>materials, including wood, plastic, glass, metal, water, and rock.</p> <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. 	<ul style="list-style-type: none"> • and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees
	<p>Working Scientifically</p>	<ul style="list-style-type: none"> • Ask simple questions and recognise that they can be answered in different ways. • Observe closely, using simple equipment • Perform simple tests • Identifying and classifying • Use their observations and ideas to suggest answers to questions. • Gather and record data to help in answering questions. 			

Year 2

		Term 1	Term 2	Term 3 + 4	Term 5 + 6
<u>Year 2</u>	Unit	Living Things and Habitats	Materials	Animals including humans (Ext Unit) Science Week	Plants (Ext Unit)
	<i>Core Knowledge I will know that.....</i>	<ul style="list-style-type: none"> • A habitat is a place where something lives. • A Microhabitat is a very small habitat. Habitat within a habitat. • A Biome is a specific environment home to living things suited to the place or climate 	<ul style="list-style-type: none"> • All materials have properties. • I can name materials and their properties: • Wood • Brick • Plastic • Metal • Materials can be changed. They can be squashed, bent, stretched, twisted, pushed, pulled and squeezed. 	<ul style="list-style-type: none"> • A Lifecycle is a series of changes that an animal passes through from birth to death. • To stay alive animals need water, food and air. • There are 5 food groups. • We need to eat the right types of food and do the right amount of exercise. 	<ul style="list-style-type: none"> • Seeds come in all shapes and sizes and can be found in fruits and vegetables. • There are different parts of a flower. • The start of growth is called germination. • Flowers need certain conditions to grow.
	<i>Knowledge</i>	<ul style="list-style-type: none"> • A Biome is a specific environment home to living things suited to the place or climate e.g. rainforest, desert, tundra, woodland, grasslands, savannah. • A Microhabitat is a very small habitat. Habitat within a 	<ul style="list-style-type: none"> • Wood is hard, stiff, strong, opaque, can be carved or formed into any shape. • Brick is strong, stiff, opaque, structural, can be solid or hollow. Vary in size and colour. • Plastic is waterproof, strong, can be made to be 	<ul style="list-style-type: none"> • We need to drink plenty of water. To stop illness and infections spreading, we must be hygienic and keep ourselves clean. • When we feel poorly, we may need to take medicines to help make us well again. We may need to see the doctor. 	<ul style="list-style-type: none"> • Parts of a flower include: roots, leaves, petal flower • Plants need certain conditions to grow. • The start of growth is called germination. • Conditions include: • Rain/water • Temperature • Sunlight

		<p>habitat. Examples include: grass, flowers, log pile, compost, soil, pond, trees.</p> <ul style="list-style-type: none"> • A Food Chain is a diagram showing how each animal gets its food. • An Organism is a living thing, including plants and animals. • Food Source is a place a living thing's food comes from. • A Botanist is someone who studies plants. 	<p>flexible or stiff, smooth or rough.</p> <ul style="list-style-type: none"> • Metal is strong, hard, easy to wash, can be melted and moulded, generally shiny. • Glass is waterproof, transparent, hard, smooth, fragile, can be heated to change shape. • Paper is lightweight, flexible, can be coloured and come in different forms. • Fabric is soft, flexible, hard-wearing, can be stretchy, warm and absorbent. • Rubber is hard-wearing, elastic, flexible, strong, bouncy, strong. • Stone is strong, used for building, comes in different forms. • 	<ul style="list-style-type: none"> • We must look after our teeth and see the dentist regularly. 	<ul style="list-style-type: none"> • Nutrients • Time • Air • Plants adapt to their environment and climate. • A plant is a living thing that usually grows from the ground. • A flower is the part of a plant that blossoms. • Leaves use light, air and water to make food for the plant. • A Stem carries water and nutrients to different parts of the plant. • Roots hold the plant in the ground and absorb water and nutrients from the soil. • A seed is the production of a flowering plant that develops into another plant. • A bulb is a round storage system in some plants e.g. lily, daffodil. • A bud is a compact growth on a plant which develops into a leaf, flower or shoot.
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	Skills	<ul style="list-style-type: none"> • Find a range of items which are dead, living. • Can name plants/animals which live in different habitats and micro habitat. • Can talk about the features of the animal/plant and how they are suited to the habitat. • Can talk about what the animal eats. Can construct a food chain. 	<ul style="list-style-type: none"> • Can name an object, say what material it is made from, identify properties and make a link between property and use. • Whilst changing a shape of an object can describe the actions used. • Can use suitable vocabulary. • Do Simple tests relevant to properties. • Describe similarities and differences. 	<ul style="list-style-type: none"> • Can sequence the stages of a baby. Observe these changes. • Can describe how animals change as they get older. • Develop understanding of how insects change (more than a butterfly) through lifecycle diagrams. • Can explain what humans and other animals need to survive. • Can describe how to keep clean and healthy. • Has a good understanding of the food plate and understands 'a healthy balanced diet'. • Can adopt a menu to substitute food from the eat well plate. • Understand the effect of exercise on the body. 	<ul style="list-style-type: none"> • Can describe how plants that have grown from seeds and bulbs have developed over time. • Can identify plants that grew well in different conditions. • Can spot similarities and differences between bulbs and seeds. • Can nurture seeds and bulbs into mature plants identifying the different requirements of different plants.
	Vocab	Living, dead, never been alive, suited, suitable, basic need, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland, names of micro habitats e.g. under logs, in bushes etc.	Names of materials: wood, plastic, glass, metal, water, rock, brick, paper, fabric, card, rubber, suitable/unsuitable, use/useful, hard/soft, stretchy/stiff. Rigid/flexible, waterproof/absorbent, strong/weak, rough/smooth, transparent/opaque, shape,	Offspring, grow, adults, nutrition, reproduce, survival, water, food, air, exercise, hygiene, survival, exercise.	Leaf, flower, blossom, bud, petal, berry, root, seed, stalk, trunk, branch, stem, bark, fruit, light, shade, sun, warm, cool, water, grow, healthy, germinate, climate, nutrients.

			push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching.		
	<p>NC links Statutory Requirements <i>Pupils should be taught to:</i></p>	<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 microhabitats. • Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. 	<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 some materials can be changed by squashing, bending, twisting and stretching 	<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"> • 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.

	Working Scientifically	<ul style="list-style-type: none"> • Ask simple questions and recognising that they can be answered in different ways • Observe closely, using simple equipment • Perform simple tests • Identifying and classifying • Use their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions. 			

