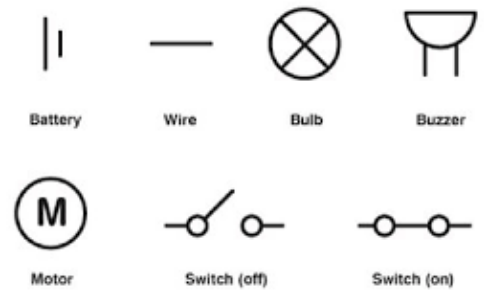
SCIENCE KNOWLEDGE PROGRESSION FROM YEAR R-6

EYFS	YEAR 1	YEAR 2	YEAR 3 and 4	YEAR 5 and 6
Objects are made of different materials and these materials have different properties. Wood comes from trees. Stone comes from the ground. Plastic is made in a factory. There are different living things (plants, animals, humans). Living things grow and die. Exercise and eating well keeps us healthy.	**Materials** Objects are things and materials are what the thing is made out of. What different materials look like and their names (wood, glass, plastic, metal, rock. Materials have describable properties. (Hard, soft, thin, thick, rough, smooth, shiny, see-through).	**Materials** Materials can be changed by physical force (twisting, bending, squashing and stretching). Things can move in different ways. Materials' properties make them suitable for different objects or uses (wood, metal, glass, brick, paper, cardboard, plastic). Different materials have different properties.	**States of Matter** Materials can be divided into solids, liquids and gases. Water boils at 100°C and freezes at 0°C. Melting changes a solid to a liquid. Condensation is when a gas changes to a liquid. Evaporation is when a liquid changes to a gas. Condensation and evaporation are processes in the Water Cycle. Some changes can be reversed and some cannot.	**Properties and changes of materials** All matter (including gases) has mass. A solution is a mixture of substances created by dissolving. Substances can be separated through sieving, filtering and evaporation. Sometimes mixed substances react to make a new substance. These changes are usually irreversible. Heating can sometimes cause materials to change permanently. When water boils, it turns into bubbles of gaseous water, starting at the bottom of the pan because that is where it is heated. It takes less energy to boil a smaller amount of liquid so smaller amounts will boil more quickly, but the boiling temperature is always 100°C.
	Animals, Including Humans There are different types of animal and five main animal groups (fish, birds, amphibians, reptiles and mammals). Carnivores eat meat. Herbivores eat plants. Omnivores eat both meat and plants. There are many different animals with different characteristics and features. There are 5 senses: Ears – hearing Eyes – seeing Nose – smelling Mouth/tongue – tasting Hands/feet – touching.	**Animals, Including Humans** Humans are animals too. All animals eventually die. Exercise keeps animals' bodies in good condition and increases survival chances. Animals need food to survive. Animals need a variety of food to help them grow, repair their bodies, be active and stay healthy. Hygiene is important to stay healthy and survive.	**Animals, Including Humans** Animals have teeth to help them eat. The different teeth are: molar, incisor, canine. The digestive system includes teeth, esophagos, stomach and intestines. Humans and animals get nutrition from what they eat. A food chain shows how nutrients produced by plants. The producer is the plant at the start of the food chain. A predator eats its prey. Some drugs are helpful (in treating illness) and some drugs and other substances can be harmful to the body. A balanced diet for a child might be different to a balanced diet for an adult. Smoking affects the whole body. Skeletons support the bodies and protect vital organs.	**Animals, Including Humans** The human circulatory system includes: blood, blood vessels and the heart. The heart pumps blood around the body. Arteries take blood away from the heart and veins carry it back to the heart. The heart has 4 chambers. Oxygen is breathed into the lungs where it is absorbed by the blood. Muscles need oxygen to release the energy from food. The muscles take the oxygen and nutrients from the blood. Diet, exercise, drugs and lifestyle can impact how the body functions. Reproduction is the process of animals producing an offspring.

