

Science from the National Curriculum

WORKING SCIENTIFICALLY: Pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

KS1	During Y1 and Y2	<ul style="list-style-type: none"> ▪ asking simple questions and recognising that they can be answered in different ways ▪ observing closely, using simple equipment ▪ performing simple tests ▪ identifying and classifying ▪ using their observations and ideas to suggest answers to questions ▪ gathering and recording data to help in answering questions.
KS2	During Y3 and Y4	<ul style="list-style-type: none"> ▪ asking relevant questions and using different types of scientific enquiries to answer them ▪ setting up simple practical enquiries, comparative and fair tests ▪ making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ▪ 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 ▪ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ▪ using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ▪ identifying differences, similarities or changes related to simple scientific ideas and processes ▪ using straightforward scientific evidence to answer questions or to support their findings.
	During Y5 and Y6	<ul style="list-style-type: none"> ▪ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary ▪ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate ▪ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs ▪ using test results to make predictions to set up further comparative and fair tests ▪ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

	identifying scientific evidence that has been used to support or refute ideas or arguments.
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BROADLY BIOLOGY BASED

PLANTS		
KS1	Y1	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.
	Y2	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
KS2	Y3	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.
<p><i>No statutory Programme of Study for PLANTS after Y3</i></p> <p><i>USE LIVING THINGS AND THEIR HABITATS FOR FURTHER CHALLENGE</i></p>		

EVOLUTION AND INHERITANCE		
KS1	Y1-2	<i>No statutory Programme of Study</i>
KS2	Y3 -5	<i>No statutory Programme of Study</i>
	Y6	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.

ANIMALS INCLUDING HUMANS

KS1	Y1	Identify and name a variety of common animals e.g. fish, amphibians, reptiles, birds	
		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 (fish, amphibians, reptiles, birds and mammals, including pets)	
		Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	
	Y2	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 (water, food and air)	
		Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	
	KS2	Y3	Identify that animals and humans need the right types / 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.
		Y4	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.			
Y5		Describe the changes as humans develop to old age	
Y6		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.	

LIVING THINGS AND THEIR HABITATS

KS1	Y1	<i>No statutory Programme of Study</i>
	Y2	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 micro-habitats
		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
KS2	Y3	<i>No statutory Programme of Study</i>
Y4	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.	
Y5	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.	
Y6	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.	

BROADLY CHEMISTRY BASED

ROCKS		
KS1	Y 1-2	<i>No statutory Programme of Study</i>
KS2	Y3	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.
<i>No statutory Programme of Study for ROCKS after Y3</i>		

MATERIALS AND STATES OF MATTER

KS1	Y1	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.
	Y2	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
		Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
KS2	Y3	<i>No statutory Programme of Study</i>
	Y4	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.
	Y5	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
		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, including through filtering, sieving and evaporating
		Give reasons, based on evidence from comparative and fair tests, for the particular uses 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 the action of

		acid on bicarbonate of soda.
	Y6	<i>No statutory Programme of Study</i>

BROADLY PHYSICS BASED

WEATHER AND SEASONS		
KS1	Y1	Observe changes across the four seasons
		Observe and describe weather associated with the seasons and how day length varies.
<i>No statutory Programme of Study for WEATHER AND SEASONS after Y1</i>		

LIGHT AND DARK		
KS1	Y1-2	<i>No statutory Programme of Study</i>
KS2	Y3	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
		Recognise that light from the sun can be dangerous and that there are ways to protect 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.
	Y4 -5	<i>No statutory Programme of Study</i>
	Y6	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.

SOUND		
KS1	Y1-2	<i>No statutory Programme of Study</i>
KS2	Y3	<i>No statutory Programme of Study</i>
	Y4	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 pitch and features of the object that produced it
		Find patterns between 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.
	Y5 -6	No statutory Programme of Study

FORCES, MAGNETS AND ELECTRICITY		
KS1	Y1-2	No statutory Programme of Study
KS2	Y3	Compare how things move on different surface
		Notice that some forces need contact between two 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 two poles
		Predict whether two magnets will attract or repel each other, depending on which poles are facing.
	Y4	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.
	Y5	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.
	Y6	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.

EARTH AND SPACE		
KS1	Y1-2	<i>No statutory Programme of Study</i>
KS2	Y3 -4	<i>No statutory Programme of Study</i>
	Y5	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		

