

Science Long-Term Plan 2024 - 2025 – All year groups

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Animals, including humans	Seasonal Changes	States of matter	Scientific enquiries inc. Mirrors, magnets, light and forces	Animals, including humans	Humans and the environment
Year 1	Animals, including humans	Seasonal Changes	Materials	Seasonal Changes	Plants	Seasonal Changes
Year 2	Uses of everyday materials		Animals, including humans	Plants	Living things and their habitats	
Year 3	Animals, including humans	Forces and magnets	Plants	Light	Rocks	
Year 4	Living things and their habitats	Animals, including humans	States of matter	Sound	Electricity	
Year 5	Properties and changes of materials	Living things and their habitats	Earth and Space	Animals, including humans	Forces	
Year 6	Animals, including humans	Living things and their habitats	Earth and Space	Evolution and inheritance	Revision of: Properties and changes of materials	Revision of: Light Forces Electricity

Y1	Autumn	
	Animals including Humans	<p>Vocab: energy, growth, habitat, fish, amphibian, reptile, bird, mammal, offspring, carnivore, herbivore, omnivore, vertebrate, organ. Sense/senses: sight, hearing, touch, taste, smell Skeleton, head, neck, ear, mouth, shoulder, hand, fingers, leg, foot, thumb, eye, nose, knee, toes, teeth, elbow.</p>
	<p><u>Required prior knowledge</u></p> <ul style="list-style-type: none"> • Pupils know that animals, including humans, grow and change throughout their lives. • Pupils can name and locate different parts of their bodies, including the sense organs. • Pupils can name and compare two different animals. • Pupils are able to talk about the life cycle of a frog, and explain how it changes over time. 	<p><u>Pupils should be taught to:</u></p> <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 • 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><u>Working scientifically</u></p> <ul style="list-style-type: none"> • Carry out observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; • group animals according to what they eat • use their senses to compare different textures, sounds and smells.

	<h2>Seasonal Changes</h2>	<p>Vocab: Weather: wind/windy, rain/rainy, snow/snowy, sun/sunny, cloud/cloudy, storm/stormy, hurricane, thunder, lightning, gale, hailstone, fog/foggy, ice/icy, frost, clear da, freezing (melting) Seasons: winter, spring, summer, autumn. Daylight, sunlight, sunset, sunrise.</p>
	<p><u>Required prior knowledge</u></p> <ul style="list-style-type: none"> • Pupils are able to name the four seasons. 	<p><u>Pupils should be taught to:</u></p> <ul style="list-style-type: none"> • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • make tables and charts about the weather • make displays of what happens in the world around them, including day length, as the seasons change.



Y1	Spring	
	<h2>Everyday materials</h2>	Vocab: Absorption Materials: wood, plastic, glass, metal, water, rock Property (properties): hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy/not bendy, waterproof/not waterproof.
	<u>Required prior knowledge</u> <ul style="list-style-type: none">• Pupils are able to sort materials into groups and explain how they have been sorted• Pupils will talk about why ice changes and predict what might happen next and explain why.• Pupils understand that some things float and some things sink and make predictions.• Pupils are able to use vocabulary involved in these Processes.	<u>Pupils should be taught to:</u> <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• 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 <u>Working scientifically</u> <ul style="list-style-type: none">• Perform simple tests to explore questions, for example: 'What is the best material for an umbrella? ... for lining a dog basket? ... for curtains? ... for a bookshelf? ... for a gymnast's leotard?'



	<h2 style="text-align: center;">Seasonal Changes</h2>	<p>Vocab: Weather: wind/windy, rain/rainy, snow/snowy, sun/sunny, cloud/cloudy, storm/stormy, hurricane, thunder, lightning, gale, hailstone, fog/foggy, ice/icy, frost, clear da, freezing (melting) Seasons: winter, spring, summer, autumn. Daylight, sunlight, sunset, sunrise.</p>
	<p><u>Required prior knowledge</u></p> <ul style="list-style-type: none">• Pupils are able to name the four seasons• Pupils can describe the changes and the weather associated with Autumn.	<p><u>Pupils should be taught to:</u></p> <ul style="list-style-type: none">• observe changes across the 4 seasons• observe and describe weather associated with the seasons and how day length varies <p><u>Working scientifically</u></p> <ul style="list-style-type: none">• make tables and charts about the weather• make displays of what happens in the world around them, including day length, as the seasons change.

