

Science

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.

They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

The national curriculum for science aims to ensure that all pupils:

- Equip children to use themselves as starting points for learning about science, and to build on their enthusiasm and natural sense of wonder about the world.*
- Develop, through practical work, the skills of observation, prediction, investigation, interpretation, communication, questioning and hypothesising, and increased use of precise measurement skills*
- and ICT.*
- Encourage and enable pupils to offer their own suggestions, and to be creative in their approach to science, and to gain enjoyment from their scientific work.*
- Enable children to develop their skills of co-operation through working with others, and to encourage where possible, ways for children to explore science in forms which are relevant and meaningful to*
- them.*
- Encourage children to collect relevant evidence and to question outcome and to persevere.*
- Stress the need for personal and group safety by the correct usage and storage of resources.*

		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIOLOGY	Plants	Plants have similar features but can look very different. Plants are living things Some plants have flower and other do not. Know that there are different kinds of plants which thrive in different places. Plants grow when they have the correct conditions. Trees are plants	Plants have common parts, but they vary between different plants. Some trees keep their leaves all year: non-deciduous/evergreen. Some trees drop their leaves during autumn and grow them again during spring: deciduous.	Plants are made up from different parts which each have their own unique role. A stem supports leaves, flowers and fruits, transports water between roots and shoots, and stores nutrients. Leaves produce food for the plant. Roots keep the plant firmly in its place,	Many plants, but not all have roots, stems / trunk, leaves, flower or blossom. The root anchors the plant and absorbs water and nutrients from the soil. The stem transports water and nutrients around the plants and holds the leaves and flowers up to the air to enhance photosynthesis,	Living things can be classified into groups according to their features. Classification keys and be used to identify and name living things. Living things live in a habitat in an environment to which they are suited. Environments change with the seasons.	Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Sexual reproduction occurs through pollination, usually involving wind or insects.	Plants can make their own food whereas animals cannot. , spiders, snails and worms. Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants.



		The stem carries water or nutrients to different parts of the plant. The stem keeps the plant standing upright. The roots of a plant take up water and nutrients from the soil. The roots anchor the plant in the ground and keeps it steady. A leaf is an important part of the plant because it produces food. Leaves can be different shapes, sizes and colours. A trunk is the main stem of a tree. A branch is a woody part of the tree that grows out from the trunk. Bark is the covering of stems on woody plants like trees. Bark protects the tree. A flower is the part of a plant that produces seeds. A flower is the bloom or blossom of a plant. Flowers can be different shapes, size and colours. Name local flowers and trees.	transports water and nutrients. Plants may grow from seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries or fruits. Plants are suited to grown best in different environments. Plants need different amounts of water and space to grow well.	pollination and seed dispersal. The leaves use sunlight and water to produce the plants food. Some plants produce flowers which enable the plant to reproduce. Pollen, produced by the male part of the plant, is transferred to the female part of other flowers – this is known as pollination. This forms seed which are dispersed in different ways. Different plants contain different conditions for germination and growth	Humans can cause the environment to change.		
Living Things and their Habitats	Habitats are where living things live. Know that there are different kinds of habitats and different living things live in them. Habitats contain animals and plants Habitats can change Humans can have a big affect on habitats	Name a variety of common wild and garden plants, including deciduous and evergreen trees. Know the basic structure of a variety of common flowering plants, including trees.	All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers An object made of wood is classed as dead.	Different parts of flowering plants have different functions: roots, stem/trunk, leaves and flowers. Plants need air, light, water, nutrients from soil, and room to grow for life and growth. The requirements vary from plant to plant. How water is transported within plants.	There are 7 life processes (movement, respiration, sensitive, nutrition, excretion, reproduce, grow). Living things can be classified into groups according to their features. Classification keys and be used to identify and name living things. Living things live in a habitat in an	As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live and then grow into adults. In other animals, there may be eggs laid that	Living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other living things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms.



