



Science

Level Expected at the End of EYFS

We have selected the Early Learning Goals that link most closely to the Science National Curriculum.

Understanding the World (The Natural World)

- Explore the natural world around them, making observations and drawing pictures of animals and plants;
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Personal, Social and Emotional Development (Managing Self)

- Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.

Key Stage 1 National Curriculum Expectations

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.

Key Stage 2 National Curriculum Expectations

Lower Key Stage 2

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them;
- setting up simple practical enquiries, comparative and fair tests;
- 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 simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables;
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions;
- using results to draw simple conclusions, make 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.

Upper Key Stage 2

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:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary;
- taking measurements, using a range 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 line graphs;
- using test results to make predictions to set up further comparative and fair tests;
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations;
- identifying scientific evidence that has been used to support or refute ideas or arguments



| Year | Working Scientifically All Topic | | | | | | Biology | | | | Chemistry | | | Physics | | | | | | | |
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| | Working Scientifically All Topic | | | | | | Plants | Animals, including Humans | Living things and their environment | Evolution and inheritance | Everyday Materials and Uses | States of Matter | Properties and changes of materials | Light | Forces and Magnets | Sound | Electricity | Earth Science | | | |
| | | | | | | | | | | | | | | | | | | Seasonal Change | Rocks | Earth and Space | |
| EYFS | Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes. | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | Plants | Animals, including Humans | Living things and their environment | Evolution and inheritance | Everyday Materials and Uses | States of Matter | Properties and changes of materials | Light | Forces and Magnets | Sound | Electricity | Earth Science | | | |
| | | | | | | | | | | | | | | | | | | Seasonal Change | | | |
| 1 | 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. | <ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees The Earth Our Home (Y2 NC) Observe and describe how seeds and bulbs grow into mature plants. The Earth Our Home (Y2 NC) Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. The Earth Our Home (Y2 NC) | <ul style="list-style-type: none"> Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) The Earth Our Home (Y1 NC) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense Super Humans (Y1 NC) Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Super Humans (Y2 NC) Describe the importance for humans of exercise, | <ul style="list-style-type: none"> Explore and compare the differences between things that are living, dead, and things that have never been alive. The Earth Our Home (Y2 NC) Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. The Earth Our Home (Y2 NC) Identify and name a variety of plants and animals in their habitats, including micro-habitats The Earth Our Home (Y2 NC) | | <ul style="list-style-type: none"> Distinguish between an object and the material from which it is made What's It Made Of? (Y1 NC) Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock What's It Made Of? (Y1 NC) Describe the simple physical properties of a variety of everyday materials What's It Made Of? (Y1 NC) Compare and group together a variety of everyday materials on the basis of their simple physical properties What's It Made Of? (Y1 NC) Identify and compare the suitability of a variety of | | | | | | | | <ul style="list-style-type: none"> Observe changes across the 4 seasons The Earth Our Home (Y1 NC) Observe and describe weather associated with the seasons and how day length varies The Earth Our Home (Y1 NC) | | |



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| | | | | | | | and stay healthy Live and Let Live / Green Fingers (Yr 2 NC) Observe and describe how seeds and bulbs grow into mature plants. Green Fingers (Yr 2 NC) identify and describe the basic structure of a variety of common flowering plants, including trees Green Fingers (Yr 1 NC) | Live and Let Live (Yr 1 NC) describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) Live and Let Live (Yr 1 NC) Notice that animals, including humans, have offspring which grow into adults. Live and Let Live (Yr 2 NC) Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Live and Let Live (Yr 2 NC) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense Look and Listen (Yr 1 NC) | plants, and how they depend on each other. Live and Let Live (Y2 NC) Identify and name a variety of plants and animals in their habitats, including micro-habitats Live and Let Live (Y2 NC) Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. Live and Let Live (Y2 NC) | | er - (Yr 2 NC) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. The Magic Toymaker - (Yr 2 NC) | | | | | | | | | | |
| | Working Scientifically All Topic | | | | | | Plants | Animals, including Humans | Living things and their environment | Evolution and inheritance | Everyday Materials and Uses | States of Matter | Properties and changes of materials | Light | Forces and Magnets | Sound | Electricity | Earth Science | | | |
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| 3 | Asking relevant questions and using different types of scientific enquiries to answer them. | Setting up simple practical enquiries, comparative and fair tests. | 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. | | | Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Let's Plant it (Y3 NC) Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Let's Plant it (Y3 NC) Investigate the way in which water is transported within plants. Let's Plant it (Y3 NC) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Let's Plant it (Y3 NC) | Construct and interpret a variety of food chains, identifying producers, predators and prey. Let's Plant it/ Land Sea and Sky (Y4 NC) | Recognise that living things can be grouped in a variety of ways. Land Sea and Sky (Y4 NC) Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Land Sea and Sky (Y4 NC) Recognise that environments can change and that this can sometimes pose dangers to living things. Land Sea and Sky (Y4 NC) | | | | | Compare how things move on different surfaces Feel the Force! (Y3 NC) Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Feel the Force! (Y3 NC) Observe how magnets attract or repel each other and attract some materials and not others. Feel the Force! (Y3 NC) Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Feel the Force! (Y3 NC) Describe magnets as | | | Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Land Sea and Sky (Y3 NC) Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Land Sea and Sky (Y3 NC) Recognise that soils are made from rocks and organic matter. Land Sea and Sky (Y3 NC) |
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| | | | | | movement. How Humans Work (Y3 NC) | | | | | formed when the light from a light source is blocked by a solid object. How Humans Work (Y3 NC) Find patterns in the way that the size of shadows change. How Humans Work (Y3 NC) | | | volume of a sound and the strength of the vibrations that produce it. Turn it Up! (Y4 NC) Recognise that sounds get fainter as the distance from the sound source increases. Turn it Up! (Y4 NC) | | simple series circuit. Bright Sparks (Y4 NC) Recognise some common conductors and insulators, and associate metals with being good conductors. Bright Sparks (Y4 NC) | | |
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| Working Scientifically All Topic | | | | | Plants | Animals, including Humans | Living things and their environment | Evolution and inheritance | Everyday Materials and Uses | States of Matter | Properties and changes of materials | Light | Forces and Magnets | Sound | Electricity | Earth Science | |
| | | | | | | | | | | | | | | | Seasonal Change | Rocks | Earth and Space |
| 5 | Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. | Taking measurements, using a range 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 line graphs. | Using test results to make predictions to set up further comparative and fair tests. | | | describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Existing, Endangered, Extinct (Y6 NC) describe the life process of reproduction in some plants and animals. Existing, Endangered, Extinct (Y6 NC) Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Existing, Endangered, Extinct (Y6 NC) | | | | compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets Bake It (Y5 NC) know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Bake It (Y5 NC) use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating | | explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Fascinating Forces (Y5 NC) identify the effects of air resistance, water resistance and friction, that act between moving surfaces Fascinating Forces (Y5 NC) | | | | describe the movement of the Earth, and other planets, relative to the Sun in the solar system Space Scientists (Y5 NC) describe the movement of the Moon relative to the Earth Space Scientists (Y5 NC) describe the Sun, Earth and Moon as approximately spherical bodies Space Scientists (Y5 NC) use the idea of the Earth's rotation to explain day and night and the apparent |



