SCIENCE Progression

The Research review series: science - GOV.UK states that '**A high-quality science education is rooted in an authentic understanding of what science is.**' This recognises science as a discipline of enquiry, underpinned by substantive and disciplinary knowledge, that seeks to explain the material world.

Substantive knowledge: This involves knowledge of the products of science, such as concepts, laws, theories and models. This is referred to,

in the national curriculum, as scientific knowledge and conceptual understanding.

Disciplinary knowledge: This refers to how scientific knowledge is generated and grows. This is specified in the 'working scientifically' sections

of the national curriculum and includes knowing how to carry out practical procedures.

This document outlines the development of science knowledge across all year groups, ensuring a clear pathway for pupil learning.

Progression is broken down into the following key areas:

Knowledge (substantive)	Working Scientifically (disciplinary)	Science In Action
• gaining foundational knowledge of key scientific concepts • addressing common misconceptions • learning specialist vocabulary to articulate scientific ideas.	• learning about scientific processes and methods through methods of enquiry, including observing over time • pattern-seeking • identifying, classifying and grouping • comparative and fair testing • and researching using secondary sources.	• learning about famous scientists of the past and the methods they used • identifying how scientific understanding has changed over time • exploring jobs and careers related to science

Knowledge

	EYFS	Year 1	Year 2
Plants	**Knowledge**		
Plant structure and function	• To help plant bulbs and observe the changes to them as they grow.	• To know a variety of common plants, and how they differ. • To know that deciduous trees lose their leaves seasonally, but evergreen trees do not. • To know the basic structure (including leaves, flowers (blossom), fruit, roots, bulb, seed, trunk, branches, stem) of a variety of common plants, including flowering plants and trees	
Plant growth and needs	• To help plant bulbs and observe the changes to them as they grow. • To help plant potatoes and flower seeds and observe the changes to them as they grow. • To harvest potatoes and talk about the changes they have gone through from seed potato to chips	• To begin to understand how plants grow and change over time	• To know that seeds and bulbs grow into seedlings by producing roots and shoots. • To know that seedlings grow into mature plants by developing parts such as roots, stems, leaves and flowers. • To know that seeds need water and warmth to germinate. • To know that plants need water, light and a suitable temperature for growth and health.

	EYFS	Year 1	Year 2
Animals	**Knowledge**		
Animal growth	• To explore the natural world around you e.g. name some common farm animals and their young.	• To know a variety of common animals (including fish, amphibians, reptiles, birds and mammals).	• To understand how living things change, and that animals have offspring that grow into adults. • To know which offspring comes from which parent animal. • To know the stages in some animal life cycles.
Animal structure and function	• To explore the natural world around you e.g. the life cycle of a caterpillar and a bee.	• To know the main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks, shell) • To know key parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth). • To know the five main senses: sight, smell, hearing, taste and touch. • To know that the skin is used for touch, the tongue is used for taste, the nose is used for smell, the eyes are used for sight and the ears are used for hearing	
Health and nutrition	• To explore the natural world around you e.g. food grows in the ground and can be made into other products.	• To know that a carnivore is an animal that eats other animals and give some examples. • To know that a herbivore is an animal that eats only plants and give some examples. • To know that an omnivore is an animal that eats both animals and plants, and to give some examples.	• To know that animals, including humans, need water, food and air to survive. • To understand the importance of exercise, a balanced diet and hygiene for humans.

	EYFS	Year 1	Year 2
Living things and their habitats	**Knowledge**		
Characteristics of living things	• To explore the natural world around you e.g. identify and name some minibeasts, talk about simple features.		• To begin to understand some of the life processes, including movement, reproduction, sensitivity, growth, excretion and nutrition. • To know the difference between things that are living, dead, and things that have never been alive, using some of the life processes.
Variation and inheritance	• To explore the natural world around you e.g. identify and name some minibeasts, talk about simple features.		• To know a variety of plants and animals and describe some differences.
Habitats and interdependence	• To compare minibeast environments, e.g. under logs, in tall grasses- which minibe-asts live there?		• To name a variety of habitats, including woodland, ocean, rainforest and seashore. • To know that a habitat is the environment where an animal or plant lives/ grows, because it provides what they need to survive. • To know that a micro-habitat is a very small habitat (e.g. stones, logs and leaf litter). • To know that living things depend upon each other (e.g. for food, shelter.) • To understand that a food chain can be used to show how animals obtain food from eating either plants and/or other animals.

