



Science: Autumn Spring Summer

Curriculum Intent:

By the end of Key Stage One

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1.

By the end of Lower Key Stage Two (Year 3 and 4)

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

By the end of Upper Key Stage Two (Year 5 and 6)

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read, spell and pronounce scientific vocabulary correctly.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants - biology	<p>Use senses to explore and talk about plants.</p> <p>Describe what a plant looks like.</p> <p>Identify, name and describe the basic structure of common plants, including garden plants and trees, both deciduous and evergreen.</p>	<p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Identify and describe the basic structure of a flowering plant including roots, stem/trunk, leaves and flowers.</p> <p>Find out about and describe what plants need to grow and stay healthy,</p>	<p>Explore the part that flowers play in the e cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p>Identify and describe the functions of different parts of flowering plants, including roots, stem/trunk, leaves and flowers.</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil and room to grow) and how these vary from plant to plant and the way in which water is transported in plants.</p>	<p>Explore in detail the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p>Identify and describe detail the functions of different parts of flowering plants, including roots, stem/trunk, leaves and flowers.</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil and room to grow) and how these vary from plant to plant and the way in which water is transported in plants. (NB Yr3 statements)</p>	<p>Describe using scientific vocabulary the key functions of a plant, including reproduction. the stigma, root and leaf.</p>	<p>Describe the features and function the stigma, root and leaf.</p> <p>Describe the process of photosynthesis</p>
Animals, including Humans – biology	<p>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> <p>Name and talk about their members of immediate and extended family.</p> <p>Identify, name and describe a variety of common animals including fish, amphibians, reptiles, birds and mammals, carnivores, herbivores and omnivores.</p> <p>Describe and compare the structure of common animals such as birds, fish, reptiles and pets</p> <p>Describe what is needed to healthy and clean.</p>	<p>Draw and label the main parts of the human body and link body parts to the associated senses.</p> <p>Name and talk about the young of humans and other animals.</p> <p>Identify and name a variety of common animals such as amphibians, mammals and invertebrates.</p> <p>Find out about and describe the basic needs of animals including humans for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, a balanced diet and hygiene, including how to look after teeth</p>	<p>Identify and describe simple features of human and other animal skeletons, and how muscles are used for support, protection and movement.</p> <p>Describe in simple terms the changes that take place as animals grow.</p> <p>Identify that animals including humans need the right types and amount of nutrition and that they cannot make their own food, that they need nutrition from what they eat.</p> <p>Describe the link between an animal's diet and their type of teeth</p>	<p>Name and describe key features of the human body, including organs, skeleton and muscles.</p> <p>Talk in simple terms about how animals grow & reproduce.</p> <p>Describe the simple functions of the human digestive system in humans.</p> <p>Identify the different types of teeth in humans and their simple functions.</p>	<p>Describe scientifically the function of the main organs in the body, including muscles, the skeleton and their main functions.</p> <p>Describe the changes that take place as humans develop from birth to old age. Learn about the changes that take place during puberty.</p> <p>Use scientific terms to describe the key features of a healthy diet, including main food groups.</p> <p>Draw a timeline to indicate stages in the growth and development of humans.</p>	<p>Identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood.</p> <p>Recognise that normally the offspring of a living thing will not be identical to its parents.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the functions of the body</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>
Life Processes - biology	<p>Use the senses to describe similarities and differences.</p> <p>Identify the parts of the body associated with the each of the senses.</p>	<p>Explore and compare the differences between things that are living, dead and things that have never been alive.</p>	<p>Recognise that living things grow and reproduce.</p> <p>Describe the basic conditions that plants and animals need in order to survive.</p> <p>Describe and compare features of living, dead and non-living things.</p>	<p>Describe basic life processes, e.g. growth and reproduction.</p> <p>Identify and discuss in simple terms things that can cause illness or decay. Identify and talk about known micro-organisms e.g. mould in some cheeses.</p> <p>Describe differences and similarities between a range of living and non-living thing</p>	<p>Describe the life process of reproduction in some plants and animals.</p> <p>Use scientific vocabulary to describe life processes, e.g. respiration in animals, pollination in flowering plants etc.</p> <p>Identify the key features of living and non-living things in detail.</p>	<p>Recognise that micro-organisms feed, grow and reproduce like other organisms.</p> <p>Recognise and suggest ways of preventing the spread of harmful micro-organisms.</p> <p>Identify an increasing range of features of living and non-living things in detail.</p>