Year 3

		Term 1	Term 2	Term 3	Term 4 + 5	Term 6
Year 3	Unit	Rocks	Light	Forces and Magnets	Animals Including Humans Science Week	Plants
	Core Knowledge I know that....	<ul style="list-style-type: none"> • There are different types of rocks: • <i>Sedimentary rock</i>: rock that 	<ul style="list-style-type: none"> • There are natural and artificial light sources. • Light bounces off surface and 	<ul style="list-style-type: none"> • Friction is a force between two surfaces that are sliding, or trying to 	<ul style="list-style-type: none"> • All mammals (including humans), birds, fish, reptiles and amphibians are vertebrates. This 	<ul style="list-style-type: none"> • Plants need certain conditions to grow. • The start of growth is called germination.

		<p>has been formed by layers of sediment being pressed down hard and sticking together.</p> <ul style="list-style-type: none"> • <i>Igneous rock</i>: Rock that has been formed from magma or lava. • <i>Metamorphic rock</i>: Rock that started out as igneous or sedimentary but changed due to being exposed to extreme heat or pressure. • <i>Anthropic Human made rock</i>: rocks made or modified by humans. • There is a process of fossilisation. 	<p>changes direction as a result.</p> <ul style="list-style-type: none"> • White light is made of a spectrum of colours with different wave lengths. Red, Orange, Green, Blue, Indigo and Violet. • Light comes from a light source reflects off the object then enters the eye. • It is very dangerous to look directly at the sun. • Light travels in straight lines. • A shadow is made when an object blocks light since light cannot get to the area behind the object blocking it, a shadow appears 	<p>slide, across each other.</p> <ul style="list-style-type: none"> • Push and pull forces can make things start and stop moving, make a moving object change direction and change the shape of an object. • Magnets have North Poles and South Poles. • Magnets can come in all shapes, sizes and strengths. • Magnets have magnetic fields. 	<p>means they have a skeleton inside their bodies.</p> <ul style="list-style-type: none"> • The human skeleton is made of bones and grows as we grow. Our skull protects our brain and our ribs protect our heart and lungs. • The skeleton bends at joints such as knees and ankles. Joints are where two or more bones join together. • Muscles are attached to the skeleton to help us move. • 	<ul style="list-style-type: none"> • Parts of a flower include: Anther, Petal, Stamen, Ovary, Stem, Sepal, Pistil, Style, Filament. •
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	Knowledge	<ul style="list-style-type: none"> • Soil is the uppermost layer of the Earth. It is a mixture of different things: • -Minerals • -Air • -Water • -Organic matter (including living and dead plants and animals). 	<ul style="list-style-type: none"> • When the Earth rotates on its axis the sun appears to move causing objects to cast shadows. • The earth spins once on its axis every 24 hours. • As places on Earth spin into sunlight, the sun appears to rise in the East and travel across the sky until it sets in the West. • As the height of the sun above the horizon increases during the morning, shadows cast by opaque, vertical objects (such as children!) reduce until they are smallest at midday, when the sun is highest. 	<ul style="list-style-type: none"> • Friction is a force between two surfaces that are sliding, or trying to slide, across each other. For example, when you try to push a book along the floor, friction makes this difficult. • Forces are pushes or pulls. • Push and pull forces can make things start and stop moving, make a moving object change direction and change the shape of an object. • The Earth is also a giant magnet. This is how compasses work. • Opposite poles attract. (Stick together) • The same poles repel. (Move away) 	<ul style="list-style-type: none"> • There are three types of skeleton: • Endoskeleton • Exoskeleton • Hydrostatic skeleton • We need: a balanced diet water, air, exercise, and Hygiene to survive and be healthy. • Nutrition means getting the food they need to grow and be healthy. 	<ul style="list-style-type: none"> • Conditions include: Rain/water, Temperature, Sunlight, Nutrients, Time, Air • Water is transported through the flower using a process called <u>capillary action</u>. The water transports up the stem to the rest of the flower. The water is needed keep the plant alive and healthy. • Plant is a living thing that usually grows from the ground. • Germinate is the start of growth. • A plant uses sunlight to make food for the plant. This is called Photosynthesis. • Photosynthesis uses sunlight to make food for the plant. • Photosynthesis happens in the leaves of a plant.

			<ul style="list-style-type: none"> • Our shadows lengthen again through the afternoon as the sun's height in the sky reduces. 	<ul style="list-style-type: none"> • Some metals are not magnetic. Some metals are magnetic. 		<ul style="list-style-type: none"> • The leaves contain chlorophyll, this and light energy help convert carbon dioxide and water into oxygen and glucose- which is food for the plant.
	Skills	<ul style="list-style-type: none"> • Can name some types of rock and give physical features of each. • Can explain how a fossil is formed. • Can explain that soils are made from rocks and also contain living/dead matter. • Classify rocks in a range of ways using scientific vocabulary. • Test properties of rocks. • Can identify plant/animal matter in soil, test 	<ul style="list-style-type: none"> • Can describe how we see objects in lights and can describe dark as the absence of light. • Know it is dangerous to look at the sun. • Define transparent, translucent, and opaque. • Can describe how shadows are formed. • Predict what materials will be more/less visible. 	<ul style="list-style-type: none"> • Give examples of forces in everyday life. • Give examples of objects moving differently on different surfaces. • Name a range of magnets and show how the poles attract and repel. • Can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets. • Can use results to describe how objects move on different surfaces. • Can use results to make predictions. 	<ul style="list-style-type: none"> • Name some bones that make up the skeleton giving examples that support, help them move or provide protection. • Can name the nutrients found in food. • Can state that to be healthy we need to eat the right types of food to give us the correct amount of these nutrients. • Give similarities and differences between skeletons. • Can describe how muscles and joints help them to move. Classify food groups (high/low 	<ul style="list-style-type: none"> • Can explain the function of the parts of a flowering plant. • Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal and germination. • Can give different methods of pollination and seed dispersal, including examples. • Can explain observations made during investigations. • Can look at features of seeds to decide on method of dispersal.

		water retention of soils.		<ul style="list-style-type: none"> • Can use some classification to know some metals are not magnetic. • Use test data to rank magnets. 	nutrients), answer q's about nutrients in food, use data to look for patterns	
	Vocab	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb, water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil.	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous.	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel. Magnetic material, metal, iron, steel, poles, north pole, south pole.	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, skull, ribs, spine, muscles, joints.	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal-wind dispersal, animal dispersal, water dispersal, pollen, roots, stem, trunk, leaves, absorb, nutrients, reproduce, germination, stamen, style.
	NC links Statutory Requirements Pupils should be taught to:	<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 	<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. 	<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. 	<ul style="list-style-type: none"> • Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. • Identify that humans and some other animals have skeletons and muscles for support, protection and movement. 	<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 how they vary from plant to plant.