Y1	Summer	
	Plants	<p>Vocab: Leaf/leaves, flower, blossom, bulb, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, wild, garden, deciduous, evergreen, growth.</p>
	<p><u>Required prior knowledge</u></p> <ul style="list-style-type: none"> • Pupils can name some wild plants such as dandelion, daisy, buttercup, nettles. • Pupils can name some plants/flowers we plant such as beans, sunflowers, roses, • Pupils can talk about how the plant changes over time. • Pupils are able to say what a plant needs to grow. 	<p><u>Pupils should be taught to:</u></p> <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 <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • observe closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees. • Pupils might keep records of how plants have changed over time, for example, the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.

	<h2>Seasonal Changes</h2>	<p>Vocab: Weather: wind/windy, rain/rainy, snow/snowy, sun/sunny, cloud/cloudy, storm/stormy, hurricane, thunder, lightning, gale, hailstone, fog/foggy, ice/icy, frost, clear da, freezing (melting) Seasons: winter, spring, summer, autumn. Daylight, sunlight, sunset, sunrise.</p>
	<p><u>Required prior knowledge</u></p> <ul style="list-style-type: none"> • Pupils are able to name the four seasons • Pupils can describe the changes and the weather associated with Autumn and Spring. 	<p><u>Pupils should be taught to:</u></p> <ul style="list-style-type: none"> • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • make tables and charts about the weather • make displays of what happens in the world around them, including day length, as the seasons change.

Y2	Autumn	
	Uses of everyday materials	<p>Vocab: Material: brick, paper, cardboard Properties: brittle, rigid, flexible/bendy, absorbent, transparent, hardwearing, reflective, suitable/unsuitable, suitable/unsuitable, waterproof Verbs/movement: twist, stretch, bend, squash, push/pushing, pull/pulling.</p>
	<p><u>Required prior knowledge</u></p> <p>From Year 1, pupils:</p> <ul style="list-style-type: none"> • know the difference between an object and the material it is made from. • are able to describe the properties of materials and group materials depending on their properties. • understand that objects can be made from different materials. 	<p><u>Pupils should be taught to:</u></p> <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 <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • compare the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); • observe closely, identifying and classifying the uses of different materials, and recording their observations.



Y2	Spring	
	<h2 style="text-align: center;">Animals including humans</h2>	<p>Vocab: Offspring, reproduction, growth, baby, toddler, child, teenager, adult, survival, growth, metamorphosis, basic needs. Exercise, heartbeat, breathing, hygiene, germs, disease, virus, Food types: fibre, carbohydrates, protein, oils and spreads, dairy. Meat, fish, grains, high-sugar.</p>
	<p><u>Required prior knowledge</u></p> <p>From Year 1, pupils:</p> <ul style="list-style-type: none">• can name a variety of common animals including: fish, reptiles, amphibians, birds and mammals.• know the diet of carnivores, omnivores and herbivores and be able to identify and name animals in these categories.• can describe and compare the structure of a variety of different animals.	<p><u>Pupils should be taught to:</u></p> <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 <p><u>Working scientifically</u></p> <ul style="list-style-type: none">• Observe through video or first-hand observation and measurement, how different animals, including humans, grow.• Ask questions about what things animals need for survival and what humans need to stay healthy.• Suggest ways to find answers to their questions.

