Cycle A

Topic		Lesson Focus	Key Knowledge	Vocabulary
Animals Including Humans	1	Understand the circulatory system	To know that human circulatory system: The heart pumps blood in the blood vessels to the lungs where oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart. It is then pumped around the body so that water, nutrients and oxygen are transported in the blood to the muscles and all the other parts of the body where they are needed. As all these are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood in blood vessels back to the heart. The cycle starts again. To know the circulatory system transports nutrients and water in the blood to all the parts of the body that need them. These nutrients provide us with energy.	Circulatory system, heart, blood vessels, lungs, carbon dioxide, blood, muscles, transports
	2	Explore arteries, veins and capillaries	To know blood vessels are narrow tubes which our blood flows through. To know arteries, veins and capillaries are blood vessels.	Blood vessels, blood, arteries, veins, capillaries
	3	Understand the importance of the lungs	To know the lungs are two organs situated in the ribcage that fill with air when you breathe in. To know the lungs remove carbon dioxide from blood and add oxygen.	Lungs, organs, ribcage, carbon dioxide, oxygen
	4	Explore pulse rate	To know the pulse rate increases when we do exercise.	Pulse rate, exercise
	5	Explore a healthy diet	To know that diet is the sort of food animals or humans regularly eat. To know that diet, exercise, drugs and lifestyle choices have an impact on how our bodies function. This can affect how well our lungs work and how fit and well we feel. To know some choices such as smoking, drinking alcohol and obesity can be harmful to our health.	Diet, food, animal, humans, exercise, drugs, lifestyle, smoking, alcohol, obesity
	6	Understand gestation for different animals including humans	To know that gestation is the length of time a mammal carries her offspring inside her body before giving birth. To know that gestation period of a human is 40 weeks. To know the gestation period of other animals may differ. To know that larger animals usually have longer gestation than smaller animals. To know that life expectancy is the length of time that an animal is normally likely to live. To know that the human life cycle starts in pregnancy, with the foetus, then a baby is born after a gestation period. The baby grows into a toddler and then a child, a teenager and then an adult before growing into old age.	Gestation, offspring, human, life expectancy, life cycle, foetus, baby, toddler, child, teenager, adult
Light	1	Explore the difference between light sources	To know that a light source is a natural or artificial source of light. To know that we see light from the light source when it enters our eyes.	Light source, natural, artificial, light, eyes

	2	Investigate the path of light	To know we can represent the path of light using an arrow. To know that light travels in straight lines. To know that a light ray is each line of light travelling in a straight line from its place of origin.	Light, path, straight lines, light ray, travelling, place of origin
	3	Understand the term reflect	To know that reflect means to throw back light from a surface. To know that for objects that are not a light source, light must be reflected from the object into our eyes for us to see the object.	Reflect, surface, light source, reflected
	4	Explore how shadows are formed	To know that shadows have the same shape as the objects that cast them. To know a shadow is a dark area created where light from a light source is blocked by an object. The object blocking the light will be opaque or translucent.	Shadow, dark area, light source, blocked, opaque, translucent
Evolution and inheritance	1	Understand evolution and explore how plants/animals have changed/adapted	To know that evolution is the way in which plants and animals have changed/adapted over millions of years. To know that adaptations are a response to the environment that the animal is in. To know that adaptation is about survival in a given environment.	Evolution, plants, animals, changed, adapted, environment, survival
	2	Have an awareness of inheritance and characteristics	To know that offspring is a person's child/children or an animal' young. To know that living things produce offspring of the same kind. The offspring are not normally identical to their parents and vary from each other. To know inherited means the way a trait or characteristic is passed to offspring from parents. To know characteristics are distinguished traits, features or qualities.	Offspring, young, human, animal, inherited, trait, characteristic, feature, qualities
	3	Understand natural selection	To know if the environment changes animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. To know this is natural selection. To know over time these inherited characteristics become more dominant within the population.	Environment, variation, reproduce, characteristics, natural selection, inherited, dominant, population
	4	Understand the importance of fossils	To know fossil is the naturally preserved remains or traces of animals or plants that lived long ago. To know fossils give us evidence of what lived on Earth millions of years ago. To know that by studying fossils, scientists can put together how a plant or animal looked. They can identify what the animal ate, where it lived and how it died.	Fossil, naturally preserved, remains, evidence, earth, scientists
	5	Investigate scientists linked to evolution	To know that Mary Anning, Charles Darwin and Alfred Wallace are top scientists who helped develop the theory of evolution.	
	1	Identify different parts of the solar system	To know the Earth is the planet we live on. It is the third planet from the sun. . To know the Sun is the star at the centre of our solar system. To know the moon is the only natural satellite of the Earth	Earth, planet, sun, star, solar system, moon, satellite, orbit, star