<p>All Living Things - biology</p>	<p>Identify and talk about a range of common animals.</p> <p>Talk about similarities between animals and plants and where some animals & plants are found.</p> <p>Talk about what animals eat.</p>	<p>Sort and group plants and animals according to simple features.</p> <p>Identify a range of similarities and differences between animals and plants.</p> <p>Describe how animals obtain their food from plants and other animals.</p>	<p>Describe reasons for criteria for sorting and grouping, for example, number of legs, shape of leaf. Recognise and talk about different living things found in different places, for example, ponds, woods.</p> <p>Use a simple food chain, identifying and naming different sources of food.</p> <p>Identify ways in which an animal or plant is suited to its environment, for example, a fish having fins to help it swim.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p>	<p>Describe features of plants and animal and compare similarities and differences between sub-groups, recognising that all living things can be grouped in different ways.</p> <p>Explore and use classification keys to help to group, identify and name a variety of living things in the local and wider environment.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p>Recognise that environments can change and that this can pose dangers to living things.</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Use keys based on external features to help identify and group living things systematically.</p> <p>Describe relationships using food chains, for example, predator and prey.</p> <p>Explain the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p>	<p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences including micro-organisms, plants and animals.</p> <p>Give reasons for classification of plants and animals based on specific characteristics.</p> <p>Describe the feeding relationships between plants and animals in a range of habitats.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago.</p>
<p>Earth and Space – physics</p>	<p>Name the four seasons and describe the changes that take place.</p> <p>Observe and describe the weather associated with the seasons.</p>	<p>Observe and talk about changes across the four seasons</p>	<p>Observe and describe weather associated with the four seasons and how the day length varies.</p>	<p>Identify the changes that occur in shape of the moon over time.</p>	<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</p>	
<p>Everyday Materials - chemistry</p>	<p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials, including wood, plastics, glass, metal, water and rock.</p> <p>Describe the physical properties of a range of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>Identify and compare the suitability of a range of everyday materials based on simple physical properties, e.g. smooth, soft, hard...</p> <p>Talk about what common materials are used for, e.g. glass for windows.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>	<p>Identify and compare the uses of a range of common everyday materials and their properties.</p> <p>Compare and group different kinds of rocks based on appearance and simple physical properties.</p> <p>Compare how objects move on different surfaces.</p> <p>Talk about materials that are magnetic.</p> <p>Recognise that soils are made from rocks and organic matter.</p>	<p>Use knowledge and understanding of materials to sort and group materials, identify and describe the features of sub-groups within a material with the same properties, e.g. oak, beech, birch etc.</p> <p>Describe why materials are used for different purposes, e.g. glass for windows.</p> <p>Compare and group materials together, according to whether they are solids, liquids or gases.</p>	<p>Identify and give reasons why materials are used for a specific task or purpose.</p> <p>Compare and group everyday materials based on evidence from comparative and fair tests, based on hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.</p>	<p>Explain how the differences between the properties of different materials can be used to classify substances.</p> <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago.</p>

<p>Changing Materials - chemistry</p>	<p>Name some familiar solids and liquids.</p> <p>Talk about some shapes that can be changed, e.g. by pinching, squashing, bending, twisting and stretching.</p>	<p>Name and describe some simple solids and liquids.</p> <p>Find out how the shapes of solid objects made from some materials can be changed, e.g. bending, twisting and stretching, melting, freezing and forces etc</p> <p>Separate a solid from a liquid with support.</p>	<p>Describe processes that can be used to change the shape of some materials, e.g. bending and stretching.</p> <p>Identify a range of simple reversible and irreversible changes, e.g. heating and cooling.</p> <p>Recognise that some things dissolve</p>	<p>Observe that some materials change state when heated or cooled and that some can be reversed, e.g. freezing water and that some are irreversible, e.g. baking clay.</p> <p>Measure or research the temperature at which materials change state when heated or cooled.</p> <p>Describe the difference between solids and liquids.</p> <p>Describe in simple terms the separation of solids by filtration.</p>	<p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of vinegar (acid) on bicarbonate of soda.</p> <p>Describe in detail the properties of liquids, solids and gases.</p>	<p>Describe evaporation and condensation in the water cycle making the link between the rates of evaporation with temperature.</p> <p>Use developing knowledge of solids, liquids and gases to describe how mixtures might be separated, including through filtering, sieving and evaporation</p>
<p>Light and Sound - physics</p>	<p>Observe and name sources of light, including electric lights, flames and the Sun.</p> <p>Observe and name a variety of sources of sound.</p>	<p>Talk about features of light and dark.</p> <p>Talk about and describe how a shadow is formed.</p> <p>Describe the link between brightness and distance.</p> <p>Use everyday words to describe sounds.</p>	<p>Recognise that light is needed to see things and that dark is the absence of light.</p> <p>Recognise that shadows are formed when light from a light source is blocked by a solid object.</p> <p>Notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun is dangerous and that there are ways to protect the eyes.</p> <p>Talk about how sound travels.</p> <p>Use the term vibration, when describing sounds and recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>	<p>Describe what happens to a light source in the dark.</p> <p>Find patterns that determine the size of shadows.</p> <p>Describe the way in which light is reflected from surfaces.</p> <p>Describe in simple terms how light travels and what happens.</p> <p>Describe in detail how sound travels and how it can be changed.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produce it.</p>	<p>Use the terms transparent & opaque when describing light.</p> <p>Use scientific terms to describe shadows, including the way in which they are formed and can be altered.</p> <p>Use scientific terms to describe the functions of the eye.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produce it.</p>	<p>Recognise and explain how light appears to travel in straight lines.</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the object that casts them.</p> <p>Use knowledge of how light travels to explain the formation of shadows.</p> <p>Use the idea that light travels in straight lines to explain that objects can be seen because they give out or reflect light into the eye.</p> <p>Explain that things are seen because light travels from light sources to the eye or from light sources to objects and then to the eye.</p>
<p>Electricity – physics</p>	<p>Identify the brightest bulb.</p> <p>Name equipment that uses electricity.</p> <p>Identify some electricity dangers.</p>	<p>Recognise that a light switch turns a bulb on and off.</p> <p>Explain in simple terms how a circuit works.</p> <p>Make and draw a simple series circuit.</p>	<p>Recognise that batteries are a source of electricity.</p> <p>Make circuits with more one than 1 bulb. Explain simply how the number of batteries affects the amount of electricity.</p>	<p>Describe why a bulb won't light and identify the problem within the circuit.</p> <p>Construct and record a simple series circuit, and name its basic parts, including cells, wires, bulbs, switches and buzzers.</p>	<p>Explain scientifically what happens if you change the number of bulbs.</p> <p>Record and construct a series electrical circuit, identifying and naming its basic parts.</p>	<p>Record and construct a parallel and series electrical circuit, identifying and naming its basic parts.</p> <p>Explain the link between the brightness of a bulb or volume of a buzzer with the number and voltage of cells used in the circuit.</p>