		<ul style="list-style-type: none"> trapped within rock Recognise that soils are made from rocks and organic matter. 	<ul style="list-style-type: none"> Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change. 	<ul style="list-style-type: none"> 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. 		<ul style="list-style-type: none"> Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
	<p>Working Scientifically</p>	<ul style="list-style-type: none"> Ask relevant questions and using different types of scientific enquiry 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 their findings 				

Year 4

		Term 1	Term 2	Term 3	Term 4 + 5	Term 6
<u>Year</u>	<u>Unit</u>	<i>Animals including humans</i>	<i>Sound</i>	<i>States of matter</i>	<i>Electricity Science Week</i>	<i>Living things</i>
<u>4</u>	<i>Core Knowledge</i> <i>I know that</i>	<ul style="list-style-type: none"> • A stomach is an organ where food is broken down with stomach acid. • An oesophagus is a muscular tube which moves food from the mouth to the stomach. • <i>Our teeth include:</i> • Molars • Canines • Premolars • And Incisors. 	<ul style="list-style-type: none"> • Sounds are made when objects vibrate. • When an object vibrates, the air around it vibrates too. • This vibrating air can also be known as sound waves. • The sound waves travel to the ear and make the ear drums vibrate. • Messages are sent to the brain which recognises the vibrations as sounds. 	<ul style="list-style-type: none"> • Changing State: • Matter can change from one state to another if it is heated or cooled- solid, liquid or gas. • Everything around you is made up of matter. Particles are tightly packed. • Celsius is a scale of temperature on which water freezes at 0 degrees and boils at 100 degrees. • There are different materials with different properties. • I can say what the properties are of a liquid, solid and gas. 	<ul style="list-style-type: none"> • Electricity can produce... • Light sound movement heat. • Electricity: a form of energy formed by charged particles. • I can say what a circuit is and what a bulb does. • I can say the names of the components of a circuit. • I can explain how electricity moves through the circuit. 	<ul style="list-style-type: none"> • Invertebrates are animals without a backbone and vertebrates are animals with a backbone. • Deciduous trees lose leaves after the growing season. • Evergreen trees stay green all year round. • Classification is the arrangement of things into groups according to their observed similarities.

						<ul style="list-style-type: none"> • The Features of Living things are: • Movement • Respire (breathe) • Sensitivity to environment • Nutrients • Excrete • Reproduce • Grow
	Knowledge	<ul style="list-style-type: none"> • A small intestine is where nutrients are absorbed and used by the rest of the body • A large intestine is responsible for absorption of water. Faeces are formed. • A rectum is where faeces are stored before leaving the body through the anus. 	<ul style="list-style-type: none"> • Sound waves travel through solids, liquids and gasses. • Sound waves carry energy from one place to another by moving the medium they travel through in a regular way. • A vibration is the movement backwards and forwards • Sound waves are vibrations travelling from a sound source. 	<ul style="list-style-type: none"> • Matter- Objects that take up space and have a mass. • Solid- a solid holds its shape and has a fixed volume. • Gas- easy to compress, expand to fill containers and occupy more space than liquids or solids. • liquid- a liquid fills up the shape. Particles move freely over each other. • Evaporation- turn liquid into a gas; pass away in the form of vapour. 	<ul style="list-style-type: none"> • Circuit- a complete flow of electricity and the way it affects objects. • Bulb- provides light when powered. • Mains- domestic or wall powered. • Plug- device for making an electrical connection • Buzzer- An electrical device that makes a buzzing sound. 	<ul style="list-style-type: none"> • Environments change all the time e.g., leaves fall from the trees during Autumn. Sometimes the changes are not expected and have a drastic effect on the living things there. • There are 41,415 endangered species. 13,306 of them are

		<ul style="list-style-type: none"> • Different animals have different teeth depending on what they eat. • <i>Scatologists</i> study animal scat (faeces) to find out biological information about the animals they are studying. • Herbivores eat plants and leaves. • Omnivores eat plants, leaves and meat/other animals. • Carnivores eat meat/other animals. • Food chains consist of the producer, primary consumer, predator, prey, 	<ul style="list-style-type: none"> • Source is the beginning: where something comes from. • Volume is the loudness of a sound. • Amplitude is the size of a vibration. A larger amplitude= a louder sound. • Pitch is how high or low a sound is. • An ear is an organ used for hearing. • Soundproof means to prevent sound from passing. • Absorb sound means to take in sound energy. Absorbent materials have the effect of muffling sound. • An Eardrum is part of the ear, which is thick, tough layer of tissue that is stretched like a drum skin. 	<ul style="list-style-type: none"> • Condensation- small drops of water which form when water vapour or steam touches a cold surface. • Temperature- Degree or intensity of heat present in a substance or object. • Molecules- very tiny particles that make matter. • The water cycle is a complete journey that water makes, from one place to another and from one state to another. 	<ul style="list-style-type: none"> • Wire- A long piece of metal that carries an electrical current often covered in plastic for safety. • Motor- A device that changes electrical energy into movement. • Cell- a device used to generate electricity. • Battery- More than one cell/ • Conductor- Any material that electricity can pass through or along. • Insulator- Any material that electricity cannot pass through or along. • Symbol- Representation of the components. • Electrons- move around a circuit. • Current- stream of charged particles moving 	<p>endangered species threatened with extinction.</p> <ul style="list-style-type: none"> • 10 most endangered species: Giant Panda, Tiger, Whooping crane, Blue whale, Asian Elephant, Sea otter, Snow leopard, Gorilla, Tasmanian Devil, Orangutan
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		tertiary consumer/predator.	<ul style="list-style-type: none"> • Sound waves make the eardrum vibrate. • A Sound is a type of energy. • Sounds are made when objects vibrate. 		<p>though an electrical conductor.</p> <ul style="list-style-type: none"> • Voltage- An electrical force that makes electricity move • through a wire, measured in volts (V). • The battery produces electricity. It has stored chemical energy. • The chemical energy converts to electrical energy which produces electrons. They travel around the circuit to all the components. 	
Skills	<ul style="list-style-type: none"> • Can sequence the main parts of the digestive system. • Can draw the main parts of the digestive system 	<ul style="list-style-type: none"> • Can describe different types of objects producing different sounds and that the sound is produced by vibration in the object. 	<ul style="list-style-type: none"> • Can create a concept map, including arrows linking the key vocabulary. • Can name properties of solids, liquids and gases. 	<ul style="list-style-type: none"> • Can name the components in a circuit. • Can make an electric circuit. • Can control a circuit using a switch. 	<ul style="list-style-type: none"> • Can identify that animals and plants can be classified in a number of possible ways including vertebrates and invertebrates, 	

