Science – Knowledge Progression

Big Idea	Concept	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Humankind	Human body	The basic body parts are the head, arms, legs, nose, eyes, ears, mouth, hands and feet. Different body parts are used for different things, such as the eyes are used to see.	The basic body parts are the head, arms, legs, nose, eyes, ears, mouth, hands and feet.	Humans grow from baby to toddler to child to teenager to adult to elderly.	Humans have a skeleton and muscles for movement, support and protecting organs. Muscles are soft tissue made up of many stretchy fibres. Muscles allow us to move, breathe and digest food. The three main types of muscle in the human body are skeletal, cardiac and smooth. A joint is where two or more bones meet and connect. Parts of the human body can bend easily because the skeleton has lots of small bones and joints.	The digestive system is responsible for digesting food and absorbing nutrients and water. The mouth, oesophagus, small intestine and large intestine are organs of the digestive system.		The heart, blood and blood vessels make up the circulatory system. The circulatory system moves blood around the body. The heart is a muscular organ that pumps blood around the body through the blood vessels. Blood is a substance that carries oxygen, other nutrients and hormones around the body. It also carries carbon dioxide and other waste products so they can be excreted. Blood is made up of plasma, platelets, red blood cells and white blood cells. Plasma is a yellowish liquid, mainly water. It carries red blood cells, white blood cells and platelets around the body. Red blood cells carry oxygen and carbon dioxide around the body.

								White blood cells fight infection and other diseases. Platelets are small cell fragments that clump together to stop bleeding from a cut in a blood vessel.
	Staying safe	Plants need air, sunlight, warmth, water and nutrients from soil to grow.	Ways to stay safe include: using sun cream and wearing and hat in the Sun; stopping, looking and listening when crossing the road; not touching sharp or hot objects; only eating or drinking what you know or have been given by an adult you trust. Using sun cream and wearing a hat helps you to stay safe in the Sun.	Humans need water, food, air and shelter to survive.	Light from the Sun is damaging for vision and the skin. People can protect themselves from the Sun by using sun cream, wearing sun hats and sunglasses and by staying indoors or in the shade.	Working with electrical circuits can be dangerous.		Lasers are intense beams of light and they should never be pointed at people's faces or aircraft.
	Healthy lifestyle	It is important to wash and dry our hands after using the toilet and before eating to stop the spread of harmful germs.	Hand washing and good hygiene prevent the spread of germs.	A healthy lifestyle includes exercise, a balanced diet, good quality sleep and personal hygiene. Risks associated with an unhealthy lifestyle include illness, obesity, tooth decay and mental health problems. Germs are microorganisms that can cause illness in humans. Germs get into the body through the eyes, nose or mouth. Washing hands with soap and clean	Humans get nutrition from what they eat. It is important to have a balanced diet made up of the main food groups, including: proteins, carbohydrates, fruit and vegetables, dairy products and alternatives, and fats and spreads. Humans stay hydrated by drinking water.	Regular teeth brushing, limiting sugary foods and visiting the dentist are important for good oral hygiene.	Good personal hygiene (washing, wearing clean clothes and brushing teeth) can prevent disease or illness.	Exercise benefits your heart by lowering blood pressure, reducing weight, strengthening muscles and lowering stress.

				running water helps humans avoid getting ill and spreading germs to others.				
Processes	Pattern seeking	The weather, plants and animals in the local environment, change throughout the year.	The four seasons are spring, summer, autumn and winter. Certain events and weather patterns happen in different seasons.	The UK has typical weather in each of the seasons. For example, winter is cold and sometimes frosty, whereas summer is warm and sometimes sunny. Many animals behave differently in different seasons in the UK. These different behaviours, such as migration and hibernation, are linked to their life cycles, with spring often being the time for new offspring.		Pitch is how high or low a sound is. Generally, the longer, looser, bigger and thicker the sound source is the lower the pitch. Generally, the shorter, tighter, smaller and thinner the sound source is the higher the pitch. Sounds are louder when more energy is put into a sound source because the vibrations and sound waves are larger. The volume of sound is measured in decibels (dB).	As Earth orbits the Sun, it also spins on its axis. It takes Earth a day (24 hours) to complete a full spin. During the day, the Sun appears to move through the sky. The Sun is not moving the Earth is rotating. Earth rotates to the east or, if viewed from above the North Pole, it rotates anti-clockwise, which means the Sun rises in the east and sets in the west. As Earth rotates, different parts of it face the Sun, which brings what we call daytime. The part facing away is in shadow, which is night time.	When a light source is close to an object, the shadow is large because the object is blocking more of the light coming from the source. As a light source moves further away from an object, the shadow gets smaller because the object blocks less light coming from the source.
	Changes	The number of daylight hours varies throughout the year, according to the season. The days are longer in summer and shorter in winter.	Day length is the number of hours of daylight. Day length is longer in the summer months and shorter in the winter months in the UK.	Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay.	Fossils form over millions of years and are the remains of a once-living organism, preserved as rock. Scientists can use fossils to find out what life on Earth was like in prehistoric times.	Heating or cooling materials can bring about a change of state. This change of state can be reversible or irreversible. Melting is the process of a solid changing into a liquid. Freezing is the process of a liquid changing into a solid.	Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions.	

