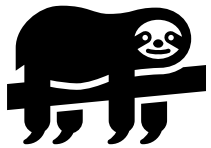
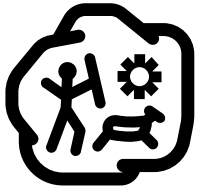
Knowledge Coverage

Biology

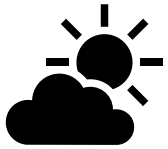
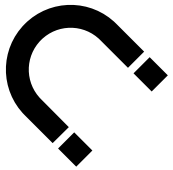
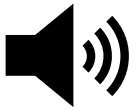
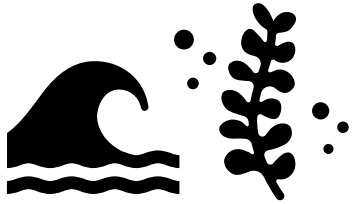
Chemistry

					
Plants	**Living Things & their habitats**	**Animals including humans**	**Evolution & inheritance**	**Materials**	**Rocks**

Knowledge Coverage

Physics

Environmental

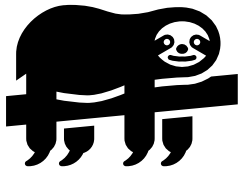
						
Seasonal changes	**Forces**	**Light**	**Sound**	**Electricity**	**Earth and space**	**Environmental Science**

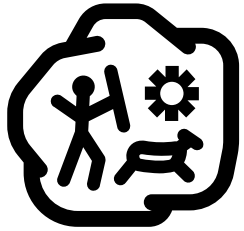
Topic	Cycle	FS	KS1	LKS2	UKS2
Plants	A		The Deep (Summer 2)	Rivers & Water Cycle (Summer 1) Swanpool (Summer 2)	
	B		Sarah Forbes (Spring 2)		
Living Things and their habitats	A				Volcanoes & Mountains (Autumn 1)
	B		Arctic Adventure (Autumn 2) Victorians (Spring1)	Rainforest (Summer 2)	WW2 (Autumn 1)
Animals including humans	A		Where am I (Autumn 1) India (Spring 2)	Stone Age (Autumn 2) Swanpool (Summer 2)	Volcanoes & Mountains (Aut1) Titanic (Summer 2)
	B		Victorians (Spring 1) Awesome Animals (Summer 2)		
Evolution and inheritance	A				Darwin (Summer 1)
	B				
Materials	A		Castles (Autumn 2) GFOL, The Plague (Spring 1)	Ancient Egypt (Spring 2)	Tin Mining (Spring 1) Islamic Golden Age (Spring 2)
	B		Here I Am (Autumn 1)		
Rocks	A			Voyage of Mystery (Autumn 1)	
	B				

Topic	Cycle	FS	KS1	LKS2	UKS2
Seasonal changes	A		Wreck & Rescue (Summer 1)		
	B				
Forces	A				
	B			Anglo-Saxons & Vikings (Spring 1 &2)	British Monarchy (Summer 1)
Light	A				
	B			TBC (Summer 1)	WW2 (Autumn 2) Greece (Spring 1)
Sound	A				
	B			Romans (Autumn 2)	
Electricity	A				Texas (Autumn 2)
	B			Romans (Autumn 1)	
Earth and Space	A				
	B				Ancient Greece (Spring 2)
Environmental Science	A		Toys (Summer1)		
	B				Climate Change (Summer 2)

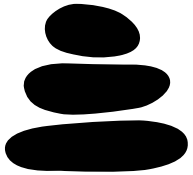
Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Plants 	Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant.	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. 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. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. (Y6 - Living things and their habitats) Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)	Cells as the fundamental unit of living organisms. The similarities and differences between plant and animal cells. The role of diffusion. How plants make carbohydrates in their leaves by photosynthesis and gain mineral nutrients and water from the soil via their roots. The adaptations of leaves for photosynthesis.
Key Questions 	Can they identify that plants grow from a seed or bulb? Can they describe the simple steps of the plant life cycle.?	• Can they name and describe the main parts of a plant? • Can they identify and name a range of common plants and trees? • Can they describe what plants need to survive? • Can they find out & describe how plants need water, light and a suitable temperature to grow and stay healthy?	• Can they identify & describe the functions of different parts of flowering plants? • Can they explore the requirement of plants for life and growth and how vary from plant to plant? • Can they investigate the way in which water is transported within plants? • Can they explore the part that flowers play in the life cycle of flowering plants?		

