

Science Knowledge Progression

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Changes	<p>Weather changes through the year. Seasons effect the natural world through the year.</p> <p>Water turns to ice when cold.</p> <p>Ice turns to water when warm/hot.</p> <p>Plants and animals change and grow in different ways.</p>	<p>Day length (the number of daylight hours) is longer in the Summer months and shorter in the Winter months.</p>	<p>Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay.</p>	<p>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 terms. Fossils form when a living thing dies in a watery environment. The body gets covered by mum and sand and the soft tissues rot away. Over time, the ground hardens to form sedimentary rock and the skeletal or shell remains turn to rock.</p>	<p>Heating or cooling materials can bring about a change of state. This change of state can be reversible or irreversible. The temperature at which materials change state varies depending on the material. Water changes state from solid (ice), liquid (water) at 0 degrees Celsius and from liquid (water) to gas (water vapour) at 100 degrees Celsius. The process of changing from a solid to liquid is called melting. The reverse process of changing from a liquid to a solid is called freezing. The process of changing from a liquid to a gas is called evaporation. The reverse process of changing from a gas to a liquid is called condensation</p>	<p>Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions.</p>	
Earth	<p>The natural world changes through the seasons.</p>	<p>Different types of weather include sunshine, rain, hail, wind, snow, fog,</p>		<p>Soils are made from tiny pieces of eroded rock, air and organic matter. There are a</p>	<p>The water cycle has four stages: evaporation, condensation,</p>	<p>The Solar System is made up of the Sun and everything that orbits around it. There</p>	<p>Light travels in straight lines.</p>

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		lightning, storm and clouds. The weather can change daily and some weather types are more common in certain seasons, such as snow in winter		variety of naturally occurring soils, including clay, sand and silt. Different areas have different soil types.	precipitation and collection. Water in lakes, rivers and streams is warmed by the Sun, causing the water to evaporate and rise into the air as water vapour. As the water vapour rises, it cools and condenses to form water droplets in clouds. The clouds become full of water until the water falls back to the ground as precipitation (rain, hail, snow and ice). The fallen water collects back in lakes, rivers and streams. Evaporation and condensation are caused by temperature changes.	are eight planets in our Solar System: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Earth orbits around the Sun and a year (365 days) is the length of time it takes for Earth to complete a full orbit.	Light sources give our 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 eye. Vertebrates, such as mammals, birds and reptiles, have cornea and lens that refract 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.
Forces	There are different forces, such as push and pull, which help make things move.	Simple equipment can be used for measuring weather, such as measuring temperature with a thermometer; identifying wind direction and force with a windsock or	Some objects float and others sink. Objects that float are typically light or hollow. Objects that sink are typically heavy or dense	An object will not move unless a pushing or pulling force is applied. Some forces require direct contact, whereas other forces can act at a distance, such as magnetic force.	A series circuit is a simple loop with only one path for the electricity to flow. A series circuit must be a complete loop to work and have a source of power from a battery or cell.	Gravity is a force of attraction. Anything with a mass can exert a gravitational pull on another object. The Earth's large mass exerts a gravitational pull on all objects on Earth, making	Voltage is measured in volts (V) and is a measure of the difference in electrical energy between two parts of a circuit. The bigger the voltage, the more electrons are pushed through

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		measuring rainfall with a rain gauge.				dropped objects fall to the ground.	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.
Gather & Record Data	Data can be recorded through verbal observations and draw pictures.	Data can be recorded and displayed in different ways, including tables, pictograms and drawings.	Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings.	Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.	Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams	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, classification keys and labelled diagrams
Habitats	Animals can be sorted into land, sky and sea.	The local environment is a habitat for living things and can change during the seasons	Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains. All living things live in habitat to which they are suited and it must provide everything they need to survive		Humans can affect habitats in negative ways, such as littering, pollution and land development, or positive ways, such as garden ponds, bird boxes and wildflower areas.	Farming in the UK can be divided into three main types: arable (growing crops), pastoral (raising livestock), mixed (arable and pastoral). Intensive farming in the past has resulted in the loss of habitats.	Living things are classified into groups, according to common observable characteristics and based on similarities and differences.
Healthy Lifestyles	Basic hygiene routines help to keep us healthy.	Hand washing and good hygiene are important parts of a healthy lifestyle and	A healthy lifestyle include exercise, good personal hygiene, good quality sleep and a	Humans have to get nutrition from what they eat. It is important to have a balanced diet made up	Regular teeth brushing, limiting sugary foods and visiting the dentist are	Good personal hygiene (washing, wearing clean clothes and brushing teeth) can prevent disease or	Lifestyle choices can have a positive (exercise and eating healthy) or negative (drugs, smoking and

