

Science Topic & Progression Map

Threshold Concept	Science Topic & Progression Map							
	Reception	Milestone 1		Milestone 2		Milestone 3		Challenge
		Year 1 Basic	Year 2 Advancing & Deep	Year 3 Basic	Year 4 Advancing & Deep	Year 5 Basic	Year 6 Advancing & Deep	
	ELG: Communication And Language ELG: Personal, Social, And emotional Development ELG: Understanding the world	Autumn 1: Forces Autumn 2: Materials Spring 1: Materials Spring 2: Plants & Living Things Summer 1: Humans Summer 2: Animals (incl. humans)	Autumn 1: Animals (incl. humans) Autumn 2: Variation (living things) Spring 1: Materials Spring 2: Materials Summer 1: Plants Summer 2: Electricity	Autumn 1: Animals (incl. humans) Autumn 2: Animals (incl. humans) Spring 1: Materials Spring 2: Forces Summer 1: Plants Summer 2: Light	Autumn 1: Plants Autumn 2: Animals (incl. humans) Spring 1: Materials Spring 2: Electricity Summer 1: Sound Summer 2: Space (Earth, Sun and Moon)	Autumn 1: Forces Autumn 2: Space (Earth and the Solar System) Spring 1: Materials Spring 2: Materials Summer 1: Living Things Summer 2: Animals (incl. humans)	Autumn 1: Evolution & Inheritance Autumn 2: Animals (incl. humans) Spring 1: Sound Spring 2: Light Summer 1: Electricity Summer 2: Electricity	
Working Scientifically	- Ask questions to find out more and to check what has been said to them - Make comments about what they have heard and ask questions to clarify meaning	- Ask simple questions. - Perform simple tests. - Observe closely, using simple equipment. - Identify and classify.	- Use observations and ideas to suggest answers to questions. - Gather and record data to help in answering questions	- Ask relevant questions. - Set up simple, practical enquiries and comparative and reliable tests. - Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. - Gather, record, classify and present data in a variety of ways to help in answering questions. - Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. - Report on findings from enquiries, including oral and	- Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests. - Identify differences, similarities or changes related to simple, scientific ideas and processes. - Use straightforward, scientific evidence to answer questions or to support their findings.	- Plan enquiries, including recognising and controlling variables where necessary. - Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work. - Take measurements, using a range of scientific equipment, with increasing accuracy and precision. - Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models. - Report findings from enquiries, including oral and written explanations of	- Present findings in written form, displays and other presentations. - Use test results to make predictions to set up further comparative and reliable tests. - Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments. - Working methodically	- Using appropriate techniques and apparatus. Paying attention to health and safety. - Making predictions, carrying out scientific enquiries and identifying variables. - Understand how scientific ideas develop - Making and recording observations and measurements and evaluating the reliability of methods and suggesting possible improvements

				written explanations, displays or presentations of results and conclusions.		results, explanations involving causal relationships, and conclusions.		
Understand Plants	• Explore the natural world around them, making observations and drawing pictures of animals and plants. • Recognise some environments that are different to the one in which they live • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand the effect of changing seasons on the natural world around them. • Understand some important	• Identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen. • Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers.	• 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, 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. • Identify how animals and plants are suited to and adapt to their environment in different ways. • Identify how plants and animals, including humans, resemble their parents in many features.	• Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. • Investigate the way in which water is transported within plants. • Identify how plants and animals, including humans, resemble their parents in many features. • Explore and use classification keys.	• Relate knowledge of plants to studies of all living things.	• Relate knowledge of plants to studies of evolution and inheritance.	

	processes and changes in the natural world around them, including the seasons and changing states of matter							
Understand Animals & Humans	- Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating – tooth brushing - Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. .	Identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates. - Identify and name a variety of common animals that are carnivores, herbivores and omnivores. - 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. - Identify how humans resemble their parents in many features.	- Describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, including pets). - Investigate and describe the basic needs of animals, including humans, for survival (water, food and air). - 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 amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat. - Construct and interpret a variety of food chains, identifying producers, predators and prey. - Identify that humans and some animals have skeletons and muscles for support, protection and movement. - Recognise that living things can be grouped in a variety of ways.	- 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. - 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 environments can change and that this can sometimes pose dangers to specific habitats.	- Describe the ways in which nutrients and water are transported within animals, including humans. - 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 importance of diet, exercise, drugs and lifestyle on the way the human body functions.	- Describe cells as the fundamental unit of living organisms. - Describe the functions of organelles inside a cell. - Compare plant and animal cells. Describe the hierarchical organisation of multicellular organisms. - An understanding of antagonistic muscles. Describe the effects of recreational drugs on behaviour, health, and life processes.