		<p>onto a human outline.</p> <ul style="list-style-type: none"> • Can describe what happens in each part of the digestive system. • Can point to three different types of teeth in their mouth and talk about what each is used for. • Demonstrate journey of food through body. • Make a dental record, • Can explain teeth in animals and if they are carnivores, herbivores or omnivores. 	<ul style="list-style-type: none"> • Can describe sounds travelling through different mediums such as air, water, metal. • Can find patterns between pitch and volume and the features of the object producing it. • Can recognise that sounds get fainter as the distance from the sound source increases. • Can explain what happens when you strike a drum or pluck a string- use diagrams to show. Demonstrates how to increase/decrease pitch and volume. 	<ul style="list-style-type: none"> • Can give everyday examples of melting and freezing. • Can give everyday examples of evaporation and condensation. • Can describe the water cycle. • Can give reasons to justify why something is a solid liquid or gas. • Can give examples of things that melt/freeze and how their melting points vary from their observations, can give the melting points of some materials. • Using their data, can explain what affects how quickly a solid melts. • Can measure temperatures using a thermometer. • Can explain why there is condensation on the inside the hot water cup but on the outside of the 	<ul style="list-style-type: none"> • Can name some metals that are conductors. • Can name materials that are insulators. • Can communicate structures of circuits using drawings. • Can incorporate a switch. • Can add a circuit with a switch to a DT project and demonstrate how it works. • Can describe how a switch works. 	<p>flowering and non-flowering plants.</p> <ul style="list-style-type: none"> • Can ask yes/no characteristic questions to classify a small number of living things. • Can name living things in a range of habitats, giving key features that helped identify them. • Can give examples of how an environment may change both naturally and due to human impact. • Can use classification keys to identify unknown plants and animals.
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				<p>icy water cup from their data, can explain how to speed up or slow down evaporation.</p> <ul style="list-style-type: none"> • Can present their learning about the water cycle in a range of ways e.g. diagrams, explanation, model. 		
Vocab	<p>Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, incisor, canine, herbivore, omnivore.</p>	<p>Sound, source, vibrate, vibration, travel, pitch, volume, faint, loud, insulation</p>	<p>Solid, liquid, gas, state, change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle, matter, air, oxygen, ice, water, water vapor, steam, heated, heat, cooled, cool, temperature, degrees Celsius, melt, melting point, freeze, freezing point, solidify, boil, boiling point, evaporate, evaporation, condense, condensation, precipitation, infiltration.</p>	<p>Electrical, appliance, mains, plug, circuit, component, cell, battery, positive, negative, connect/connectors, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol, voltage, current.</p>	<p>Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate, fish, amphibian, reptile, bird, mammal, vertebrate, invertebrate, shelter, food, protection.</p>	
NC links Statutory Requirements	<ul style="list-style-type: none"> • Describe the simple functions of the basic parts of the digestive system in humans 	<ul style="list-style-type: none"> • Identify how sounds are made, associating some of them with something vibrating. 	<ul style="list-style-type: none"> • Compare and group materials together, according to whether they are solids, liquids or gases. 	<ul style="list-style-type: none"> • Identify common appliances that run on electricity 	<ul style="list-style-type: none"> • Recognise that living things can be grouped in a variety of ways 	

	<p><i>Pupils should be taught to:</i></p>	<ul style="list-style-type: none"> • 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"> • 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"> • 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). • 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"> • 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 	<ul style="list-style-type: none"> • 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.
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					<ul style="list-style-type: none"> • good conductors 	
	<p>Working Scientifically</p>	<ul style="list-style-type: none"> • Ask relevant questions. • Make careful observations and use a range of equipment. • Gather, record and classify data. • Record findings using scientific language, drawings, labelled diagrams. • Identify similarities and differences. • Use straightforward scientific evidence to answer questions to support findings. • Interpret models to demonstrate how things work. • Record findings using labelled diagrams. 				
Year 5						
	Term 1	Term 2	Term 3	Term 4 & 5	Term 6	

<u>Year</u>	<u>Unit</u>	Forces	Properties of Materials	Space	Science week Living Things and Habitats	Animals including Humans
<u>5</u>	Core Knowledge I know that	<ul style="list-style-type: none"> Forces are changes the motion of an object. Pushes and pulls in a particular direction. Gravity is a force which pulls things towards the centre of the Earth. Weight is the measure of the force of gravity on an object. Mass is a measure of how much matter (stuff) is inside an object. Air resistance is resistance or drag, acts against gravity on falling objects. Water resistance is a type of force that uses friction to slow things down that 	<ul style="list-style-type: none"> There are reversible and irreversible changes to materials. Processes include: <ul style="list-style-type: none"> Boiling, sieving, melting, dissolving, condensation, filtering, distillation and evaporation. A Solid material is a firm shape or form that can be measured in length, width, and height not like a liquid of gas. Liquid material is no defined shape, takes the shape of its container. Particles free to move over each other. Gas is easy to compress, expand to fill containers and 	<ul style="list-style-type: none"> Our Solar System includes the planets in order closest to the sun: <ul style="list-style-type: none"> Rocky planets- Mercury, Venus, Earth and Mars Gas Giants- Jupiter, Saturn, Uranus, Neptune. Pluto is no longer classed as a planet due to its size. The Moon has no light of its own. Moonlight is sunlight reflecting off the Moon's surface. As the Moon orbits the Earth the sun lights up whatever side of the Moon is facing it. The Earth rotates around the sun once every 24 hours. 	<ul style="list-style-type: none"> A life cycle is the different stages of life for a living thing. All animals, including humans, have a life cycle as all animals are born, grow, reproduce and die. A life cycle is a course of events that brings a new living thing into existence. 	<ul style="list-style-type: none"> Puberty is when a child's body begins to develop and change as they become an adult. <u>We can look after our mental health by:</u> <ul style="list-style-type: none"> -Eating well, drinking water, doing activities we enjoy, sleeping well, having good friends, working towards our goals, talking to people we trust about how we feel. lifecycle- is the different stages of life

