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| **Class 1 Year A** | | |
| Term | NC objectives | Knowledge |
| 1 | **Animals Including Humans (Y1)**  Sc1/2.2d identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. | Big ideas B2, B3  Know that feet, legs, arms, hands, torso, head, skin, ears, eyes, nose, mouth and tongue are part so the body and identify them  Know that eyes are associated with sight, ears with sound, nose with smell, tongue with taste and skin with touch. |
| 2 | **Seasonal Changes (Y1):** Autumn  Sc1/4.1a observe changes across the 4 seasons  Sc1/4.1b observe and describe weather associated with the seasons and how day length varies. | Big Ideas E2  New learning and vocabulary  **energy, freezing, melting, orbit, reflection,** Sun, clouds, wind, snow, ice, spring, summer, autumn, winter  Know that days are longer in the summer and shorter in winter  Know that weather changes through the year, getting hotter in the summer and colder in the winter  Know that the winter is likely to bring ice on the ground when water freezes due to the cold  Know that the Earth orbits the Sun with one orbit constituting a year of 365/366 days  (NB: the Sun and the Earth are capitalised when being discussed in an astronomical context.) |
| 3 | **Seasonal Changes**: Winter |
| 4 | **Everyday Materials (Y1)**  Sc1/3.1a distinguish between an object and the material from which it is made  Sc1/3.1b identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock  Sc1/3.1c describe the simple physical properties of a variety of everyday materials  Sc1/3.1d compare and group together a variety of everyday materials on the basis of their simple physical properties | Big Ideas C1, C2  New learning and vocabulary  **absorption, matter, property,** wood, plastic, glass, metal, water, rock  Know from observation how to distinguish between materials made of wood, plastic, glass, metal, water, rock  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; these descriptions denote the properties of a material  Know that matter (stuff) is made from tiny building blocks |
| 5 | **Animals (Y1)**  Sc1/2.2a identify and name a variety of common animals including, fish, amphibians, reptiles, birds and mammals  Sc1/2.2b identify and name a variety of common animals that are carnivores, herbivores and omnivores  Sc1/2.2c describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) | Big Idea B2, B3  New learning and vocabulary  **energy, growth, habitat**, fish, amphibian, reptile, bird, mammal, offspring, carnivore, herbivore, omnivore, vertebrate, skeleton, organ  Know that a trout is an example of fish, a frog is an example of an amphibian; a lizard is an example of a reptile; a robin is an example of a bird; a rabbit and a human are examples of a mammal  Know that herbivorous animals eats plants; a carnivorous animal eats other animals; omnivorous animals eat both animals and plants  Know that a cat is an example of a carnivore; that a rabbit is an example of a herbivore; know that many humans are examples of omnivores (though not vegetarians)  Know that fish, amphibians, reptiles, birds and mammals are similar in that they have internal skeletons and organs; these are known as vertebrates, which means they are animals that have a backbone  Know that fish are different in having gills so that they can breathe underwater **and** scaly skin  Know that amphibians are different in that they begin their lives with gills but then develop lungs and breath on land  Know that reptiles are different 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 |
| 6 | **Living Things and their Habitats (Y2)**  Sc2/2.1a explore and compare the differences between things that are living, dead, and things that have never been alive  Sc2/2.1b identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other  Sc2/2.1c identify and name a variety of plants and animals in their habitats, including microhabitats  Sc2/2.1d describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. | Big idea(s): **B1, B3**  Revision  **habitat**, **growth, absorption**, deciduous, evergreen, flower, plant, tree, structure, roots, stem, leaf, trunk, flower, herbivore, carnivore, omnivore  Dandelions, rose bushes, grass, ash trees, birch trees and conifers trees are examples of plants.  Trees can be deciduous or evergreen.  A trout is an example of fish, a frog is an example of an amphibian; a lizard is an example of a reptile; a robin is an example of a bird; a rabbit and a human are examples of a mammal  Herbivorous animals eats plants; a carnivorous animal eats other animals; omnivorous animals eat both animals and plants  New learning and vocabulary  **birth, decay, energy,** microhabitat, dead, life cycle, food chain, source, nutrients, reproduction, consumption, environment  Know that living things move, grow, consume nutrients and reproduce; that dead things used to do these things, but no longer do; and that things that never lived have never done these things.  Know that polar bears are an example of an animal adapted to its environment – thick fur for warmth and oily paw pads to ensure that they don’t freeze to the ice.  Know that sharks are another example – smooth skin and streamlined shape for quick swimming; and gills for breathing underwater  Know that cacti are an example of a plant adapted to its environment – thick skin keeps a store of water safe; sharp spikes keep animals from stealing the water  Know that pine trees have thick bark and pine cones to protect against cold winters  Know that woodlice live under logs – an example of a microhabitat - as they need somewhere dark and damp so that they do not dry out  Know that frogs can live in ponds – an example of a microhabitat - as they water in which to lay their eggs (frogspawn)  Know that plants absorb energy from the Sun; that this energy is consumed by herbivorous animals; and that carnivorous animals eat other animals.  Know that the arrows on a food chain show the direction that the energy travels. |