	EYFS	Year 1	Year 2
Materials	**Knowledge**		
Identifying and naming	• To explore different natural materials found in the environment e.g. wood, straw, brick, sticks, stone	• To know that objects are items or things. • To know that a material is what an object is made from. • To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock	.
Properties and uses	• To describe some basic properties- hard, strong, soft, bendy • To explore floating and sinking, full and empty.	• To know that property refers to how a material can be described. • To describe the physical properties of a variety of everyday materials. • To understand that materials can be grouped based on their physical properties.	• To know why objects are made from particular materials and to give examples of their suitability. • To know that one material can be used for a range of purposes (and to give examples.) • To know that different materials can be used for the same purpose (and to give examples). • To know why certain materials are unsuitable for particular objects.
Change	• To explore frozen items and observe and encourage melting.		• To know that a push or pull must be applied to change the shape of a solid object. • To know that solid objects can be squashed, bent, twisted or stretched. • To know that different solid objects may take a different amount of force to change shape.

	EYFS	Year 1	Year 2
Forces, Earth and Space	**Knowledge**		
Key facts	• To recognise and talk about daily weather patterns- sunny, rainy, cloudy, cold, hot, wet	• To know the name and order of the four seasons; spring, summer, autumn and winter. • To know that it is unsafe to look directly at the Sun.	
Forces in motion	• To explore the natural world around you, describing what you see, hear and feel whilst outside. • To talk about common signs of Autumn, Winter, Spring and Summer.	• To know weather associated with the four seasons and how it changes (in the UK). • To understand that day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer.	

Working Scientifically

	EYFS	Year 1 & Year 2
Working Scientifically		
Posing questions	• Exploring the world around them using key questions. • Answering questions through observing the world around them and using adult interactions. • Predicting and observing using adult interactions and opportunities provided in the natural world. • Classifying and sorting things found in the environment around them e.g floating and sinking, minibeasts and magnetic tiles	• Exploring the world around them and raising their own simple questions. • Recognising there are different types of enquiry (ways to answer a question). • Responding to suggestions on how to answer questions.
Planning		• Beginning to recognise whether a test is fair. • Deciding if suggested observations are suitable, with support. • Ordering a simple method
Predicting		• Suggesting what might happen, often justifying with personal experience
Observing (qualitative data)		• Using their senses to describe, in simple terms, what they notice or what has changed.
Measuring (quantitative data)		• Using non-standard units to measure and compare. • Beginning to use standard units and read simple scales to measure and compare. • Beginning to use simple measuring equipment to make approximate measurements.
Researching		• Gathering specific information from one simplified, specified source
Recording (diagrams)		• Drawing and labelling simple diagrams.
Recording (tables)		• Using a prepared table to record results including: Numbers. Simple observation Tally frequency
Grouping and classifying		• Grouping based on visible characteristics. • Organising questions to create a simple classification key
Graphing		• Representing data using pictograms and block graphs.
Analysing and drawing conclusions		• Using their results to answer simple questions. • Beginning to recognise when results or observations do not match their predictions.

Science In Action

EYFS	Year 1 & Year 2
Science In Action	
• To know about some jobs that use scientific knowledge e.g. a vet, a nurse or a doctor. • To discover the natural world around them e.g finding a plant outside and learning more about it during child-initiated learning.	• To know about famous scientists throughout history. • To know about a range of jobs and careers that use scientific knowledge and methods. • To know about the work of modern-day scientists. • To know about science in the news and recent discoveries. • To know there are spiritual, moral, social and cultural links with Science.