		<p>are moving through water.</p> <ul style="list-style-type: none"> • Resistance is a force between surfaces that are touching. • The weight of an object is caused by gravity pulling down on it. 	<p>occupy more space than liquids or solids.</p> <ul style="list-style-type: none"> • Transparent means you can see through it 	<ul style="list-style-type: none"> • The Moon rotates around the Earth once every 27.3 days (28 days). 		<p>for a living thing.</p> <ul style="list-style-type: none"> • Mammal- A warm-blooded vertebrate animal of a class that is distinguished by the possession of hair or fur, females that secrete milk for their young, and typically give birth of live young.
	Knowledge	<ul style="list-style-type: none"> • Discovered by Sir Isaac Newton. • Earth's gravitational pull- pull that Earth exerts on an object pulling it towards the Earth's centre. 	<ul style="list-style-type: none"> • Tightly packed molecules. • Liquid material is no defined shape, takes the shape of its container. Particles free to move over each other. • Gas is easy to compress, expand to fill containers 	<ul style="list-style-type: none"> • Planets- celestial body moving in an elliptical orbit round a star • Celestial- positioned in the sky, or outer space as observed in astronomy. • Spherical- shaped like a sphere. • Solar System- collection of eight planets and their moons in orbit 	<ul style="list-style-type: none"> • In science, it's usually displayed as a circular diagram showing each stage in words and/or pictures. • Fertilises- to develop a new individual by introducing the 	<ul style="list-style-type: none"> • Gestation period- foetal development period from the time of conception until birth. • Foetus- an unborn or unhatched offspring of a mammal. • Puberty- time when the body

		<ul style="list-style-type: none"> • Mass is a measure of how much matter (stuff) is inside an object. • Air resistance is resistance or drag, acts against gravity on falling objects. • Water resistance is a type of force that uses friction to slow things down that are moving through water. • Objects with more mass have a greater weight, as the force of gravity pulls them down more strongly. 	<p>and occupy more space than liquids or solids.</p> <ul style="list-style-type: none"> • Transparent means you can see through it • Soluble- able to be dissolved • insoluble- cannot be dissolved. • Conductor- a substance that heat or electricity can pass along or through. • Filtering- a device used to remove dirt or other solids from liquids or gasses. • Evaporation- turn liquid into a gas; pass away in the form of vapour. • Condensation- small drops of water which form when water vapour 	<p>around the sun, together with smaller bodies in the form of asteroids, meteoroids, and comets.</p> <ul style="list-style-type: none"> • Rotates- move or cause to move in a circle round an axis or centre. • Galaxy- a system of millions or billions of stars, together with gas and dust, held together by gravitational attraction. • Hemisphere- half of the Earth, usually divided into Northern and Southern. • Orbit- curved path of celestial object or spacecraft round a star, planet or moon. • Lunar- determined by or resembling the moon. • revolve- move in a circle on a central axis. 	<p>male sperm to the female egg</p> <ul style="list-style-type: none"> • Reproduce- produce offspring by a sexual and asexual process • Sexual reproduction- method of producing plants and animals in which male sperm and a female egg join • Asexual reproduction- method of producing new offspring with a single parent. • Sperm- male reproductive cell. • Egg- female reproductive cell. • Live young- when animals give birth to live offspring (do not lay eggs) 	<p>begins to develop and change as you move from a child to an adult.</p> <ul style="list-style-type: none"> • Reproduction- the production of offspring by a sexual or asexual process.
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		<ul style="list-style-type: none">• Sir Issac Newton was an English mathematician, physicist, astronomer and author who is famous for his laws of motion, theory of colour and the discovery of gravity.• Gravity is measured in Newtons (N)	<p>or steam touches a cold surface.</p> <ul style="list-style-type: none">• Reversible- can be changed back e.g. ice to water.		<ul style="list-style-type: none">• Metamorphosis- to process of transformation from an immature form to an adult• Gestation- the time it takes for a baby to develop inside the mother's body.• Runners- a stem that grows horizontally along the ground to produce clone plants• Bulbs- a underground food storage organ present in some plants which helps it to lie dormant over winter• Cuttings- a piece of plant which is used for	
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					vegetative propagation <ul style="list-style-type: none"> Plantlets- a young or small plant 	
	Skills	<ul style="list-style-type: none"> Can demonstrate the effect of gravity acting on an unsupported object. Can give examples of friction, water resistance and air resistance. Can give examples of when it is beneficial to have high or low friction, water resistance, and air resistance. Can demonstrate how pulleys, levers and gears work 	<ul style="list-style-type: none"> Can explain everyday uses of material e.g. how bricks, wood, glass are used in buildings. Can explain what dissolving is, giving examples. Can name equipment used for filtering and sieving. Can use knowledge of liquids, gases and solids to suggest how materials can be recovered from solutions or mixtures by evaporation, filtering or sieving. Can describe simple reversible and non-reversible changes to materials, giving examples. Can create chart/table grouping materials 	<ul style="list-style-type: none"> Can show using diagrams the movement of the Earth and moon. Can explain the rotation of the Earth and how this causes night and day. Can explain evidence gathered about the position of shadows in terms of movement of the Earth. Can explain how a sundial works. Can explain why we have time zones. 	<ul style="list-style-type: none"> Can describe the lifecycles of mammals, amphibians and insects using diagrams. Can describe similarities and differences between them. 	<ul style="list-style-type: none"> Can explain the changes that takes place in boys and girls during puberty. Can explain how a baby changes physically as it grows and also what it is able to do.

			<p>using properties. Suggest appropriate material for purpose.</p> <ul style="list-style-type: none"> • Can explain results from investigations involving dissolving and non-reversible change 			
Vocab	Force, Gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears, Newton, up thrust, opposing, streamline, brake, cog, weight, mass.	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/not reversible, change, burning, rusting, new material.	Earth, sun, moon, Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune, Pluto (dwarf planet), spherical, solar system, rotates, star, orbit, planets, axis, night, day, season, galaxy. Meteorite, celestial.	life cycle, live, young, fertilises, egg, runners, reproduce, sperm, metamorphosis gestation, cuttings, plantlets, bulb, sexual/asexual reproduction	Adolescent, adult, asexual reproduction, sexual reproduction, fertilization, death, teenager, elderly, toddler, reproduction, foetus, growth, puberty, menstrual cycle, gestation.	
NC links Statutory Requirements <i>Pupils should be taught to:</i>	<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 	<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 	<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 	<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. 	

		<p>friction, that act between</p> <ul style="list-style-type: none"> • moving surfaces. • Recognise that some mechanisms, including levers, pulleys and gears, allow a • smaller force to have a greater effect. 	<p>in liquid to form a solution, and describe how</p> <ul style="list-style-type: none"> • to recover a substance from a solution. • Use knowledge of solids, liquids and gases to decide how mixtures might be • separated, including through filtering, sieving and evaporating • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. • Explain that some changes result in the formation of new 	<p>the Earth's rotation to explain day and night and the apparent</p> <ul style="list-style-type: none"> • movement of the sun across the sky. 		
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			<p>materials, and that this kind</p> <ul style="list-style-type: none"> • of change is not usually reversible, including changes associated with burning and • the action of acid on bicarbonate of soda. 			
	Working Scientifically	<ul style="list-style-type: none"> • 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 present 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. • Identify scientific evidence that has been used to support or refute ideas or arguments. 				

