



Science: Long Term Plan

	Big Question One Essential Knowledge	Big Question Two Essential Knowledge	Big Question Three Essential Knowledge	Big Question Four Essential Knowledge	Big Question Five Essential Knowledge	Big Question Six Essential Knowledge
FS2	Throughout the year <ul style="list-style-type: none"> → Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. → Knows about similarities and differences between themselves and others, and among families, communities, cultures and traditions. → Knows about similarities and differences in relation to places, objects, materials and living things. → Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. → Talks about the features of their own immediate environment and how environments might vary from one another, → Asking questions help to understand things. 					
Y1	Autumn One: How do we use our senses? <ul style="list-style-type: none"> → 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. 	Autumn Two: Why do we use different materials for different jobs? <ul style="list-style-type: none"> → Compare and group materials in a variety of ways. → A material is what an object is made from. Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric. → 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. → With support, follow instructions to perform simple tests. 	Spring: What are the flowers and plants like in our environment? <ul style="list-style-type: none"> → Plants are living things. Common plants include the daisy, daffodil and grass. Trees are large, woody plants and are either evergreen or deciduous. Trees that lose their leaves in the autumn are called deciduous trees (e.g. oak, beech and rowan). Trees that keep their leaves all year round are called evergreen trees (e.g. holly and pine). → The basic plant parts include root, stem, leaf, flower and petal. → Trees have a woody stem called a trunk. → Ask simple scientific questions. → With support, use simple equipment to measure and make observations. → Observe objects, materials, living things and changes over time, sorting and grouping them based on their features. → Data can be recorded and displayed in different ways, 	Summer One: How can animals be grouped? <ul style="list-style-type: none"> → Animals are living things. Animals can be sorted and grouped into six main groups: fish, amphibians, reptiles, birds, mammals and invertebrates. → Carnivores eat other animals (meat), herbivores eat plants and omnivores eat other animals and plants. → Different animal groups have some common body parts, such as eyes and a mouth, and some different body parts, such as fins or wings. → Ask simple scientific questions. → With support, follow instructions to perform simple tests 	Summer Two: What changes happen in each season? <ul style="list-style-type: none"> → There are four seasons: spring, summer, autumn and winter. → Day length (the number of daylight hours) is longer in the summer months and shorter in the winter months. → The weather can change daily and some weather types are more common in certain seasons, such as snow in winter. → Observe objects, materials, living things and changes over time, sorting and grouping them based on their features. → Data can be recorded and displayed in different ways, including tables, pictograms and drawings. 	



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			<p>including tables, pictograms and drawings.</p> <p>→ The results are information that has been found out from an investigation.</p>			
Y2	<p>Autumn One: Why do different living things live in different places?</p> <ul style="list-style-type: none"> → All living things live in a habitat to which they are suited and it must provide everything they need to survive. → A habitat is a place where a living thing lives. A microhabitat is a very small habitat. 	<p>Autumn Two: How can we change materials?</p> <ul style="list-style-type: none"> → Compare the suitability of a range of everyday materials for particular uses. → Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay. → Ask and answer scientific questions about the world around them. 	<p>Spring One: What do humans need to grow?</p> <ul style="list-style-type: none"> → Animals have offspring that grow into adults. → Animals need water, food, air and shelter to survive. Their habitat must provide all these things → A healthy lifestyle includes exercise, good hygiene and a balanced diet. 	<p>Spring Two: What do living things need to stay alive?</p> <ul style="list-style-type: none"> → 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. → 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. → Use simple equipment to measure and make observations. → Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning. → Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. 	<p>Summer: What do plants need to grow?</p> <ul style="list-style-type: none"> → Observe and describe how seeds and bulbs change over time as they grow into mature plants. → Plants need water, light and a suitable temperature to grow and stay healthy. → Follow a set of instructions to perform a range of simple tests, making simple predictions → Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language. → The results are information that has been found out from an investigation and can be used to answer a question. 	
Y3	<p>Autumn One: How do we move?</p> <ul style="list-style-type: none"> → Humans have a skeleton and muscles for movement, support and protecting organs. → Some animals have skeletons for support, movement and protection. Endoskeletons are those found inside some 	<p>Autumn Two: How can we make an object move?</p> <ul style="list-style-type: none"> → 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. 	<p>Spring One: What can rocks tell us about the past?</p> <ul style="list-style-type: none"> → There are three different rock types: sedimentary, igneous and metamorphic. → Fossils form over millions of years and are the remains of a 	<p>Spring Two: Can we change our shadows?</p> <ul style="list-style-type: none"> → Dark is the absence of light and we need light to be able to see. → Light can be reflected from different surfaces. → Light from the Sun is damaging for vision and the skin. 	<p>Summer One: What do different plants need to grow in different places?</p> <ul style="list-style-type: none"> → 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 	<p>Summer Two: How do humans stay healthy?</p> <ul style="list-style-type: none"> → Animals cannot make their own food and need to get nutrition from the food they eat.