						Evaporation is the process of a liquid changing into a gas. Condensation is the process of a gas changing into a liquid. Temperature is a measure of how hot or cold something is. It is measured in degrees (°) using an instrument called a thermometer. The three different scales temperature can be measured in are Celsius (°C), Fahrenheit (°F) and Kelvin (K). We use the Celsius scale in the UK. When solid water (ice) is heated to 0°C, it begins to melt. This is called its melting point. When liquid water is cooled to 0°C, it begins to freeze. This called its freezing point. When liquid water is heated to 100°C, it begins to evaporate. This is called its boiling point. When gaseous water (water vapour) is cooled to 100°C, it begins to condense. This is called its condensing point. On Earth, temperatures range from around -80°C		

						at their lowest to around 50°C at their highest. Materials exist as solids, liquids or gases. A material's state on Earth depends on Earth's temperature because materials have different melting and boiling point.		
	Earth	Winter is a season, it comes after autumn. The weather is colder in winter with more snow, hail and rain. Spring is a season. It comes after winter and before summer. Spring weather is changeable. It can be warm, cold, sunny, rainy and even snowy.	Wind strength is measured by the Beaufort Scale. Different types of weather include sunshine, rain, hail, wind, snow, fog, lightning, storm and cloud. The weather can change daily and some weather types are more common in certain seasons, such as snow in winter.	The Earth is spherical and is covered in water and land. When it is daytime in one location, it is night time on the other side of the world.		The water cycle has four stages: evaporation, condensation, precipitation (rain) and collection. Evaporation and condensation are caused by temperature changes.	The Solar System is made up of the Sun and everything that orbits around it. The Sun is a huge, hot ball of gas and is the only source of heat and light in the Solar System. The Sun's force of gravity, created by its huge mass, keeps the planets in orbit. The eight planets in our Solar System are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. The tilt of the Earth's axis as it orbits the Sun changes the length of daytime and night time and creates different seasons. When the Northern or Southern Hemisphere tilts away from the Sun, it is winter. It gets less direct sunlight, the weather is colder,	Light waves travel faster than sound waves. Light speed is nearly 300 million metres per second, the fastest thing in the universe. The light waves travels in a straight line from the light source to an object. Reflected light bounces off in a straight line at an angle equal to the angle of impact. Light waves in diagrams are drawn as straight lines with arrowheads that show the direction of travel. Light sources give out light. They can be natural or artificial. When light hits an object, it is absorbed, scattered, reflected or a combination of all three. Light from a source or reflected light enter

							the daytime is shorter and the night time is longer. When the Northern or Southern Hemisphere tilts towards the Sun, it is summer. It gets plenty of direct sunlight, the weather is warmer, the daytime is longer and the night time is shorter. When it is winter in the Northern Hemisphere it summer in the Southern Hemisphere. Water and oxygen are important to all life on Earth. Earth orbits around the Sun. The length of time it takes for Earth to complete a full orbit is 365.25 days, one year. The Earth completes one rotation on its axis in 24 hours, one day. The Moon is Earth's only natural satellite. The Moon is about 385,000km from the Earth. The Moon is not a natural light source. We can only see it because it reflects the Sun's light. The Moon orbits the Earth once every	the eye. Vertebrates, such as mammals, birds and reptiles, have a cornea and lens that refracts light that enters the eye and focuses it on the nerve tissue at the back of the eye, which is called the retina. Once light reaches the retina, it is transmitted to the brain via the optic nerve.