	<h1>Plants</h1>	<p>Vocab: Prior: leaf/leaves, flower, blossom, bulb, petal, fruit, berry, root, seed, seedling, trunk, branch, stem, bark, stalk, bud, wild, garden, deciduous, evergreen, light, shade, sun, warm, cool, water, grow, suited, conditions.</p> <p>Germinate, germination, healthy/healthily.</p>
	<p><u>Required prior knowledge</u></p> <p>From Year 1, pupils:</p> <ul style="list-style-type: none"> • Can name some common wild plants in their local area and some garden plants. • Understand that deciduous trees are large flowering plants that have leaves that change colour and fall to the ground and name some examples. • Understand that evergreen plants keep their colour and leaves all year round. • Can Identify the structure and basic parts of a plant. 	<p><u>Pupils should be taught to:</u></p> <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 <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • observe and record, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth. • set up a comparative test to show that plants need light and water to stay healthy.



Y2	Summer	
	<h2>Living things and their habitats</h2>	<p>Vocab: Prior: deciduous, evergreen, flower, plant, tree, structure, roots, stem, leaf, trunk, flower, herbivore, carnivore, omnivore.</p> <p>Life cycle: birth, living, dead. Reproduction, suited, suitable, basic needs, food chain, producer, consumer, shelter, feed, habitat, microhabitat, source, nutrients, decay Environment: seashore, woodland, ocean, rainforest, desert, Polar regions, wetlands, grasslands, mountains, marine.</p>
	<p><u>Required prior knowledge</u></p> <p>From reception, pupils:</p> <ul style="list-style-type: none">• can describe what they see, hear and feel whilst outside.• can recognise and describe different environments, including describing how some environments are different to the one they live in. <p>From Year 1, pupils:</p> <ul style="list-style-type: none">• can name some common wild and garden plants.• can identify and describe the basic structure of a variety of common flowering plants, including trees.• can name a variety of common animals including fish, mammals, amphibians, reptiles, birds and describe their structures.	<p><u>Pupils should be taught to:</u></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 <p><u>Working scientifically</u></p> <ul style="list-style-type: none">• sort and classify things according to whether they are living, dead or were never alive, and recording their findings using charts.



		<ul style="list-style-type: none">• They should describe how they decided where to place things, exploring questions like: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions.• They could construct a simple food chain that includes humans (eg, grass, cow, human).• They could describe the conditions in different habitats and microhabitats (under log, on stony path, under bushes); and find out how the conditions affect the number and type(s) of plants and animals that live there.
--	--	---



Y3	Autumn	
	<h2 style="text-align: center;">Animals including humans</h2>	<p>Vocab: nutrients, fat, carbohydrate, protein, skeleton, protection, support, muscles, joint, movement.</p>
	<p><u>Required prior knowledge</u></p> <p>From Years 1 and 2, pupils:</p> <ul style="list-style-type: none">• Know that animals, including humans, have offspring which grow into adults• Know the basic stages in a life cycle for animals, including humans.• Can find out and describe the basic needs of animals, including humans, for survival (water, food and air).• Can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	<p><u>Pupils should be taught to:</u></p> <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 <p><u>Working scientifically</u></p> <ul style="list-style-type: none">• identify and group animals with and without skeletons and observe and compare their movement; exploring ideas about what would happen if humans did not have skeletons.• They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat.• They might research different food groups and how they keep us healthy, and design meals based on what they find out.

	<h2>Forces and magnets</h2>	<p>Vocab: surface, friction, magnetic forces, attract, repel, magnetic, push, pull.</p>
	<p><u>Required prior knowledge</u></p> <ul style="list-style-type: none"> • Children may have an awareness of how to make things stop and start, using simple pushes and pulls. • They may know about floating and sinking. 	<p><u>Pupils should be taught to:</u></p> <ul style="list-style-type: none"> • compare how things move on different surfaces • notice that some forces need contact between 2 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 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • compare how different things move and grouping them; • raise questions and carrying out tests to find out how far things move on different surfaces, and gather and record data to find answers to their questions; • explore the strengths of different magnets and find a fair way to compare them • sort materials into those that are magnetic and those that are not • look for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another • identify how these properties make magnets useful in everyday items and suggest creative uses for different magnets.