Investigate Living Things			• 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 micro-habitats. Explore and compare the differences between things that are living, that are dead and that have never been alive. • 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.			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. • Give reasons for classifying plants and animals based on specific characteristics	.	
Understand Evolution & Inheritance						Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. • Recognise that living things have changed over time and that fossils provide information about living things that inhabited	Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	• Describe how variation occurs and describe this as continuous or discontinuous.

							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.	
Investigate Materials		• 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.	• Distinguish between an object and the material from which it is made. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard for particular uses.	• Compare and group together different kinds of rocks on the basis of their simple, physical properties. • Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). • Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. • Recognise that soils are made from rocks and organic matter. • .	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 the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics. • 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 based on evidence from comparative and fair tests, including their hardness, solubility, conductivity (electrical and thermal), and response to magnets. • Understand how 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, including through filtering, sieving and evaporating. • Give reasons, based on evidence from comparative and reliable tests, for the particular uses of everyday materials,	•Describe chemical reactions as the rearrangement of atoms. •Represent chemical reactions using formulae and using equations. •Define acids and alkalis in terms of neutralisation reactions. •Explain how indicators work and the relevance of the pH scale for measuring acidity/alkalinity •Describe reactions of acids with alkalis to produce a salt plus water. •Explain changes of state, shape and density and the anomaly of ice–water transition.	

						including metals, wood and plastic. • 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, including changes associated with burning, oxidation and the action of acid on bicarbonate of soda.		
Understand Movement, Forces & Magnets		• Notice and describe how things move, using simple comparisons such as faster and slower. • Compare how different things move. • To know the difference between push and pull		Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Describe magnets as having two poles. • 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. • Observe how magnets attract or repel		• Describe magnets as having two poles. • Predict whether two 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 effect of drag forces, such as air resistance, water resistance and friction that act between moving surfaces.		• Describe forces as pushes or pulls and as associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water. • Use force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. • Describe Hooke's Law

				each other and attract some materials and not others. • Predict whether two magnets will attract or repel each other, depending on which poles are facing.		• Describe, in terms of drag forces, why moving objects that are not driven tend to slow down. • Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs. • Understand that some mechanisms including levers, pulleys and gears, allow a smaller force to have a greater effect.		Calculate pressure as force over area. • Describe forces as being needed to cause objects to stop or start moving, or to change their speed or direction of motion. • Explain that a change in force depends on direction of force and its size.
Understand the Earth's Movement in Space		• Observe the apparent movement of the Sun during the day. • Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.			• 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. • Describe the phases of the moon	• 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. • To explore the difference between a solar and lunar eclipse Exploration of Mars		
Investigate Senses: Light		• Observe and name a variety of sources of light, including electric lights, flames and the Sun, explaining that we see things because light travels from them to our eyes. - <i>To be drip fed through both years</i>	• Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces.			• Understand that light appears to travel in straight lines. • Use the idea that light travels in straight lines to explain why shadows have the same shape		

			• 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 a solid object. • Find patterns in the way that the size of shadows change.			as the objects that cast them, and to predict the size of shadows when the position of the light source changes. • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eyes. • 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.	
Investigate Senses: Sound		• Observe and name a variety of sources of sound, noticing that we hear with our ears.		• 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.	• Describe waves on water as undulations which travel through water with transverse motion; which can be reflected, and add or cancel. • Describe frequencies of sound waves, measured in Hertz (Hz) • Describe how echoes are made and the reflection and absorption of sound.

							Explain that sound needs a medium to travel through. • Compare how sound is detected by the human ear and what happens in a microphone. Compare the auditory range of humans and animals. • Describe uses of sounds waves, to include ultrasound scans and sonar.
Understand Electrical Circuits			• Identify common appliances that run on electricity. • Construct a simple series electrical circuit. • 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.		• 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. • 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 • Use recognised symbols when representing a simple circuit in a diagram.	• 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.	• Describe current as flow of charge and how to measure it using an ammeter. • Explain that potential difference is measured in volts and resistance as the ratio of potential difference to current. • Compare resistance between conducting and insulating components.