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| **Class 2 - Year A** | | |
| Term | NC objectives | Knowledge |
| 1 | **Forces**  Sc3/4.2a compare how things move on different surfaces  Sc3/4.2b notice that some forces need contact between 2 objects, but magnetic forces can act at a distance  Sc3/4.2c observe how magnets attract or repel each other and attract some materials and not others  Sc3/4.2d compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials  Sc3/4.2e describe magnets as having 2 poles  Sc3/4.2f predict whether 2 magnets will attract or repel each other, depending on which poles are facing. | Big idea(s): **P2**  Revision  **energy, matter, property,**  **wave,** metal, material, surface, friction, force, stretch, squash, rough, smooth  Metal is a material from which objects can be made.  As objects move across a surface there is friction when they rub against each other and that sometimes this friction is larger or smaller.  Applying forces to objects can change their shape.  Know that the roughness of a material is an example of a property  New learning and vocabulary  magnetic, non-magnetic, pole, north, south, sliding friction, static friction, elastic, resist, attraction, repulsion  Know that a force can be thought of as a push or a pull  Know that there are three types of contact force: impact forces (when two surfaces collide), frictional forces (when two surfaces are already in contact) and strain forces (when an elastic material is stretched or squashed).  Know that objects move differently on rough and smooth surfaces; objects resist movement more on rough surfaces because there is higher friction as the object moves  Know that there are also non-contact forces that can act between objects without them touching and that magnetism is an example of a non-contact force  Know that magnets have two poles called north and south  Know that like poles (south-south and north-north) of two magnets repel each other and that opposite poles of two magnets (north-south) attract each other  Know that there is a magnetic field around a magnet which is strongest at each pole  Know that some materials are magnetic, meaning that they are attracted to a magnet, while other materials are non-magnetic |
| 2 | **Living things and their habitats**   * Sc4/2.1a recognise that living things can be grouped in a variety of ways * Sc4/2.1b explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment * Sc4/2.1c recognise that environments can change and that this can sometimes pose dangers to living things. | Big idea(s): **B2, B3**  Revision  **decay, energy, habitat**, **freezing** plant, structure, herbivore, carnivore, omnivore, microhabitat, environment, reproduction, vertebrate    Living things move, grow, consume nutrients and reproduce; that dead things used to do these things, but no longer do; and that things that never lived have never done these things.  Polar bears are an example of an animal adapted to its environment – thick fur for warmth and oily paw pads to ensure that they don’t freeze to the ice.  A trout is an example of fish, a frog is an example of an amphibian; a lizard is an example of a reptile; a robin is an example of a bird; a rabbit and a human are examples of a mammal  Herbivorous animals eats plants; a carnivorous animal eats other animals; omnivorous animals eat both animals and plants  A cat is an example of a carnivore; that a rabbit is an example of a herbivore; know that many humans are examples of omnivores (though not vegetarians)  Fish, amphibians, reptiles, birds and mammals are similar in that they have internal skeletons and organs; these are known as vertebrates, which means they are animals that have a backbone  Fish are different in having gills so that they can breathe underwater **and** have scaly skin  Amphibians are different in that they begin their lives with gills but then develop lungs and breath on land  Reptiles are different in that they breath air **and** have scaly skin  Birds are different to other animals in that they have feathers and wings  Mammals are different to other animals in that they have fur/hair **and** they feed milk to their young  Know a rose bush, grass, dandelion by sight  Know an ash tree, birch tree and conifer tree by sight  New learning and vocabulary  kingdom, classification key, species, fungi, bacteria, climate change, characteristics, offspring, extinction, pollution  Know that animals can be grouped based on their physical characteristics (e.g. vertebrates and invertebrates) and based on their behavior (e.g. herbivores, carnivores and omnivores)  Know that living things are divided into kingdoms: the animal kingdom, plants, fungi, bacteria, and single-celled organisms  Know that a species is a group of living things have many similarities that can reproduce together produce offspring  Know that a classification key uses questions to sort and identify different living things  Know how to use a classification key to identify living things  Know how to create a classification key to sort plants on the school premises  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 the polar bear is a famous example of climate change endangering the existence of a species; as the climate changes and gets warmer, the sea ice on which polar bears live reduces in amount making it harder for them to survive and reproduce |
