



Science Knowledge Progression

Key Stage 2



Working scientifically

Lower Key Stage 2

- Raise their own questions about the world around them
- Be given a range of scientific experiences including different types of science enquiries to answer
- Start to make their own decisions about the most appropriate type of scientific enquiry they might use
- Set up simple practical enquiries ensuring they are fair.
- Talk about criteria for grouping, sorting and classifying (use simple keys)
- Recognise when and how secondary sources might help them answer questions that cannot be answered through investigations
- Make systematic and careful observations - make decisions about what observations to make, how long to make them and the equipment which can be used to make them
- Begin to look for naturally occurring patterns and relationships
- Take accurate measurements using standard units
- Learn how to use a range of equipment such as data loggers/thermometers appropriately
- Collect and record data from their own observations in a variety of ways: notes, bar graphs and tables, standard units, drawings, labelled diagrams, keys.
- With support, children to look for changes, similarities and differences in their data in order to draw conclusions
- Use relevant scientific vocabulary to discuss their ideas and communicate their findings in an appropriate way
- Identify new questions from the data and make predictions

Upper Key Stage 2

- Use their science experiments to explore ideas and raise different questions
- Discuss how scientific ideas have developed over time
- Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions
- Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled
- Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment
- Recognise which secondary sources will be most useful to research their ideas and begin to separate fact/opinion
- Make their own decisions about what observations to make, what measurements to use and how long to make them for
- Look at different causal relationships in their data and identify evidence that refutes or supports their ideas
- Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeated measurements where necessary.
- Decide how to record data and results (scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs)
- Identify scientific evidence to support or refute ideas
- Use scientific vocabulary to communicate and justify ideas
- Use results to make predictions and further observations

	Year 3	Year 4	Year 5	Year 6
	<p><u>Plants</u></p> <ul style="list-style-type: none"> • Can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. • Can 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. • Can investigate the way in which water is transported within plants. • Can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 	<p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> • 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 and have an impact on living things 	<p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> • Can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • Can describe the life process of reproduction in some plants and animals. 	<p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> • Can 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. • Can give reasons for classifying plants and animals based on specific characteristics.

	<p><u>Animals including humans</u></p> <ul style="list-style-type: none"> • Can 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. • Can identify that humans and some other animals have skeletons and muscles for support, protection and movement. 	<p><u>Animals including humans</u></p> <ul style="list-style-type: none"> • Can describe the simple functions of the basic parts of the digestive system in humans. • Can identify the different types of teeth in humans and their simple functions. • Can construct and interpret a variety of food chains, identifying producers, predators and prey. 	<p><u>Animals including humans</u></p> <ul style="list-style-type: none"> • Can describe the changes as humans develop to old age. 	<p><u>Animals including humans</u></p> <ul style="list-style-type: none"> • Can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. • Can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. • Can describe the ways in which nutrients and water are transported within animals, including humans.
			<p><u>Earth and Space</u></p> <ul style="list-style-type: none"> • Can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • Can describe the movement of the Moon relative to the Earth. • Can describe the Sun, Earth and Moon as approximately spherical bodies. • Can use the idea of the Earth's rotation to explain 	<p><u>Evolution and inheritance</u></p> <ul style="list-style-type: none"> • Can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. • Can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their

			<p>day and night and the apparent movement of the sun across the sky.</p>	<p>parents.</p> <ul style="list-style-type: none"> • Can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
	<p><u>Rocks</u></p> <ul style="list-style-type: none"> • Can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • Can describe in simple terms how fossils are formed when things that have lived are trapped within rock. • Can recognise that soils are made from rocks and organic matter. 	<p><u>States of matter</u></p> <ul style="list-style-type: none"> • Can compare and group materials together, according to whether they are solids, liquids or gases. • Can 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 ($^{\circ}\text{C}$). • Can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	<p><u>Properties and changes of materials</u></p> <ul style="list-style-type: none"> • Can 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. • Can name some materials that will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. • Can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • Can give reasons, based on evidence from 	

			<p>comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <ul style="list-style-type: none"> • Can demonstrate that dissolving, mixing and changes of state are reversible changes. • Can 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><u>Light</u></p> <ul style="list-style-type: none"> • Can recognise that they need light in order to see things and that dark is the absence of light. • Can notice that light is reflected from surfaces. • Can recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Can recognise that shadows are formed when the light from a 	<p><u>Sound</u></p> <ul style="list-style-type: none"> • Can identify how sounds are made, associating some of them with something vibrating. • Can recognise that vibrations from sounds travel through a medium to the ear. • Can find patterns between the pitch of a sound and features of the object that produced it. • Can find patterns 		<p><u>Light</u></p> <ul style="list-style-type: none"> • Can 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. • Can 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.

	<p>light source is blocked by a solid object.</p> <ul style="list-style-type: none"> • Can find patterns in the way that the size of shadows change. 	<p>between the volume of a sound and the strength of the vibrations that produced it.</p> <ul style="list-style-type: none"> • Can recognise that sounds get fainter as the distance from the sound source increases. 		<ul style="list-style-type: none"> • Can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
	<p><u>Forces and Magnets</u></p> <ul style="list-style-type: none"> • Can compare how things move on different surfaces. • Can notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Can observe how magnets attract or repel each other and attract some materials and not others describe magnets as having two poles. • Can predict whether two magnets will attract or repel each other, depending on which poles are facing. • Can compare and group together a variety of everyday materials on the basis of whether they are attracted to a 		<p><u>Forces</u></p> <ul style="list-style-type: none"> • Can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Can identify the effects of air resistance, water resistance and friction, that act between moving surfaces. • Can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	

	magnet, and identify some magnetic materials.			
		<p><u>Electricity</u></p> <ul style="list-style-type: none"> • Can identify common appliances that run on electricity. • Can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Can 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. • Can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • Can recognise some common conductors and insulators, and associate metals with being good conductors. 		<p><u>Electricity</u></p> <ul style="list-style-type: none"> • Can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Can 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. • Can use recognised symbols when representing a simple circuit in a diagram.