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		prevent the spread of germs.	balanced diet. Risks associated with an unhealthy lifestyle include obesity, tooth decay and mental health problems.	of the main food groups, including proteins, carbohydrates, fruit and vegetables, dairy products and alternatives, and fats and spreads. Humans need to stay hydrated by drinking water.	important for good oral hygiene.	illness. Puberty is the period during which adolescents reach sexual maturity and become capable of reproduction. It causes physical and emotional changes.	alcohol) impact on the body.
Human Body	Name some basic human body parts e.g. head, arms, legs, feet, hands. We use our five senses to explore.	The basic body parts are the head, arms, legs, nose, eyes, ears, mouth, hands and feet. The five senses are hearing, sight, smell, taste and touch. Ears are used for hearing, eyes are used to see, the nose is used to smell, the tongue is used to taste and skin gives the sense of touch.	Human offspring go through different stages as they grow to become adults. These include baby,	Humans have a skeleton and muscles for movement, support and protecting organs. Major bones in the human body include the skull, ribs, spine, humerus, ulna, radius, pelvis, femur, tibia and fibula. Major muscle groups in the human body include the biceps, triceps, abdominals, trapezius, gluteals, hamstrings, quadriceps, deltoids, gastrocnemius, latissimus dorsi and pectorals.	The digestive system is responsible for digesting food and absorbing nutrients and water. The main parts of the digestive system are the mouth, oesophagus, stomach, small intestines, large intestines and rectum. The mouth starts digestion by chewing food and mixing it with saliva. The oesophagus transports the chewed food to the stomach, where it mixes with stomach acid and gets broken down in to smaller pieces. In the small intestine, nutrients from the food are absorbed by the body. In the large intestine, water is absorbed by	Human reproduce sexually, which involves two parents (one female and one male) and produces offspring that are different from the parents.	The circulatory system includes the heart, blood vessels and blood. The heart pumps blood through the blood vessels and around the body. There are three types of blood vessel: arteries, veins and capillaries. They each have a different-sized hole (lumen) and walls. The bloody carries gases (oxygen and carbon dioxide), water and nutrients to where they are needed. The red blood cells carry oxygen and carbon dioxide around the body. The blood also contains white blood cells, which protect

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					the body. The remaining undigested waste is stored in the rectum before excretion through the anus		the body from infection.
Identify & Classify	Materials can be sorted into soft and hard.	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. Some surfaces are poor reflectors, such as some fabrics, while other surfaces are good reflectors, such as mirrors	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	Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. Some materials (solutes) will dissolve in liquid (solvents) to form a solution. The solute can be recovered by evaporating off the solvent by heating.	
Investigation	Senses can be used to explore.	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 guess at what might happen in an investigation	Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge	Scientific enquiry 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	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

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					test is one in which only one variable is changed and all others remain constant.		fair test. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding
Living Things	Animals and plants change over time.	All living things (plants and animals) change over time as they grow and mature	Plants grow from seeds and bulbs. Seeds and bulbs need water and warmth to start growing (germinate). As the plant grows bigger, it develops leaves and flowers	Flowers are important in the life cycle of flowering plants. The processes of a plant's life cycle include germinations, flower production, pollination, seed formation and seed dispersal. Insects and the wind can transfer pollen from one plant to another (pollination). Animals, wind, water and explosions can disperse seeds away from the parent plant (seed dispersal).		Humans go through characteristic stages as they develop towards old age. These stages include baby, infant, toddler, child, adolescent, young adult, adult and senior citizen. Puberty is the transition between childhood and adulthood.	Scientists compare fossilised remains from the past to living species that exist today to hypothesise how living things have evolved over time. Humans and apes share a common ancestry and evidence for this comes from fossil discoveries and genetic comparison.
Measurement	Measures can be compared and described as long, tall, short, heavy and light.	Simple equipment is used to take measurements and observations. Examples include metre sticks, measuring tape, 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 (degrees Celsius) and	Equipment is used to take measurement in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (degrees Celsius), and	Specialised equipment is used to take measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (degrees	Specialised equipment is used to take accurate measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and

