

Science Curriculum Progression of Knowledge 2022-23

Year 3	Year 4	Year 5	Year 6
<p style="text-align: center;">Rocks</p> <p>Know that rock is a naturally occurring material Know that rocks can be hard or soft Know that rocks can contain crystals or grains and these may be different sizes Know that rocks can be different sizes (stones, pebbles, boulders) Know that there are three types of rocks and they have different properties: igneous, sedimentary and metamorphic</p>	<p style="text-align: center;">Electricity</p> <p>Know many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. Know electricity is a useful form of energy, which flows through a complete circuit to make electrical appliances function Know an electrical circuit consists of a cell or battery connected to a component using wires Know a switch opens and closes a circuit. Know a switch must be made of a conductive material</p>	<p style="text-align: center;">Properties and changes of materials</p> <p>Know that materials can be sorted in a variety of ways based on their properties Know that in some solid materials the bonds between particles break when surrounded by a liquid; and the result is a solution Know that when a solid does dissolve in a liquid it is described as being soluble in that solvent Know that things are composed of a matter commonly in one of three states of matter: solid, liquid or gas Know that things are made of particles (tiny building blocks) and that these are organized differently in each state</p>	<p style="text-align: center;">Light</p> <p>Know that light travels in straight lines Know that light is reflected when it travels from a light source and then 'bounces' off an object Know that we need light to see things and that darkness is an absence of light Know that everything we see is either a light source or something that is reflecting light from a light source into our eyes Know that opaque objects block light creating shadows Know that as objects move towards a light source the size of the shadows increase</p>
<p style="text-align: center;">Forces</p> <p>Know that a force is a push, pull or twist Know that some forces need contact between two objects Know that when an object moves on a surface, the texture of the surface and the object affect how it moves. Know that a magnet attracts magnetic material Know that iron, nickel, and other materials containing these (e.g. stainless steel) are magnetic Know that magnets have two poles- a north pole and a south pole</p>	<p style="text-align: center;">Sound</p> <p>Know that sound is a form of energy Know that sound travels through a medium Know that sound waves are detected in the ear by humans and that the brain interprets this as the sounds we hear Know that pitch is how high or low a sound Know that volume is how loud or quiet a sound Know that the volume of a sound is quieter if the listener is further away from the object</p>	<p style="text-align: center;">Earth and Space</p> <p>Know that the universe comprises all matter and space in existence Know that a celestial body is a large object in the universe Know that a star is an exceptionally hot ball of gas, originally made from hydrogen and helium Know that the Sun is a star Know that a planet (e.g Earth) is defined as a spherical celestial body that orbits a star</p>	<p style="text-align: center;">Electricity</p> <p>Know that when electrical current flows through a circuit components within that circuit – such as buzzers which make a noise and bulbs which emit light – begin to work Know that a switch functions by completing or breaking a complete circuit Know that electrical current can flow if there is a complete circuit Know the recognized symbols for a battery, bulb, motor, buzzer and wire Know that the more cells or more voltage will mean a brighter lamp or louder buzzer Know that adding more bulbs or buzzers to a circuit will mean that they become dimmer or quieter</p>
<p style="text-align: center;">Light</p> <p>Know that we see objects because our eyes can sense light Know that light is the absence of dark Know that we cannot see anything in complete darkness Know that some objects, like the sun, light bulbs and candles are light sources. Know that some surfaces reflect light.</p>	<p style="text-align: center;">States of Matter</p> <p>Know that things are composed of a matter commonly in one of three states of matter: solid, liquid or gas Know that an object is made from/of a material Know that materials can be hard, soft, strong, weak, absorbent, heavy, light, solid and runny, smooth and rough;</p>	<p style="text-align: center;">Forces</p> <p>Know that a force is measured in a unit called Newtons Know that the amount of matter (stuff) in an object is its mass Know that gravity is a force that acts between all objects in the universe, but that it acts much more strongly between objects that have more mass and that are close together</p>	<p style="text-align: center;">Animals including humans</p> <p>Know that animals, including humans, need oxygen to survive Know a system is a set of connected organs or parts forming a whole, or a set of things Know that the heart pumps blood around the body, which is transported through the blood vessels Know that deoxygenated blood returns to the heart and is shown as blue in diagrams</p>