		Term 1	Term 2	Term 3 + 4	Term 5	Term 6
Year 6	Unit	<i>Animals including humans</i>	<i>Evolution and inheritance</i>	<i>Electricity Science Week</i>	<i>Light</i>	<i>Living things and habitats</i>
	<i>Core Knowledge I know that</i>	<ul style="list-style-type: none"> • My heart is an organ and that pumps blood around my body. • My blood contains oxygen and nutrients. • Narrow tubes called blood vessels carry my blood around my body. They are called veins. • <u>Oxygen</u>- is a colourless gas that exists in large quantities in the air. All plants and animals need 	<ul style="list-style-type: none"> • Natural Selection is the process in which populations of living things adapt and change. • <u>Evolution is</u> the way in which living things change and develop over millions of years. • <u>Adapted</u> means to adjust or modify fittingly • <u>Survival is</u> the act of surviving, especially under 	<ul style="list-style-type: none"> • A cell is a single unit that stores energy. A battery is a collection of cells that store energy. • Batteries have voltage which is the amount of force that makes the electrical current move through the wires. The voltage can be found on the battery. • Light is measured in Lux. • Voltage is measured in Volts. Using a volt metre. • The current is measured in amps using an ammeter. • One end of a battery is an anode and the other a cathode. Electrolytes (liquid) 	<ul style="list-style-type: none"> • Light travels in straight lines. • White light is made up of a spectrum of colours with different wavelengths: red, orange, yellow, green, blue, indigo and violet. • When light hits an object, it is reflected (bounces off) and enters our eye. This is how we see the object. • The little dark circle in the centre of each eye lets light in. It is called the pupil. • When you turn the light on from a dark room your 	<ul style="list-style-type: none"> • An organic living system composed of cells is an organism. • An organism of microscopic size is called a microorganism • Fungus is part of Fungi kingdom such as mushrooms. • Bacteria are small single cell organisms found everywhere on earth. • Virus are microscopic parasites. • An Amphibian is a cold blooded

		<p>oxygen in order to live.</p> <ul style="list-style-type: none"> • <u>Lungs</u>- two spongy organs inside the chest which fill with air when you breathe in. • Animals produce carbon dioxide when they breathe out. 	<p>adverse or unusual circumstances</p>	<p>are found in a battery which ions flow through.</p>	<p>pupil will dilate (get smaller)</p> <ul style="list-style-type: none"> • When an object passes in front of a beam of light, the light can be blocked making a shadow. 	<p>vertebrate animal.</p> <ul style="list-style-type: none"> • An Insect is a small arthropod animal which has 6 legs. • A Reptile is a vertebrate animal. • Bird- warm blooded egg laying vertebrate animal with feathers, wings and a beak. • Arachnid- an arthropod e.g. spiders and scorpions. • Mollusc- an invertebrate including snails, slugs, mussels and octopuses. • Vertebrate- animal with backbone • Invertebrate- animal without backbone.
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						<ul style="list-style-type: none"> • Classification- To make smaller groups.
	Knowledge	<ul style="list-style-type: none"> • Heart- the organ in your chest that pumps the blood around your body. • Blood vessels- the narrow tubes through which your blood flows include the arteries, veins and capillaries. • Blood- this is pumped by the heart and supplies the body with nutrients and oxygen. • Veins- blood vessels that carry blood to the heart. 	<ul style="list-style-type: none"> • Individuals in the population of an organism have traits which are better suited to the environment in which they live and are therefore more likely to survive. • These individuals then pass the desirable traits to their offspring and over time these become more common within the population. 	<ul style="list-style-type: none"> • Circuit- A path that an electrical current can flow around. • Symbol- a visual picture that stands for something else. • Cell- A single unit battery that stores chemical energy. • Battery- A collection of cells which stores chemical energy. • Current- The flow of electrons, measured in amps. • amps- How electric current is measured. • Voltage- The force that makes the electric current move through the wires. The greater the voltage the more current will flow. • Resistance- the difficulty that the electric current has when flowing around a circuit. 	<ul style="list-style-type: none"> • Light travels in straight lines. It reflects off mirrors according to the law of reflection which states that the angle of incidence (i) = angle of reflection (r). • Light appears colourless (or white), when produced by natural light sources such as the sun or artificial light sources such as light bulbs or torches. • Light travels in straight lines. • Opaque objects let no light through. 	<ul style="list-style-type: none"> • Organism- An organic living system composed of cells. • Microorganism - organism of microscopic size. • Fungus- part of Fungi kingdom includes yeast, rust, molds and mushrooms. • Bacteria- small single cell organisms found everywhere on earth. • Virus- microscopic parasites generally smaller than bacteria. • Fish- aquatic gill bearing animals