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				metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement	metre sticks, rulers or trundle wheels (millimetres, centimetres, metres).	Celsius); timers (seconds, minutes and hours); thermometers (degrees Celsius), and measuring tapes (millimetres, centimetres, metres)	temperature (degrees Celsius); timers (seconds, minutes and hours); thermometers (degrees Celsius) and measuring tapes (millimetres, centimetres, metres)
Modelling	Materials can provide different purposes.		Models can have moving parts that use levers, slides, wheels and axles		Electrical components include cells, wires, lamps, motors, switches and buzzers. Switches open and close a circuit and provide control.	Mechanisms, such as levers, pulleys and gears, give us a mechanical advantage. A mechanical advantage is a measurement of how much a simple machine multiplies the force that we put in. The bigger the mechanical advantage, the less force we need to apply.	There are recognised symbols for different components of circuits.
Nutrition	Healthy eating supports overall health and well-being.	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. All food chains start with a plant, followed by animals that either eat the plant or other animals.	Animals cannot make their own food and need to get nutrition from the food they eat. Carnivores get their nutrition from eating other animals. Herbivores get their nutrition from plants. Omnivores get their nutrition from eating a	Food chains show what animals eat within a habitat and how energy is passed on over time. All food chains start with a producer, which is typically a green plant. The producer is eaten by a primary consumer (prey), which is eaten by a	Population changes in a habitat can have significant consequences for food chains and webs	The role of the circulatory system is to transport oxygen, water and nutrients around the body. They are transported in blood and delivered to where they are needed.

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				combination of both plants and animals	secondary consumer (prey), which is eaten by a tertiary consumer. All food chains end with a top or apex predator. Changes within a food chain, such as an abundance or lack of one food type, have an impact on the entire food chain.		
Observation	Objects, materials and living things can be explored and described.	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.	An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.	An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time	An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons
Parts & Functions	Plants start from a seed and grow into a flower/ tree.	The basic plant parts including roots, stem, leaf, flower, petal, fruit, seed and bulb. Trees have a woody stem called a trunk	Plants need water, light and a suitable temperature to grow and stay healthy. Without any of these things, they will die.	The plant's 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. The leaves collect energy from the Sun and make food for the plant.	There are four different types of teeth: incisors, canines, premolars and molars. Incisors are used for cutting. Canines are used for tearing. Premolars and molars are used for grinding and chewing. Carnivores, herbivores and omnivores have	Parts of a flower include the stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal. Pollination is when the male part of a plant (pollen) is carried by the wind, insect or other animals, to the female part of the plant	Animals that sexually reproduce generate new offspring of the same kind by combining the genetic material of two individuals. Each offspring inherits two of every gene, one from the female

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				Flowers make seeds to produce a new plant	characteristic types of teeth. Herbivores have many large molars for grinding plant materials. Carnivores have large canines for killing their prey and tearing meat.	(carpel). The pollen travels to the ovary, where it fertilises the ovules (eggs)	parent and one from the male parent Animals and plants can be bred to produce offspring with specific desired characteristics. This is called selective breeding. Examples include cows that produce large quantities of milk or crops that are disease-resistant.
Pattern Seeking	There are four seasons: Spring, Summer, Autumn and Winter. Changes happen through each season.	There are four seasons: 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	Shadows change shape and size when the light source moves. For example, when the light source is high above the object, the shadow is short and when the light source is low down, the object's shadow is long	Pitch is how high or low a sound is. Parts of an instrument that are shorter, tighter or thinner producing high-pitched sounds. Parts of an instrument that are longer, looser or fatter produce low-pitched sounds. Volume is how loud or quiet a sound is. The harder an instrument is hit, plucked or blown, the stronger the vibrations and the louder the sound	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. However, this is due to the Earth rotating and not the Sun moving. 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	A shadow appears when an object blocks the passage of light. Apart from some distortion or fuzziness at the edges, shadows are the same shape as the object. The distortion or fuzziness depends on the position or type of light sources.

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						face the Sun, which brings what we call daytime. The part facing away in shadow, which is night time	
Phenomena				Friction is a force between two surfaces as they move over each other. Friction slows down a moving object. Smooth surfaces usually generate less friction than rough surfaces	When an instrument is played, the air around or inside it vibrates. These vibrations travel as a sound wave. Sound waves travel through a medium, such as air or water, to the ear. 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. These forces can be useful, such as bike brakes and parachutes, but sometimes we need to minimise their effects, such as streamlining boats and planes to move through water or air more easily, using lubricants and ball bearings between two surfaces to reduce friction	A circuit needs a power source, such as a battery or cell, with wires connected to both the positive and negative terminals. Other components include lamps, buzzers or motors. Which an electric current passes through and affects a response, such as lighting a lamp or turning a motor. 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.
Physical Things	Plants and animals are living things.	Materials can be grouped according to their properties	Living things are those that are alive. Dead things are those that were	Magnets have two poles (North and South). Opposite poles attract each other,	Electricity is a type of energy. It is used to power many everyday items, such as kettles,	A life cycle is the series of changes in the life of a living thing and includes these	