				Objects made of rock, metal and plastic have never been alive. Animals and plants live in a habitat to which they are suited. Animals have suitable features that help them move and find food. Plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water. Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. Micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there. The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals can be shown in a food chain.	Which part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	environment to which they are suited. Environments change with the seasons. Humans can cause the environment to change.	hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called metamorphosis. Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Sexual reproduction occurs through pollination, usually involving wind or insects.	Plants can make their own food whereas animals cannot. Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics. Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants.
Animals Including Humans	Humans are animals Name of some common animals from their immediate environment Animals have different body parts which have special names Know that animals and humans grow Know that offspring from animals sometimes look like their parents and sometimes look different	There are different groups of animals. Group the animals according to the features of each group. Animals have different diets. What a carnivore, herbivore and omnivore is. Animals have different body parts.	All animals including humans need to feed, drink and breathe to survive. Know that babies change and grow into adults. Humans need the right amounts and type of food and exercise to grow into healthy adults. Good hygiene stops infections and illness.	Humans and some other animals have skeletons and muscles which help them move and provide protection and support. Identify skull, kneecap, pelvis, ribs and backbone. There are different types of skeletons: endoskeleton, hydrostatic skeleton and exoskeleton.	The journey of food: 1. Food enters the body through the mouth. 2. Digestion starts when the teeth start to break the food down. 3. Saliva is added and the tongue rolls the food into a ball. Food is swallowed and passed down the oesophagus.	Humans can be classified different ways including different stages of life. Classification can change as humans go through stages of growth and development. A life cycle are the stages an animal goes through from birth to death. An animal's life cycle and stages of	Circulatory System 1. The heart pumps blood in the blood vessels around the body. 2. Oxygen goes into the blood and carbon dioxide is removed. 3. After travelling around the body, the blood goes back to the heart. 4. Nutrients, water and oxygen are	



		Animals use their body parts to help them survive. We have five human senses. The five senses are sight, hearing, smell, touch and taste. We see with our eyes We smell with our nose We taste with our tongues. We hear with our ears. We touch with our body parts.	Food can be grouped five different ways. A healthy diet has a balance of the five groups of food. Carbohydrates: provide us with energy Fats and oils: give us an energy store which allows us to absorb vitamins Dairy: help keep our bones healthy by providing calcium Proteins: help our body grow and repair Fruit and Vegetables: provide fibre which helps digestion. They are packed with vitamins and minerals. Water helps our bodies function properly. We should try to eat 5 portions of fruit and vegetables	Animals can be grouped into vertebrates and invertebrates. Vertebrates have a backbone Invertebrates do not have a backbone. Animals need to eat food to get the nutrients they need. A piece of food can provide a range of nutrients. Macronutrients are carbohydrates, protein and fats. Humans need to eat a balanced diet.	4. Food is broken down further in the stomach. 5. Food passes into the small intestine where nutrients are removed from the food. Food leaves the digestive system to be used by other parts of the body. 6. Food passes into the large intestine. Water is removed for use elsewhere in the body. 7. What is left is then stored in the rectum and leaves the body when we go to the toilet. There are four types of teeth. Incisors are used for cutting food. Canines are used for tearing food. Pre-molars and molars are used for grinding and chewing. Living things can be classified as producers, predators and prey according to their place in the food chain.	development can vary between different animals. Babies have a rapid rate of development in their early years. As humans develop, they learn many skills. At puberty a child's body changes and enables them to reproduce as an adult.	transported in the blood. They are transported to the muscles and other parts of the body. 5. When nutrients, water and oxygen are used up they produce carbon dioxide and other waste products. 6. Carbon dioxide is carried back to the heart and the cycle starts again. Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They affect how our heart and lungs work, how likely we are to suffer health conditions, how clearly we think and how we generally feel. Some conditions are caused by deficiencies in our body.
Evolution and Inheritance	Living things have things that are similar and things that are different.	N/A	Most living things live in habitats to which they are suited How different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Animals, including humans, have offspring which grow into adults.	How fossils are formed when things that have lived are trapped within rock. parts that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Environments can change and that this can sometimes pose dangers to living things.	Life process of reproduction in some plants and animals	All living things have offspring of the same kind as features of the offspring are inherited from parents. The offspring are not identical to their parents and vary from each other. Features of offspring are inherited from the parents. Plants and animals have characteristics that make them suited to their environment.



