

Science Sticky Knowledge at Parkfield LKS2

Curriculum Topic	Year 3	Year 4
<p>Animals including humans</p>	<p>Animals</p> <ul style="list-style-type: none"> ✓ Different animals are adapted to eat different foods ✓ Plants can make their own food from energy from the sun ✓ Animals (including humans) need to eat food to stay alive ✓ Humans need to eat different types of food ✓ Food can be sorted into five main food groups: carbohydrates, vitamins and minerals, protein, calcium, fats and sugars ✓ To keep our bodies healthy, it is important to eat the right amount of food from each group ✓ Eating too much from one group is not healthy ✓ We can measure food using portions ✓ Humans and many animals have skeletons to support their and protect their vital organs ✓ Muscles are connected to bones and move them when they contract ✓ Moveable joints connect bones <p>Key Scientist: Nicholas Appert invented ways to keep food fresh for longer in air tight sealed containers</p>	<p>Digestion</p> <ul style="list-style-type: none"> ✓ The oesophagus is a muscular tube which moves food from the mouth to the stomach ✓ The stomach is an organ in the digestive system where food is broken down with stomach acid and by being churned around ✓ The small intestine is part of the intestine where nutrients are absorbed into the body ✓ The large intestine is where water is absorbed from the remaining waste food ✓ Faeces are formed in the large intestine <p>Teeth</p> <ul style="list-style-type: none"> ✓ Incisors bite and cut food ✓ Canines tear and rip food ✓ Molars grind food and pre-molars hold and crush food ✓ Some people have wisdom teeth but they have no function <p>Food chains</p> <ul style="list-style-type: none"> ✓ A producer is an organism, such as a plant, that produces its own food ✓ A predator is an animal that hunts and consumes other animals ✓ Prey is an animal that is hunted and eaten by another animal ✓ An example of a food chain is: Grass (producer) → slug (prey) → frog (predator) → owl → ✓ The direction of the arrow shows the flow of energy <p>Key scientist: Abu Al-Qasim Al-Zahrawi is known as the 'Father of Modern Surgery' and introduced over 200 surgical tools.</p>
<p>Living things and their habitats</p>		<p>Living Things</p> <ul style="list-style-type: none"> ✓ Living things can divided into groups based on their characteristics, vertebrates and invertebrates ✓ Vertebrate animals are fish, amphibians, reptiles, birds and mammals ✓ Invertebrate animals are: snails, slugs, spiders, worms and insects ✓ Plants can be categorized into flowering plants (including grasses) and non-flowering plants such as ferns and mosses <p>Habitats</p> <ul style="list-style-type: none"> ✓ Environmental changes affect different habitats differently ✓ Different organisms are affected differently by environmental changes ✓ Human activity significantly affects the environment ✓ There are positive and negative impacts of human activity to the environment e.g. parks and nature reserves, or litter, deforestation and over population <p>Key Scientist: Charles H Turner discovered that insects could hear and bees could recognise colours and patterns</p>
<p>Plants</p>	<p>Plants</p> <ul style="list-style-type: none"> ✓ Plants are producers, they make their own food Roots take in water and nutrients from the soil and keep the plant in the ground. ✓ The stem holds the plant up and carries the water and nutrients from the roots to the leaves and flowers. Leaves absorb sunlight and carbon dioxide to help the plant to make its own food. ✓ Flowers attract insects and birds. ✓ Plants need: water, light, nutrients from the soil, air and room to grow. ✓ Different plants vary in how much of these things they need e.g. cacti can survive in areas with little water, whereas water lilies need to live in water. ✓ Seeds/bulbs require the right conditions to germinate and grow. ✓ Seeds contain enough food for the plant's initial growth. ✓ The roots absorb water from the soil. ✓ 2.The stem transports water to the leaves. ✓ 3.Water evaporates from the leaves. ✓ 4.This evaporation causes more water to be sucked up the stem. ✓ 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. ✓ Seed dispersal – the fully formed seeds are moved away from the parent plant. ✓ Germination – The seed starts to grow. ✓ Growing and flowering – The plant grows bigger and forms a flower. Pollination – pollen from the anther lands on the stigma and travels down the style. ✓ Fertilisation and seed formation – the pollen joins with an ovule and a seed starts to form. <p>Key Scientist: George Washington Carver was an American scientist and teacher who is famous for many agricultural discoveries and inventions. He devised more than 300 uses of the peanut</p>	