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| 4 | Sc3/3.1a compare and group together different kinds of rocks on the basis of their appearance and simple physical properties  Sc3/3.1b describe in simple terms how fossils are formed when things that have lived are trapped within rock  Sc3/3.1c recognise that soils are made from rocks and organic matter. | Big idea(s): **C1, C2, C3, E3**  Revision  **decay, matter**, **melting**, material,  Rock is a type of solid material.  New learning and vocabulary  **extinction,** igneous, metamorphic, sedimentary, paleontologist, weathering, molten rock, crust, tectonic plates, scavengers, fossil  Know that there are three kinds of rocks: igneous, sedimentary and metamorphic  Know that the Earth has a solid crust made up of tectonic plates with molten rock beneath  Know that granite and basalt are types of igneous rock and that igneous rocks form from molten rock below the Earth’s crust  Know that limestone and sandstone are types of sedimentary rock which form when small, weathered fragments of rock or shell settle and stick together, often in layers  Know that marble and slate are types of metamorphic rock which form when rocks in Earth’s crust get squashed and heated in processes such as when tectonic plates press against each other  Know that fossils form when a plant or animal dies and is quickly covered with silt or mud so that it cannot be rotted by microbes or eaten by scavenging animals; in time layers of sediment build, squashing the mud and turning it to stone around the dead plant or animal; the materials in the body are replaced by minerals that flow in water through the rock, leaving a rock in the shape of the animal or plant that was once there  Know that soil is made from tiny particles of rock broken down by the action of weather (weathering) |
| 5 | Sc4/2.2a describe the simple functions of the basic parts of the digestive system in humans  Sc4/2.2b identify the different types of teeth in humans and their simple functions  Sc4/2.2c construct and interpret a variety of food chains, identifying producers, predators and prey. | Big idea(s): **B3**  Revision  **absorption, component, energy,** nutrients, consumption, hygiene, herbivore, carnivore, organ  Proteins are good for growth, carbohydrates for energy and fruit and vegetables provide vitamins and minerals which help keep us healthy (e.g. calcium for healthy bones and teeth)  A food group can cause ill health, such as tooth decay due to excess sugar  Living things move, grow, consume nutrients and reproduce  Plants absorb energy from the Sun; that this energy is consumed by herbivorous animals; and that carnivorous animals eat other animals.  New learning and vocabulary  **dissolving,** digestion, excretion, peristalsis, anus, duodenum, small intestine, large intestine, stomach, rectum, esophagus, tongue, saliva, acid, bile, enzymes, incisors, canines, molars, predator, prey, producer, consumer, primary, secondary, tertiary  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  Know that children develop an initial set of teeth which are gradually replaced between the ages of 6 and 12  Know that food is squeezed down the esophagus towards the stomach in a wave-like action called peristalsis  Know that the stomach releases acid and enzymes to continue breaking down the food; the stomach is an organ; an organ is a part of living thing that is self-contained and has a specific important job  Know that further enzymes and bile break down the food further as it moves through the duodenum towards the small intestine  Know that the small intestine adds more enzymes and then absorbs the nutrients  Know that the large intestine absorbs water from the undigested food  Know that undigested food is stored in the rectum before being excreted through a muscle called the anus  Know that a food chain traces the path of energy 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 which are called producers  Know that consumers take in energy by eating  Know that an animal that is eaten by another is called prey, and that an animal that eats other animals is called a predator  Know that the first consumer in a food chain is called a primary consumer, the second is called a secondary consumer and above it is called a tertiary consumer  Know that the arrows in a food chain show the direction that energy is travelling through a habitat |
| 6 | Sc3/2.1a identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers  Sc3/2.1b explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant  Sc3/2.1c investigate the way in which water is transported within plants  Sc3/2.1d explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. | Big idea(s): **B1, B2, B3**  Revision  **component, energy, growth, habitat, reproduction, decay,** offspring, adult, bulb, seed, survival, temperature,deciduous, evergreen, flower, plant, tree, structure, roots, stem, leaf, trunk, flower,  Evergreen trees maintain their leaves throughout the year and that deciduous trees shed their leaves in autumn  Flowering plants consist of roots, stem, leaves and flowers, and that a tree’s stem is called a trunk  Living things move, grow, consume nutrients and reproduce; that dead things used to do these things, but no longer do; and that things that never lived have never done these things.  Plants absorb energy from the Sun; that this energy is consumed by herbivorous animals; and that carnivorous animals eat other animals.  Seeds and bulbs need to be buried underground in soil and that they will grow into adult plants under the right conditions (water, warmth)  The arrows on a food chain show the direction that the energy travels.  Plants that are deprived of light, food or air will not grow and will die.  New learning and vocabulary  **extinction,** fruit, nectar, anther, ovary, ovule, petal, pollen, stigma, style, stamen, function, exchange, dispersal, fertilization,  Know that different parts of plants have one or more functions (jobs)  Know that the roots collect water and minerals from the soil, and hold the plant firmly in the ground  Know that the stem holds up the leaves so that they can gather light to make food and holds up the flowers so that they can receive pollen and disperse their fruits; know that the stem also transports water and minerals from the roots to the other parts of the plant  Know that the leaves make food by trapping light and using its energy to turn carbon dioxide and water into carbohydrates  Know that the function of a flower is reproduction, where flowers of the same kind exchange pollen – made by an anther – in a process called fertilisation, and a structure in the flower’s ovary called an ovule becomes a seed; the ovary then becomes a fruit which helps the seed leave the plant in a process called dispersal |