			Muscles are connected to bones and move when they contract.	
		Living things and their Habitats A habitat is where an animal lives. Woodland, rainforest, ocean and seashore are examples of habitats. Living things are adapted to survive in different habitats. Animals eat plants and/or other animals. A predator eats its prey. Some things are living, some were once living but now dead and some things have never lived.	**Living things and their Habitats** Living things can be divided into groups based on their characteristics. A key can be used to identify living things. Environments can change and this may mean it is hard for some living things to survive.	**Living things and their Habitats** A body changes through puberty. The gestation period is the length of time for an animal to develop in the womb. Sexual reproduction where offspring inherit information from both their parents. Asexual reproduction is a copy of a single organism. Mammals gestate in the womb; in birds, reptiles and insects these vital organs develop in the egg. Humans take much longer to reach maturity than most other mammals because of the need to learn social behaviours like speech. Important classifications are plants and animals (and vertebrates, invertebrates, mammals, birds, reptiles, amphibians and insects). Carl Linnaeus developed the classification system used today.
	Plants Flowering plant - Stem - Leaves - Petals - Roots - Seeds Tree - Roots - Trunk - Branches - Leaves Evergreen plants stay green all year round. Deciduous plants lose their leaves in winter.	**Plants** Plants usually grow from seeds and bulbs. Flowering plants make seeds to reproduce and make more plants. Plants need warmth, light and water to grow and survive. Different amounts of warmth, light and water will have different effects on how a plant grows.	**Plants** Plants have roots to provide support and to draw moisture from the soil through stems to take water to the rest of the plant. Plants absorb sunlight and carbon dioxide through leaves. Plants make their own food in their leaves to provide them with energy, grow, repair and reproduce. The flower attracts a pollinator for reproduction. Seed dispersal is when seeds spread from the parent plant. This could be through wind, water or an animal.	**Plants** Seeds and bulbs need the right conditions to germinate. They contain a food store for the first stages of growth (i.e. until the plant is able to produce its own food).

	The tree on the school field is oak tree. Acorns come from an oak tree. Conkers come from a horse-chestnut tree.			
	Seasonal Changes The four seasons are winter, spring, summer and autumn. The days are longer in summer and shorter in winter. Weather is hotter and drier in summer. Deciduous plants lose their leaves in winter. Lots of flowers and plants start to grow in spring.		**Electricity** A source of electricity (mains or battery) is needed for electrical devices to work. Many appliances need electricity to work, for example television, kettle, mobile phone. Electricity sources *push* electricity round a circuit. A complete circuit is needed for electricity to flow and devices to work. This includes a cell or battery and wires, and a bulb, switch, motor or buzzer. A switch opens and closes a circuit. Some materials allow electricity to flow easily and these are called conductors. Metals are usually good conductors. Materials that do not allow electricity to flow easily are called insulators. Plastic is a good insulator.	**Electricity** Batteries and cells are a store of energy. This energy pushes electricity round the circuit. Voltage measures the push of electricity from a cell. A larger voltage causes a brighter lamp or louder buzzer. Current is how much electricity is flowing round a circuit. A circuit diagram uses specific symbols to represent the different parts. 
			Light There must be light for us to see. Without light it is dark. Light comes from a source. A shadow is formed where light is blocked. Shadows change according to the location of the light source. Transparent materials let light through them and opaque materials do not let light through. Light from the sun can be dangerous to eyes and skin which is why we wear sunglasses and suncream for protection.	**Light** Light travels in straight lines. We see light sources when light travels from the source into the eyes. We see objects when light is reflected off that object and enters the eyes. Shadows have the same shape as the objects that cast them because of light travelling in straight lines.

			Sound Sound is produced when an object vibrates and these vibrations travel to our ear. Sound moves through all materials, including air, by making them vibrate. Volume means how loud a sound is. Bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds. Pitch is how high or low a sound is. Faster vibrations produce higher pitched sounds. An echo is a reflection of a sound.	**Earth and Space** The Earth, Sun and Moon are approximately spherical. The Earth and other planets move around the sun. The length of the time it takes for a planet to move (orbit) around the sun is one year. The Moon orbits the Earth. This takes approximately one month. The Earth rotates on its own axis. This takes 24 hours and is how we have day and night. It looks like the sun is moving across the sky but it is actually the Earth spinning and the Sun stays still.
			Forces and Magnets Magnets exert attractive and repulsive forces on each other. Magnetic forces can act at a distance or through some materials. Not all metals are magnetic. Magnets have 2 poles.	**Forces** Air resistance, water resistance and friction are forces that act between moving surfaces. Air resistance, water resistance and friction cause objects to move more slowly. Gravity is a force that causes objects to be attracted towards the centre of the earth. Gears, pulley and levers can reduce the force needed to make things move. Gears, levers and pulleys are called force multipliers because they allow a small input force to be converted into a large output force.
			Rocks The 3 main rock types are sedimentary, igneous and metamorphic. Fossils form when once living things become trapped within sand and clay that hardens into rock over millions of years. Soils are made from rocks.	**Evolution and Inheritance** Organisms reproduce and offspring have similar characteristics to parents. Some organisms reproduce sexually where offspring inherit information from both parents. Some organisms reproduce asexually by making a copy of a single parent. Evolution is change in characteristics over generations of a living thing. Natural selection is sometimes called ‘survival of the fittest’ and is where living things that are best adapted to their environment survive and reproduce. This can cause evolution. Fossil records and DNA provide evidence that organisms have changed over time.