Year group	Topic	Knowledge	Key Vocabulary
3	Plants	By the end of this unit of learning, children will know: • Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. • The roots absorb water and nutrients from the soil and anchor the plant in place. • The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. • The leaves use sunlight and water to produce the plant's food. • Some plants produce flowers which enable the plant to reproduce. • Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. • Different plants require different conditions for germination and growth.	photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)
	Animals, including humans	By the end of this unit of learning, children will know: • Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. • 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. • A piece of food will often provide a range of nutrients. Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support.	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints
	Rocks	By the end of this unit of learning, children will know: • Rock is a naturally occurring material and that there are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. • Rocks can be hard or soft. They have different sizes of grain or crystal and that they may absorb water. • Rocks can be different shapes and sizes (stones, pebbles, boulders). • Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter).	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil

		• The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. • Some rocks contain fossils. • Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.	
	Light	By the end of this unit of learning, children will know: • We see objects because our eyes can sense light. • Dark is the absence of light and that we cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. • Some surfaces reflect light. • Objects are easier to see when there is less light if they are reflective. • The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. • Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. • The size of the shadow depends on the position of the source, object and surface.	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous
	Forces and Magnets	By the end of this unit of learning, children will know: • A force is a push or a pull. • When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. • A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. • The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract. • For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. • The magnet does not need to touch the object that it attracts.	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole

4	Living things and their habitats	By the end of this unit of learning, children will know: • Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things. • Living things live in a habitat which provides an environment to which they are suited. These environments may change naturally e.g. through flooding, fire, earthquakes etc. • Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering). • These environments also change with the seasons; different living things can be found in a habitat at different times of the year.	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate
	Animals including humans	By the end of this unit of learning, children will know: • Food enters the body through the mouth. • Digestion starts when the teeth start to break the food down. • Saliva is added and the tongue rolls the food into a ball. • The food is swallowed and passes down the oesophagus to the stomach. • Here the food is broken down further by being churned around and other chemicals are added. • The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. • The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet. • Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing). • Living things can be classified as producers, predators and prey according to their place in the food chain.	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain
	Electricity	By the end of this unit of learning, children will know: • Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries.	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery,

		• An electrical circuit consists of a cell or battery connected to a component using wires. • If there is a break in the circuit, a loose connection or a short circuit, the component will not work. • A switch can be added to the circuit to turn the component on and off. • Metals are good conductors so they can be used as wires in a circuit. • Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity.	positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.
	States of matter	By the end of this unit of learning, children will know: • A solid keeps its shape and has a fixed volume. • A liquid has a fixed volume but changes in shape to fit the container. • A liquid can be poured and keeps a level, horizontal surface. • A gas fills all available space; it has no fixed shape or volume. • Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid. • Melting is a state change from solid to liquid. • Freezing is a state change from liquid to solid. The freezing point of water is 0oC. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC. • Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. • Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. • Condensation is the change back from a gas to a liquid caused by cooling. • Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle

	Sound	By the end of this unit of learning, children will know: • A sound produces vibrations which travel through a medium from the source to our ears. • Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). • The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound. • The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. • A sound insulator is a material which blocks sound effectively. • Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.	Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation
5	Living things and their habitats	By the end of this unit of learning, children will know: • As part of their life cycle, plants and animals reproduce. • Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. • Animals, including humans, have offspring which grow into adults. • In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis. • Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. • Gardeners may force plants to reproduce asexually by taking cuttings. • Sexual reproduction occurs through pollination, usually involving wind or insects.	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings
	Animals including humans	By the end of this unit of learning, children will know: • When babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills.	Puberty – the vocabulary to describe sexual characteristics

		• At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce. This needs to be taught alongside PSHE.	
	Earth and Space	By the end of this unit of learning, children will know: • The Sun is a star. It is at the centre of our solar system. There are 8. These travel around the Sun in fixed orbits. • Earth takes 365¼ days to complete its orbit around the Sun. • The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). • As the Earth rotates, the Sun appears to move across the sky. • The Moon orbits the Earth. It takes about 28 days to complete its orbit. • The Sun, Earth and Moon are approximately spherical.	Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets
	Forces	By the end of this unit of learning, children will know: • A force causes an object to start moving, stop moving, speed up, slow down or change direction. • Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall. • Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object. • A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. • Pulleys, levers and gears are all mechanisms, also known as simple machines	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears
	Properties and changes of materials	By the end of this unit of learning, children will know: • Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. • Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. • Mixtures can be separated by filtering, sieving and evaporation.	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material

		• Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.	
6	Living things and their habitats	By the end of this unit of learning, children will know: • Living things can be formally grouped according to characteristics. • Plants and animals are two main groups but there are other livings things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. • Plants can make their own food whereas animals cannot. • Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). • Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. • Each group has common characteristics. • Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. • Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants.	Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering
	Animals including humans	By the end of this unit of learning, children will know: • The heart pumps blood in the blood vessels around to the lungs. • Oxygen goes into the blood and carbon dioxide is removed. • The blood goes back to the heart and is then pumped around the body. • Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. • Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. • Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our heart and lungs work, how likely we are to suffer	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle

		from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. • Some conditions are caused by deficiencies in our diet e.g. lack of vitamins. This content is also included in PSHE.	
	Evolution and Inheritance	By the end of this unit of learning, children will know: • All living things have offspring of the same kind, as features in the offspring are inherited from the parents. • Due to sexual reproduction, the offspring are not identical to their parents and vary from each other. • Plants and animals have characteristics that make them suited (adapted) to their environment. • If the environment changes rapidly, some variations of a species may not suit the new environment and will die. • If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. • Over time, these inherited characteristics become more dominant within the population. • Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. This is evolution. • Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics.	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils
	Light	By the end of this unit of learning, children will know: • Light appears to travel in straight lines, and we see objects when light from them goes into our eyes. • The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen. • Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, straight lines, light rays

	Electricity	By the end of this unit of learning, children will know: • Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. • Adding more bulbs to a circuit will make each bulb less bright. • Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. • Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. • Any bulbs, motors or buzzers will then turn off as well. • You can use recognised circuit symbols to draw simple circuit diagrams.	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage N.B. Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably