

Progression in Science

Purpose of study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims

The national curriculum for science aims to ensure that all pupils:

- develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics
- develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.



National Curriculum		Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
WORKING SCIENTIFICALLY		<p>Ask a relevant scientific question to find out more, explain how things work and why they might happen.</p> <p>With support, use simple equipment, such as timers, rulers and containers, to measure length, height, capacity and time.</p> <p>Record data in simple tables and pictograms.</p> <p>Represent scientific observations by mark making, drawing or creating simple charts and tables.</p> <p>Offer explanations for why things happen, making use of vocabulary, such as, because, then and next.</p> <p>Observe how activities are going and adapt their ideas if necessary.</p> <p>With support, observe, record and talk about materials and living things.</p> <p>Explore the natural world around them and give simple descriptions, following observation, of changes.</p> <p>Follow instructions when in different environments and when handling simple equipment, such as scissors.</p>	<p>Ask simple questions.</p> <p>Recognise that questions can be answered in different ways Perform simple test</p> <p>Observing closely</p> <p>Compare things and sort them into groups.</p> <p>Using simple equipment to take measurements.</p> <p>Gathering and record simple data in different ways.</p> <p>Talking about what I have found out using scientific language.</p>		<p>Ask questions and use scientific knowledge to answer them.</p> <p>Setting up simple fair tests.</p> <p>Make careful observations and take accurate measurements using a range of resource.</p> <p>Gathering and record findings using simple scientific language, drawings, labelled diagrams bar charts, and tables.</p> <p>Using results to draw conclusions and make predictions about future investigations.</p> <p>Using straight forward scientific evidence to answer questions.</p>		<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Record 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</p> <p>Report and present 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.</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p>	
	BIOLOGY	Plants	Name and describe basic features of plants and trees.	Identify and name a variety of wild and garden plants and describe the basic structure of a variety of common flowering plants, including trees.	Find out what healthy plants need to grow and stay healthy. Observe and describe how seeds and bulbs grow into mature plants	Identify and describe the functions of different parts of flowering plants and investigate the way in which water is transported within plants Explore the parts that flowers play in the life cycle of flowering plants.	Construct and interpret a variety of food chains, identifying predators, producers and prey	Describe the life process of reproduction in some plants and animals.
	Animals including humans	Draw pictures of the human body and name some of the different body parts. Match animals to their young. Identify common features for different groups of animals, including wild and domestic animals. Match animals to the foods that they eat.	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)	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	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	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	Describe the changes as humans develop 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 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

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			Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense					
	Living things and their habitats	Wash and dry hands regularly and say why this is important. Describe some ways that plants or animals should be cared for in order for them to survive. Observe and describe living things and their habitats within the local environment		Explore and compare the differences between things that are living, dead and things that have never been alive. Describe how animals obtain their food using simple food chains. Identify and name a variety of plants and animals in their habitats, how they are suited to them and how they depend on each other.		Recognise that living things can be grouped in a variety of ways Explore and use classification keys Recognise that environments can change and that this can sometimes pose dangers to living things.	Describe the life processes of reproduction in some plants and animals Describe the differences in life cycles and the life process of reproduction in some plants and animals	Describe how living things are classified into broad groups and give reasons for classifying plants and animals based on specific characteristics
	Evolution and inheritance		Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Identify that most living things live in habitats to which they are suited Notice that animals, including humans, have offspring which grow into adults		Explore and use classification keys to help group, identify and name a variety of living things Recognise that environments can change and that this can sometimes pose dangers to living things.		Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Identify how plants and animals are adapted / leads to evolution. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
	Rocks				Describe in simple terms how fossils are formed when things that have lived are trapped within rock			
PHYSICS	Seasonal change	Notice and begin to describe patterns of weather in summer and winter. Notice and talk about the differences in day length between the seasons. Describe simply how weather changes as the seasons change.	Observe changes across all four seasons and describe the weather associated with the seasons and how day length varies.	Find out and describe how healthy plants need water, light and a suitable temperature to grow and stay healthy.	Explore the requirements of plants for life and growth and how they vary from plant to plant	Recognise that environments can change and that this can sometimes pose dangers to living things.	Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	
	Electricity	Explore and describe electrical and non-electrical light sources.	Describe the simple physical properties of, compare and group together a variety of everyday materials.	Identify and compare the suitability of a variety of everyday materials.		Conduct a simple series circuit, identifying and naming its basic parts. Identify whether or not a lamp will light in a simple series circuit. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights up.	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	Associate the brightness of a bulb or volume of a buzzer with number of voltage of cells used in the circuit. Compare and give reasons for variation in how components function. Use symbols when representing a simple circuit in a diagram.
	Forces and Magnets		Name a variety of everyday materials. 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.	Identify and compare the suitability of a variety of everyday materials. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Compare how things move on different surfaces Notice that some forces need contact between two objects, but magnetic forces can act at a distance Observe how magnets attract or repel. Describe magnets as having two poles Predict whether two magnets will attract each other or repel each other depending on which poles are facing		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	