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	<p>animals, such as humans, cats and horses. Exoskeletons are those found on the outside of some animals, such as beetles and flies. Some animals have no skeleton, such as slugs and jellyfish.</p> <ul style="list-style-type: none"> → Some materials have magnetic properties. Magnetic materials are attracted to magnets. → Magnets have two poles (north and south). Opposite poles (north and south) attract each other, while like poles (north and north, or south and south) repel each other. → Take measurements in standard units, using a range of simple equipment. → Equipment is used to take measurements in standard units. 	<p>once-living organism, preserved as rock.</p> <ul style="list-style-type: none"> → Fossils form when a living thing dies in a watery environment. The body gets covered by mud 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. → Soils are made from tiny pieces of eroded rock, air and organic matter. → Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy. → With help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements. → Results are information that has been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected. 	<ul style="list-style-type: none"> → A shadow is formed when light from a light source, such as the Sun, is blocked by an opaque object. → 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. → Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy. → With help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements. → Results are information that has been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected. 	<p>above the ground. The leaves collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants.</p> <ul style="list-style-type: none"> → Different plants have different needs depending on their habitat. Examples include cacti, which need less water than is typical, and ferns, which can grow in lower light levels. → Water is transported in plants from the roots, through the stem and to the leaves, through tiny tubes called xylem. → Flowers are important in the life cycle of flowering plants. The stages of a plant's life cycle include germination, flower production, pollination, fertilisation, seed formation and seed dispersal. → Ask questions about the world around them and explain that they can be answered in different ways. → Set up and carry out some simple, comparative and fair tests → A prediction is a best guess for what might happen in an investigation based on some prior knowledge. 	
Y4	Autumn One: What happens to our food?	Autumn Two: What makes a bulb light up?	Spring One: How do scientists classify living things?	Spring Two: Why does rain fall?	Summer: Why do we hear different sounds?



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	<ul style="list-style-type: none"> → The digestive system is responsible for digesting food and absorbing nutrients and water. The main parts of the digestive system are the mouth, esophagus, 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 into smaller pieces. In the small intestine, nutrients from the food are absorbed by the body. In the large intestine, water is absorbed by the body. The remaining undigested waste is stored in the rectum before excretion through the anus. → 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. → 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 secondary consumer (prey), which is eaten by a tertiary consumer. 	<ul style="list-style-type: none"> → Construct operational simple series circuits. → Electricity is a type of energy. It is used to power many everyday items, such as kettles, computers and televisions. → Electrical components include cells, wires, lamps, motors, switches and buzzers. Switches open and close a circuit and provide control. → 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. → Electrical conductors allow electricity to flow through them, whereas insulators do not. Common electrical conductors are metals. → Questions can help us find out about the world and can be answered using scientific enquiry. → Begin to independently plan, set up and carry out a range of comparative and fair tests. → 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. 	<ul style="list-style-type: none"> → Scientists classify living things according to shared characteristics. → Classification keys are a scientific tools that aid the identification of living things. → Habitats change over time, either due to natural or human influences. These changes can pose a risk to animals and plants that live in the habitat. → Take accurate measurements in standard units, using a range of equipment. → Observations can be made regularly to identify changes over time. → Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs). 	<ul style="list-style-type: none"> → Materials can be grouped according to whether they are solids, liquids or gases. Solids stay in one place and can be held. Liquids move around (flow) easily and are difficult to hold. Gases spread out to fill the available space and cannot be held. → Heating or cooling materials can bring about a change of state. Water changes state from solid (ice) ⇌ liquid (water) at 0°C and from liquid (water) ⇌ gas (water vapour) at 100°C. 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. → The water cycle has four stages: evaporation, condensation, precipitation, collection. 	<ul style="list-style-type: none"> → 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. → Pitch is how high or low a sound is. Parts of an instrument that are shorter, tighter or thinner produce 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. → Sounds are louder closer to the sound source and fainter as the distance from the sound source increases. → Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.
Y5	<p>Autumn One: How do animals and plants reproduce?</p> <ul style="list-style-type: none"> → Flowering plants reproduce sexually. The flower is essential for sexual reproduction. Other 	<p>Autumn Two: How do humans change as they grow?</p> <ul style="list-style-type: none"> → Humans go through characteristic stages as they develop to old age. These 	<p>Spring: How can materials be changed?</p> <ul style="list-style-type: none"> → Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity 	<p>Summer One: How can moving objects be slowed down?</p> <ul style="list-style-type: none"> → The Earth's large mass exerts a gravitational pull on all objects 	<p>Summer Two: What is in our solar system?</p> <ul style="list-style-type: none"> → The Solar System is made up of the Sun and everything that orbits around it. There are eight planets in our Solar System: Mercury, Venus, Earth,