			<p>Talk about the effect of making or breaking contacts in a circuit. Recognise common conductors and insulators.</p>	<p>Know that a bulb lights up when there is an effective conducting material in the circuit and is part of a complete circuit.</p> <p>Describe what happens when making and breaking a circuit, recognise that a switch opens and closes a circuit and link to the lighting of a bulb.</p> <p>Identify common appliances that run on electricity.</p> <p>Recognise common conductors and insulators and associate metals with being good conductors</p>	<p>Identify whether a bulb will light in a simple series circuit based on whether the bulb is part of a complete loop with a battery.</p> <p>Explain how to/what happens when you connect more than 1 battery. Describe the use of conductors & insulators in wires.</p>	<p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.</p> <p>Use recognised symbols when representing a simple circuit diagram.</p> <p>Identify whether a bulb will light in a simple parallel or series circuit based on whether the bulb is part of a complete loop with a battery.</p> <p>Recognise that a switch opens and closes a circuit and the impact on a bulb within a series circuit.</p> <p>Use by knowledge of conductors & insulators to construct wires.</p>
<p>Forces & Magnets – physics</p>	<p>Talk about and describe the movements made.</p> <p>Talk about and describe the movement of objects, e.g. squashing, turning, rolling, pushing etc</p>	<p>Talk about why some objects will not move.</p> <p>Recognise that actions such as, throw, kick and blow are examples of pushes and pulls.</p> <p>Describe the way in which pushes and pulls can make objects speed up, slow down and change direction.</p>	<p>Compare how things move on different surfaces.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>Describe magnets as having two poles.</p> <p>Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance.</p> <p>Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials.</p> <p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Recognise that pushes and pulls will bring an object to rest more quickly. Describe situations where friction is helpful and where it is not. Identify the effects of friction acting between moving surfaces</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p> <p>Describe situations where there is more than one force acting on an object.</p> <p>Compare and group everyday materials that are magnetic and identify magnetic materials.</p> <p>Identify factors than increase resistance.</p>	<p>Identify the effects of air resistance, water resistance and friction that act between moving surfaces.</p> <p>Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p> <p>Recognise that weight is a force and is measured in Newtons.</p> <p>Use a Force meter accurately.</p> <p>Recognise that when an object is at rest the forces are balanced.</p> <p>Recognise that unsupported objects fall to Earth because of the force of gravity acting between the Earth and the falling object.</p>	<p>Identify the effects of air and water resistance that act between moving surfaces.</p> <p>Recognise that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs.</p> <p>Explain how motion is affected by forces such as gravitational attraction, magnetic attraction and friction.</p> <p>Describe motion in detail, in terms of balanced and unbalanced forces.</p> <p>Describe how gravity acts between the Earth and a falling object.</p>