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	Earth and Space	Describe simply how weather changes as the seasons change.	Observe and describe weather associated with the seasons and how day length varies.		Recognise that light from the sun can be dangerous and that there are ways to protect their eyes	Recognise that environments can change and that this can sometimes pose dangers to living things. Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	Describe the movement of the Earth, and other planets, relative to the Sun in the Solar System and the movement of the Moon relative to the Earth Describe the Sun, Earth and Moon as approximately spherical bodies Use the idea that the Earth's rotation to explain day and night.	
	Light	Name and describe natural phenomena, such as the size of shadows, the colours of a rainbow, the speed of clouds moving across the sky and the strength of a wave. Make a shadow bigger or smaller using toys, play equipment and a light source.			Recognise that they need light in order to see things. Notice that light is reflected from surfaces 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			Recognise that light appears to travel in straight line and use this idea that to explain that objects are seen because light travels from light sources to our eyes or from the light sources to objects then brings it to our eyes and to explain why shadows have the same shape as the objects cast on them
	Sound		Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.			Identify how sounds are made. Recognise that vibrations from sounds travel through the inner ear Find patterns between the pitch of a sound and features of the object which has produced it Recognise that sounds get fainter as the distance from the sound source increases	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	
	Forces	Describe, predict and sort things that float and sink and talk about the forces that they can feel.		Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Compare how things move on different surfaces 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	Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Identify the effect of air resistance, water resistance and friction. Recognise that some mechanisms allow a smaller force to have a greater effect	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	
CHEMISTRY	Materials	Compare and group objects and materials according to simple given criteria. Name and sort everyday items into groups of the same material.	Describe the difference between an object and the materials from which it is made. Describe the simple properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple properties.	Identify and compare the suitability of a variety of everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Recognise that soils are made from rocks and organic matter. 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		Compare and group together everyday materials. Give reasons for the particular uses of everyday material and know that some materials will dissolve into liquid to form a solution and describe how best to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated. Demonstrate that dissolving, mixing and changes of state are reversible changes and explain that some changes result in the formation of new materials	

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States of Matter		Properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple properties.		Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	Compare and group materials according to whether they are solids, liquids or gases Observe that some materials change state when they are heated or cooled, Identify the part played by evaporation and condensation in the water cycle.	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 or bicarbonate of soda.	
Rocks		Distinguish between an object and the material from which it is made Identify and name a variety of everyday materials and describe their properties	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties			
Forces and Magnets	Identify that materials have different properties and explore and sort magnetic and non-magnetic materials through play and exploration.	Distinguish between an object and the material from which it is made Identify and name materials. Describe, compare and group together a variety of everyday materials on the basis of their simple physical properties.	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	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 or their appearance and simple physical properties Notice that some forces need contact between two objects, but magnetic forces can act at a distance	Recognise some common conductors and insulators, and associate metals with being good conductors.	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.	Distinguish between an object and the material from which it is made Identify and name materials. Describe, compare and group together a variety of everyday materials on the basis of their simple physical properties.
Electricity		Compare and group together a variety of everyday materials on the basis of their simple physical properties. Describe the simple physical properties of a variety of everyday materials.			Recognise some common conductors and insulators, and associate metals with being good conductors.	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.	Compare and group together a variety of everyday materials on the basis of their simple physical properties. Describe the simple physical properties of a variety of everyday materials.