



# Science Planning for Progression



December 2019

## **Essential Objectives**

To work scientifically

To understand plants....

To understand animals and humans

To investigate living things

To understand evolution and inheritance

To investigate materials

To understand movement, forces and magnets

To understand light and seeing

To investigate hearing and sound

To understand electrical circuits

To understand the Earth's movement in space

# Essential Objective: To work scientifically

MILESTONE 2		MILESTONE 3	
Year 3	Year 4	Year 5	Year 6
Asking relevant questions and using different types of scientific enquiries to answer them		Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work.	
Setting up simple practical enquiries, comparative and fair tests		Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	
Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers		Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate	
Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions			
Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables		Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	
Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions		Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degrees of trust in results, in oral and written forms such as displays and other presentations	
Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions		Using test results to make further predictions to set up further comparative and fair tests	
Identify differences, similarities or changes related to simple scientific ideas and processes			
Using straight forward scientific evidence to answer questions or to support their findings		Identify scientific evidence that has been used to support or refute ideas or arguments	

# BIOLOGY

## Essential Objective: To understand plants

MILESTONE 2		MILESTONE 3	
Year 3	Year 4	Year 5	Year 6
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.			

# Essential Objective: To understand animals and humans

MILESTONE 2		MILESTONE 3	
Year 3	Year 4	Year 5	Year 6
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.	Describe the simple functions of the basic parts of the digestive system in humans	Describe the changes as humans develop from birth 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
Identify that humans and some other animals have skeletons and muscles for support, and protection and movement.	Identify the different types of teeth in humans and their simple functions		Recognise the importance of diet, exercise, drugs and lifestyle on the way the human body functions.
	Construct and interpret a variety of food chains, identifying producers, predators and prey		Describe the ways in which nutrients and water are transported within animals, including humans

# Essential Objective: To investigate living things

MILESTONE 2		MILESTONE 3	
Year 3	Year 4	Year 5	Year 6
	Recognise that living things can be grouped in a variety of ways	Describe the differences in the life cycle of a mammal, an amphibian, an insect and a bird	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
	Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	Describe the life process of reproduction in some plants and animals	Give reasons for classifying plants and animals based on specific characteristics
	Recognise that environments can change and that this can sometimes pose dangers to living things		

# Essential Objective: To understand evolution and inheritance

MILESTONE 2		MILESTONE 3	
Year 3	Year 4	Year 5	Year 6
			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.

# CHEMISTRY

## Essential Objective: To investigate materials

MILESTONE 2		MILESTONE 3	
Year 3	Year 4	Year 5	Year 6
Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	Compare and group materials together, according to whether they are solids, liquids or gases	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	
Describe in simple terms how fossils are formed when things that have lived are trapped in rock.	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	Know that some materials will dissolve in liquids to form a solution, and describe how to recover a substance from a solution	
Recognise that soils are made from rocks and organic matter	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	
Relate the simple physical properties of some rocks to their formation (igneous and sedimentary).		Give reasons, based on evidence from comparative and fair tests, for the particular use of everyday materials, 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 and action of acid on bicarbonate of soda	



# PHYSICS

## Essential Objective: To understand movement, forces and magnets

MILESTONE 2		MILESTONE 3	
Year 3	Year 4	Year 5	Year 6
Compare how things move on different surfaces		Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	
Notice that some forces need contact between two objects, but magnetic forces can act at a distance		Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	
Observe how magnets attract or repel each other and attract some materials and not others		Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	
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 two poles			
Predict whether two magnets will attract or repel each other, depending on which poles are facing			

# Essential Objective: To understand light and seeing

MILESTONE 2		MILESTONE 3	
Year 3	Year 4	Year 5	Year 6
Recognise that they need light in order to see things and that dark is absence of light			Recognise that light appears to travel in straight lines
Notice that light is reflected from surfaces			Use the idea that light travels in straight lines to explain that objects are seen because they give out light or reflect light into the eye
Recognise that light from the sun can be dangerous and that there are ways to protect their 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.
Recognise that shadows are formed when the light from a light source is blocked by a solid object			Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes.
Find patterns in the way that they size of shadows change			

# Essential Objective: To investigate hearing and sound

MILESTONE 2		MILESTONE 3	
Year 3	Year 4	Year 5	Year 6
	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		

# Essential Objective: To understand electrical circuits

MILESTONE 2		MILESTONE 3	
Year 3	Year 4	Year 5	Year 6
	Identify common appliances that run on electricity		Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells in the circuit
	Construct a simple series circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers		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 the switches
	Identify whether or not a lamp will light in a simple series circuit, based on whether the lamp is part of a complete loop with a battery		Use recognised symbols when representing a simple circuit in a diagram
	Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a series circuit		
	Recognise some common conductors and insulators, and associate metals with being good conductors		

# Essential Objective: To understand the Earth's movement in space

MILESTONE 2		MILESTONE 3	
Year 3	Year 4	Year 5	Year 6
		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	