Y3	Spring	
	Plants	Vocab: nutrients, fat, carbohydrate, protein, skeleton, protection, support, muscles, joint, movement.
	<u>Required prior knowledge</u> From Years 1 and 2, pupils: <ul style="list-style-type: none">• can observe and describe how seeds and bulbs grow into mature plants.• can find out and describe how plants need water, light and warmth to grow and stay healthy.	<u>Pupils should be taught to:</u> <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• 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 <u>Working scientifically</u> <ul style="list-style-type: none">• compare the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time;• look for patterns in the structure of fruits that relate to how the seeds are dispersed.• They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.

	<h1>Light</h1>	<p>Vocab: reflection, surface, shadow, transparent, translucent, opaque, artificial, energy, light source, refraction, spectrum.</p>
	<p><u>Required prior knowledge</u></p> <p>Children may:</p> <ul style="list-style-type: none"> • Have observed changes across the four seasons • Have observed and can describe weather associated with the seasons and how day length varies. • Have some knowledge of where light comes from. • Have seen their shadows and may know they appear when it is sunny. • Have some understanding of a reflection. • May understand they need light to be able to see things 	<p><u>Pupils should be taught to:</u></p> <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 from a light source is blocked by an opaque object • find patterns in the way that the size of shadows change <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.



Y3	Summer	
	<h2 style="text-align: center;">Rocks</h2>	Vocab: igneous, sedimentary, metamorphic, properties, permeable, absorbent, erosion, fossils, organic matter.
	<u>Required prior knowledge</u> From Years 1 and 2, pupils: <ul style="list-style-type: none">• can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.• Can find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Children may already have <ul style="list-style-type: none">• some understanding of a variety of different rocks in the natural world.• Some understanding of what soil is. (how to identify soil etc)• some knowledge of what a fossil is.	<u>Pupils should be taught to:</u> <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 <u>Working scientifically</u> <ul style="list-style-type: none">• observe rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time• use a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them.• Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed.• Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water.• They can raise and answer questions about the way soils are formed.



Y4	Autumn	
	<h2>Living things and their habitat</h2>	<p>Vocab: kingdom, classification key, species, fungi, bacteria, climate change, characteristics, offspring, extinction, pollution, decay, energy, habitat, freezing plant, structure, herbivore, carnivore, omnivore, microhabitat, environment, reproduction, vertebrate</p>
	<p><u>Required prior knowledge</u></p> <p>From Year 2, pupils can:</p> <ul style="list-style-type: none">• explore and compare the difference 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 the different sources of food.	<p><u>Pupils should be taught to:</u></p> <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 <p><u>Working scientifically</u></p> <ul style="list-style-type: none">• use and make simple guides or keys to explore and identify local plants and animals• make a guide to local living things• raise and answer questions based on their observations of animals and what they have found out about other animals that they have researched.



Animals including humans

Vocab:

digestion, excretion, peristalsis, anus, duodenum, small intestine, large intestine, stomach, rectum, oesophagus, tongue, saliva, acid, bile, enzymes, incisors, canines, molars, predator, prey, producer, consumer, primary, secondary, tertiary.

Required prior knowledge

From Years 1, 2 and 3 pupils:

- can identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat.
- Know how nutrients, water and oxygen are transported within animals and humans.
- Know about the importance of a nutritious, balanced diet.
- Can identify that humans and some other animals have skeletons and muscles for support, protection and movement

Pupils should be taught to:

- describe the simple functions of the basic parts of the digestive system in humans
- identify the different types of teeth in humans and their simple functions
- construct and interpret a variety of food chains, identifying producers, predators and prey

Working scientifically

- compare the teeth of carnivores and herbivores and suggest reasons for differences
- find out what damages teeth and how to look after them.
- They might draw and discuss their ideas about the digestive system and compare them with models or images.

Y4	Spring	
	States of matter	<p>Vocab: bond, condensation, evaporation, reversible, boiling point, melting point, liquid, gas, thermometer, water cycle, continuous precipitation, transpiration, surface runoff process, sublimation, freezing, particle, absorption, dissolving.</p>
	<p><u>Required prior knowledge</u></p> <p>From Years 1, 2 and 3 pupils can:</p> <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. 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. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<p><u>Pupils should be taught to:</u></p> <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 (°C) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> group and classify a variety of different materials explore the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.

