



SCIENCE: WHOLE SCHOOL OVERVIEW



CAPS = new unit
(brackets) = old unit
that could be used for resources.

Including 2014 National Curriculum Guidelines

KS1 The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them.

‘Working scientifically’ is described separately in the programme of study, but must **always** be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

WORKING SCIENTIFICALLY

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ■ 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.

Year 1 Science		
ANIMALS INCLUDING HUMANS (Ourselves)	PLANTS (Growing plants)	EVERYDAY MATERIALS (Grouping and changing from Y2)
Pupils should be taught to: <ul style="list-style-type: none"> • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • 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 	Pupils should be taught to: <ul style="list-style-type: none"> ■ 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. 	Pupils should be taught to: <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • compare and group together a variety of everyday materials on the basis of their simple physical properties • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
SEASONAL CHANGES (New)	WORKING SCIENTIFICALLY	
Pupils should be taught to: <ul style="list-style-type: none"> • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies 	During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: <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 	

Year 2 Science

ANIMALS INCLUDING HUMANS (Health and growth)	LIVING THINGS & THEIR HABITATS (Plants and animals; Variation)	PLANTS (Plants and animals)
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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
USES OF EVERYDAY MATERIALS (Characteristics of materials from Y3)	MOVEMENT (Forces)	WORKING SCIENTIFICALLY
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> notice and describe how things are moving, using simple comparisons such as faster and slower compare how different things move 	<p>During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <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

LOWER KS2

The principal focus of science teaching in lower Key Stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' is described separately at the beginning of the programme of study, but must **always** be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Year 3 Science		
ANIMALS, INCLUDING HUMANS (Teeth and eating; Moving & Growing from Y4)	PLANTS (Helping plants grow well)	LIGHT (Light and shadows)
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 notice that light is reflected from surfaces associate shadows with a light source being blocked by something; find patterns that determine the size of shadows.
ROCKS (Rocks and soils)	FORCES & MAGNETS (Magnets and springs; Friction from Y4)	WORKING SCIENTIFICALLY
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>compare how things move on different surfaces</p> <ul style="list-style-type: none"> 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 	<p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <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.

Year 4 Science		
ANIMALS INCLUDING HUMANS (Moving and growing; Teeth and eating from Y3)	ALL LIVING THINGS (Habitats)	ELECTRICITY (Circuits and conductors)
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify and name a variety of living things (plants and animals) in the local and wider environment, using classification keys to assign them to groups give reasons for classifying plants and animals based on specific characteristics recognise that environments are constantly changing and that this can sometimes pose dangers to specific habitats. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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
STATES OF MATTER (Solids and liquids; Gases around us from Y5)	SOUND (Changing sounds from Y5)	EVOLUTION & INHERITANCE (NEW)
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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) <p>identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify how plants and animals, including humans, resemble their parents in many features recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago identify how animals and plants are suited to and adapt to their environment in different ways. <p>Pupils should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by exploring the family trees and family resemblances of historical personalities such as the Tudors or the Hapsburgs. Note: At this stage, pupils are not expected to understand how genes and chromosomes work.</p> <p>Building on the topic on rocks in Year 3, pupils should be reintroduced to fossils and find out, for example by studying dinosaurs, how things living on the Earth have changed over time. Pupils might find out about the work of palaeontologists such as Mary Anning.</p> <p>Pupils might work scientifically by identifying, comparing and recording similarities and differences among themselves and other animals and looking for patterns; observing and raising questions about local animals and how they are adapted to their environment; finding out about how some other animals and plants, beyond their own locality, adapt to their environments.</p>
WORKING SCIENTIFICALLY		
<p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <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 <p>using straightforward scientific evidence to answer questions or to support their findings.</p>		

UPPER KS2 The principal focus of science teaching in upper Key Stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper Key Stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must **always** be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read, spell and pronounce scientific vocabulary correctly.

Year 5 Science		
MAGNETISM (NEW)	ALL LIVING THINGS (Life cycles)	ANIMALS, INCLUDING HUMANS (Keeping Healthy + NEW)
<p>* describe magnets as having two poles</p> <p>* Predict whether two magnets will attract or repel each other, depending on which poles are facing</p> <p>Pupils should be introduced to a predictive model for the way magnets behave. They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe) and find out about how the Earth acts as a magnet</p> <p>Pupils should be introduced to a predictive model for the way magnets behave. They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe) and find out about how the Earth acts as a magnet..</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age <p>Pupils should build on their learning from Years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore how the circulatory system enables the body to function. Pupils should find out how ideas about the circulatory system have changed through studying the work of scientists in the past, such as William Harvey, who described the circulatory system in the seventeenth century, and Galen, the Roman physician of the second century. Pupils might work scientifically by: discussing and drawing what they think the circulatory system looks like and comparing this with images from other sources; discussing, drawing or creating models of how the main organs of the body fit together and function; comparing the effect of different types of activity on pulse rate and breathing rate. They might find out about the effects of things that might damage the body's systems. They might compare the organ systems of the human body with the organ systems of a variety of animals, asking pertinent questions and suggesting reasons for similarities and differences.</p>
PROPERTIES OF EVERYDAY MATERIALS AND REVERSIBLE CHANGE (Changing state; More about dissolving from Y6; Reversible & Irreversible change from Y6 – ONLY REVRISIBLE PART)	EARTH AND SPACE (Earth Sun and Moon)	WORKING SCIENTIFICALLY
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 <p>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</p>	<p>Pupils should be taught to:</p> <p>describe the movement of the Earth and other planets relative to the sun in the solar system</p> <p>describe the movement of the moon relative to the Earth</p> <p>describe the sun, Earth and moon as approximately spherical bodies</p> <p>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</p>	<p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <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 a 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

Year 6 Science		
ALL LIVING THINGS (Microorganisms; Keeping healthy from Y5 + NEW)	FORCES (Forces in action)	LIGHT (How we see things)
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> explain the classification of living things into broad groups according to common observable characteristics and based on similarities and differences, including plants, animals and micro-organisms <input type="checkbox"/> describe the life process of reproduction in some plants and animals <input type="checkbox"/> describe the changes as humans develop from birth to old age <input type="checkbox"/> recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object <input type="checkbox"/> identify the effect of drag forces, such as air resistance, water resistance and friction, that act between moving surfaces <input type="checkbox"/> describe, in terms of drag forces, why moving objects that are not driven tend to slow down <input type="checkbox"/> understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
EVOLUTION & INHERITANCE (Interdependence and adaptation)	ELECTRICITY (Changing circuits)	CHANGES THAT FORM NEW MATERIALS (Reversible & Irreversible change from Y6 – ONLY IRREVERSIBLE PART)
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents <input type="checkbox"/> describe how adaptation leads to evolution <input type="checkbox"/> recognise how and why the human skeleton has changed over time, since we separated from other primates. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • <input type="checkbox"/> identify and name the basic parts of a simple electrical circuit, including cells, wires, bulbs, switches and buzzers • <input type="checkbox"/> associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • <input type="checkbox"/> 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • <input type="checkbox"/> 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.
WORKING SCIENTIFICALLY		
<p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <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 a 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 		