

Science

Intent



Teaching mastery across the curriculum involves employing approaches that help our pupils to develop a deep and secure knowledge and understanding of science at each stage of their learning, so that by the end of every school year or Key Stage, pupils will have acquired mastery of the scientific facts and concepts they've been exposed to, equipping them to move on confidently and securely to more advanced material.

Implementation

We teach science in a variety of ways. We will develop children's knowledge, skills and understanding. Where possible science will be practical and will involve elements of scientific enquiry. There will be a mixture of whole-class, group, paired and individual work. Children will be encouraged to pose questions of their own and investigate possible answers. Work can be differentiated in a variety of ways, for example, through outcome, the resources provided, the work undertaken and/or the level of support given.

A wide range of resources are available to support the teaching of science, including PKC, Hamilton Trust, Twinkl and PiXL. Science equipment is organised in boxes in a central store. The library contains a range of books relating to different science topics. Teachers can use ICT based simulations, animations and models to show children concepts which it is difficult or impracticable to do in the classroom.

Science can be linked to other areas of the curriculum and where possible these links should be exploited. Links to maths should be made when children are measuring or collecting data. Collecting, organising and interpreting data will involve aspects of the computing curriculum. Drama, role-play and discussions can support the delivery of speaking and listening objectives in English. Work on healthy lifestyles will link with aspects of PSHE.

Additional opportunities - During science week we have a themed day of practical science activities across the school. When appropriate visitors are invited into school and out of school visits are organised that relate to class science topics. Children are able to use the garden area and the riverbank area to study living things and their habitats.

In EYFS the science curriculum links with the area Knowledge and Understanding of the World in The Early Learning Goals. Children will explore areas within this theme in relation to their half termly topic.

SEND - We teach science to children, whatever their ability. Science forms part of the school curriculum policy to provide a broad and balanced education for all children. Through our science teaching we provide learning opportunities that enable all pupils to make progress by setting suitable learning challenges and responding to differing needs.

Impact

Teachers assess children by making judgements of observations during lessons, the work produced and discussions. Work produced is marked, in line with the feedback policy. Teachers make judgements about children's knowledge and understanding and their use and understanding of key vocabulary. Parents are informed of pupils' progress in science annually. Attainment in science is reported to the DfE in Years 2 and 6.

Upwell Academy

Subject Overview – Science



	Plants	Animals	Classification and Evolution	Human Body	Seasons and Weather	Environment and Ecology	Materials and Matter	Electricity	Astronomy	Light	Forces	Rocks	Sound
Year R	Growing things.	Minibeasts.	Animals.	Naming body parts.	The four seasons.		Describing materials.		Earth, sun and moon. Earth and beyond.	Light and dark.	Gravity. Floating and sinking. Push and pull. Speed.		
Year 1	What plants need to grow. Parts and functions of plants. How plants obtain food.	Naming, grouping and describing animals. How animals obtain food. Caring for animal babies and for pets.		Naming body parts. The five senses. Understanding sensory impairment.	Four seasons. Daily weather, weather forecasts and weather symbols. Weather around the world.	The Earth's natural resources. Conservation of resources and recycling. Pollution – causes and prevention.	Classification of materials.				Magnets and magnetic attraction.		
Year 2	Seeds and bulbs. What plants need to grow healthy.	Habitats and habitat destruction. Food chains.		The parts of the skeletal, muscular, digestive and circulatory systems. Exercise, healthy eating, preventing illness and disease.		Habitat destruction.	Comparing materials. Changing materials. Solids, liquids and gases.	Circuits. Conductive and non-conductive materials. Safety rules.	Solar system. Orbit and rotation. Sun, moon, planets, stars and constellations.				
Year 3	Plant life cycles. Parts of a plant. Functions of plants. Water transportation. Seed formation and dispersal.	Life cycles. Seasonal cycles – animal migration.		The digestive system. Teeth. Healthy diet and nutrition. Skeletons and muscles for support, protection and movement.	Seasonal cycles.					How light travels and how shadows are formed. How shadows change throughout the day. Transparent and opaque objects. Reflection.	Friction. Magnetism.	Sorting rocks. How rocks are formed. Hardness and permeability. Fossils. Soil.	
Year 4	Classification of plants.	Classification of animals.	Classification of animals. Characteristics of animal classes. Classification of plants.	The muscular system. The skeletal system. The nervous system. The digestive system. Teeth.		Habitats. Interdependence of organisms and their environment. Producers, consumers and decomposers. Food webs. Human threats to the environment.	Changes of state. The Water Cycle.	Electric current. Circuits. Switches. Conductors and insulators.					How sound is created. How sound travels. Sound waves. Speed of sound. Pitch and intensity. The human ear.
Year 5	Reproduction in plants. Photosynthesis.	Life cycles of mammals, amphibians, insects and birds. Reproduction in animals.		Human growth stages. Adolescence and puberty. The human reproductive system. The endocrine system.	Weather and the climate. The atmosphere. The Ozone Layer.		Properties of materials. Separation of mixtures. Reversible changes.		The Big Bang theory. The universe, our solar system, the moon and our galactic neighbourhood.		Gravity. Friction. Air resistance. Water resistance. Pulleys, gears and levers.		
Year 6	Plant cells. Reproduction in flowering and non-flowering plants.	Animal cells. Reproduction in animals. Growth stages.	Classifying organisms. Taxonomy. Fungi, protists and monera. Fossils. Adaptation. Characteristics passing through generations.	The circulatory system. Changes to humans as we get older. Reproduction.			The circulatory system. Brightness, buzzers, voltage and switches.	Circuits and symbols. Brightness, buzzers, voltage and switches.		How light travels. Light sources, shadows and periscopes. Our eyes.			