	<h2>Sound</h2>	<p>Vocab: vibration, percussion instrument, wind instrument, string instrument, frequency, volume, pitch, transverse wave, longitudinal wave, medium, vacuum, absorption, conductor, energy, insulator, particle, wave..</p>
	<p><u>Required prior knowledge</u></p> <p>Children may have some understanding that objects make different sounds. Some understanding that they use their ears to hear sounds. Know about their different senses.</p>	<p><u>Pupils should be taught to:</u></p> <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 <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • find patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. • They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. • They could make and play their own instruments by using what they have found out about pitch and volume.

Y4	Summer	
	Electricity	<p>Vocab: circuit, component, appliance, charge, electron, battery, cell, bulb, buzzer, switch, wire, current electricity, static electricity, negative terminal, positive terminal, voltage, chemical reaction, absorption, conductor, energy, insulator, particle, property, wave.</p>
	<p><u>Required prior knowledge</u></p> <p>Children may have some understanding that objects need electricity to work. They may understand that a switch will turn something on or off.</p>	<p><u>Pupils should be taught to:</u></p> <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 <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • observe patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.



Y5	Autumn	
	<h2>Properties and changes of materials</h2>	<p>Vocab: Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection. Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing Material, conductor, dissolve, insoluble, suspension, chemical, physical, irreversible, solution, reversible, separate, mixture, insulator, transparent, flexible, permeable, soluble, property, magnetic, hard.</p>
	<p><u>Required prior knowledge</u></p> <p>From KS1, children should be able to:</p> <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.• 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.• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. <p>From Year 4, children should be able to:</p>	<p><u>Pupils should be taught to:</u></p> <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 decide how mixtures might be separated, including through filtering, sieving and evaporating• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic• demonstrate that dissolving, mixing and changes of state are reversible changes• explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda

<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 heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	<p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • carry out tests to answer questions, for example, ‘Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?’ • They might compare materials in order to make a switch in a circuit. • They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. • They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.
<p style="text-align: center;">Living things and their habitat</p>	<p>Vocab: Reproduction, Sexual, Asexual, Pollination, Dispersal, reproduction, cell, fertilisation, pollination, male, female, pregnancy, young, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant</p>
<p><u>Required prior knowledge</u></p> <p>From Year 4, children should be able to:</p> <ul style="list-style-type: none"> • Construct and interpret a variety of food chains, identifying producers, predators and prey • 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. 	<p><u>Pupils should be taught to:</u></p> <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 • <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • Observe and compare the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. • They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs.



Y5	Spring	
	<h2>Earth and Space</h2>	Vocab: Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, day, night, rotate, orbit, axis, spherical, geocentric, heliocentric.
	<u>Required prior knowledge</u> <p>From Key Stage 1 and Year 3, children should be able to:</p> <ul style="list-style-type: none">• Understand changes in weather patterns and seasons.• Compare how things move on different surfaces.• Notice that some forces need contact between two objects, but magnetic forces can act at a distance.• Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing	<u>Pupils should be taught to:</u> <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 <u>Working scientifically</u> <ul style="list-style-type: none">• compare the time of day at different places on the Earth through internet links and direct communication• create simple models of the solar system• construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day;• find out why some people think that structures such as Stonehenge might have been used as astronomical clocks.



	<h2 style="text-align: center;">Animals including humans</h2>	Vocab: Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, Hormone, Physical, Emotional
	<u>Required prior knowledge</u> From Year 4, children should be able to: <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.	<u>Pupils should be taught to:</u> <ul style="list-style-type: none">• describe the changes as humans develop to old age <u>Working scientifically</u> <ul style="list-style-type: none">• research the gestation periods of other animals and comparing them with humans• find out and record the length and mass of a baby as it grows.