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| **Class 3 - Year A** | | |
| Term | NC objectives | Knowledge |
| 1 | **Forces (Y5)**  Sc5/4.2a explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object  Sc5/4.2b identify the effects of air resistance, water resistance and friction, that act between moving surfaces  Sc5/4.2c recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect | Big idea(s): **P1, P2**  Revision  **energy, matter, particle,** surface, friction, force, stretch, squash, rotation, rough, smooth, sliding friction, static friction  A force can be thought of as a push or a pull  As objects move across a surface there is friction when they rub against each other and that sometimes this friction is larger or smaller.  Applying forces to objects can change their shape.  Know that the roughness of a material is an example of a property  There are three types of contact force: impact forces (when two surfaces collide), frictional forces (when two surfaces are already in contact) and strain forces (when an elastic material is stretched or squashed).  Objects move differently on rough and smooth surfaces; objects resist movement more on rough surfaces because there is higher friction as the object moves  New learning and vocabulary  acceleration, air resistance, buoyancy, effort, force meter, fulcrum, gravity, load, mass, mesh, Newton, pivot, rigid, streamlined, terminal velocity, unsupported, water resistance, weight  Know that a force is measured in a unit called Newtons, named after a British scientist called Sir Isaac Newton who discovered lots about gravity and how planets move  Know that pull forces can be measured using a device called a force meter  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  Know that unsupported objects are pulled towards the Earth by the force of gravity  Know that acceleration is a change in speed and that unbalanced forces acting on an object cause it to accelerate  Know that air resistance is a force felt by an object as it moves through the air; it is caused by the object bumping into the gas particles that make up air; the quicker an object moves, the more gas particles it bumps into and the more air resistance it experiences  Know that a falling object will accelerate until its air resistance matches the gravitational force pulling it down; at this point, the object will continue to move at this speed (called its terminal velocity) without getting any quicker or slowing down  Know that a parachute’s shape increases the air resistance that a falling object experiences, giving it a much lower terminal velocity  Know that a lever is a rigid length pivoting around a fulcrum  Know that a pulley is a wheel with a fulcrum that supports a moving cable or belt  Know that a gear is a rotating wheel with cut teeth that mesh with the teeth of another gear so that turning one gear turns an adjacent gear in the opposite direction  Know that gears, levers and pulleys are simple machines that used to allow a smaller force to have a greater effect; they do this by moving a smaller force over a longer distance at one end of the machine, which the machine turns into a larger forcer over a small distance at the other end |
| 2 | **Earth and Space (Y5)**  Sc5/4.1a describe the movement of the Earth, and other planets, relative to the Sun in the solar system  Sc5/4.1b describe the movement of the Moon relative to the Earth  Sc5/4.1c describe the Sun, Earth and Moon as approximately spherical bodies  Sc5/4.1d use the idea of the Earth’s rotation to explain day and night, and the apparent movement of the Sun across the sky. | Big Ideas E1, E2  Revision  **absorption, energy, freezing, melting, orbit, reflection, wave,** Sun, spring, summer, autumn, winter  Days are longer in the summer and shorter in winter  Weather changes through the year, getting hotter in the summer and colder in the winter  Earth orbits the Sun with one orbit constituting a year of 365/366 days  Light is a form of energy  We need light to see things and that darkness is the absence of light  Light travels in straight lines  Everything that we can see is either a light source or something that is reflecting light from a light source into our eyes  The Sun is a light source, but that the Moon is not and is merely reflecting light from the Sun  Many light sources give off light and heat  The Sun gives off light and heat when hydrogen turns into helium  (NB: the Sun and the Earth are capitalized when being discussed in an astronomical context.)  