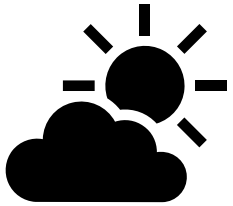
Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Living Things & their Habitats 	Begin to understand the need to respect and care for the natural environment and all living things. Explore the surrounding natural environment. Explore natural objects from the surrounding environment. Explore the plants and animals in the surrounding natural environment. Explore plants and animals in a contrasting natural environment. Name and describe animals that live in different habitats. Describe different habitats	Explore and compare the differences between things that are living, dead, and things that have never been alive. 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. Identify and name a variety of plants and animals in their habitats, including microhabitats. 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	Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things.	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals give reasons for classifying plants and animals based on specific characteristics.	Cells as the fundamental unit of living organisms. The similarities and differences between plant and animal cells. The role of diffusion in the movement of materials in and between cells. The process of anaerobic respiration in humans and micro-organisms. The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops. The importance of plant reproduction through insect pollination.
Key Questions 	Can they explain why they need to care for their environment? Can they identify where some common animals live?	• Can they describe a range of habitats and match living things to their habitats saying what the habitat needs to provide? • Can they explain differences between living and non-living things?	• Can they recognise that living things can be grouped in a variety of ways? • Can they explore and use a classification key to group, identify and name a variety of living things?	• Can they describe the differences in the life cycles of a mammal, an amphibian, an insects, a bird and common plants? • Can they describe how living things are classified into groups according to common characteristics?	

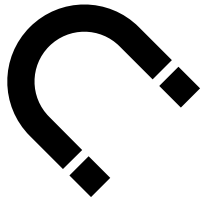
Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Animals including humans 	Learn about the life cycles of animals. Compare adult animals to their babies. Observe how baby animals change over time. Learn about the life cycles of humans. Learn about how to take care of themselves. Learn about their senses. Describe people who are familiar to them. Learn about how to take care of themselves.	Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	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. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey.	Describe the changes as humans develop to old age. Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans.	The structure and functions of the human skeleton. Understand the interaction between skeleton and muscles. Know the content of a healthy human diet. The consequences of imbalances in the diet.. How the digestive system digests food. The importance of bacteria in the human digestive system. The mechanism of breathing to move air in & out of the lungs. The impact of exercise, asthma and smoking on the human gas exchange system. Reproduction in humans including the structure and function of the male and female reproductive systems.
Key Questions 	Can they describe the simple life cycle of a human being? Can they explain how they can take care of themselves?	• Can they identify and name a variety of common animals that are carnivores, herbivores and omnivores and say what they need to survive? • Can they explain that animals grow and reproduce and their basic life cycles?	• Can they explain the importance of a nutritionally balanced diet? • Can they describe how nutrients, water and oxygen are transported within animals and humans? • Can they explain what a simple food chain shows?	• Can they describe the functions of the heart, blood vessels and blood? • Can they recognise the impact of diet, exercise, drugs and lifestyle on themselves? • Can they describe the ways in which nutrients and water are transported within animals?	

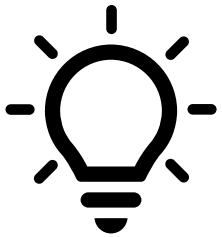
Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Evolution and Inheritance 	Make connections between the features of their family and other families. Notice differences between people.	Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. (Y2 - Living things and their habitats) Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)	Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants) Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Heredity as the process by which genetic information is transmitted from one generation to the next. Differences between species and the variation between individuals within a species. The variation between species and individuals of the same species meaning some organisms compete more successfully, which can drive natural selection which may leave individuals and some entire species, less well adapted to compete and reproduce, which in turn may lead to extinction. The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.
Key Questions 	Can they identify their immediate family and say who they are to them? Can they say which physical characteristics they may share with their immediate family?			• Can they explain the process of evolution and describe the evidence for this? • Can they identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution?	

