

Curriculum Statement: Science

“Equipped with his five senses, man explores the universe around him and calls the adventure Science.” Edwin Powell Hubble

Whole-School Vision:

Our aim is **“Everyone Thriving”** and at the heart of what we do is enabling your child to **be the best that they can be**. We believe that children are thriving when they are **happy, motivated, growing and successful**. We work hard to ensure that your child has the very best education possible during their time with us so that they leave as knowledgeable, confident learners who are able to build on their successes in the future.

Science Curriculum Vision:

We believe that our pupils deserve to benefit from a strong foundational knowledge of all three aspects of the Science curriculum: Biology, Chemistry and Physics.

Our vision is to develop the **natural curiosity** of the child, encourage **respect for living organisms and the physical environment** and provide opportunities for **critical evaluation of evidence**. We want our pupils to strive to achieve their goals and by offering a well-rounded Science curriculum we want to **nurture tomorrow’s scientists**.

At Woodvale, we intend to provide a high-quality science education that provides the children with the foundations they need to recognise the importance of science in every aspect of daily life. We want our pupils to be able to use the knowledge and skills they gain in Science to confidently talk about **‘what is occurring, predict how things will behave and analyse causes’** (National Curriculum 2014) and then use these skills in the wider world.

By providing the children with a well-rounded and interesting Science curriculum that promotes increasing pupils’ knowledge and understanding of our world and developing skills associated with science as a process of enquiry, the children will be encouraged to apply their knowledge and skills in different areas of the curriculum and to always be inquisitive.

In our school, we believe that our children deserve a curriculum that is rooted in rich learning experiences that develop knowledge and skills. These scientific learning experiences will **hook the children’s interest**, enabling them to develop a sense of excitement and curiosity about natural phenomena. They will be encouraged to **ask questions** about the world around them and **work scientifically** to further their conceptual understanding and scientific knowledge. Pupils will be immersed in **key scientific vocabulary**, which supports the acquisition of scientific knowledge and understanding.

We recognise that for our pupils to aspire to strive academically and in the wider areas of their lives, they need to be given **rich and sustained opportunities to develop their cultural capital**. Using the National Curriculum alongside the Cornerstones Science Curriculum, which offers the children lots of opportunity for hands-on practical experiences as well as offering valuable cross-curricular links, we have designed a curriculum which places our school values at its heart.

Our school is underpinned by 3 values that we believe is keys to everyone thriving:

| <i>We Strive</i> | <i>We Support</i> | <i>We Succeed</i> |
|--|---|---|
| This value relates to trying our best, to challenging ourselves showing perseverance and resilience. | This value relates to supporting each other, working as a team, building effective relationships and supporting those who need it most to thrive. | We believe that success leads to increased motivation and so we celebrate success in all its forms and we value achievement and accomplishment. |

Key Scientific Concepts

Our science curriculum is planned based on these key concepts:

- **Working Scientifically:** The understanding that there is so much we can learn about the world that we must always question and analyse the world around us to deepen our understanding and that the world is always changing so we are always learning.
- **Living Things:** There is a wide variety of living things (organisms), including plants and animals. They are distinguished from non-living things by their ability to move, reproduce and react to certain stimuli. To survive they need water, air, food, a way of getting rid of waste and an environment which stays within a particular range of temperature.
- **Evolution and Inheritance:** The understanding that genetic information is passed down from one generation of organisms to another and that the diversity of these organisms is the result of evolution.
- **Materials:** The knowledge that everything has properties that allow it to be categorised.
- **Energy:** That the total amount of energy in the Universe is always the same but can be transferred from one energy store to another during an event.
- **Forces and Magnets:** That objects can affect other objects at a distance and changing the movement of an object requires a net force to be acting on it.
- **Earth & Space:** The knowledge that our solar system is a very small part of one of billions of galaxies in the Universe.

Intent, Implementation and Impact in Science

Intent

(What will take place before teaching in the classroom? What do we want our children to know and be able to do?)

- It is our intent for science to develop in all children a lifelong curiosity and interest in the sciences, which contributes to their personal development and ability to contribute in the future to the advancement of the sciences.
- We intend for children to have the opportunity, wherever possible, to learn through varied investigations, leading to them being equipped to ask and answer scientific questions about the world around them.
- Children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.
- To help reinforce the key knowledge for each unit as set out in the science national curriculum, as well as additional vocabulary, each science unit taught has an accompanying knowledge organiser.
- As children progress through the year groups, they develop their **disciplinary knowledge** by building on their skills in **working scientifically**, as well as **substantive scientific knowledge**, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions.