							27.3 days and also rotates on its axis once every 27.3 days. A solar eclipse happens a few times a year when the Moon passes directly between the Earth and the Sun, blocking our view of the Sun and casting a shadow on the Earth. A lunar eclipse happens a few times a year when the Earth is in line between the Moon and the Sun, casting a shadow on the Moon.	
	Phenomena	Rain is drops of water that fall from clouds. A shadow is a dark shape that can be seen on a floor or wall. Shadows are made when a solid object blocks light.	A shadow is formed when light from a light source, such as the Sun, is blocked by an opaque object, but not by transparent objects.	When an instrument is played by plucking, striking or blowing, the air around or inside it vibrates. These vibrations travel as a sound wave to the ear.	A light source is something that produces light. A reflector is something that reflects light. Light is a form of energy that travels in straight lines from a light source. Dark is the absence of light and we need light to be able to see. The main natural light source on Earth is the Sun. Opaque objects cast dark shadows. Translucent objects cast lighter, blurry shadows.	Sound waves travel through a medium, such as air or water, to the ear. A sound source is something that vibrates and creates a sound, such as human vocal cords, part of a musical instrument or a piece of machinery. Volume is a measure, in decibels, how loud or quiet sound is. Applying more force to a sound source adds more energy and results in a louder sound. Pitch is how high or low a sound is.	All planets are spherical because their mass is so large that they have their own force of gravity. This force of gravity pulls all of a planet's material towards its centre, which compresses it into the most compact shape – a sphere.	

					Transparent objects allow light to pass through them and do not create shadows. Shadows change when the light source or the object moves. The lower the light source the longer the shadow. A shadow is an area of darkness made when an object blocks light. A shadow is the same shape as the object that casts it because light travels in straight lines. Shadows always appear on the opposite side of the light source.	Generally, the longer, looser, bigger and thicker the sound source is the lower the pitch. Generally, the shorter, tighter, smaller and thinner the sound source is the higher the pitch. Distant and direction of sound can be judged. When energy is put into a sound source it starts to vibrate. These vibrations disturb tiny particles of air. They vibrate and collide with each other, creating sound waves. When the sound waves enter the ear, the eardrum vibrates. These vibrations pass through small bones, called ossicles, and are turned into electrical signals in the cochlea. They travel to the brain and are interpreted as sounds. A sound wave diagram can be drawn as a wavy line with peaks and troughs. The distance between two peaks or troughs is called a wavelength. The shorter the wavelength the		

						higher the pitch of a sound. The longer the wavelength the lower the pitch of the sound. The smaller the peaks and troughs the quieter the sound. The larger the peaks and troughs the louder the sound.		
	Forces	Some objects float and others sink. When an object sinks it falls through water to the bottom of the vessel. An object that floats stays at the water's surface.	Simple equipment can be used for measuring weather including windsocks, thermometers and rain gauges.	Some objects float and others sink.	Forces cause objects to move, change speed or change shape. Some push and pull forces require direct contact. Friction is a force between two surfaces as they move across each other. Friction slows down a moving object. Friction produces heat, which can be a problem.	A series circuit must be a complete loop to work and have a source of power from a battery or cell.	Gravitational force, or gravity, is a non-contact, pulling force between objects that have mass. Gravitational force increases as the mass of an object increases. The mass of the Earth is very large so it exerts a gravitational force large enough for its effects to be seen.	Voltage is measured in volts (V). The bigger the voltage, the more electrons are pushed through the circuit. The more voltage flowing through a lamp, buzzer or motor, the brighter the lamp, the louder the buzzer and the faster the motor.
	Modelling	Dark is the absence of light.	Electrical circuits can light lamps or sound a buzzer. A switch turns an electrical circuit off and on.	Models can have moving parts that use levers, sliders, wheels and axles.		A circuit is a collection of components connected by wires through which an electric current can flow. A circuit must be a complete loop to work. A series circuit has a single path for an electric current to flow through.	A lever is a simple machine that provides a mechanical advantage to make it easier to lift a heavy load. A lever consists of a lever arm, a fulcrum, a load and effort. As the distance between the fulcrum and the effort increases, the effort needed to lift a load decreases. A pulley is a simple machine that	Electrical symbols represent electrical components such as a switch, buzzer or lamp. Electricity is a form of energy that makes things work. Circuit components include cells, buzzers, switches, wires, lamps and motors. A collection of components connected by wires

							provides a mechanical advantage to make it easier to lift a heavy load. A pulley consists of one or more grooved wheels and a rope. As the number of wheels, and the number of pieces of rope supporting the pulleys, increases, the effort needed to lift an object decreases, but the distance the rope has to be pulled increases. Gears are toothed, interlocking wheels that can be place together to make a mechanism that provides a mechanical advantage. Linking different sized gears creates a mechanical advantage. Smaller gears rotate more quickly and are easier to turn but do not provide much force. Larger gears rotate more slowly and are harder to turn but provide more force.	in a loop is called a series circuit.
Creativity	Report and conclude	Some dinosaurs ate plants and some dinosaurs ate other dinosuars. Plants draw up water through their roots and it travels through the stem to	Results are information that has been found out from an investigation.	Results from an investigation can be used to answer a question.	Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses	A conclusion is the answer to a question that uses the evidence collected.	A conclusion is an explanation of what has been discovered using evidence collected.	Electric current is measured using an ammeter. The force that pushes electric charge around a circuit, called the

