



**Newall Green
Primary School**

Aiming High To Reach Our Goals

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Science Curriculum

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All policies can be found on the school web page.	
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Intent

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

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

The nature, processes and methods of science

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key

features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Key stage 1

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Working scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions

- gathering and recording data to help in answering questions

Modifications

As we have such beautiful grounds that leads children to naturally be curious we have introduced the theme of the local environment into Reception. Through this curriculum Reception children will be able to learn about a variety of common wild and garden plants including deciduous and evergreen trees.

Each link refers to a task or number of tasks that need to be engaged with. It does not set an allocated time, as the approach that we use is that Scientific Enquiry links with children's curious nature and this needs an approach where scientific skills are not learnt in isolation to a 'science lesson.' Life is the science lesson we all learn from and this involves exploring, talking about, testing and asking questions to develop ideas about scientific functions, relationships and interactions, which cannot be undertaken in isolation. The curriculum that we teach has been planned to develop the **five key skills for life** of: Problem solving, Teamwork, Self-management (initiative, organisation, accountability) Self-belief (confidence, resilience, positive attitude) and Communication.

For these key skills to be developed, knowledge needs to be learnt, remembered and schemas need to be formed. We have developed the Science curriculum so that concepts build and children are able to construct schemas to be able to articulate processes. Using retention of knowledge skills regularly, helps to cement that knowledge and vocabulary in the mind of the learner.

The green section is there to remind teachers that this process needs to take place. However, as each cohort is different, the content of this section will vary in-line with the needs of the children in the class.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Reception</p> <p>Theme: why things happen</p>	<p>Autumn – how trees, flowers, bushes change in autumn</p>	<p>Light and dark.</p> <p>Change over time.</p> <p>Children will be able to observe changes across the 4 seasons</p>	<p>Hot and cold.</p> <p>Liquids and solids.</p>	<p>Spring. Growing plants from seeds.</p>	<p>Similarities and differences between animals.</p>	<p>Know about the impact of heat and warmth in summer on materials.</p> <p>Difference and similarities in trees.</p>
<p>Year 1</p> <p>Theme: different animals and their habitats.</p> <p>Scientific observation being able to sort and classify according to whether they are living, dead or were never alive.</p>	<p>Parts of the human body</p> <p>Children will be able to label head, neck, arms, elbow, legs, knees, face, ears, eyes, hair, mouth and teeth</p>	<p>Sense of smell, touch, sight, taste, hearing</p>	<p>Antarctic animals and their habitats</p>	<p>Materials and their properties linked to their function.</p> <p>Children will be able to identify; wood, plastic, glass, metal, water and rock and describe the physical properties.</p> <p>Hard/soft</p> <p>Stretchy/ stiff</p> <p>Waterproof/ not water proof</p> <p>Absorbent / non-absorbent</p>	<p>The features and habitats of invertebrates and how the basic habitat provides for the needs of the animal.</p> <p>Introduce simple food chains and where the invertebrate gets its food.</p>	<p>Know the features of a bird, a human and shellfish</p> <p>Food chains</p> <p>Basic needs of an animal – food, water and air</p> <p>Animals, including humans, have offspring which grow into adults.</p>
<p>Year 2</p> <p>Theme: sorting and classifying</p>	<p>Healthy eating and drinking. The effect of food and exercise on the body.</p>	<p>Materials – opaque and transparent. Properties of materials and the suitability of everyday materials for particular uses.</p>	<p>Invertebrates – molluscs, sponges, arachnids and insects.</p>	<p>Forces – push and pull. How forces make things move and change shape.</p>	<p>Definition and types of vegetable, fruit and herb. Germination. Parts of plant.</p>	<p>Reversible and irreversible change in cookery</p>
<p>Year 3</p> <p>Theme: predicting and setting up an investigation to test the prediction</p>	<p>Rocks and minerals.</p> <p>Types of rock and what makes up soil.</p> <p>Fossils.</p> <p>Soils are made from rocks and organic matter</p>	<p>The human body: joints, skeleton and how to care for the body.</p> <p>Sugars, starches and carbohydrates.</p> <p>Humans need the right amount of nutrition and they can only get nutrition from what they eat.</p>	<p>Light – how shadows are formed. Dark – the absence of light Opaque, translucent, transparent. Mirrors. How light travels.</p> <p>We need light to be able to see reflections</p>	<p>Trees and plants. The functions of leaves and roots. Parts of flowers.</p> <p>Children will be able to identify and describe the functions of different parts of a flowering plant.</p>	<p>The force of magnetism. What is attracted to magnets? Poles.</p> <p>Forces – what is a force?</p>	<p>Know how humans have gone into space</p>

Year 4 Theme: fair tests	Sound and decibels. Vibration, how sound travels.	Echoes. Sound in animals. Pitch.	States of matter: solid, liquid and gases. How gases expand.	Teeth – names, functions, tooth care, the process of digestion.	Electrical circuits, conductors and insulators. Bell, Faraday and scientists.	Bubbles and solutions. Marie Curie.
Year 5 Theme: variables	The origin of species. Space – why we have a day, a year and tides in the Oceans. Earth and Space Sun / solar system	Separating solids. Dissolving. Absorbency and hydrophobia.	Life cycles of butterflies; humans, mammals. The concept of becoming extinct.	The characteristics of gravity, water resistance and friction. Viscosity and air resistance. (Forces)	DNA testing. Uniqueness of fingerprints. Eliminating possibilities through science testing.	Life cycle of a humans
Year 6	Fungi and bacteria. The role of leaves in plants. Types of plant.	Nutrition. Vitamins. Circulatory systems of the body.	Classification/ Evolution. / inheritance Natural selection in species. Humbolt, Darwin and Goodall.	How light forms a rainbow. Rays of light and the idea of reflection and refraction. Linking light to how the eye works.	Electricity: volts, amps, electrical symbols. Solving problems in circuits.	Know the process of human reproduction and development