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	<p>plants reproduce asexually. Bulbs, corms and rhizomes are some parts used in asexual reproduction in plants.</p> <p>→ 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 wind, insects or other animals, to the female part of the plant (carpel). The pollen travels to the ovary, where it fertilises the ovules (eggs). Seeds are then produced, which disperse far away from the parent plant and grow new plants.</p> <p>→ A life cycle is the series of changes in the life of a living thing and includes these basic stages: birth, growth, reproduction and death. Mammals' life cycles include the stages: embryo, baby, 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.</p> <p>→ Humans reproduce sexually, which involves two parents (one female and one male) and produces offspring that are different from the parents.</p> <p>→ 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</p>	<p>stages include baby, infant, toddler, child, adolescent, young adult, adult and senior citizen. Puberty is the transition between childhood and adulthood.</p>	<p>(electrical and thermal) and magnetism.</p> <p>→ Some materials (solutes) will dissolve in liquid (solvents) to form a solution. The solute can be recovered by evaporating off the solvent by heating.</p> <p>→ 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.</p> <p>→ Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions.</p> <p>→ Questions can help us find out about the world and can be answered using a range of scientific enquiries.</p> <p>→ Plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding.</p> <p>→ Take increasingly accurate measurements, in standard units, using a range of chosen equipment.</p> <p>→ Specialised equipment is used to take measurements in standard units. Examples include data loggers and thermometers.</p> <p>→ Accurate observations can be made repeatedly or at regular intervals to identify changes over time.</p> <p>→ Gather and record data and results of increasing</p>	<p>on Earth, making dropped objects fall to the ground.</p> <p>→ Friction, air resistance and water resistance are forces that oppose motion and slow down moving objects.</p> <p>→ Mechanisms, such as levers, pulleys and gears, give us a mechanical advantage.</p>	<p>Mars, Jupiter, Saturn, Uranus and Neptune.</p> <p>→ The Moon orbits Earth.</p> <p>→ The Sun, Earth, Moon and other planets and stars are roughly spherical.</p> <p>→ As Earth orbits the Sun, it also spins on its axis. It takes Earth a day (24 hours) to complete a full spin.</p> <p>→ 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.</p>
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	<p>parents (one female and one male) and produces offspring that are different from the parents. Asexual reproduction involves one parent and produces offspring that is identical to the parent.</p>		<p>complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models).</p> <p>→ 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 evidence collected.</p>		
Y6	<p>Autumn One: How do we see?</p> <ul style="list-style-type: none"> → Light travels in straight lines. → We see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. → A shadow appears when an object blocks the passage of light. Shadows are the same shape as the object because light travels in straight lines. 	<p>Autumn Two: How can we control the brightness of a bulb?</p> <ul style="list-style-type: none"> → The more voltage flowing through a lamp, buzzer or motor, the brighter the lamp, the louder the buzzer and the faster the motor. → Create circuits using a range of components and record diagrammatically using the recognised symbols for electrical components. → Questions can help us find out about the world and can be answered using a range of scientific enquiries. → Plan and carry out a range of enquiries, including writing methods, identifying and controlling variables, deciding on equipment and data to collect and making predictions based on prior knowledge and understanding. → Choose an appropriate approach to recording accurate results, including scientific diagrams, labels, timelines, classification keys, tables, models and graphs (bar, line and scatter), linking to mathematical knowledge. 	<p>Spring One: Why is it useful to classify living things?</p> <ul style="list-style-type: none"> → Classification keys help us identify living things based on their physical characteristics. → Living things are classified into groups, according to common observable characteristics and based on similarities and differences. → Take accurate, precise and repeated measurements in standard units, using a range of chosen equipment. → Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons. 	<p>Spring Two: How have humans changed over time?</p> <ul style="list-style-type: none"> → 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 parent and one from the male parent. → 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. 	<p>Summer: What is the function of the circulatory system?</p> <ul style="list-style-type: none"> → The circulatory system includes the heart, blood vessels and blood. The heart pumps blood through the blood vessels and around the body. → The blood 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 the body from infection. → Lifestyle choices can have a positive (exercise and eating healthily) or negative (drugs, smoking and alcohol) impact on the body. → 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. → Report on and validate their findings, answer questions and justify their methods, opinions and conclusions, and use their results to suggest improvements to their



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					methodology, separate facts from opinions, pose further questions and make predictions for what they might observe.
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