Earth and Space			To know that the solar system is the sun and all the planets that orbit around it. To know a star is a huge ball of glowing gas in space.	
	2	Name and understand the planets	To know that planets are large round objects, made of rock or gas, that move around the sun. To know there are eight planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.	Planets, solar, system, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.
	3	Understand orbits and how long they take	To know that orbit is the curved path that an object follows going around a star or planet. To know that the moon orbits the earth and it takes about 28 days to compete its orbit. To know that the Earth orbits the Sun and it takes 365 ¼ days to complete its orbit around the Sun. This is a year. To know the Earth rotates on its axis once every 24 hours. This is a day. To know that to rotate means when an object turns (spins) on its axis. To know that the Sun, Earth and Moon are approximately spherical bodies.	Orbit, star, planet, earth, sun, year, day, rotate, axis
	4	Explore the position of the earth	To know it is day for the half of the Earth facing the sun. It is night for the half of the Earth facing away from the Sun.	Earth, sun
Electricity	1	Understand what makes a complete circuit	To know that a circuit is a complete path that an electric current can flow around. It flows from the battery, through wires and devices before returning to the battery. If the circuit is not complete the electric current cannot flow. To know that voltage (volts) are a measure of the energy of a flow of electricity. Mains electricity carries a voltage of 210-240 volts. A typical cell in school has 1.5 volts.	Electric current, circuit, battery, wires, voltage, cell
	2	Identify and use circuit symbols	To know a circuit symbol is a symbol used to represent various electronic components or functions in a diagram of a circuit. To know that a circuit diagram is a visual representation of an electrical circuit using symbols to represent the electrical components. To know the circuit symbols	Circuit symbol, electronic components, circuit, symbols
	3	Understand how and why switches are used	To know a cell is a single electrical energy source. To know a battery is a device consisting of one or more cells. To know a switch is an electrical component that can make or break an electrical circuit. When a switch is open there is a gap in the circuit and electricity cannot flow around the circuit.	Cell, energy source, battery, electrical circuit, switch, electricity
	4	Explore the brightness of bulbs	To know that adding more cells to a circuit makes a bulb brighter. To know that using a battery with a higher voltage would make a bulb brighter.	Cells, bulbs, voltage, brighter
	5	Explore the brightness of bulbs	To know adding more bulbs to a circuit will make each bulb less bright. To know if we add a motor into a circuit with a single bulb, the bulb will be less bright.	Cells, bulbs, voltage, lighter
	6	Understand how motors work	To know that if we add more motors to the circuit, each motor will spin more slowly.	Motor, circuit, electricity

Cycle B

Topic		Lesson Focus	Key Knowledge	Vocabulary
Forces	1	Understand forces and how they are measured	To know a force is a push or a pull and causes an object to start moving, stop moving, speed up, slow down or change direction. To know a force meter is a piece of equipment used to measure the size of a force. To know newton (N) is the unit for measuring force.	Force, push, pull, force meter, newton
	2	Understand gravity	To know gravity is a force that acts at a distance. To know it pulls things down towards the centre of the earth. To know everything is pulled to the Earth by gravity. To know this causes unsupported objects to fall. To know seeds fall to the ground because of gravity.	Gravity, force, down, pulled
	3	Explore forces that act between moving surfaces	To know air resistance, water resistance and friction are contact forces that act between moving surfaces. To know the object may be moving through the air or water or the air and water may be moving over a stationary object. To know air resistance is the force that slows down objects that move through air. To know water resistance is a force that slows objects moving through water. To know friction is when one surface moves against another, the rubbing force that tries to stop them is called friction. It gives us grip.	Air resistance, water resistance, friction, surface
	4	Understand how mechanisms work	To know a mechanism is a device that allows a small force to be increased to a larger force. To know the small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover.	Mechanism, force, distance
	5	Understand simple machines	To know that pulleys, levers and gears are all mechanisms, also known as simple machines. To know simple machines are used to make tasks easier. To know a lever tilts on a pivot which is nearer to the end of the pivot with a heavy load. To know pulleys have rope or cable which goes over a wheel. This is pulled to lift, lower or move heavy objects. Gears are toothed wheels which lock together and turn each other to form simple mechanisms.	Pulley, lever, gear, simple machine, pivot, rope, cable, wheel, toothed wheels
	6	Explore real-life examples of forces	To know real-life examples of forces – a skydiver falls fast until they open their parachute; a dolphin has a streamline shape; a non-slip mat uses friction.	
Properties and changes of materials	1	Understand the difference between a thermal insulator and thermal conductor	To know that thermal insulator does not allow heat to pass through it easily. To know that thermal conductor allows heat to pass through it easily.	Thermal insulator, thermal conductor, heat
	2	Understand the difference between a	To know that an electrical insulator does not allow electricity to pass through it. To know that an electrical conductor allows electricity to pass through it.	Electrical insulator, electricity, electrical conductor