		<ul style="list-style-type: none"> • <u>Arteries</u>- blood vessels that carry blood away from the heart. • <u>Capillaries</u>- microscopic blood vessels found in the muscles and lungs. • <u>Carbon dioxide</u>- is a gas produced by animals and people breathing out 	<ul style="list-style-type: none"> • <u>Offspring</u>- children or young of a particular parent • <u>Sexual reproduction</u>- method of producing plants and animals in which male seed and a female egg join • <u>Environment</u> - the air, water and land in or on which people, animals and plants live. • <u>Variance</u>- the fact that two or more things are different or the amount by which they are different. 	<ul style="list-style-type: none"> • <u>Electrons</u>- Very small particles that travel around an electrical circuit. • Watt is a unit of power. (Rate of which energy is consumed). 	<ul style="list-style-type: none"> • <i>Translucent</i> objects let some light through. • <i>Transparent</i> objects let all the light through. • The closer an object is to the light source the bigger the shadow. • <u>Refraction</u> is the change in the direction of a wave passing from one medium to another. • <u>Light</u>- Light is a type of energy that makes it possible for us to see. • <u>Source of light</u>- The sun and other stars, fires, torches and lamps all make light are examples of light sources. • <u>Reflection</u>- Reflection occurs 	<ul style="list-style-type: none"> • <u>Amphibian</u>- cold blooded vertebrate animal. • <u>Insect</u>- small arthropod animal which has 6 legs and generally one or two pairs of wings. • <u>Reptile</u>- a vertebrate animal typically with dry scaly skin and lay soft shelled eggs on land. • <u>Bird</u>- warm blooded egg laying vertebrate animal with feathers, wings and a beak. • <u>Arachnid</u>- an arthropod e.g. spiders and scorpions. • <u>Mollusc</u>- an invertebrate including snails, slugs,
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			<ul style="list-style-type: none"> • <u>Inherited</u>- received by transmission of hereditary traits. • <u>Genetics</u>- the study of how, in all living things, the characteristics and qualities of parents are given to their children by their genes. • <u>Characteristics</u>- a typical or noticeable quality of someone or something. • <u>Species</u>- a set of animals or plants in which members have similar characteristics to each 		<p>when a light ray hits a surface and bounces off.</p> <ul style="list-style-type: none"> • <u>Visible spectrum</u>- The range of colours we can see with our eyes. • <u>Prism</u>- A prism is a 3d shape with identical ends, called bases and flat sides called faces. A prism allows us to see the visible spectrum. • <u>Shadow</u>- A dark area of shape produced by an object coming between rays of light and a surface. • Opaque- An opaque material does not let light through. It does not reflect light. • Translucent- A translucent material lets light pass through, but 	<p>mussels and octopuses.</p> <ul style="list-style-type: none"> • <u>Vertebrate</u>- animal with backbone • <u>Invertebrate</u>- animal without backbone. • <u>Classification</u>- To make smaller groups. • Aristotle was the first person to try and classify living things into groups. • Carl Linnaeus was a Swedish scientist who believed it was a very important to have a standard system of classification.
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			<p>other and can breed with each other.</p> <ul style="list-style-type: none"> • Living thing- an organism which: moves, breathes, sensitive to environment , nutrients, excretes, reproduce and grows. 		<p>objects on the other side cant be seen clearly.</p> <ul style="list-style-type: none"> • Transparent- Transparent materials allow you to see clearly through them. • Refraction- Light changes direction when passing through two different mediums. 	
Skills	<ul style="list-style-type: none"> • Can draw a diagram of the circulatory system, label the parts and annotate it to show what the parts do. • Can explain the positive and negative effects on diet, exercise, drugs and lifestyle on the body 	<ul style="list-style-type: none"> • Can explain the process of evolution. • Can give examples of how plants and animals are suited to their environment. • Can give examples of how an animal or plant has evolved over time e.g. penguin, peppered moth. 	<ul style="list-style-type: none"> • Make circuits to solve particular problems e.g. how to make the door bell louder. • Carry out fair tests exploring changes in circuits • Make circuits that can be controlled. • Understand electricity symbols and draw circuits. • Understand how switches work. • Understand electrical hazards. 	<ul style="list-style-type: none"> • Can describe with diagrams how light travels in straight lines, either from sources or reflected from other objects into our eyes. • Can describe with diagrams how light travels in straight lines past translucent or opaque objects to form a shadow of the same shape. 	<ul style="list-style-type: none"> • Can give examples of animals in the five vertebrate groups and some of the invertebrate groups. Can give key characteristics of the five vertebrate groups and some invertebrate groups. • Can give examples of flowering and non-flowering plants. 	

			<p>Give examples of things that lived millions of years ago and the fossil evidence to support this.</p> <ul style="list-style-type: none"> • Can identify where offspring are not identical to their parents. 	<ul style="list-style-type: none"> • Understand how cells/batteries work. • Understand voltage. 		<ul style="list-style-type: none"> • Can use classification keys to identify unknown plants and animals. • Can create classification keys. • Can give a number of characteristics that explain why an animal belongs to a particular group.
Vocab	Heart, pulse, rate, pumps, blood, blood vessel, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle.	Offspring, sexual reproduction, vary, variation, characteristics, suited, adapted, environment, inherited, species, fossils, adaptation, acquired characteristic, inherited characteristic, gene, natural selection, artificial selection.	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage. NB Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words cells and batteries are now used interchangeably	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, refraction, medium, dense.	Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering.	
NC links Statutory Requirements	<ul style="list-style-type: none"> • Identify the main parts of the human circulatory system and describe the function of the 	<ul style="list-style-type: none"> • Recognise that living things have changed over time and that fossils provide information 	<ul style="list-style-type: none"> • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and 	<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 	<ul style="list-style-type: none"> • Describe how living things are classified into broad groups according to common observable 	

<p><i>Pupils should be taught to:</i></p>	<p>heart, blood vessels and blood.</p> <ul style="list-style-type: none"> Describe the ways in which nutrients and water and transported within animals including humans. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. 	<p>about living things that inhabited the Earth millions of years ago</p> <ul style="list-style-type: none"> 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. 	<p>the on/off position of switches.</p> <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. Use recognised symbols when representing a simple circuit in a diagram. 	<p>explain that objects are seen because they give out or reflect light into the eye</p> <ul style="list-style-type: none"> 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. 	<p>characteristics and based on similarities and differences including micro-organisms, plants and animals</p> <ul style="list-style-type: none"> Give reasons for classifying plants and animals based on specific characteristics.
<p><i>Working Scientifically</i></p>	<ul style="list-style-type: none"> Evaluate different aspects of their enquiries such as equipment and accuracy of measurements. Use scientific language and illustrations to discuss, communicate and justify scientific ideas. Make careful observations when heating solutions. Plan own investigation to test how materials react with each other. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. 				

		<ul style="list-style-type: none">• Report and present 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.• Identify scientific evidence that has been used to support or refute ideas or arguments• Answer questions by investigating.• Make predictions using own ideas and subject knowledge.• 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 .• Use test results to make predictions to set up further comparative and fair tests
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Primary Science

Planning Inclusive Lessons

Learning in science involves children and young people building their knowledge of important concepts and procedures. When learning new content, learners must connect this to what they already know. This means that it is important that learners develop secure understanding of previously taught concepts and procedures.

When planning lessons, it is important to consider learners with SEND. Carefully consider the objective of each individual lesson; what specifically do you want pupils to learn? How can you present new information in a way that all learners can access? How can complex ideas be broken down into simpler parts for pupils to learn and practice? How can you focus learner's attention on the new content? For example, learners could observe and explore a stimulus to hook them into the new learning. This could be an object, a model, or an image. You should encourage learners to ask questions about their learning and build in opportunities for small group and whole-class discussions. [Oracy-led sessions](#), with visuals to support the access of all learners, can enable you to build on and extend your learners' scientific thinking. If you have an additional adult in the lesson, plan their role and share their responsibilities with them in advance. Further guidance on how you can deploy additional adults is provided [here](#).



Creating an Inclusive Environment

Carefully consider the classroom – can all learners access the environment? Consider learners with [sensory impairments](#) and [physical disabilities](#).

In creating a conducive learning environment, it is important for each lesson to follow on from prior learning, this can be both from the lesson before, or the academic year before. The curriculum can enable this by making sure that key concepts and procedures are systematically developed over time. Identify possible misconceptions that learners may have, and plan for how you will address these in the lesson. It is also important that curriculum plans try to pre-empt misconceptions by making sure content is taught in a logical order. Create opportunities to pre-teach, providing some learners with the opportunity to learn new vocabulary and concepts in advance of a lesson in a small group setting. Pre-teaching opportunities can also support learners who struggle with transitions or engaging in whole class teaching sessions, as it can prepare them for the learning and practical elements, they are likely to experience in a lesson.