<p>Everyday materials</p>	<p>Rocks</p> <ul style="list-style-type: none"> ✓ Igneous rock is rock that has been formed from magma or lava. ✓ Sedimentary rock is rock that has been formed by layers of sediment being pressed down hard and sticking together, you can see the layers of sediment in the rock. ✓ Metamorphic rock is rock that started out as igneous or sedimentary rock but changed due to being exposed to extreme heat or pressure. ✓ More layers of rock cover it. <p>Fossils</p> <ul style="list-style-type: none"> ✓ Only hard parts of the creature remain, e.g. bones, shells and teeth. ✓ Over thousands of years, sediment might enter the mold to make a cast fossil. ✓ Bones may change to mineral but will stay the same shape. ✓ Changes in sea level take place over a long period. ✓ As erosion and weathering take place, eventually the fossil becomes exposed. <p>Soil</p> <ul style="list-style-type: none"> ✓ Soil is the uppermost layer of the Earth. ✓ It is a mixture of different things: minerals (the minerals in soil come from finely broken-down rock), air, water, organic matter (including living and dead plants and animals). <p>Key Scientist: Mary Anning was a pioneering paleontologist and fossil collector.</p>	<p>States of matter</p> <ul style="list-style-type: none"> ✓ Solids, liquids and gases are described by observable properties. ✓ Particles in a solid are close together and cannot move, they can only vibrate. ✓ Particles in a liquid are close together but can move around each other easily. ✓ Particles in a gas are spread out and can move around very quickly in all directions. ✓ 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. ✓ When water and other liquids reach a certain temperature, they change state into a solid or a gas. ✓ The temperatures that these changes happen at are called the boiling, melting or freezing point. Condensation and evaporation occur within the water cycle. <p>The Water Cycle</p> <ol style="list-style-type: none"> 1. Water from lakes, puddles, rivers and seas is evaporated by the sun's heat, turning it into water vapour. 2. This water vapour rises, then cools down to form water droplets in clouds (condensation). 3. When the droplets get too heavy, they fall back to the earth as rain, sleet, hail or snow (precipitation). <p>Key Scientist:</p>
<p>Light</p>	<p>Light</p> <ul style="list-style-type: none"> ✓ There must be light for us to see. ✓ Without light it is dark. ✓ We need light to see things even shiny things. ✓ Beams of light bounce off some materials (reflection). ✓ The pupils control the amount of light entering the eyes. ✓ If too much light enters, then it can damage the retina. ✓ To help protect the eyes, you can wear a hat with a wide brim and sunglasses with a UV rating. <p>Shadows</p> <ul style="list-style-type: none"> ✓ A shadow is caused when light is blocked by an opaque object. ✓ A shadow is larger when an object is closer to the light source. ✓ This is because it blocks more of the light <p>Key Scientist: Christiaan Huygens (1629-1695), is the founder of light science, he theorized that light is a wave</p>	
<p>Electricity</p>		<p>Electricity</p> <ul style="list-style-type: none"> ✓ A source of electricity (mains or battery) is needed for electrical devices to work. ✓ Electricity sources push electricity round a circuit. ✓ Electricity can only flow around a complete circuit that has no gaps. ✓ There must be wires connected to both the positive and negative end of the power supply/battery. Electricity can only flow around a complete circuit that has no gaps. ✓ There must be wires connected to both the positive and negative end of the power supply/battery. Switches can be used to open or close a circuit. ✓ When off, a switch 'breaks' the circuit to stop the flow of electricity. ✓ When on, a switch 'completes' the circuit and allows the electricity to flow. ✓ A conductor of electricity is a material that will allow electricity to flow through it. ✓ Metals are good conductors. ✓ Materials that are electrical insulators do not allow electricity to flow through them. Wood, plastic and glass are good insulators. <p>Key Scientist: Michael Faraday made several key discoveries, such as electromagnetic induction, the basis for generators and electric motors. A Faraday cage is used to block electro magnetic currents</p>
<p>Forces and magnets</p>	<p>Forces</p> <ul style="list-style-type: none"> ✓ Different surfaces create different amounts of friction. ✓ The amount of friction created by an object moving over a surface depends on the roughness of the surface and the object, and the force between them. ✓ A force that acts between two surfaces or objects that are moving, or trying to move, across each other. <p>Magnets</p> <ul style="list-style-type: none"> ✓ Magnetic force can act at distance. ✓ Magnets produces a magnetic force that pulls certain objects towards it. ✓ Objects which are attracted to a magnet are magnetic. ✓ Objects containing iron, nickel or cobalt metals are magnetic. ✓ Objects which are attracted to a magnet are magnetic. ✓ Objects containing iron, nickel or cobalt metals are magnetic. ✓ North and south poles are found at different ends of a magnet. ✓ Repulsion is a force that pushes objects away, for example, when a north pole is placed near the north pole of another magnet, the two poles repel (push away from each other). <p>Key scientists: William Gilbert (1600) was the first was the first scientist to create a magnet.</p>	

Sound

Sound

Sound is a type of energy.

Sounds are created by vibrations.

The louder the sound, the bigger the vibration.

Inside your ear, the vibrations hit the eardrum and are then passed to the middle and then the inner ear.

They are then changed into electrical signals and sent to your brain.

Your brain tells you that you are hearing a sound.

Pitch is a measure of how high or low a sound is.

A whistle being blown creates a high-pitched sound.

A rumble of thunder is an example of a low-pitched sound.

The size of the vibration is called the amplitude.

Louder sounds have a larger amplitude, and quieter sounds have a smaller amplitude.

When sound vibrations spread out over a distance, the sound becomes quieter, just like ripples in a pond.

Key Scientist: Alexander Graham Bell developed a device to transmit the human voice over electrical wires.