



Science Medium Term Plan Cycle A



Year 5/6	Autumn 1 - Earth and Space	Autumn 2 - Evolution and Adaptation	Spring 1 - Light and Shadows	Spring 2 - Changing Circuits	Summer 1 - Our Bodies	Summer 2 - Coast to Country Animals including humans
Big Concepts						
Big Question	How do the planets move?	How and why do living things change over time?	How are shadows made?	What affects the brightness of a bulb and the loudness of a buzzer?	What effect does diet and exercise have on our bodies?	
Prior Learning	Explore the natural world around them. (F2 Earth and space) Describe what they see, hear and feel whilst outside. (F2 – Earth and space) Observe changes across the four seasons. (Y1/2 - Seasonal changes) Observe and describe weather associated with the seasons and how day length varies. (Y1/2 - Seasonal changes)	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. (Y1/2 - Living things and their habitats) Notice that animals, including humans, have offspring which grow into adults. (Y1/2 - Animals, including humans) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3/4 - Plants) Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3/4 - Rocks) Recognise that environments can change and that this can sometimes pose dangers to living things. (Y3/4 - Living things and their habitats) Describe the life process of reproduction in some plants and animals. (Living things and their habitats - Y5/6)	Recognise that they need light in order to see things and that dark is the absence of light. (Y3/4 - Light) Notice that light is reflected from surfaces. (Y3/4 - Light) Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3/4 - Light) Recognise that shadows are formed when the light from a light source is blocked by an opaque object. (Y3/4 - Light) Find patterns in the way that the size of shadows change. (Y3/4 - Light) Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. (Y5/6 - Properties and changes of materials)	Identify common appliances that run on electricity. (Y3/4 - Electricity) Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. (Y3/4 - Electricity) Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. (Y3/4 - Electricity) Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. (Y3/4 - Electricity) Recognise some common conductors and insulators, and associate metals with being good conductors. (Y3/4 - Electricity)	Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y1/2 - Animals, including humans) • Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. (Y3/4 - Animals, including humans) • Describe the simple functions of the basic parts of the digestive system in humans. (Y3/4 - Animals, including humans) • Identify the different types of teeth in humans and their simple functions. (Y3/4 - Animals, including humans)	Notice that animals, including humans, have offspring which grow into adults. (Y1/2 - Animals, including humans)



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Overview of Knowledge for topic	Children will describe the movement of Earth, and other planets, relative to the Sun in our Solar System. They will describe the movement of the Moon relative to Earth and describe the Sun, Earth and the Moon as approximately spherical bodies. Pupils will use the idea of Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. They will also have the opportunity to find out about how ideas about the solar system have developed and changed over time.	Children will learn that 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.	Children will learn about how light travels and that we see things because light travels from light sources to our eyes, or from light sources to objects and then to our eyes. They will learn that shiny or reflective surfaces alter the direction in which light travels. Children will have the opportunity to solve problems related to everyday life about how light travels and how we see. Children will also investigate and explain the shapes of shadows, and relate this to light travelling in straight lines.	Children will recognise and use accepted scientific symbols in circuit diagrams. They will learn that altering the brightness of bulbs and the volume of a buzzer can be achieved in different ways, including changing the number of components, battery voltage, or the properties of the wires in the circuits. They will apply their knowledge of complete circuits.	Children will work towards creating a 'health roadshow' incorporating multimedia presentations which show that they will have recognised the impact of diet, exercise and lifestyle choices on the way their bodies function. Children will learn that there are many different but related aspects to keeping healthy. They will investigate the functions of the heart and circulatory system and will describe how nutrients and water are transported in human and animal bodies.	Taught alongside PSHE Children will learn that when babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce.
Common misconceptions	Some children may think: • the Earth is flat • the Sun is a planet • the Sun rotates around the Earth • the Sun moves across the sky during the day • the Sun rises in the morning and sets in the evening • the Moon appears only at night • night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.	Adaptation occurs during an animal's lifetime: giraffes' necks stretch during their lifetime to reach higher leaves and animals living in cold environments grow thick fur during their life Offspring most resemble their parents of the same sex, so that sons look like fathers All characteristics, including those that are due to actions during the parent's life such as dyed hair or footballing skills, can be inherited Cavemen and dinosaurs were alive at the same time.	We see objects because light travels from our eyes to the object.	Larger-sized batteries make bulbs brighter A complete circuit uses up electricity The components in a circuit that are closer to the battery get more electricity.	Some children may think: • your heart is on the left side of your chest • the heart makes blood • the blood travels in one loop from the heart to the lungs and around the body • when we exercise, our heart beats faster to work the muscles more • some blood in our bodies is blue and some blood is red • we just eat food for energy • all fat is bad for you • all dairy is good for you	Some children may think: • a baby grows in a mother's tummy • a baby is "made".



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					• protein is good for you, so you can eat as much as you want • foods only contain fat if you can see it • all drugs are bad for you.	
Working Scientifically	The children will have the opportunity to plan an enquiry using a shadow stick and look at changes over time. They will take accurate measurements of the shadows formed, decide how to record them and present their findings. They will also identify scientific evidence that has been used to support or refute changing ideas about the Solar System.	The children will have had the opportunity to use secondary sources to research and evaluate evidence about evolution and inheritance. Children will have identified scientific evidence that has been used to support or refute ideas or arguments by finding out about the fossil records used by pivotal scientists such as Mary Anning, Alfred Wallace and Charles Darwin.	The children will have the opportunity to plan and carry out an investigation in the context of finding a reflective material for children's clothing. They will have the opportunity to use light sensors and data logging equipment to measure and record their observations and they will write a report detailing what they have concluded.	The children will have the opportunity to choose to investigate altering the brightness of bulbs and the volume of a buzzer in different ways, possibly including changing the number and/or type of components, battery voltage, or the properties of the wires in the circuits. They will predict outcomes relating to the arrangement in electrical circuits and record their results.	The children will investigate how exercise and heart rate are related, and also to find out how scientific ideas about health have developed over time. They will plan an investigation and will take measurements with accuracy and precision. Children will present their findings in a number of ways, and will explain causal relationships emerging from their own data.	N/A
Key Vocabulary	Day, night, light, dark, dim, sunrise, sunset, dusk, Earth, moon, moons, reflect, sun, star, spherical, rotation, Earth's axis, solar system, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune (Pluto as a dwarf planet), shadow clock, sundial	Fossils, evolution, evolve, inherit, inheritance, offspring, vary, variation, species, adapted, environment, climate, habitat, suite, Charles Darwin, Beagle	See, eyes, light, straight lines, reflect, reflected, reflection, light sources, shadows, size, shape, pattern, mirrors	Component, bulb, buzzer, battery, cell, wire, motor, switch, open, closes, circuit, series, complete loop, bright, brightness, current, volume, volts, voltage, symbols, circuit diagram	Blood, heart, heart rate, circulation, oxygen, lungs, veins, arteries, cells, pulse rate, healthy diet, exercise, drugs, nutrients, water	Puberty – the vocabulary to describe sexual characteristics