Meticulously plan, and always test practical experiments before the lesson. Use your practice to create step-by-step instructions, which you can then modify with visuals and/or more precise steps for learners needing additional guidance. Make sure learners understand the purpose of each step and that they can link scientific content to what they are doing. The instructions can also be useful for additional adults supporting the lesson, giving them increased confidence when supporting the learning.

Curriculum Considerations

Working scientifically is an important goal of science education. It improves a learner's cognitive, social and linguistic development whilst becoming more inquisitive and interested in the world around them. Skills that are underpinned by scientific knowledge range from making predictions and asking scientific questions, to drawing conclusions and interpreting data or information collected.

As learners progress through each key stage, their knowledge of the methods, processes and nature of science is developed and deepened.

Key Stage 1

Key Stage 1 learners should regularly experience first-hand practical activities to explore and spark their interest for the topic. Scientific enquiry weaves throughout the whole of the Key Stage 1 curriculum, so practical activities should be considered which support and develop their understanding of scientific ideas. Secondary sources such as books, photos, videos and simulations should be used to help children and young people learn and make sense of the scientific content.

Key Stage 2

In lower Key Stage 2, learners should now be encouraged to broaden their scientific view of the world around them through exploration, discussion, testing and developing ideas.

In upper Key Stage 2, learners begin to learn about more abstract concepts which support learners in comprehending and predicting how the world around them works. Learners should continue to build on the foundational skills of exploration and talking about their ideas; asking their own questions; analysing functions, becoming methodical when identifying relationships and interactions.

Primary Science

Strategies to Scaffold Learning

How can I support learners who struggle to access lessons because of literacy difficulties?

- Provide topical word banks and picture cards that the learner can point or refer to when explaining scientific processes.
- Ask teaching assistants to collate word/picture banks on a mini whiteboard/paper with the learner during the teaching input to support their independent learning activity.
- Scaffold learning to make it accessible for all, e.g., if writing up the method for their experiment, a learner with writing difficulties could verbally explain for you or a teaching assistant to scribe, note-take or film explaining their answers.

How can I support learners who struggle to access lessons because of numeracy difficulties?

- Scaffold learning to make it accessible for all, e.g., when creating data tables for an experiment, learners with numeracy difficulties could create a pictogram.
- Employ manipulatives and resources used in maths lessons to support learning in science.
- Bring abstract concepts to life through concrete resources and comparisons.

How can I support learners who struggle to retain vocabulary?

- Begin each lesson with a review of the vocabulary learnt in the previous lesson.
- Provide word banks that are accessible throughout the science topic. Encourage learners to tick the words they feel confident with to help target language that still needs support, e.g., when learners can independently use a word in a sentence. This could also encourage and motivate the learner to use language they have yet to use.
- Refer to language regularly during lessons and, where applicable, throughout the school day, as this will embed the vocabulary and build stronger links and associations.

How can I support learners who need additional time to develop conceptual understanding?

- Provide pre-teaching opportunities for learners to hear vocabulary prior to the lesson, to support their access and engagement in whole-class teaching.
- Plan small group teaching opportunities, for example whilst learners who have already met an objective are doing enrichment activities independently, dedicate time to conference with and/or provide additional learning opportunities for learners working towards the learning objective.
- Provide learners with worked examples to use as a model whilst completing independent work.



*Progression of scientific knowledge across Key Stages:
Electricity*

Early Learning Goal:

Children know about similarities and differences in relation to pictures, objects, materials and living things.

Year 4:

Recognise some common conductors and insulators, and associate metals with being good conductors.

Year 6:

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.

Primary Science

How can I support learners who struggle with attention?

- Create a working classroom environment that is calming and simple, e.g., clear routines, organised workspaces.
- Use preferential seating and proximity to engage all learners – have learners who struggle to concentrate at the front of the class, or plan for a teaching assistant to encourage the learner to participate and maintain focus.
- Pre-expose learners to the equipment and nature of the lesson (especially for experiments and practical lessons) to spark engagement and interest in the upcoming lesson.
- Plan movement breaks and classroom jobs (e.g., handing out materials) for individual learners.

How can I support learners who struggle with change and transition?

- Science doesn't always follow the same lesson format and structure, so prepare learners in advance by explaining how the lesson will run.
- Use visuals (e.g., now, next, then boards or visual timetables) to segment the lesson into manageable chunks that are achievable for the learner.
- Think about the individual learner – some learners may be highly motivated if they know something in advance of a lesson. Show them an object, or picture about the lesson, as detailed in the case study.

Case Study

Supporting a learner with autism in mainstream Year 1 science lessons

One of the learner's targets was to initiate and sustain attention to a given task. Following discussions with the SENCO, a Now, Next, Then board (NNT) was created and implemented across all areas of the school day to help structure lessons and support the learner's engagement in modified tasks aligned to the Year 1 curriculum. The NNT had three images for tasks and activities – with some being 'demands' (tasks that had to be completed), and some preferred, motivational activities which served as a reward for completed curricular tasks.

Planning: For science lessons, the teacher and teaching assistant (TA) talked through the expectations and planned outcomes for the lesson, and how these would be communicated to the learner. Some visuals were consistent, though sometimes the teacher and TA agreed language and visuals for more specialised tasks (e.g., when the class went on a learning walk in the local area to observe the changing of the seasons). Tasks were developed in line with the learner's individual needs, and most were planned to take about five minutes to complete. When the NNT was first implemented, the 'next' task was a preferred activity; as the learner made progress towards his target and was consistently able to complete the five-minute task, the 'then' task on the NNT became the preferred activity, so that the learner was extending his attention to curriculum tasks, completing two five-minute tasks before the preferred activity.

Implementation: At transition, when the learner came in from morning play, the teacher greeted the learner and walked with him to the back of the classroom to quietly discuss the lesson 1:1 whilst the TA settled the rest of the class on the carpet. The language staff used was familiar to the learner, and consistent across all adults in the classroom: 'Now you are sorting the animals into groups, next you will draw the animals into your chart, then you can have five minutes free time to create your favourite animal with the Lego' – the teacher pointed to pictures on the NNT board whilst reviewing the parts of the lesson. The teacher would then prompt, 'What are you going to do now?'. Once the learner was set up with his task, the teacher would work with other learners, checking in with the learner regularly. As each task was finished, the learner enjoyed taking the picture off the board – it provided both a sense of achievement and motivation, as he knew he was moving closer to his desired activity. The teacher or TA would prompt the learner, 'You have finished sorting the animals, well done! Let's move the pictures – what is happening next?'



