|  |
| --- |
| Science Knowledge Map |

|  |
| --- |
| **Lower KS2 Cycle A** |
| Autumn Term: Forces |
| * I know that the same object may move differently on different surfaces such as on a road, on ice, on a table or on carpet.
* I know that many forces need contact between objects to pass on a force (such as pushing or pulling an object), but some forces (such as magnetic forces or gravity) do not need to have contact.
* I know that friction is a force that acts between two surfaces or objects that are trying to move across each other.
* I know that magnets can attract and repel each other and that magnets attract some materials but not all materials.
* I know which materials are attracted by a magnet and others that are not.
* I know materials that contain iron, nickel and cobalt are always attracted to magnets.
* I know that not all metals are magnetic.
* I know that magnets have two poles.
* I know that like poles on a magnet repel, and opposite poles on magnets attract.

**Working Scientifically*** I can

**Key Vocabulary**: push, pull, surface, friction, forces, contact, attract, repel, pole, like and opposite. |
| Spring Term: Animals - classification and habitat  |
| * I know organisms (living things) can be classified (placed into groups).
* I know that plants or animals are placed into groups according to their similarities e.g. by their size, their appearance, their habitat or needs.
* I know that a classification key in science can be used to identify an animal or plant.
* I know that characteristics are features that are specific to a species of animal or plant.
* I know that there are seven life processes that animals need to stay alive and healthy. These are movement, respiration, sensitivity, growth, reproduction, excretion and nutrition.
* I know that a habitat is a specific place where animals or plants may live that supports the seven life processes.
* I know that a habitat may be natural or human-made.
* I know that an animal’s environment may change over time, and this can be dangerous for the living things in that environment and may lead to endangered species or extinction.

**Working Scientifically*** I can

**Key Vocabulary**: organisms, group, classification, vertebrates, invertebrate, mammals, fish, birds, reptiles, amphibians, insects, spiders, worms, slugs, snails, flowering plants, non-flowering plants, habitat, endangered species, extinction. |
| Summer Term: Electricity |
| * I know a number of common objects that need electricity to function through battery or mains electricity supply.
* I know that a circuit is a pathway that electricity can flow around.
* I know that a circuit consists of a power supply and wires and may contain bulbs, switches and buzzers.
* I know that electricity can only flow around a complete circuit that has no gaps.
* I know when a bulb will light when I look at a circuit as I know the circuit must be a complete loop with a battery.
* I know that wires must be connected to both the positive and negative end of the power supply/battery.
* I know that a switch can be used to break/complete a circuit and stop/start the flow of electrons.
* I know that metals are good conductors of electricity and can name some good insulators e.g. wood or plastic.

**Working Scientifically*** I can

**Key Vocabulary:** electricity, mains electricity supply, battery, electrons, circuit, wires, bulb, loop, switch, conductor and insulator. |
| Summer Term: States of Matter |
| * I know there are three states of matter – solid, liquid and gas.
* I know that some materials can change state from one to another and back again according to temperature changes, e.g. ice to water to water vapour to water to ice.
* I know that the particles in solids are close together and cannot move and only vibrate.
* I know that solids keep their shape.
* I know that the particles in liquids are close together but can move around each other freely.
* I know that liquids take the shape of their container.
* I know that the particles in gases are spread out and can move around very quickly in all directions.
* I know that gases can spread out completely to take the shape of the container or room they are in.
* I know that some materials change to a different state when they reach a different temperature, e.g. at boiling point, melting point and freezing point.
* I know the temperature, in centigrade, that changes of state take place for some materials, e.g. water.
* I know that evaporation, condensation and precipitation are parts of the water cycle.
* I know that more water evaporates when the temperature is higher.

**Working Scientifically*** I can

**Key Vocabulary:** material, solids, liquids, gases, water, ice, water vapour, change of state, centigrade, temperature, (rate of) evaporation and condensation, precipitation. |

|  |
| --- |
| **Lower KS2 Cycle B** |
| Autumn Term Animals - movement, digestion, nutrition and food chains |
| * I know that digest means to break down food so it can be used by the body.
* I know the basic parts of the digestive system in humans and understand their simple functions.
* I know and can name the different types of animal teeth.
* I know that each tooth type has a different function when eating.
* I know that the teeth of an animal are differently arranged depending on if they are herbivore, carnivore or omnivore.
* I know that animals (including humans) need the correct nutrition to be healthy.
* I know that animals get nutrition from the different food groups they eat.
* I know that different species of animal need a different diet to maintain a healthy balance.
* I know that different nutrients support different processes in the body e.g. carbohydrates give you energy.
* I know that different types of food are dense in particular nutrients. e.g. milk contains lots of calcium.
* I know that humans and some other animals have skeletons and muscles for support, protection and movement.
* I know that muscles contract and relax to cause movement.
* I know that tendons attach muscles to bones.
* I know that joints are when two or more bones are fitted together.
* When I build a food chain, I know who are the producers and consumers and also the predators and prey.