		the leaves and petals. Water turns to ice when the temperature is very cold. Heat causes ice to melt. When ice melts it becomes water again.			the evidence collected.			voltage, is measured using a voltmeter. A multimeter measures both electric current and voltage. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.
	Gather and record data	Data can be recorded in tables and pictograms.	Data can be recorded and displayed in different ways, including tables, pictograms and drawings.	A timeline is a linear diagram. A life cycle is a circular diagram.	Data can be used to provide evidence to answer questions.	A line graph is a way of displaying data that might show a relationship between two things (variables). Many show changes over the time. A flat line means that there was no change over time. A line with a shallow curve means there was a gradual change over time. A line with a steep curve means there was a quick change over time. Classification keys are created by devising a set of yes or no questions that separate a group into two groups until objects end up on their own.	Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams.	Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams. Bar charts can be used to display for discontinuous variation when there is a set number of outcomes, such as eye colour and blood groups. Line graphs can be used to display continuous variation when there is a range of values, such as the height or mass of different individuals of the same species. Scatter graphs can be used when looking for a correlation between two data sets.
Investigation	Questioning	There is no sunlight at night so the sky is dark.	Question words include what, why,	Questions can help us find out about the world.	Questions can help us find out about the world and can be	Questions can help us find out about the world and can be	Questions can help us find out about the world and can be	Questions can help us find out about the world and can be

		The stars and Moon are always in the sky but the Sun's bright light hides them in the daytime. Living things including dinosaurs lived millions of years ago. Dinosaur remains are called fossils. Dinosaurs were living things that lived on Earth millions of years ago. They are now extinct. Dinosaur means terrible lizard. A volcano is a mountain with a large hole at the top. Lava comes out of the top of the volcano. We can see our reflections in mirrors and other shiny surfaces. Smooth, shiny surfaces reflect light.	how, when, who and which.		answered in different ways.	answered using scientific enquiry.	answered using a range of scientific enquiries.	answered using a range of scientific enquiries, including fair tests, research and observation.
	Measurement	Simple equipment can be used to measure distance, height, weight and time.	Simple equipment is used to take measurements and observations. Examples include metre sticks, measuring tapes, egg timers and hand lenses.	Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels.	Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the	Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C), and metre sticks, rulers or trundle wheels (millimetres, centimetres, metres).	A force meter can be used to measure an object's mass in grams (g) or kilograms (kg) and its weight in newtons (N). Many people commonly mix up and misuse the words mass and weight. Mass is the amount of matter that an	Resting heart rate is the number of times a heart beats per minute when a person is at rest. Heart rate increases during exercise because the body requires more oxygen to meet its needs. Heart rate can be measured by recording the pulse

					accuracy of the measurement.		object or substance contains. Weight is a measure of gravitational force which is different on for example Earth and the Moon.	at different points of the body. A heart rate monitor can also be used to measure the pulse. Specialised equipment is used to take accurate measurements in standard units including light sensors measuring light intensity (lux).
	Investigation	Water turns to ice when the temperature is very cold. Heat causes ice to melt. When ice melts it becomes water again.	Simple tests can be carried out by following a set of instructions.	Tests can be carried out by following a set of instructions. A prediction is a best guess at what might happen in an investigation. Tests can be carried out by following a set of instructions.	A prediction is a best guess for what might happen in an investigation based on some prior knowledge.	Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed and all others remain constant.	A method is a set of clear instructions for how to carry out a scientific investigation. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.	A method is a set of clear instructions for how to carry out a scientific investigation, including what equipment to use and observations to make. A variable is something that can be changed during a fair test. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.
	Observation	The weather and some plants and trees change with the seasons. In autumn, the weather starts to turn colder and some leaves change colour and fall from the trees. Owls are nocturnal birds. They are awake during the night and sleep during the day. Nocturnal animals are awake during	Objects, materials and living things can be looked at and compared.	Objects, materials and living things can be looked at, compared and grouped according to their features.	An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.	Observations can be made regularly to identify changes over time. Classification is the arrangement of living and non-living things into groups or categories. Single-stage classification involves separating a large group of objects into smaller groups based on a single property.	Accurate observations can be made repeatedly or at regular intervals to identify changes over time.	Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons.

