Substantive Knowledge Progression

	Plants	Animals including humans	Living things and their Habitats	Materials	Seasons (KS1) Light and Sound (KS2)	Earth and Space	Forces (YR,3&5) and Electricity (Yr4&6)
Year R Children will be immersed in continuous provision activities to experience the world around them.	I can talk about where plants come from. I can give some simple examples of what a seed needs to grow (water) and explain what happens	I can name some animals I am starting to label some parts of animals I can spot and name a variety of common animals I can talk about the changes that happen to minibeasts using knowledge from stories and texts I can talk about a minibeast's lifecycle using knowledge from stories and texts I understand I should brush my teeth twice a day I can talk about some food that has lots of sugar in it and sugar is not good for our teeth. I can talk about foods that are good/not good for our teeth		I can label some materials using appropriate vocabulary I am learning to describe materials I can say what materials are good for I can describe the properties of materials I can give examples of some materials and changes I can describe how materials change and why.	I can name the seasons and some of the changes that happen during them. I can observe which changes happen over time and start to make links - e.g. winter-snow-cold. I can talk about ways to stay safe in the sun		I am starting to show how things can be moved by pushing or pulling I know about forces for movement- pushes and pulls
Year 1	Plants grow from seeds/bulbs. Plants need light and water to grow and survive. Plants are important. We can eat lots of plants.	There are many different animals with different characteristics. Animals have senses to help individuals survive. When animals sense things they are able to respond. Animals need food to survive. Animals need a variety of food to help them grow, repair their bodies, be active and stay healthy.		There are many different materials that have different describable and measurable properties. Materials that have similar properties are grouped into metals, rocks, fabrics, wood, plastic and ceramics (including glass). The properties of a material determine whether they are suitable for a purpose.	Weather can change. There are lots of different types of weather: rain, sun, cloud, wind, snow. Days are longer and hotter in the summer Days are shorter and colder in the winter There are four seasons: Spring, Summer, Autumn, Winter		
Year 2	Plants need light, water and **warmth** to grow and survive Flowers make seeds to make more plants (reproduce) We need plants to survive (to clean air, to eat) We can eat **different parts** of the plants (leaves, stems, roots, seeds, fruit)	Animals move in order to survive. Different animals move in different ways to help them survive. Exercise keeps animal's bodies in good condition and increases survival chances. All animals eventually die. Animals reproduce new animals when they reach maturity. Animals grow until maturity and then don't grow any larger.	Some things are living, some were once living but now dead and some things never lived. There is variation between living things. Different animals and plants live in different places. Living things are adapted to survive in different habitats. Environmental change can affect plants and animals that live there.	Materials can be changed by physical force (twisting, bending, squashing and stretching)			
Year 3	Plants are producers, they make their own food. Their leaves absorb sunlight and carbon dioxide. Plants have roots, which provide support and draw water from the soil. Flowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed production. Seed dispersal improves a plants chances of successful reproduction. Seeds/bulbs require the right conditions	Different animals are adapted to eat different foods. Many animals have skeletons to support their bodies and protect vital organs. Muscles are connected to bones and move them when they contract. Movable joints connect bones.		There are different types of rock. Rocks are formed in different ways. Soil is made up of living and non-living matter. Explain how fossils are formed. Fossils provide evidence that living things have changed over time.	There must be light for us to see. Without light it is dark (absence). We need light to see things even shiny things. Transparent materials let light through them and opaque materials don't let light through. Beams of light bounce off some materials (reflection). Shiny materials reflect light beams better than non-shiny materials. Light comes from a source. Know how to stay safe in the sun.		Friction is a contact force between two surfaces. Magnets exert attractive and repulsive forces on each other. Magnets exert non-contact forces, which work through some materials. Magnets exert attractive forces on some materials. Magnet forces are affected by magnet strength, object mass, distance from object and object material. Magnets have two poles

	(light, warmth, soil, water, space)to germinate and grow. Seeds contain enough food for the plant's initial growth.						
Year 4		Animals have teeth to help them eat. Different types of teeth do different jobs. Food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood. The blood takes nutrients around the body. Nutrients produced by plants move to primary consumers then to secondary consumers through food chains.	Living things can be divided into groups based upon their characteristics. Environmental change affects different habitats differently. Different organisms are affected differently by environmental change. Different food chains occur in different habitats. Human activity significantly affects the environment.	Solids, liquids and gases are described by observable properties. Materials can be divided into solids, liquids and gases. Heating causes solids to melt into liquids and liquids evaporate into gases. Cooling causes gases to condense into liquids and liquids to freeze into solids. The temperature at which given substances change state are always the same.	Sound travel can be blocked. Changing the shape, size and material of an object will change the sound it produces. Sound is produced when an object vibrates. Sound moves through all materials by making them vibrate. Changing the way an object vibrates changes it's sound. Bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds. Faster vibrations (higher frequencies) produce higher pitched sounds.		A source of electricity (mains or battery) is needed for electrical devices to work. Electricity sources push electricity round a circuit. More batteries will push the electricity round the circuit faster. Devices work harder when more electricity goes through them. A complete circuit is needed for electricity to flow and devices to work. Some materials allow electricity to flow easily and these are called conductors. Materials that don't allow electricity to flow easily are called insulators.
Year 5		Different animals mature at different rates and live to different ages.	Different animals mature at different rates and live to different ages. Some organisms reproduce sexually where offspring inherit information from both parents. Some organisms reproduce asexually by making a copy of a single parent. Different types of organisms have different lifecycles.	When two or more substances are mixed and remain present the mixture can be separated. Some changes can be reversed and some can't. Materials change state by heating and cooling. Sometimes mixed substances react to make a new substance. These changes are usually irreversible. Heating can sometimes cause materials to change permanently. When this happens, a new substance is made. These changes are not reversible. Indicators that something new has been made are: The properties of the material are different (colour, state, texture, hardness, smell, temperature) If it is not possible to get the material back easily it is likely that it is not there anymore and something new has been made (irreversible change).		Stars, planets and moons have so much mass they attract other things, including each other due to a force called gravity. Gravity works over distance. Objects with larger masses exert bigger gravitational forces. Objects like planets, moons and stars spin. Smaller mass objects like planets orbit large mass objects like stars. All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars.	Air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way. Friction is a force **against motion** caused by two surfaces **rubbing against each other**. Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move
Year 6		The heart pumps blood around the body. Oxygen is breathed into the lungs where it is absorbed by the blood. Muscles need oxygen to release energy from food to do work. (Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.)	Variation exists within a population (and between offspring of some plants) – *NB: this Key Idea is duplicated in Year 6 Evolution and Inheritance.* ** Organisms best suited to their environment are more likely to survive long enough to reproduce. Organisms are best adapted to reproduce are more likely to do so. Organisms reproduce and offspring have		Animals see light sources when light travels from the source into their eyes. Animals see objects when light is reflected off that object and enters their eyes. Light reflects off all objects (unless they are black). Non shiny surfaces scatter the light so we don't see the beam. Light travels in straight lines.		Batteries are a store of energy. This energy pushes electricity round the circuit. When the battery's energy is gone it stops pushing. Voltage measures the 'push.' The greater the current flowing through a device the harder it works. Current is how much electricity is flowing round a circuit. When current flows through wires heat is released. The greater

			similar characteristic patterns. Competition exists for resources and mates.				the current, the more heat is released.
	Evolution and Inheritance** Life cycles have evolved to help organisms survive to adulthood. Over time the characteristics that are most suited to the environment become increasingly common.						