New learning and vocabulary  planet, satellite, sphere, solar system, eclipse, star, universe, constellation, axis, celestial body, Moon, rotating, lunar, solar, telescope, rotation  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 and that has cleared the neighbourhood of its orbit of other objects, some of which crash into the planet and others that become moons of that planet  Know it was once thought that everything orbited the Earth, but that scientists like Copernicus and Galileo used telescopes and measurement to show that the Earth orbited the Sun  Know that there are eight major planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune  Know that the universe is utterly vast and that our solar system makes up a tiny fraction of the universe  Know that a satellite orbits a planet and that moons are natural satellites  Know that the Moon orbits the Earth roughly every 28 days  Know that as the Moon orbits the Sun, different parts of it are lit up by the Sun, which is why we see a different shape lit up on the Moon as the lunar cycle progresses  Know that humans have sent man-made satellites into orbit that assist with telecommunication  Know that all the planets in the solar system orbit the Sun and that the further away they are from the Sun, the longer their orbit  Know that the Earth spins around an imaginary line through its centre called an axis and that this axis is tilted relative to the Earth’s orbit  Know that night and day are the result of the Earth rotating on its axis  Know that the tilt of the Earth towards and away from the Sun’s light as the Earth orbits the Sun leads to the seasons as during winter the light is spread over a wider area  Know that a solar eclipse occurs when the Moon is between the Sun and the Earth, casting a shadow on the Earth; a lunar eclipse occurs when the Earth is between the Sun and the Moon, casting a shadow on the Moon |
| 3 | **Electricity (Y6)**  Sc6/4.2a associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit  Sc6/4.2b compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches  Sc6/4.2c use recognised symbols when representing a simple circuit in a diagram. | Big idea(s): **P1, P3**  Revision  **circuit, component, conductor, energy, insulator, particle, property,** material, appliance, charge, electron, battery, cell, bulb, buzzer, switch, wire, current electricity, static electricity, negative terminal, positive terminal, voltage, chemical reaction, emit  An object is made from/of a material  Metal is a material from which objects can be made.  Matter (stuff) is made from tiny building blocks  Electrical energy is a form of energy  Energy comes in different forms and can be neither created nor destroyed, only changed from one form to another  Static electricity is an imbalance of charged particles on a material; it does not operate by flowing around a complete circuit  Current electricity is the flow of charged particles called electrons around a circuit  Electrical current flows well through some materials, called electrical conductors, and poorly through other materials, called electrical insulators  Conductors have free electrons, and when electrical current flows through a conductor, the electrons move like people in a queue  Electrical conductivity (how well a material conducts electricity) is an example of a property  Metals are good electrical conductors  A chemical reaction inside a cell produces the charged particles that can flow around a circuit  More than one cell lined up to work together is called a battery  Electrical current can flow if there is a complete circuit  Wires – which contain a conductor inside them, usually made of metal – can allow electrical current to flow around a circuit  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  A switch functions by completing or breaking a complete circuit  A simple circuit can be constructed using components  Exposure to high levels of electrical current can be dangerous  New learning and vocabulary  series circuit, parallel circuit, resistance, voltage  Know that voltage is a measure of the power of a cell to produce electricity; it is a measure of the ‘push’ of electric current, **not** the size of the electric current  Know that as the number and voltage of cells in a circuit increases, the brightness of a bulb or the volume of a buzzer will increase (though too high a voltage may ‘blow’ the bulb or buzzer)  Know how to draw simple circuit diagrams  Know the recognized symbols for a battery, bulb, motor, buzzer and wire  Know how to predict whether components will function in a given circuit, depending on whether or not the circuit is complete; whether or not a switch is in an on or off position; and whether or not there is a cell to provide electrical current to the circuit  Know that two bulbs in a circuit can be wired up to create a series circuit or a parallel circuit; if one bulb blows in a series circuit the other will not shine as the circuit has been broken; in contrast, if one bulb blows in a parallel circuit, there will still be a complete circuit for the other bulb so it will continue to shine; use this knowledge to explain the advantages of using parallel circuits (e.g. in the lighting in homes) |
