



At Nicholas Hawksmoor Primary School our science education provides children with strong foundations to understand the world they live in through aspects of biology, chemistry and physics. From years 1 – 6 pupils will be taught essential aspects of the knowledge, methods, processes and uses of science. Each year contains a variety of topics where children will build up a body of key foundational knowledge and concepts, they will be encouraged to explain their findings and develop a sense of excitement and curiosity about natural phenomena. In lessons, the pupils will also be encouraged to understand how science can be used to explain what is happening in our everyday lives, predict how things may behave and analyse data.

Aims of the Science National Curriculum

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 shown below, that are taught here at Nicholas Hawksmoor, provide a sequence of knowledge and concepts designed to help children not only make progress but develop a secure understanding of each stage before moving on. This removes insecure understandings and the build-up of misconceptions to allow genuine progression.

From this curriculum, pupils should be able to describe scientific processes and key characteristics, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build on their scientific vocabulary at all stages and apply their mathematical knowledge through the tasks of presenting and analysing data.

An understanding of the nature, processes and methods of science

Children will achieve this through 'working scientifically' an area of the Science curriculum which is not taught as a separate strand but embedded within the content of biology, chemistry and physics so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry will be included in the curriculum at Nicholas Hawksmoor and will consist of observations over time, pattern seeking, identifying, classifying and grouping, comparative and fair testing and researching using secondary resources.



A scientific language

At Nicholas Hawksmoor we understand the importance of spoken language in science lessons as well as the rest of the curriculum in pupils' development cognitively, socially and linguistically. To develop their scientific vocabulary and help children to articulate scientific concepts it is important that the pupils hear and speak a variety of quality scientific language. We ensure the occurrence of this in our science lessons by providing opportunities for discussion so that thinking is clear, misconceptions are addressed and secure foundations are built.

	Autumn Term		Spring Term		Summer Term	
Year 5	Earth and Space	Properties and changes of materials	Forces	Living things and their Habitats	Animals including humans	Scientists
Year 6	Living Things and their Habitats	Animals including Humans	Light	Electricity	Evolution and Inheritance	Scientists

Working Scientifically

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Plan different types of scientific enquiry to answer questions, including recognising and controlling variables.
- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs
- Use test results to make predictions to set up further comparative and fair tests
- Use simple models to describe scientific ideas
- Report and present findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations
- Identify scientific evidence that has been used to support ideas or arguments.



Year 5

These are the outcomes expected for each topic in year 5:

Living things and their habitats

- Investigate the life cycles of mammals, amphibians, insects and bird and describe the differences between these.
- Describe in sequence the stages of reproduction in some plants and animals

Animals, including humans

- Describe the changes as humans develop to old age. Identify trends in changes to size, weight and mobility.

Properties and changes of materials

- Compare and group together everyday materials on the basis of their properties including their hardness, solubility, transparency, conductivity and response to magnets. (Test and sort a range of materials based on their physical appearance)
- Understand that some materials dissolve in liquid to form a solution.
- Describe how to recover a substance from a solution (e.g. sugar).
- Decide how mixtures might be separated, including through filtering, sieving and evaporating by using existing knowledge of solids liquids and gases.
- Demonstrate how original materials can be retrieved, highlighting that these changes in state are reversible.
- Understand and explain that some changes result in the formation of a new material which is not reversible.

Year 6

These are the outcomes expected for each topic in year 6:

Living things and their habitats

- Use similarities and differences in observable features to decide how living things should be grouped, including micro-organism, plants and animals.
- Give reasons for classifying animals and plants based on specific characteristics. Explaining why certain features are useful when classifying.

Animals, including humans

- Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood.
- Describe the ways in which nutrients and water are transported within animals including humans.
- Recognise the impact of diet, exercise, drugs and lifestyles on the way their bodies function. Suggesting how our bodies are affected by substances and actions.

Evolution and inheritance

- Recognise that things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago. Explaining that things have died out and others have taken their place.
- Recognise that living things produce off spring of the same kind, but normally vary from each other and from their parents. Eg puppies.
- Describe how living things adapt to live in particular habitats and evolved as a result.



Earth and Space

- Describe the movement of the Earth and other planets, relative to the Sun in the solar system.
- Describe the movement of the Moon relative to the Earth, drawing a diagram to describe the Moon's orbit around the Earth.
- Describe the Sun, Earth and Moon as spheres.

Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Forces

- Explain that unsupported objects fall towards the earth because of the force of gravity acting between the Earth and the falling object.
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.
- Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. Describe how devices can turn a smaller force into a larger one.

Light

- Recognise that light appears to travel in straight lines and represent these using straight line diagrams.
- Explain that objects are seen because they give out or reflect light into the eye.
- Explain how we see things; because light travels from light sources to our eye or from light sources to objects and then to our eyes.
- Understand and explain how shadows are formed and why shadows have the same shape as the objects that cast them.

Electricity

- Explain how number and voltage of cells affects the lamp brightness or the volume of the buzzer in a circuit.
- Compare and give reasons for variations in how components function, explaining the effect of changing the order of components in a circuit.
- Design/represent a circuit using recognised symbols.