

Lower Key Stage 2 Programme of Study

Working Scientifically

Working Scientifically Focus	Questioning	Observing	Identifying	Testing	Recording	Drawing Conclusions
Year 3	<p>The child can, with support, develop relevant testable questions</p> <p>The child can, with support, identify different types of scientific enquiry that could be used to answer questions</p>	<p>The child can use various equipment as instructed e.g. a hand lens</p> <p>The child can use standard measurements when taking measurements</p>	<p>The child can, with some support, identify differences and similarities between objects and sets of results</p>	<p>The child can plan an enquiry such as comparative or fair test</p>	<p>The child can, with prompting, draw and label diagrams</p> <p>The child can, with prompting, use tables to record evidence</p> <p>The child can, with prompting, gather and display evidence in various ways</p>	<p>The child can, with prompting, use evidence to write a simple conclusion</p>
Year 4	<p>The child can develop relevant testable questions</p> <p>The child can identify different types of scientific enquiry that could be used to answer questions</p>	<p>The child can use various equipment, as instructed, repeatedly and with care</p> <p>The child can recognise the importance of using standard units and measures accurately</p>	<p>The child can identify differences and similarities between objects and sets of results</p> <p>The child can recognise patterns that relate to scientific ideas and processes</p>	<p>The child can plan investigations using different types of scientific enquiry</p> <p>The child can set up comparative and fair tests</p>	<p>The child can use words and diagrams to record findings</p>	<p>The child can write a conclusion based on evidence</p> <p>The child can present findings either in writing or orally</p>
END OF LOWER KS2	<p>Asking relevant questions and using different types of scientific enquiry to answer them</p>	<p>Making systematic and careful observations and where appropriate taking accurate measurements using standard units using a range of equipment including thermometers and data loggers</p>	<p>identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>using straightforward scientific evidence to answer questions or to support their findings.</p>	<p>Setting up simple practical enquiries, comparative and fair tests</p>	<p>gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p>	<p>reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p>

Year 3 Knowledge

Plants

Pupils will be taught to:

- 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

Animals including humans

Pupils will be taught to:

- 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

Rocks

Pupils will be taught to:

- 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

Light

Pupils will be taught to:

- 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 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

Forces

Pupils will be taught to:

- 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

Year 4 Knowledge

Living things and their habitats

Pupils will be taught to:

- 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

Animals including humans

Pupils will be taught to:

- 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

States of matter

Pupils will be taught to:

- 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

Sound

Pupils will be taught to:

- 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

Electricity

Pupils will be taught to:

- 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

Upper Key Stage 2 Programme of Study

Working Scientifically

Working Scientifically Focus	Questioning	Observing	Identifying	Testing	Recording	Drawing Conclusions
Year 5	The child can, with support, answer questions using evidence gathered from different types of scientific enquiry	The child can, following discussion of alternatives, select appropriate equipment The child can take measurements which are precise as well as accurate The child knows that they can repeat readings	The child can, with support, indicate why some results may not be entirely trustworthy	The child can, with prompting, identify and manage variables The child can suggest further relevant comparative or fair tests	The child can start to use labelled diagrams to show more complex outcomes The child, with prompting, uses various ways to record data including a line graph	The child can, with prompting, write a conclusion using evidence and identify causal links The child can, with some support, display and present key findings from enquiries both orally and in writing
Year 6	The child can answer questions using evidence gathered from different types of scientific enquiry	The child can use appropriate equipment to take measurements The child can consider how by modifying equipment or technique, measurements can be improved including taking repeat readings	The child can identify how an idea is supported or refuted by evidence The child can indicate why some results may not be reliable	The child can identify and manage variables The child can use evidence to suggest further comparative or fair tests that would further develop the investigation	The child can use labelled diagrams to show more complex outcomes The child can use various ways, as appropriate, to record complex data including all types of graph	The child can write a conclusion using evidence and identify causal links The child can display and present key findings from enquiries both orally and in writing
END OF KS2	planning different types of scientific enquiries to answer questions	taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	identifying scientific evidence that has been used to support or refute ideas or arguments Reporting a degree of trust in results	using test results to make predictions to set up further comparative and fair tests recognising and controlling variables where necessary	recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations

Year 5 Knowledge

Living things and their habitats

Pupils will be taught to:

- 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

Animals including humans

Pupils will be taught to:

- describe the changes as humans develop to old age

Properties and changes in materials

Pupils will be taught to:

- 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

Earth and space

Pupils will be taught to:

- 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

Forces

Pupils will be taught to:

- 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

Year 6 Knowledge

Living things and their habitats

Pupils will be taught to:

- 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

Animals including humans

Pupils will be taught to:

- 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

Evolution and inheritance

Pupils will be taught to:

- 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

Light

Pupils will be taught to:

- 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

Electricity

Pupils will be taught to:

- 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