		the night and sleep in the daytime. Some materials are waterproof, meaning water cannot pass through. Other materials are not waterproof, meaning the water can pass through. Living things live in different habitats. Gardens are habitats for many plants, trees and animals. Butterflies are insects. They feed on nectar from flowers.						
Materials	Identification and classification	Shiny materials reflect light.	A material is what an object is made from. Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric.	Some foods, such as ice and chocolate, melt when heated, but then harden (solidify or freeze) when cooled.	Light can be reflected from different surfaces. Reflective materials are light in colour, shiny and smooth. Less reflective and non-reflective materials are dark in colour, dull and rough.	Materials can be grouped according to whether they are solids, liquids or gases. Solids stay in one place and can be held. Some solids can be squashed, bent, twisted and stretched. Examples of solids include wood, metal, plastic and clay. Liquids move around (flow) easily and are difficult to hold. Liquids take the shape of the container in which they are held. Examples of liquids include water, juice and milk.	Materials can be grouped according to their basic physical properties. Properties of materials include: hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. Thermal conductors, such as metals, are materials that allow the transfer of heat. Thermal conductors are useful for quickly heating things up. Thermal insulators, such as wood, glass and plastic, are materials that do	Heat energy is transferred in three different ways: conduction, convection and radiation. A material that allows heat energy to travel through it is a thermal conductor. Poor thermal conductors are known as thermal insulators. Insulation is important for the survival of many animals. Blubber is a layer of fat that acts as an insulator under the skin of some animals, such as walruses and whales. It is an adaptation that is

						Gases spread out to fill the available space and cannot be held. Air is a mixture of gases. Some materials have properties of more than one state including: gels, powders and foams.	not transfer heat effectively. Thermal insulators are useful for keeping things at the same temperature. Dissolving is when a solute (material) becomes incorporated into a solvent (liquid) and can no longer be seen. Solubility is a measure of a material's ability to dissolve in a solvent.	essential for their survival. Animals with fur, such as polar bears and Arctic foxes, trap a layer of air close to their skin to insulate them from the cold.
	Properties and uses	Some materials are magnetic, which means that they are attracted to (pull towards) a magnet. Some metals are magnetic. Other materials are non-magnetic, such as wood, dough and glass.	Materials have different properties, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof.	A material's physical properties make it suitable for particular purposes, such as glass for windows and brick for building walls. Objects can be made from one material, more than one material or different materials with similar properties.	Sedimentary, igneous and metamorphic are the three different rock types. Sedimentary rocks form from mud, sand and particles that have been squashed together over a long time to form rock. Igneous rocks are made from cooled magma or lava. Metamorphic rocks are formed when existing rocks are heated by the magma under the Earth's crust or squashed by the movement of the Earth's tectonic plates. Magnetic materials are attracted to magnets.	Electrical conductivity is a measure of a material's ability to allow an electric current to pass through it. Electrical conductors, like metals, have low resistance and allow electricity to flow through them. Non-conductive materials, like plastics, are often known as electrical insulators they do not let electricity through, they have high resistance.	A mixture is a combination of two or more substances that aren't chemically joined and can be separated back into their individual substances. Heterogeneous mixtures consist of distinctly different substances and are easy to separate by classifying and grouping or sieving or filtering. Substances in homogeneous mixtures are evenly distributed and you cannot see the different parts. Homogeneous substances are difficult to separate. Sieving can be used to separate large solids from liquids	Plane mirrors are flat, concave mirrors curve inwards and convex mirrors curve outwards. Plane mirror reflections are the same size, and the right way up but they are reversed. Concave mirrors enlarge the image and concentrate the rays of light into a focal point. Convex mirrors make images smaller and disperse light which reflects a wider view.