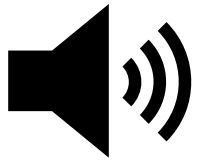
Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Materials 	Explore a range of materials. Shape and join materials. Combine and mix ingredients. Change materials by heating and cooling, including cooking. Explore a range of materials, including natural materials. Make objects from different materials, including natural materials. Observe, measure and record how materials change when heated and cooled. Compare how materials change over time and in different conditions.	Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties. Identify and compare the suitability of a variety of everyday materials for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Compare and group together everyday materials on the basis of their properties. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible.	The properties of the different states of matter in terms of the particle model. Changes of state in terms of the particle model. Differences between atoms, elements and compounds. Chemical symbols and formulae for elements and compounds. Diffusion in terms of the particle model. Simple techniques for separating mixtures. The identification of pure substances. Chemical reactions as the rearrangement of atoms. Defining acids and alkalis. The varying physical and chemical properties of different elements The periodic table.
Key Questions 	Can they choose the right media to join materials together? Can they use materials to make other things?	• Can they distinguish between an object and the material from which it is made? • Can they explore how the shapes of solid objects can be changed? (squashing, bending, twisting, stretching)	• Can they compare and group materials together, according to whether they are solids, liquids or gases? • Can they explain what happens to materials when they are heated or cooled?	• Can they use their knowledge of solids, liquids and gases to decide how mixtures might be separated? • Can they describe changes using scientific words?	

Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Rocks 	Use all their senses in hands-on exploration of natural materials. (Nursery – Living things and their habitats) Explore collections of materials with similar and/or different properties. (Nursery – Living things and their habitats) Explore the natural world around them. (Reception – Living things and their habitats) Describe what they see, hear and feel whilst outside. (Reception – Living things and their habitats)	Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) Identify and compare the suitability of a variety of everyday materials, for particular uses. (Y2 - Uses of everyday materials)	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter.	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance)	The rock cycle and the formation of igneous, sedimentary and metamorphic rocks.
Key Questions 			• Can they compare and group together different rocks on the basis of their appearance and simple physical properties? • Can they describe and explain how different rocks can be useful to us? • Can they describe in simple terms how fossils are formed when things that have lived are trapped within rock?		

Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Seasonal Changes 	Play and explore outside in all seasons and in different weather. Observe living things throughout the year.	Observe changes across the 4 seasons. Observe and describe weather associated with the seasons and how day length varies.	Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light)	Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 - Earth and space)	The seasons and the Earth's tilt, day length at different times of year, in different hemispheres.
Key Questions 	Can they name the four seasons? Can they describe the weather most likely in each season?	• Can they observe changes across the four seasons? • Can they name the four seasons in order? • Can they observe and describe weather associated with the seasons? • Can they observe and describe how day length varies?			

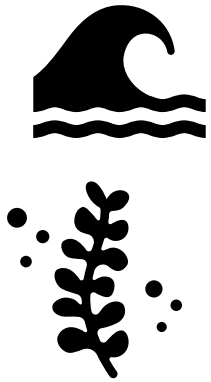
Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Forces 	Feel forces. Explore how things work. Explore how objects/materials are affected by forces. Explore how to change how things work. Explore how the wind can move objects. Explore how objects move in water.	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)	Compare how things move on different surfaces. Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. 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. Describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.	Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.	Simple machines give bigger force but at the expense of smaller movement. Energy as a quantity that can be quantified & calculated. Forces as pushes or pulls, arising from the interaction between 2 objects; deforming objects; friction between surfaces, pushing things out of the way; resistance to motion of air & water; needed to cause objects to stop or start moving, or to change their speed or direction of motion. Pressure measured by ratio of force over area. Change depending on direction of force & its size magnetic poles, attraction and repulsion Earth's magnetism, compass and navigation & the magnetic effect of a current.
Key Questions 	Can they say why something has moved? Can they identify that objects need something to make them move?		• Can they classify which materials are attracted to magnets and which are not? • Can they notice that some forces need contact between two objects, but magnetic forces can act at a distance? • Can they predict whether two magnets will attract or repel each other depending on which poles are facing?	• Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object? • Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect?	

Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Light 	Explore light sources Shine light on or through different materials Explore shadows Explore rainbows	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials)	Recognise that they need light in order to see things & that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change.	Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	The similarities and differences between light waves and waves in matter. Light waves travelling through a vacuum; speed of light. The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing; the human eye. Light transferring energy from source to absorber, leading to chemical and electrical effects; photosensitive material in the retina and in cameras. Differential colour effects in absorption and diffuse reflection.
Key Questions 	Can they identify some things that give off light?		• Can they recognise that they need light in order to see things? • Can they notice that light is reflected from surfaces? • Can they find patterns in the way that the size of shadows change?	• Can they use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye? • Can they use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them?	

Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Sound 	Listen to sounds Make sounds Listen to sounds outside and identify the source Make sounds	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)	Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases.		Frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound. Sound needs a medium to travel, the speed of sound in air, in water, in solids. Sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone, diaphragm and the ear drum; sound waves are longitudinal the auditory range of humans and animals
Key Questions 	Can they identify some objects that give sound? Can they make different sorts of requested sounds?		• Can they describe a range of sounds and explain how they are made? • Can they compare sources of sound and explain how the sounds differ? • Can they recognise how vibrations from sound travel through a medium to a ear? • Can they explain how you could change the pitch of a sound?		

Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Electricity 	Explore how things work. Identify electrical devices. Use battery-powered devices	Useful to Know Identify that things that plug into a socket use electricity to work. Know that a battery is a store of electricity. Know that electricity is a form of energy.	Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. 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. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. 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. Use recognised symbols when representing a simple circuit in a diagram.	Electric current, measured in amperes, in circuits, series and parallel circuits, currents and where branches meet and current as flow of charge. Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference to current. Differences in resistance between conducting and insulating components. Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects. The idea of electric field, forces acting across the space between objects not in contact.
Key Questions 	Can they name some things that use electricity?		• Can they construct a simple series electric circuit? • Can they 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? • Can they recognise some common conductors and insulators?	• Can they identify and name the basic parts of a simple electric series circuit? • Can they compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches?	

Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Earth & Space 	Learn about the Earth, Sun, Moon, planets and stars Learn about space travel	Observe changes across the four seasons. (Y1 – Seasonal changes) Observe and describe weather associated with the seasons and how day length varies. (Y1 – Seasonal changes)	<u>Useful to Know</u> Know that they sun does not move. Know that the earth goes round the sun. Know that the moon goes round the earth.	Describe the movement of the Earth and other planets relative to the sun in the solar system. Describe the movement of the moon relative to the Earth. Describe the sun, Earth and moon as approximately spherical bodies. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	The composition of the Earth. The structure of the Earth. Gravity force, weight = mass x gravitational field. Strength (g), on Earth g=10 N/kg, different on other planets and stars; Gravity forces between Earth and Moon, and between Earth and sun Our sun as a star, other stars in our galaxy, other galaxies. The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. The light year as a unit of astronomical distance.
Key Questions 	Can they identify the moon, sun and stars in the sky?			• Can they identify and explain the movement of the Earth and other plants relative to the sun in the solar system? • Can they explain how seasons and the associated weather is created? • Can they use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky?	

Topic	EYFS	Y1 & Y2	Y3 & Y4	Y5 & Y6	KS3
Environmental Science 	Recognise when they are hot or cold and know how to warm or cool themselves down.	Know what sorts of thing we can recycle. Know why we recycle. 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. (living tings and their habitats) Find out about and describe the basic needs of animals, including humans, for survival.(Animals including humans)	Recognise that environments can change and that this can sometimes pose dangers to living things.(living things and their habitats) Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.(materials)	Know how our climate is changing? Know some of the causes of climate change? Investigate the effects of climate change around the world. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.(evolution and inheritance)	Earth as a source of limited resources and the efficacy of recycling. The composition of the atmosphere. The production of carbon dioxide by human activity and the impact on climate. How organisms affect, and are affected by, their environment, including the accumulation of toxic materials.
Key Questions 	Can they say why they are hot or cold? Can they suggest ways they could warm themselves up or cool themselves down?	Why can plastic be a useful material? Why is plastic bad for the environment?	How do changes in the environment sometimes pose a danger to living things?		