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| | | | | | | | <p>functions of the heart, blood vessels and blood. Being Human (Y6 NC) Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Being Human (Y6 NC) Describe the ways in which nutrients and water are transported within animals, including humans. Being Human (Y6 NC)</p> | <p>information about living things that inhabited the Earth millions of years ago. Out of Africa (Y6 NC) Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Out of Africa (Y6 NC)</p> | | | | <p>in straight lines to explain that objects are seen because they give out or reflect light into the eye. Look Hear (Y6 NC) Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Look Hear (Y6 NC) Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> | <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Full Power (Y6 NC) Use recognised symbols when representing a simple circuit in a diagram. Full Power (Y6 NC)</p> | | | |
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Intent

IPC units of study offer a coherently planned sequence of lessons to help teachers ensure they have progressively covered the skills and concepts required in the National Curriculum. It is our intention in Science to develop in all young people a lifelong curiosity and interest in the sciences. Through our IPC units of work, we intend for children to have the opportunity, wherever possible, to learn through varied systematic investigations, leading to them being equipped for life to ask and answer scientific questions about the world around them. As children progress through the year groups, they build on their skills in working scientifically, as well as on their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions. Our aim is that children learn and retain the important, useful and powerful scientific vocabulary - the development of this is shown through our science vocabulary progression document. Our carefully selected IPC units of work ensures that children have a varied, progressive and well-mapped-out science curriculum that provides the opportunity for progression across the full breadth of the science national curriculum for KS1 and KS2.



Implementation

The acquisition of key scientific knowledge is an integral part of our science lessons. The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons. The progression of these skills is set out in this progression of skills document and the progression of key scientific vocabulary is set out in the scientific vocabulary progression document. In accordance with the progression documents, scientific knowledge and enquiry skills are developed with increasing depth and challenge as children move through the year groups. They complete investigations and hands-on activities while gaining the scientific knowledge for each unit. Interwoven into the teaching sequence are opportunities for assessment rubrics (aimed at targeting next steps in learning). These allow teachers to assess children's levels of understanding at various points in the unit being studied. They also enable opportunities to recap concepts where necessary. The sequence of lessons helps to embed scientific knowledge and skills, with each lesson building on previous learning - The diagram to the right demonstrates our approach to teaching each unit and throughout this process and there also the opportunity to regularly review and evaluate children's understanding. Our IPC units of work include adult guidance to ensure that teachers are equipped with secure scientific subject knowledge, enabling them to deliver high-quality teaching and learning opportunities while making them aware of possible scientific misconceptions.



Impact

In Science, progress is measured through a child's ability to know more, remember more and explain more. This can be measured in different ways in our IPC units. The use of our IPC assessment rubrics ensures opportunities are built into each unit for ongoing assessment. Attainment and progress can be measured across the school using our end of year summative assessments and end of year subject reviews that will inform the following year's action plan. The impact of using the full range of resources included in the science unit will also be seen across the school with an increase in the profile of Science. The learning environment across the school will be more consistent with science technical vocabulary displayed, spoken and used by all learners. Whole-school and parental engagement will be improved through the use of science-specific home learning tasks and end of unit exit points. 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 also the importance of science in the real world.