					Iron, cobalt, nickel and steel are magnetic metals. Other metals and materials such as plastic, paper, glass and wood are not magnetic.		and some solids from other solids. Filtering can be used to separate small solids from liquids. A material's properties dictate what it can be used for.	
Nature	Identification and classification	Parts of a plant include the roots, stem, leaves, flowers and petals Animals are living things. There are different types of animal. Parent and baby mammals include cow and calf, sheep and lamb, and cat and kitten. Parent and baby birds include duck and duckling, chicken and chick, and goose and gosling.	Plants are living things. Trees are large, woody plants and are either evergreen or deciduous. Trees that lose their leaves in the autumn are called deciduous trees. Plants are important because they provide food, shelter and materials for animals, including humans. Humans are living things. They belong to a group of animals called mammals. Humans normally have the same body parts. Humans look different from each other. Animals are living things. Fish, amphibians, reptiles, birds, invertebrates and mammals are groups of animals.	A habitat is a place where plants and animals live. A microhabitat is a very small habitat. Invertebrates are animals without a backbone. Invertebrates include worms, molluscs, crustaceans, insects, arachnids and myriapods. Animals are born or hatch from eggs. The young grow and change until they become adults that can reproduce. A life cycle can be drawn as a circular diagram.	Vertebrates are animals with a spine. Invertebrates are animals without a spine. All vertebrates have an endoskeleton meaning their skeleton is found inside their body. Invertebrates have an exoskeleton or no skeleton.	Scientists classify living things according to shared characteristics. A classification key is a set of questions that helps us identify a living thing or decide which group it belongs to. The animal kingdom is divided into vertebrates and invertebrates. A vertebrate is an animal with a backbone. An invertebrate is an animal without a backbone. Invertebrates usually have soft bodies or a hard outer shell or covering called an exoskeleton. The plant kingdom is divided into vascular and non-vascular plants. Vascular plants have tiny tubes or vessels that carry water, nutrients and provide structure. Plants with seeds and plants with spores are the two	Flowering plants reproduce sexually. The flower is essential for sexual reproduction. Other plants reproduce asexually. Asexual reproduction involves one parent and produces offspring that is identical to the parent.	The first and widest level in the biological classification system is called a kingdom, the second a phylum, then class, order, family, genus and species. There are five kingdoms: animals, plants, fungi, protists and monerans. Members of each kingdom have features in common.

						main types of vascular plants. Flowering and cone-bearing plants are the two groups of plants with seeds. Vertebrates are covered with skin, feathers, scales, fur or hair. They give birth to live young or lay eggs. Vertebrates can be cold blooded or warm blooded.		

	Parts and functions	A sunflower is a type of plant that usually has a very tall stem and a yellow flower with lots of long, thin, petals. Plants need air, sunlight, warmth, water and nutrients from soil to grow. Animals live in different habitats. Animals such as rabbits, badgers and foxes live in a woodland habitat. All animals have special features or ways of behaving that help them to survive. Nocturnal animals including owls, foxes and bats are awake during the night and asleep during the day. Dinosaurs were prehistoric reptiles that lived millions of years ago. Living things are different in different places around the world. Animals have special features that help them live in their environment. Living things are different in different places around the world. Animals have special features that	The basic plant parts include root, stem, leaf, flower, petal and fruit. Plants grow from seeds or bulbs. Different animal groups have some common body parts.	Plants need water, light and a suitable temperature to grow and stay healthy. Many plants grow from seeds or bulbs. Plants have roots, stems, leaves, flowers and fruit. A bulb contains a tiny plant and all the food needed to grow.	Many plants grow from seeds or bulbs. Plants have roots, stems, leaves, flowers and fruit. Roots anchor the plant in the ground and transport water and minerals from the ground to the plant. The stem (or trunk) support the plant above the ground. Leaves collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants. Parts of a flower include the sepal, petal, stamen and carpel. Water is transported in plants from the roots, through the stem to the leaves.	A baby grows 20 primary teeth that start to fall out when a child is six years old. They are replaced by 32 adult teeth. The four different types of teeth are incisors, canines, premolars and molars. Incisors have sharp, straight edges for slicing and cutting food. Canines are pointed for gripping and tearing chewy food such as meat. Pre-molars and molars are wide and have cusps, for crushing and grinding up food so it is small enough to swallow.	Parts of a flower include the stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal.	Inheritance is when living things pass on characteristics following sexual reproduction, such as height, skin colour and eye colour. Variation is the natural differences in characteristics between individuals of the same species. Continuous variation contains a range of values, such as the height or mass of different individuals of the same species. Discontinuous variation has a certain number of outcomes, such as eye colour and blood groups. Animals and plants can be bred to produce offspring with specific and desired characteristics. This is called selective breeding.