<p>Know that the light from the sun can damage our eyes and therefore, we should not look directly at it, and we can protect our eyes by wearing sunhats and sunglasses</p>	<p>these descriptions denote the properties of a material Know that materials can change state when temperature changes Know that when solids turn into liquids, this is called melting and that the reverse process is called freezing</p>	<p>Know that unsupported objects are pulled towards the Earth by the force of gravity Know that air resistance is a force felt by an object as it moves through the air</p>	<p>Know that arteries (shown in red) carry blood away from the heart Know that veins (shown in blue) carry blood back to the heart Know that the heart is made of four chambers – two upper and two lower chambers</p>
<p>Animals including humans Know that animals, unlike plants, need to eat in order to get the nutrients they need Know that food contains a range of different nutrients- carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water- and fibre that are needed by the body to stay healthy. Know that a piece of food will often provide a range of nutrients. Know that humans, and some other animals, have skeletons and muscles which help them to move and provide protection and support. Know that humans, and some other animals, have skeletons and muscles which help them to move and provide protection and support.</p>	<p>Living things and their habitats Know that food passes through the body with the nutrients being extracted and the waste products excreted, and that this process is called digestion Know that the process of digestion involves breaking complex foodstuffs into simpler building blocks that can be absorbed by the body Know that the process of digestion begins with food being chewed in the mouth by the teeth and saliva added Know that a human has three types of teeth – incisors, canines and molars – and that these each perform different functions Know that incisors slice food, canines tear food (especially meat) and that molars grind food</p>	<p>Animals including humans Know that humans go through stages of development; they begin as fertilized eggs and then develop into embryos before developing into babies; once they are born, these newborn babies become infants (roughly 2 months to 2 years) then into young children (roughly 2-12 years old); children develop into adults during adolescence (roughly 12-16 years old) at which age they become physically capable of reproduction; as adults develop into old age (roughly 55+ years old) they experience changes in their body which require them to move more carefully and rest more frequently Know that the life cycle of a living thing is a series of stages of development starting with a fertilized egg in animals or a seed in many plants Know that in most mammals (e.g. dogs) a fertilized egg develops in the womb into an embryo and is then born and fed on milk before it is weaned onto the food that is adapted to eat; it then develops to maturity in a period called adolescence after which it can reproduce and the cycle can begin again</p>	<p>Evolution Know that a species is a group of living things have many similarities that can reproduce together produce offspring Know that changes to the environment can make it more difficult for animals to survive and reproduce; in extreme cases this leads to extinction, where an entire species dies Know that human activity – such as climate change caused by pollution - can change the environment for many living things, endangering their existence Know that fossils can help us learn about things that lived long ago Know that all life on Earth began from a single point around 4.5 thousand million years ago Know that living things change over time and that this gradual change is called evolution Know that natural selection is the cause of this change</p>
<p>Plants Know that flowering plants consist of roots, stem, leaves and flowers, and that a tree's stem is called a trunk Know that living things move, grow, consume nutrients and reproduce; that dead things use to do these things, but no longer do; and that things that never lived have never done these things. Know that plants need food, water and air to survive Know that veins carry nutrients to cells through the leaves</p>	<p>Animals including humans Know that herbivorous animals eats plants; a carnivorous animal eats other animals; omnivorous animals eat both animals and plants Know that fish, amphibians, reptiles, birds and mammals are known as vertebrates, which means they are animals that have a backbone Know that fish are different to other animals in having gills so that they can breathe underwater and have scaly skin</p>	<p>Living things and their habitats Know that the life cycle of a living thing is a series of stages of development starting with a fertilized egg in animals or a seed in many plants Know that in amphibians (e.g. frogs) a fertilized egg develops into an embryo and then hatches into a tadpole; the tadpole develops adult characteristics, metamorphoses into the adult form after which it can reproduce and the cycle can begin again</p>	<p>Living things and their habitats Know that a food chain traces the path of energy through a habitat Know that the arrows in a food chain show the direction that energy is travelling through a habitat Know that all energy for a food chain initially comes from the Sun which is absorbed and turned into energy by plants Know that an animal that is eaten by another is called prey, and that an animal that eats other animals is called a predator</p>

<p>Know that leaves are a darker green on the upper surface than the lower surface Know that all plants need to use sunlight to make their own food (photosynthesis)</p>	<p>Know that amphibians are different to other animals in that they begin their lives with gills but then develop lungs and breath on land Know that reptiles are different to other animals in that they breath air and have scaly skin Know that birds are different to other animals in that they have feathers and wings Know that mammals are different to other animals in that they have fur/hair and they feed milk to their young</p>	<p>Know that in many insects (e.g. butterflies) a fertilized egg develops into wingless feeding form called a larva (caterpillar); the larva feeds then later becomes a pupa (chrysalis) with a protective cocoon; inside this cocoon, the pupa metamorphoses into the adult butterfly after which it can reproduce and the cycle can begin again</p>	<p>Know that there are three types of micro-organism: viruses, fungi and bacteria Know that germs are disease-causing micro-organisms</p>
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