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			once living but are no longer. Some things have never been alive	while like poles repel each other.	computers and televisions. Electricity can also come from batteries. Batteries eventually run out of power and need to be recycled or recharged. Batteries power devices that can be carried around, such as mobile phones and torches.	basic stages: birth, growth, reproduction and death. Mammals' life cycle includes the stages: embryo, juvenile, adolescent and adult. Amphibians' life cycles include the stages: egg, larva (tadpole), adolescent and adult. Some insects' (butterflies, beetles and bees) life cycles include the stages: egg, larva, pupa and adult. Birds' life cycles include the stages: egg, baby, adolescent and adult.	
Properties & their uses	Materials are used for different purposes.	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; magnetic or non-magnetic.	A material's properties make it suitable for particular purposes, such as glass for windows and brick for building walls. Many materials are used for more than one purpose, such as metal for cutlery and cars	There are three different rock types: sedimentary, igneous and metamorphic. Sedimentary rocks form from mud, sand and particles that have been squashed together over a long time to form rock. Examples include sandstone and limestone. Igneous rocks are made from cooled magma or lava. They usually contain	Electrical conductors allow electricity to flow through them, whereas insulators do not. Common electrical conductors are metals. Common insulators include wood, glass, plastic and rubber	Some mixtures can be separated by filtering, sieving and evaporating. Sieving can be used to separate large solids from liquids and some solids from other solids. Filtering can be used to separate small solids from liquids. Evaporating can be used to separate dissolved solids from liquids.	Mirrors and lenses are used in a range of everyday objects (telescopes, periscopes, cards and on the roads). The human eye has a lens that bends and focuses light on the back of the eye (retina) s that we can see.

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				<p>visible crystals. Examples include pumice and granite. 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. They are usually very hard. Examples include slate and marble.</p>		<p>A material's properties dictate what it can be used for. For example, cooking pans are made of metal, which is a good thermal conductor, allowing heat to quickly transfer from the hob to the contents of the pan</p>	
Questioning	Question words include what, why, how, when, and who.	Question words include what, why, how, when, who and which	Questions can help us find out about the world	Questions can help us find out about the world and can be answered in different ways	Questions can help us find out about the world and can be answered using scientific enquiry	Questions can help us find out about the world and can be answered using a range of scientific enquiries	Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation.
Report & Conclude	Observations can be made to find an end result.	The results are information that has been found out from an investigation	The results are information that has been found out from an investigation and 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 the evidence collected	Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected	The results are information, such as measurements or observations, that have been collected during and investigation. A conclusion is an explanation of what has been discovered using evidence collected	The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology

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							and collected evidence.
Staying Safe	It is important to stay safe. Some ways include staying safe in hot and cold weathers (things to wear), in the sun (sun cream, sun hat and shade), crossing roads (stop, look, listen), riding a bike (wearing a helmet), using simple tools (scissors, fork and knife).	It is important to stay safe. Some ways to stay safe include staying safe in strong sunlight (sun cream, sun hat and sunglasses), crossing roads (stop, look and listen), in the kitchen (not touching hot or sharp objects) and with household chemicals (not touching, drinking and eating)	Humans need water, food, air and shelter to survive	Light from the Sun is damaging for vision and the skin. Protection from the Sun includes sun cream, sun hats, sunglasses and staying indoors or in the shade.	Working with electrical circuits can be dangerous. Precautions include not touching electrical components with wet hands and not putting batteries in mouths	Very hot and very cold materials can burn skin. Heating materials should be done safely	Lasers are intense beams of light and they should never be pointed at people's faces or aircraft
Survival	Living things need to be cared for.	Living things need to be cared for in order for them to survive. They need water, food, warmth and shelter	Animals need water, food, air and shelter to survive. Their habitat must provide all these things	Plants need air, light, water, minerals from the soil and room to grow, in order to survive. Different plants have different needs depending on their habitat. Examples include cacti, which need less water than is typical, and ferns, which grow in lower light levels		Reproduction is the process of producing offspring and is essential for the continued survival of a species. There are two types of reproduction: sexual and asexual. Sexual reproduction involves two parents (one female and one male) and produces offspring that are different from the parents. Asexual reproduction involves one parent and produces offspring	An adaptation is a physical or behavioural trait that allows a living thing to survive and fill an ecological niche. Adaptations evolve by natural selection. Favourable traits help an organism survive and pass on their genes to subsequent generations

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						that is identical to the parent	
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