| 4 | **Forces (Y5 cont.)**  Sc5/4.2b identify the effects of air resistance, water resistance and friction, that act between moving surfaces | Know that water resistance is a force felt by an object as it moves through water; it is caused by the object bumping into the water particles  Know that the shape of an object determines how much air resistance or water resistance it experiences; shapes of object that experience little air resistance or water resistance are described as streamlined  Know how to draw a force diagram with arrows representing the different forces acting on an object |
| 5 | **Animals incl Humans (Y5)**  Sc5/2.2a describe the changes as humans develop to old age. |  |
| 6 | **Animals incl Humans (Y6)**  Sc6/2.2a identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood  Sc6/2.2b recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function  Sc6/2.2c describe the ways in which nutrients and water are transported within animals, including humans. | Big idea(s): **B1**  Revision  **component, energy, growth,** survival,nutrients, consumption, skeleton, ribcage, protein, carbohydrate, fat, digestion, skeleton, organ  Living things move, grow, consume nutrients and reproduce; that dead things used to do these things, but no longer do; and that things that never lived have never done these things.  Animals, including humans, need food, water and air to survive  People need to exercise often to help their body stay strong and fit  Keeping clean, including washing and brushing teeth, is an important part of staying healthy  There are food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods  Proteins are good for growth, carbohydrates for energy and fruit and vegetables provide vitamins and minerals which help keep us healthy (e.g. calcium for healthy bones and teeth)  More than half of our diet should be made up of carbohydrates, fruit and vegetables  Fats and sugary foods should be eaten rarely and in small amounts  Getting the right amount of each food group (including over half of the diet made up of fruit, vegetables and carbohydrates) is called a balanced diet  A lack of a nutrient can cause ill health; for example, a lack of vitamin D leads to a disease called rickets  Know that excess of a food group can cause ill health, such as tooth decay due to excess sugar  **NB – some food groups are difficult to afford for some families so sensitivity is required in teaching this area**  Food passes through the body with the nutrients being extracted and the waste products excreted, and that this process is called digestion  The process of digestion involves breaking complex foodstuffs into simpler building blocks that can be absorbed by the body  New learning and vocabulary  artery, aorta, atrium, blood vessels capillary, circulatory system, vein, pulse, ventricle, replenished, resting heart rate, body  Know that the heart and lungs are organs protected by the ribcage  Know that blood travels around the body transporting nutrients that have been absorbed into the blood stream from digestion; blood also carries oxygen around the body which is used to power the body; this use of oxygen to create energy is called respiration  Know that the heart beats, pumping blood around the body and that blood vessels carry the blood; arteries carry blood away from the heart; veins carry blood towards the heart; capillaries are tiny blood vessels that connect arteries and veins  Know that the heart is composed of four chambers: two atria and two ventricles; the aorta is the largest artery in the body and most major arteries branch off from it  Know that when we exercise, our heart beats more frequently so that the oxygen that is used around the body can be replenished; it returns to a resting heart rate afterwards; fitter people tend to have lower resting heart rates  Know that drugs are chemicals that have an impact on the natural chemicals in a person’s; know that drugs can be harmful or helpful, depending on what they are and how they are used; know that all drugs can be harmful if overused  Know that paracetamol and aspirin are examples of drugs that can be helpful as a painkiller  Know that cannabis and cocaine are examples of illegal drugs that can have serious negative effects  Know that alcohol and tobacco are examples of drugs that are legal to adults but that can have serious negative effects, such as liver disease and lung disease, respectively  **NB – note that discussion of drugs needs sensitive teaching due to family circumstances** |