							<i>If an environment changes rapidly, some variations of species may not suit the environment and may die.</i> <i>If an environment changes slowly, animals and plants with variations that are best suited, survive in greater numbers.</i> <i>Characteristics are passed onto the young and over time the inherited characteristics become more dominant within the population.</i> <i>Over a very long period the characteristics might be very different to what the original species was.</i> <i>A new species is created.</i> <i>This is evolution.</i> <i>Fossils give us evidence of what lived on earth millions of years ago.</i> <i>Fossils provide evidence of what lived on the earth millions of years ago and provide evidence to support the theory of evolution.</i> <i>More recently, scientists have observed how living things adapt to different environments.</i> <i>New variants are created.</i>
Rocks	N/A	<i>Name a variety of everyday materials, including rock.</i> <i>Know the basic properties of rock as a material</i>	<i>Know when rock is a suitable material for an object</i>	<i>Rock is a naturally occurring material.</i> <i>Rocks can be hard or soft.</i> <i>Igneous rocks are formed when melted rock cools and becomes solid.</i> <i>Sedimentary rocks are formed from layers of tiny particles being pressed together.</i>	N/A	<i>Living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</i>	N/A

					Sedimentary rocks often contain fossils. Metamorphic are rocks that change into a new kind of rock because of heat, pressure or both. Soil is a mixture of rock, organic matter, air and water. Fossils are the preserved remains or traces of a dead organisms buried in small particles of sediment rock. Over time, the dissolving animal or plant matter is replaced by minerals from the water.			
PHYSICS	Seasonal Change	There are different kinds of weather. The names of different kinds of weather We wear different clothes depending on the weather We can see different animals and plants during different seasons.	The weather changes with the seasons. In the UK it is usually colder and rainier in winter. In the UK it is usually drier and hotter in the summer. The change in weather causes many other changes. (eg. numbers of minibeasts found outside, seed/plant growth, types of clothes worn by people). In the UK the day length is longest in mid summer. The day gets shorter each day until mid-winter (about 8 hours) before getting longer again. Different seasons have different features. There are four seasons: Autumn, Winter, Spring, Summer.		light from the sun can be dangerous and that there are ways to protect their eyes. (	The Earth's rotation explains day and night and the apparent movement of the Sun across the sky.		
	Electricity	Thae electricity powers some objects to work.	N/A	N/A	N/A	Many household devices and appliances run on electricity.	N/A	Adding more cells to a complete circuit will make a bulb brighter, a



					Some devices plug into the mains and others on battery. An electrical circuit consists of a cell or battery connected to a component using wires. Electricity sources push electricity round a circuit. More batteries will push the electrical current round the circuit faster. A complete circuit is needed for the electrical current to flow and devices to work. When a switch is added to the electrical circuit, this allowed electrical current to flow when it is switched on. When we turn it off, this creates a break in the circuit meaning electricity cannot flow anymore and the appliance will not work. Some materials allow electricity to flow easily, and these are called conductors. Metals are good conductors. Non-metals are not. Materials that don't allow electrical flow to flow easily are called insulators.	motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well. You can use recognised circuit symbols to draw simple circuit diagram.
Forces and Magnets	Magnets attract some materials	N/A	Some materials can be changed by squashing, bending, twisting and stretching.	A force is a push or a pull. When an object moves on a surface the texture of the surface and object affects how it moves. Magnets attract magnetic material. Iron, nickel and other materials containing these (stainless steel) are magnetic.	Unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Air resistance, water resistance and friction, act between moving surfaces and have an effects.	

					<i>The strongest part of a magnetic are the poles.</i> <i>There are two poles: north and south.</i> <i>If two like poles are brought together, they will repel.</i> <i>If two unlike poles are brought together, they will attract.</i> <i>Some forces can act at a distance (e.g. magnetism).</i> <i>The magnet does not need to touch the object to attract.</i>		<i>Some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</i>	
Earth and Space	<i>There are different planets</i> <i>There are stars in the sky</i> <i>The moon is not a planet</i>	<i>There are changes across all seasons</i> <i>Weather changes during the different seasons.</i>					<i>The sun is a star and is the centre of our solar system.</i> <i>There are 8 planets in our solar system.</i> <i>The 8 planets travel around the sun in a fixed orbit.</i> <i>The earth spins on its own axis every 24 hours.</i> <i>As the earth rotates, half faces the sun (day), half faces away from the sun (night).</i> <i>The moon orbits the earth.</i> <i>The moon orbits the earth every 28 days.</i> <i>The earth takes 365 ¼ days to orbit the sun (year).</i> <i>The sun, earth and moon are approximately spherical.</i>	n/a
Light	<i>The sun is a source of light</i>	N/A	N/A	<i>Light sources are either natural or man-made.</i> <i>We see objects because our eyes can sense light.</i> <i>Dark is the absence of light.</i> <i>We cannot see anything in complete darkness.</i> <i>Shadows are formed on a surface when an opaque or translucent</i>	N/A	<i>Materials have properties including transparency</i>	<i>Light appears to travel in straight lines.</i> <i>We see objects when light from them goes not our eyes.</i> <i>Light may come directly from light sources but for other objects some light must be reflected the object into our eyes, for it to be seen.</i>	