Working Scientifically	Plants	Animals	Classification and Evolution	Human Body	Seasons and Weather	Environment and Ecology	Materials and Matter	Electricity	Astronomy	Light	Forces	Rocks	Sound
EYFS													
Make observations.	YR				YR								
Sort and classify according to similarities and differences.		YR	YR				YR						
Key Stage 1													
Asking simple questions and recognising that they can be answered in different ways.	Y1 Y2	Y2		Y2	Y1		Y1		Y2		Y1		
Observing closely using simple equipment.	Y1 Y2			Y1	Y1		Y2		Y2				
Performing simple tests.	Y1 Y2			Y1			Y2		Y2				
Identifying and classifying.		Y1		Y1		Y1	Y1	Y2	Y2		Y1		
Using their observations and ideas to suggest answers to questions.	Y1 Y2	Y1			Y1		Y2		Y2				
Gathering and recording data to help in answering questions.	Y1 Y2				Y1		Y1 Y2		Y2		Y1		
Lower Key Stage 2													
Asking relevant questions and using different types of scientific enquiries to answer them.	Y3					Y4					Y3	Y3	Y4
Setting up simple practical enquiries, comparative and fair tests.	Y3		Y4			Y4	Y4	Y4			Y3	Y3	Y4
Making systematic and careful observations and, where appropriate taking accurate measurements using standard units, using a range of equipment.	Y3		Y4							Y3	Y3		
Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	Y3	Y3	Y4	Y3	Y3	Y4					Y3	Y3	Y4
Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	Y3	Y3	Y4	Y3 Y4	Y3		Y4	Y4			Y3	Y3	Y4
Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.				Y3							Y3	Y3	
Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	Y3		Y4			Y4		Y4					Y4
Identifying differences, similarities or changes related to simple scientific ideas and processes.	Y3	Y3	Y4	Y3 Y4	Y3	Y4	Y4			Y3	Y3	Y3	Y4
Using straightforward scientific evidence to answer questions and support their findings.											Y3	Y3	
Upper Key Stage 2													
Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.				Y5			Y5	Y6		Y6	Y5		
Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.				Y5	Y5		Y5	Y6		Y6	Y5		
Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.				Y5	Y5			Y6		Y6	Y5		
Using test results to make predictions to set up further comparative and fair tests.				Y5			Y5	Y6			Y5		
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.		Y5		Y5			Y5	Y6		Y6	Y5		
Identifying scientific evidence that has been used to support or refute ideas or arguments.		Y5		Y5			Y5	Y6	Y5	Y6	Y5		