		help them live in their environment.						
	Nutrition	Animals eat different kinds of food, including other animals, plants or both animals and plants.	Carnivores eat other animals (meat), herbivores eat plants and omnivores eat other animals and plants.	Food chains show how living things depend on one another for food. Plants always start a food chain because they are producers that make their own food using sunlight. Prey animals have different ways to avoid capture by predators. Plants have adaptations that protect them from being eaten by animals.	Nutrition is the life process of making or finding food to eat. Humans must eat food and drink water to gain the nutrients they need to survive. Humans are omnivores, so they can eat both plant parts and animals. In the wild, animals' diets change over the year as the seasons change due to certain foods becoming available or unavailable. Carnivores only eat meat. Herbivores only eat plants. Omnivores eat meat and plants.	All the different food chains in a specific ecosystem can be linked together. These connected food chains are called a food web. Food chains start with a plant (producer), show what animals eat within a habitat and how energy is passed on over time. A producer is a living thing that makes its own food for energy. Almost all producers are plants. Producers make their own food through the process of photosynthesis. Grass and seaweed are examples of producers. A consumer is a living thing that feeds on other living things. Most consumers are animals. Wolves and penguins are examples of consumers. A predator is a consumer that hunts, kills and eats other animals for food. An animal is called prey if it is killed by a predator for food.	Population changes in a habitat can have significant consequences for food chains and webs.	The human body has different systems that support the seven life processes. The skeletal system supports movement, gives the body shape and protects the organs. The skeletal muscular system supports movement. The endocrine system supports growth. The nervous system supports sensation and movement as it controls almost everything the body does. The digestive system supports nutrition by breaking down food so the body can absorb nutrients. The excretory system supports excretion (getting rid of waste). The reproductive system supports reproduction. The respiratory system supports respiration by taking in oxygen when we breathe in and removing carbon dioxide when we breathe out.

						An ecosystem is a community of living organisms and their environments that are interdependent. Ecosystems have biotic, or living, features including plants, animals and microorganisms. They also have abiotic, or non-living, features including sunlight, water, air, soil and temperature.		The circulatory system supports the transport of oxygen, water and nutrients around the body.
	Survival	In winter the days are short and the nights are cold. Some birds need us to feed them during winter to help them survive. Plants need water, sunlight and air to grow and survive. Gardeners use compost to help plants grow. Plants need water, sunlight and air to survive.	Living things need to be cared for in order for them to survive. Living things need water, food, warmth and shelter.	An animal's habitat must provide water, food, air and shelter for the animal to survive. Animals eat food that is found in their habitat. Herbivores eat plants. Omnivores eat plants and animals (meat). Carnivores eat other animals (meat).	Plants are living things because they grow, take in water and nutrients and reproduce. Plants need air, light, water, nutrients and room to grow, in order to survive.	An adaptation helps an animal or plant survive in its habitat. If living things are unable to adapt to changes within their habitat, they are at risk of becoming extinct.	Sexual reproduction is the process of producing offspring and is essential for the continued survival of a species. Asexual reproduction involves one parent and produces offspring that is identical to the parent.	An adaptation is a physical or behavioural trait that allows a living thing to survive and fill an ecological niche. Natural selection is also known as 'survival of the fittest' because favourable traits help an organism survive and pass on their genes through reproduction. The three different types of plant adaptations are structural, behavioural and chemical. Structural adaptations include modified leaves, roots and trunks. Behavioural adaptations include movement towards the Sun and regulated growth.

								Chemical adaptations include the presence of stings and poisons.
Place and space	Habitats	Living things live in different habitats. Gardens are habitats for many plants, trees and animals.	The local environment is a habitat for living things and can change during the seasons.	A habitat is a place where plants and animals live. Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains. A habitat provides food, water, shelter and space. Humans can damage or destroy habitats. Their actions can harm and even kill living things. Humans can help habitats. They can create new habitats, make habitats safer or provide food and shelter for living things.	Environments are constantly changing due to natural influences, such as seasons, extreme weather, population changes and availability of food. Living things must adapt to these changes in order to survive.		Arable (growing crops), pastoral (raising livestock), mixed (arable and pastoral) are the three main types fo farming in the UK. Intensive farming in the past has resulted in the loss of habitats.	Microorganisms are microscopic living things found in the fungus, protista and monera kingdoms. Microorganisms and can be helpful or harmful to other living things. Viruses are not included in the kingdoms as they are not living and need a host to survive and reproduce. Living things are classified into groups, according to common observable characteristics and based on similarities and differences.
Comparison	Physical things	Materials can feel soft, smooth, rough, squashy thick and thin. Objects can be grouped according to how they feel. Soft materials bend easily. They are not hard or rough to touch.	A property is a quality a material has. Materials with different properties have different uses.	Living things are those that are alive. Dead things are those that were once living but are no longer. Some things have never been alive. The seven life processes of living things are moving, breathing, using their senses, feeding, getting rid of waste,	Magnetism is a non-contact force. Magnets have two poles (north and south). Opposite poles (north and south) attract each other. Like poles (north and north, or south and south) repel each other.	Electricity is a type of energy. It is used to power many everyday items. Electricity comes from two sources, mains and batteries.	Embryo, juvenile, adolescent and adult are stages of a mammal's life cycle. Egg, larva (tadpole), adolescent and adult are stages of an amphibian's life cycle.. Egg, larva, pupa and adult are the stages of some insects including	Environmental factors can affect the distribution of living things within a habitat. These factors include light (intensity and duration), weather, altitude, soil type and humans, such as when we mow or trample grass.