Implementation

(What will this look like in the classroom?)

- The Science Programme of Study for KS1 and KS2 is used to deliver learning in line with the National Curriculum expectations for Science.
- All children develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- At Woodvale, we value the significant impact that outdoor learning has on physical development, communication and mental wellbeing. We want our outdoor space to be used as the valuable tool that it is which is why within our science planning. We aim to offer our children the opportunity to learn outside through hands-on experiences.
- Children 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.
- Key vocabulary is explicitly taught to children as part of quality-first teaching. Specialist scientific vocabulary is clearly modelled on Knowledge Organisers. Knowledge Organisers enable children to learn and retain the key vocabulary and basis of expected knowledge contained within each unit and are used throughout lessons.
- The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons.
- Children will have the opportunity to plan, carry out and evaluate a science investigation. This and as well as hands-on experiences will enable children to develop Scientific knowledge and enquiry skills with increasing depth and challenge as children move through the year groups.
- Medium term planning: Teachers medium term plans are linked to Cornerstones Science Curriculum units. Valuable learning links are made

to the wider curriculum, that revisit and help **secure knowledge in the long-term memory**, for example making electrical circuits in DT (design and make a torch). These cross-curricular links are beneficial for children as they help them to **build their mental models** if learning is interlinked. Medium term plans allow teachers to identify prior learning, future learning, substantive and disciplinary knowledge and skills.

- Sequences of lessons help to embed scientific knowledge and skills, with each lesson building on previous learning. There is also the opportunity to regularly review and evaluate children's understanding. Learning will be recorded in science books.

Evidence of Curriculum Impact (How will this be measured?)

Children:

Our aim is for children to reach their age-related expectations at the end of their cohort year through providing a broad but balanced Science curriculum.

- Children will be able to speak confidently about their learning in science and use their books to support explanations of what they have learned.
- Children will be able to use the skills they have learnt to question, work collaboratively to investigate and will be able to use scientific vocabulary to explain the process they have taken and reason scientifically.
- Children will demonstrate an understanding that science is a search to explain and understand phenomena in the natural world. There is no single scientific method for doing this; the diversity of natural phenomena requires a diversity of methods and instruments to generate and test scientific explanations.
- Children who feel confident in their science knowledge and enquiry skills will be excited about science, show that they are actively curious to learn more and will see the relevance of what they learn in science lessons to real-life situations and the importance of science in the real world.
- Children will speak about science lessons and learning with enthusiasm and more will leave primary school with a positive experience of and enthusiasm to continue studying science at secondary school.

Children's Work:

- Ready-to-Progress assessments in science will reflect progression of knowledge, skills and understanding.

Teachers:

- Progress in science is measured through a **child's ability to know more, remember more and explain more**. This includes both subject specific knowledge and scientific enquiry skills.

Working Scientifically National Curriculum Objectives
(taught throughout all strands of Science)

| EYFS (Development Matters) | KS1 | LKS2 | UKS2 |
|---|---|--|---|
| <ul style="list-style-type: none"> • Understanding the World(3 & 4 Year Olds) • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Begin to observe and talk about living things in the local environment. • Use all their senses in hands-on exploration of natural materials. Explore collectionsof materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. • Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. • Explore and talk about different forces they can feel. | <p>Pupils should be taught to use thefollowing practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • asking simple questions andrecognising that they can beanswered in different ways • observing closely, using simpleequipment • performing simple tests • identifying and classifying • using their observations andideas to suggest answers to questions • gathering and recording data tohelp in answering questions. | <p>Pupils should be taught to use thefollowing practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • asking relevant questions and using different types of scientificenquiries to answer them • setting up simple practical enquiries, comparative and fairtests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simplescientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results andconclusions • using results to draw simple conclusions, make | <p>Pupils should be taught to use thefollowing practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • planning different types of scientific enquiries to answer questions, including recognisingand controlling variables wherenecessary • taking measurements, using arange of scientific equipment,with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels,classification keys, tables, scatter graphs, bar and linegraphs • using test results to make predictions to set up furthercomparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanationsof and a degree of trust in results, in oral and written forms such as displays and other |

- Talk about the differences between materials and changes they notice.

(Reception) UtW

- Explore the natural world around them.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
- Describe what they see, hear and feel whilst outside.
- Understand the effect of changing seasons on the natural world around them.
- Know and talk about the different factors that support their overall health and wellbeing:
 - regular physical activity
 - healthy eating
 - toothbrushing
 - sensible amounts of 'screentime'
 - having a good sleep routine

- predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings.

presentations
identifying scientific evidence that has been used to support or refute ideas or arguments