Sound				object is between a light source and the surface, and it blocks the light. The size of the shadow depends on the position of the source, object and surface. Light from the sun can damage our eyes so we should not look directly at the sun. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective.		Objects that block light will cause shadows. As light travels in straight lines the shape of the shadow will be the same as the outline of the object.
	Sounds can be loud or quiet Different objects can make different sounds We can change the sound of objects from tapping, beating, lucking them. Our bodies can make different sounds.	Ears are the body part that allows us to hear			A sound produces vibrations which travel through a medium from the source to our ears. Sounds are made by something vibrating. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). Vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound. Loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively. Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds.	



	Forces	Things move if we push or pull them We can change the shape of things like dough by bending and twisting them.				Smaller objects usually produce higher pitched sounds	A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the earth by gravity. This causes unsupported objects to fall. Contact forces act between moving surfaces. Air resistance, water resistance and friction are contact forces. A mechanism is a device that allows a small force to be increased to a larger force.	
CHEMISTRY	Materials	Objects are made of different materials Materials have different properties that can be described using vocabulary such as hard, soft, rough, smooth	Objects are made of one or more materials. Objects can be made from different materials. Materials can be described by their properties e.g. shiny, rough, stretchy Everyday materials are made from e.g. plastic, metal, wood Some materials can be in different forms e.g. plastic can be rigid or flexible	All objects are made of one or more material. Materials are chosen because they have suitable properties for the task (e.g. water bottle / plastic / transparent) Materials can be suitable for different purposes. An object can be made from different materials. Objects made in some materials can change shape by twisting, bending and squashing e.g. clay.	Some materials can be changed by squashing, bending, twisting and stretching. Different kinds of rocks differ in their appearance and simple physical properties. Fossils are formed when things that have lived are trapped within rock. Some materials are magnetic		Materials have different uses dependent on their properties and state (solid / liquid / gas) Properties include hardness, transparency, electrical conductivity and attraction to metal. Some materials will dissolve in a liquid and form a solution, this called soluble. Some materials do not dissolve, and this is called insoluble. Mixtures can be separated by filtering, sieving and evaporation. Some changes to materials are reversible, but some result in the formation of new materials and these are non-reversible.	



States of Matter

*Objects can be solid
Objects can be liquid like
water*

*The particles in a solid
shape are tightly packed
together and don't move
– solids retain their
shape.*

*The particles in a liquid
are not as tightly
packed. A liquid can be
poured and keeps a level
horizontal surface.*

*Liquid can change
shape to fit a container.
A gas fills all available
shape and has no fixed
shape or volume.*

*Melting is state change
from solid to liquid.*

*Freezing is a state
change from liquid to
solid.*

*The freezing point of
water is zero degrees.*

*Boiling is a state of
change from liquid to
gas that happens when
liquid is heated to a
certain temperature.*

*Water boils at 100
degrees Celsius.*

*Evaporation is the same
state change as boiling
but happens at a slower
rate only on the surface
of the liquid.*

*Evaporation increases if
the temperature is
higher, the liquid is
spread out or it is windy.*

Water Cycle

- 1. Water at the surface
(e.g. seas, rivers,
oceans etc)
evaporates into
water vapour,
which is a gas.*
- 2. Water vapour rises,
cools and
condenses back
into a liquid
forming clouds.*



						3. Precipitation is when too much water condenses, the water vapour in the clouds is too heavy and falls back down (rain, sleet, snow).		
Rocks	<i>Rocks are hard. Rocks can be different colours Rock are natural materials</i>				<i>Rock is a naturally occurring material. Rocks can be hard or soft. Igneous rocks are formed when melted rock cools and becomes solid. Sedimentary rocks are formed from layers of tiny particles being pressed together. Sedimentary rocks often contain fossils. Metamorphic are rocks that change into a new kind of rock because of heat, pressure or both. They can be smooth or shiny. Soil is a mixture of rock, organic matter, air and water. Fossils are the preserved remains or traces of a dead organisms buried in small particles of sediment rock. Over time, the dissolving animal or plant matter is replaced by minerals from the water.</i>			