		Hard materials are difficult to bend break and cut. Smooth materials have no lumps, bumps or holes. Some objects block light and make a shadow. Some objects let light through.		having offspring and growing.	There are different types of magnets including bar magnets, horseshoe magnets and floating magnets. Magnets have different strengths.		butterflies, beetles and bees. Egg, baby, adolescent and adult are stages of a bird's life cycle. A mammal is a vertebrate, which means it has a backbone. Producing milk to feed their young, being warm blooded, giving birth to live young, having fur or hair and breathing air with lungs are the five key characteristics of mammals. All mammalian life cycles have the same processes of birth, growth, puberty and reproduction as well as the same stages. The duration of each life cycle stage is different for different mammals.	
	Phenomena	Shadows are made when a solid object blocks a source of light.	Shadows are normally the same shape as the object that cast them. Shadows change during the day as the Sun appears to change position in the sky. Shadows occur where light is blocked by an opaque object.	Volume is how loud or quiet a sound is. Pitch is how high or low a sound is.	Friction is a force between two surfaces as they move over each other. Smooth surfaces usually generate less friction than rough surfaces. Friction slows down a moving object.	Sounds are louder closer to the sound source and fainter as the distance from the sound source increases.	Friction, air resistance and water resistance are forces that oppose motion and slow down moving objects. Lubricants reduce the contact between two surfaces and therefore reduce frictional forces.	A circuit needs a power source, such as a battery or cell, with wires connected to both the positive and negative terminals. An electric current is the flow of electric charge around a circuit. The electric current flows from the cell through all the components

							Liquids, such as water and oil, are used as lubricants. Heat caused by friction can damage moving parts and stop machines from working. Friction can be reduced through streamlining or the use of lubricants and ball bearings between surfaces or using materials with different properties. The larger the surface area of an object the greater the resistance, air or water, it will have when it moves. This will slow it down. Designing objects to have a smaller surface area and streamlined shape decreases resistance, air or water, and allows them to move more quickly through the air. Friction, air resistance and water resistance are forces that oppose motion and slow down moving objects.	and back to the cell. When a switch is open, it creates a gap and the current cannot travel around the circuit. When a switch is closed, it completes the circuit and allows a current to flow all the way around it.
Change	Living things	The weather and some plants and trees change with the seasons. In autumn, the weather starts to turn colder and	Deciduous trees change across the four seasons. Changes happen to animals across the four seasons.	A seed is a small object made by a plant that can grow into a new plant. Seeds need water and warmth to start	The stages of a plant's life cycle include: germination, flower production, pollination, fertilisation, seed	Habitats change over time, either due to natural or human influences. All living things depend on the biotic and abiotic	The human gestation period is around 40 weeks. During this time, the organs, limbs and senses develop, and the foetus grows	The theory of evolution was developed in the 19th century by the naturalists Charles Darwin and Alfred Russel Wallace.

		some leaves change colour and fall from the trees. Living things change over time. In autumn some leaves change colour and fall from the trees. A female butterfly lays eggs. Caterpillars hatch from a butterfly's eggs. Caterpillars grow, then form a chrysalis or cocoon. A butterfly emerges from a chrysalis.	Changes happen to plants across the four seasons.	growing (germinate). As the plant grows bigger, it develops leaves and flowers. The flowers of plants produce seeds. The flowers on some plants develop into fruit that contains seeds. Seeds also form inside cones.	formation and seed dispersal. Pollination is the process where pollen is transferred from the male stamen to the female carpel of another flower of the same type. Seeds can be dispersed by wind, animals, explosion and water.	features of their ecosystems to survive; therefore, any change to one part will affect all the other parts.	until it is ready to be born. Humans go through characteristic stages as they develop towards old age. Puberty is the transition between childhood and adulthood. As humans age, many of the body's systems gradually decline, leading to the changes seen in older people. The gestation period is the time between conception and birth. In general mammals with a smaller mass have a shorter gestation period than mammals with a larger mass. Humans are mammals and have a mammalian life cycle.	The theory states that: all life on Earth has evolved from simple life forms to more complex ones over time; all life on Earth has common ancestors and is therefore related, and; living things with characteristics most suited to their environment are more likely to survive and reproduce. The fossil record and the DNA of living and extinct things provide evidence of evolution.