**This Curriculum was developed using Chris Such’s Curriculum mapping ideas.**

**THE BIG IDEAS OF SCIENCE**

Physics

P1: The universe follows unbreakable rules that are all about forces, matter and energy.

P2: Forces are different kinds of pushes and pulls that act on all the matter that is in the universe. Matter is all the stuff, or mass, in the universe.

P3: Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it.

Chemistry

C1: All matter (stuff) in the universe is made up of tiny building blocks.

C2: The arrangement, movement and type of the building blocks of matter and the forces that hold them together or push them apart explain all the properties of matter (e.g. hot/cold, soft/hard, light/heavy, etc).

C3: Matter can change if the arrangement of these building blocks changes.

Biology

B1: Living things are special collections of matter that make copies of themselves, use energy and grow.

B2: Living things on Earth come in a huge variety of different forms that are all related because they all came from the same starting point 4.5 billion years ago.

B3: The different kinds of life, animals, plants and microorganisms, have evolved over millions of generations into different forms in order to survive in the environments in which they live.

Earth science

E1: The Earth is one of eight planets that orbit the sun.

E2: The Earth is tilted and spins on its axis leading to day and night, the seasons and the climate.

E3: The Earth is made up of several layers, including a relatively thin rocky surface which is divided into tectonic plates, and the movement of these plates leads to many geologic events (such as earthquakes and volcanoes) and geographical features (such as mountains.)

Along with the ‘big ideas’ *of* science, it can be worthwhile to consider ‘big ideas’ *about* science[[1]](#footnote-1). The former underpin the substantive knowledge of primary science; the latter underpin the disciplinary knowledge:

Big ideas *about* science

D1: Science seeks to explain things that we see in the natural world by attempting to understand their causes.

D2: Scientific theories are explanations of what we see in the natural world that best fit with evidence that has been gathered. Because of this, theories can be changed when new evidence is found.

D3: The knowledge produced by science leads to new technology that humans find useful. These technologies don’t always necessarily make the world better so we have to think carefully about how – and whether – we use them.

The disciplinary knowledge of science is supported by the ‘working scientifically’ statements of the national curriculum that relate to the scientific enquiries that children should undertake in primary science.

Repeating key concepts

Also contained within this science curriculum document are 26 key concepts that repeat in different topics across the curriculum: **absorption, birth, bond, circuit, component, condensation, conductor, decay, dissolving, energy, evaporation, extinction, freezing, growth, habitat, insulator, irreversible, matter, melting, orbit, particle, property, reflection, reproduction, reversible, wave.** All of the vocabulary that children learn is important for their understanding of science. However, an understanding of these key concepts is essential and provides uniquely powerful opportunities to assess children’s grasp of the knowledge contained within the curriculum.

1. Harlen, Wynne, ed. *Principles and big ideas of science education*. Association for Science Education, 2010. [↑](#footnote-ref-1)