Y5	Summer	
	Forces	<p>Vocab: Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys, force, push, pull, opposing, streamline, brake, mechanism, lever, cog, machine, pulley..</p>
	<p><u>Required prior knowledge</u></p> <p>From Year 3, children should be able to:</p> <ul style="list-style-type: none"> • Compare how things move on different surfaces. • Know how a simple pulley works and use making lifting an object simpler • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract and 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 with attract or repel each other, depending on which poles are facing. 	<p><u>Pupils should be taught to:</u></p> <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 <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • explore falling paper cones or cupcake cases, and design and make a variety of parachutes and carry out fair tests to determine which designs are the most effective. • They might explore resistance in water by making and testing boats of different shapes. • They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.



Y6	Autumn	
	<h2>Animals including humans</h2>	Vocab: Oxygenated, Deoxygenated, Valve, Exercise, Respiration Circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco.
	<u>Required prior knowledge</u> From Year 5, children should be able to: <ul style="list-style-type: none">• Describe the changes as humans develop to old age. From Year 4, children should know that: <ul style="list-style-type: none">• Animals have teeth to help them eat.• Different types of teeth do different jobs.• Food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood.• The blood takes nutrients around the body.	<u>Pupils should be taught to:</u> <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, exercise, drugs and lifestyle on the way their bodies function• describe the ways in which nutrients and water are transported within animals, including humans <u>Working scientifically</u> <ul style="list-style-type: none">• explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.

	<h2 style="text-align: center;">Living things and their habitats</h2>	<p>Vocab: Variation Organisms Populations. Classification Characteristics Environment, flowering, nonflowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation. Classify, compare, bacteria, microorganism, organism, invertebrates, vertebrates, Linnaean.</p>
	<p><u>Required prior knowledge</u></p> <p>From Year 4, children should be able to:</p> <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 danger to living things. 	<p><u>Pupils should be taught to:</u></p> <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 specific characteristics <p><u>Working scientifically</u></p> <ul style="list-style-type: none"> • use classification systems and keys to identify some animals and plants in the immediate environment. • They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.



Y6	Spring	
	<h2 style="text-align: center;">Earth and Space</h2>	<p>Vocab: Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, day, night, rotate, orbit, axis, spherical, geocentric, heliocentric.</p>
	<p><u>Required prior knowledge</u></p> <p>From Key Stage 1 and Year 3, children should be able to:</p> <ul style="list-style-type: none">• Understand changes in weather patterns and seasons.• Compare how things move on different surfaces.• Notice that some forces need contact between two objects, but magnetic forces can act at a distance.• Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing	<p><u>Pupils should be taught to:</u></p> <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 <p><u>Working scientifically</u></p> <ul style="list-style-type: none">• compare the time of day at different places on the Earth through internet links and direct communication• create simple models of the solar system• construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day;• find out why some people think that structures such as Stonehenge might have been used as astronomical clocks.



Evolution and Inheritance

Vocab:

Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Variation, Inherited, Environmental, Mutation, Competition, Survival of the Fittest, Evidence.

Required prior knowledge

From KS1 and KS2, children should be able to:

- Understand there is a variety of life on Earth
- Know that some animal's differences are important to their survival
- Know how animals and plants reproduce
- Know how fossils form over time

Pupils should be taught to:

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- 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

Working scientifically

- observe and raise questions about local animals and how they are adapted to their environment
- comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels.
- They might analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.



Y6

Summer

Properties and changes of materials

Vocab:

Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection. Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing Material, conductor, dissolve, insoluble, suspension, chemical, physical, irreversible, solution, reversable, separate, mixture, insulator, transparent, flexible, permeable, soluble, property, magnetic, hard.

Required prior knowledge

From KS1, children should be able to:

- Distinguish between an object and the material from which it is made.
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- Describe the simple physical properties of a variety of everyday materials.
- Compare and group together a variety of everyday materials on the basis of their simple physical properties.
- 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.

From Year 4, children should be able to:

- Compare and group materials together, according to whether they are solids, liquids or gases.

Pupils should be taught to:

- 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 decide how mixtures might be separated, including through filtering, sieving and evaporating
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda



- Observe that some materials change state when heated or cooled, and measure and 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.

Working scientifically

- carry out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?'
- They might compare materials in order to make a switch in a circuit.
- They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes.

They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.