		electrical insulator and electrical conductor		
	3	Explore how matter can change state	To know that to dissolve is when a solid completely mixes in with a liquid and cannot be seen. To know that a solution is a mixture of a liquid with a dissolved solid or gas. To know soluble are solids and gases that dissolve in liquids. To know insoluble are solids that no dot dissolve in liquid.	Dissolve, solid, liquid, gas, solution, soluble, insoluble
	4	Explore reversible changes	To know a reversible change is a change that can be switched back and is not permanent. To know dissolving, melting and freezing, condensing and evaporating are examples of reversible change.	Reversible change, not permanent, dissolving, melting, freezing, condensing, evaporating
	5	Explore non-reversible changes	To know non-reversible change is a change that cannot be reversed back to the original state. To know that burning, mixing vinegar and bicarbonate of soda and rusting are examples of non-reversible change.	Permanent, original state, burning, rusting
	6	Identify and group materials	To be able to group materials together based on their properties: hardness, solubility, transparency, thermal conductivity, electrical conductivity.	Materials, properties, hardness
Living things and their habitats	1	Understand there are different types of reproduction	To know that a life cycle shows how things are born, how they grow and how they reproduce. To know that reproduction is part of the life cycle of animals and plants. There is sexual and asexual reproduction. To know that sexual reproduction needs a male and a female. To know that fertilise in animals means: when he male sperm reaches the female egg. Most animals reproduce sexually. To know asexual reproduction only needs one parent. This occurs mostly in plants and bacteria.	Life cycle, born, grow, reproduce, reproduction, animals, plants
	2	Explore how plants reproduce	To know that plants reproduce both sexually (this occurs through pollination usually involving wind or insects) and asexually (this involves only one parent using bulbs, tubers, runners and cuttings). In plants: when the male pollen reaches the female ovule. To know that runner is a long stem of a plant that grows along the ground in order to put down roots in a new place. To know a bulb is a round root of some plants from which the plant grows. To know a cutting is a piece, such as a root, stem or leaf cut from a plant and used to grow another plant of the same type. To know that a tuber is a swollen underground stem or root of a plant from which new plants can grow. To know that lily, apple tree and tomato are examples of sexual reproduction. To know that spider plant, potato and strawberry are examples of asexual reproduction.	Plants, reproduce, pollination, wind, insects, sexually, asexually, runner
	3	Understand and explore metamorphism	To know metamorphosis is a major change from one form to another in the life cycle of some animals when they change from young to an adult.	Life cycle, metamorphosis, young, adult
	4	Understand how life cycles are	To know life cycles: Mammals: - female gives birth to young	Life cycle, mammal, amphibian, insect, bird

		different for different types of animals	- Live young are born - young looks like adult - female provides milk for young Amphibian - eggs laid in water - young go through different form before looking like adult - no parental care Insect - egg laid and then hatch - some grow to adult but most go through metamorphosis to adult Bird: - eggs laid in a nest - young hatches from an egg - grow to adult - parental care after hatching	
Living things and their habitats	1	Understand a vertebrate	To know that vertebrates are animals that have a backbone. They can be divided into 5 groups: fish, amphibians, reptiles, birds, mammals.	Vertebrate, fish, amphibians, reptiles, birds, mammals
	2	Understand the differences between fish, amphibians and reptiles	To know fish are cold blooded, have scales, have fins, live in water, lay eggs in water and breathes through gills. To know amphibians: are cold blooded, start as eggs in water and breathe through gills, later develop lungs and live on land and water, have damp skin/body. To know that reptiles: are cold blooded, breathe with lungs, have dry scaly skin, lay soft-shelled eggs on land.	Fish, cold blooded, scales, fins, gills
	3	Compare birds and mammals	To know birds: are warm blooded, breathe with lungs, lay eggs with hard shells and have wings, but not all can fly. To know that mammals: are warm blooded, have fur or hairy skin, give birth to live young, feed their young milk.	Warm blooded, eggs, shells, wings, fly, fur, hairy skin
	4	Understand an invertebrate	To know that invertebrates are animals that do not have a backbone. Can be divided into several groups including insects, spiders, snails and worms.	Invertebrates, no backbone, insects, spiders, snails, worms
	5	Explore how plants create their own food	To know that plants can make their own food. They can be divided into broadly two main groups: flowering plants and non-flowering plants. To know that flowering plants are numerous and diverse groups and reproduce through flowers and seeds. To know that non-flowering plants are smaller groups. They have simple structures and do not have flowers or seeds.	Plants, food, flowering, non-flowering, flowers, seeds
	6	Explore micro-organisms	To know that micro-organisms are tiny living creatures. Most can only be seen through a microscope. They can be subdivided into smaller groups including: bacteria, fungi and viruses.	Micro-organisms, creatures, microscope, bacteria, fungi, viruses