**Working Scientifically*** I can

**Key Vocabulary:** nutrition, food groups (fruits and vegetables, meat, fish, non-dairy protein, starchy food, sugary foods, milk and dairy), carbohydrates, proteins, fats, vitamins, minerals, fibre, water, mouth, oesophagus, stomach, small intestine, large intestine, rectum, incisor, canine, premolar, molars, herbivore, carnivore, omnivore, skeleton, exoskeleton, endoskeletons, hydrostatic, skeletons, muscle, food chain, producers, consumers, predators and prey. |
| Spring Term: Light |
| * I understand that we need light to see things around us,
* I know that we have darkness if there is no light source.
* I know that a light source makes its own light.
* I know that light travels from a source in a wave. These are waves are called light rays.
* I know that light travels in a straight line.
* I know that reflection happens when light hits the surface of an object and bounces back into our eyes.
* I know that smooth shiny surfaces reflect the light best.
* I know that light direct from the sun can be dangerous to the retina in your eye and that our eyes should be protected by wearing sunglasses or shading your eyes with a hat.
* I know that a shadow is made when light is blocked by an opaque object.
* I know that a shadow is larger when an object is closer to a light source because it blocks out more of the light.

**Working Scientifically*** I can

**Key Vocabulary**: light, light source, darkness, reflection, sunlight, shadow, opaque. |

|  |
| --- |
| Spring Term: Sound |
| * I know that sounds are created by vibrations.
* I know that vibration is a movement backwards and forwards.
* I know that a sound wave is a vibration travelling from a sound source.
* I know vibrations from sound sources must travel through a medium to the ear.
* I know that sound can travel through solids, liquids and gases.
* I know that sound travels by vibrating the particles of the medium it is traveling though until it vibrates the particles closest to your ear drum.
* I know that the inner ear coverts vibrations into signals that get sent to your brain.
* I know that fast vibrations create a higher pitched sound and slower vibrations create a lower pitched sound.
* I know that the size and strength of the vibrations can affect the volume of the sound.
* I know that sounds get quieter as you move away from the sound source.

**Working Scientifically*** I can make systematic and careful observations of simple scientific enquiries.
* I can record observations using notes and diagrams.
* I can begin to decide how to set up and perform simple scientific enquiries.
* I can draw simple conclusions and answer scientific questions, using straightforward evidence to support my findings.

**Key Vocabulary**: sound source, sound wave, vibration, medium, pitch, volume, high and low, oud and quiet. |
| Summer Term: Plants |
| * I know the different parts of a flowering plant.
* I know that the roots anchor the plant into the ground and absorb water and nutrients from the soil.
* I know that holds the plant up and carries water and nutrients from the soil to the leaves. A trunk is the stem of a tree.
* I know that leaves make food for the plant using sunlight and carbon dioxide from the air.
* I know that flowers make seeds to grow into new plants. Their petals attract pollinators to the plant.
* I know that plants get nutrients from the soil and also make their own food in their leaves.
* I know that a plant needs water, light, nutrients, air and space to grow.
* I know that some plants need more or less air, light, water, nutrients from the soil, and room to grow, depending on the plant variety.
* I know that when water is transported in a plant, the roots absorb water from the soil and the stem transports water to the leaves. Water evaporates from the leaves and this evaporation causes more water to be sucked up the stem.
* I know that a flower is important in the life cycle of a plant as the flower helps the plant to pollenate, create a seed and then disperse the seed.
* I know that the life cycle of a flowering plant is germination, flowering, pollination, seed formation, seed dispersal.
* I know that seeds can be dispersed by water, shaking, dropping, carrying bursting and eating.

**Working Scientifically*** I can

**Key Vocabulary**: roots, stem/trunk, leaves, flowers, air, light, water, evaporation, nutrients, germinate, flower, pollinate, seed formation, seed dispersal. |
| Summer Term: Rocks |
| * I know that rocks can be grouped and compared based on their appearance and properties.
* I know that some rocks are permeable and others impermeable, and some more dense than others.
* I know that igneous rock has been formed from magma or lava e.g. obsidian.
* I know that sedimentary rock has been formed from formed by layers of sediment being pressed down hard and sticking together and forming layers, e.g. limestone.
* I know that metamorphic rock started out as igneous or sedimentary rock but changed due to being exposed to extreme heat or pressure, e.g. marble.
* I know that magma is molten rock that stays underground, and that lava is molten rock that comes out of the ground.
* I know that soil is made from rocks and rotting organic matter such as leaves or plants.
* I know that a fossil is formed when things that have lived are covered in layers of sediment that eventually form rock. Only hard parts of the creature remain, e.g. bones, shells and teeth. Bones may change to mineral but will stay the same shape.

**Working Scientifically*** I can

**Key Vocabulary**: rock, soil, organic matter, fossil, igneous rock, sedimentary rock, metamorphic, rock, magma, lava, permeable, impermeable, density. |