



Harbertonford Church of England Primary

Science Plan Years EYFS-6



Rationale/Intent

At Harbertonford, we believe Primary Science should nurture children's natural curiosity, develop their understanding of the world and teach them essential enquiry skills. We are committed to ensuring all children are inspired to develop their Science Capital to become Scientists of the future as they build their understanding of the value and place science has in their lives. As one of the core subjects taught in Primary Schools, we give the teaching and learning of Science the prominence it requires.

Through our teaching of Science we aim to increase pupils' knowledge and understanding of our world and develop the skills associated with Science as a process of enquiry. Through Science we will develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence.

Our Science teaching aims to:

- stimulate and excite pupils' curiosity about natural phenomena and events in the world around them.
- support this curiosity with the teaching of scientific knowledge and conceptual understanding through an investigative and practical approach to 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;
- develop pupils' understanding of how major scientific ideas contribute toward technological change that impact locally and globally and become equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future;
- develop the essential scientific enquiry skills to deepen their scientific knowledge through a progressive curriculum.
- use a range of methods to communicate their scientific information and present it in a systematic, scientific manner, including I.C.T., diagrams, graphs and charts;
- develop a respect for the materials and equipment they handle with regard to their own, and other children's safety;
- learn to question, discuss and act on science based issues that may affect their own lives, the directions of society and current global sustainability;
- support children in developing a lifelong love of scientific learning, discovery and a skill set required to do so.

Implementation

Harbertonford's vision is to go beyond just delivering the National Curriculum Aims but to provide children with a 5 Star Science Curriculum. This involves raising their Science Capital, making them global citizens by showing them the importance of science in the wider world and developing their sense of self in the impacts their actions have on the planet. As part of their primary education in Science, pupils will have the opportunity to experience:

- ★ Meeting a Scientist through the STEM Ambassador program.
- ★ Taking part in a Science focused inspirational trip to develop their understanding of Science in the wider world.

- ★ Having the opportunity to explore and fully engage with nature through Science lessons and Forest School.
- ★ Taking part in a National Nature Survey such as the Big Bug Hunt, The Big Bird Watch, Devon Horseshoe Bat project to increase their understanding of biodiversity and the threats it faces.
- ★ Through use of the Practical Action resources, engage with the global sustainability goals of food, water, climate, recycling and energy to be able to understand their impact on the planet and the implications for future generations, enabling them to take action.

As Scientists, children at Harbertonford experience the 5 Star Science Curriculum as outlined above. Children have weekly lessons in Science throughout Key Stage 1 and 2 and this is planned using a 2 year rolling programme in each curriculum phase to ensure complete curriculum coverage. We build upon the learning and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.

In Early years, science is taught through opportunities to investigate the world around them in their learning through play and planned activities. A positive and encouraging classroom environment can be found across all Key Stages. Children's questions are always welcomed and they are given the opportunity to explore new ideas as well as test them. They are provided with problem solving opportunities that allow children to find out for themselves by asking their own questions and given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Working Scientifically skills are embedded into lessons, taught alongside the knowledge objectives to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.

In order to provide suitable learning opportunities for all children, teachers ensure that they use a variety of strategies to accommodate different learning styles. Links to other curriculum areas are made, for example the use of data tables and graphing scientific results for maths as well as using measuring equipment and reading scales. In their Science writing, children are taught science vocabulary for each topic and are then expected to use it in their planning, recording and explaining.

The National Curriculum

At the end of EYFS, level expected:

Understanding the World (The World)

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.

Physical Development (Health and Self-Care)

Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.

Key Stage One, 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.

Key Stage One, Units:

Plants, Animals including Humans, Everyday Materials, Seasonal changes, Living Things and Their Habitats

Lower Key Stage Two, Working scientifically:

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.

Lower Key Stage Two, Units:

Plants, Animals including Humans, Rocks, Light, Forces & Magnets, Living Things and their Habitats, States of Matter, Sound, Electricity.

Upper Key Stage Two, 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:

- 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.

Upper Key Stage Two, Units:

Animals including Humans, Light, Forces, Living Things and their Habitats, Properties and Changes of Materials, Earth and Space, Evolution and Inheritance, Electricity.

EYFS~ Progressive curriculum plan			
30-50 Months	Physical Development	Health and Self-Care	<ul style="list-style-type: none"> • To observe the effects of physical activity on their bodies.
	Understanding the World	The World	<ul style="list-style-type: none"> • To comment and ask questions about aspects of their familiar world, such as the place where they live or the natural world. • To talk about some of the things they have observed, such as plants, animals, natural and found objects. • To talk about why things happen and how things work. • To develop an understanding of growth, decay and changes over time. • To show care and concern for living things and the environment.
	Expressive Arts and Design	Exploring and Using Media and Materials	<ul style="list-style-type: none"> • To begin to be interested in and describe the texture of things.
40-60 Months	Physical Development	Health and Self-Care	<ul style="list-style-type: none"> • To eat a healthy range of foodstuffs and understand a need for variety in food. • To show some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health.
	Understanding the World	The World	<ul style="list-style-type: none"> • To look closely at similarities, differences, patterns and change.
ELG	Physical Development	Health and Self-Care	<ul style="list-style-type: none"> • To know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.

Understanding the World

The World

- To 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.

Progressive curriculum plan ~ key NC end points Y1-Y6

KS1

LKS2

UKS2

Asking Questions and Carrying Out Fair and Comparative Tests

KS1 Science National Curriculum

Asking simple questions and recognising that they can be answered in different ways.

Performing simple tests.

Children can:

- a explore the world around them, leading them to ask some simple scientific questions about how and why things happen;
- b begin to recognise ways in which they might answer scientific questions;
- c ask people questions and use simple secondary sources to find answers;
- d carry out simple practical tests, using simple equipment;
- e experience different types of scientific enquiries, including practical activities;
- f talk about the aim of scientific tests they are working on;
- g with support, start to recognise a fair test.

Lower KS2 Science National Curriculum

Asking relevant questions and using different types of scientific enquiries to answer them.

Setting up simple practical enquiries, comparative and fair tests.

Children can:

- a start to raise their own relevant questions about the world around them in response to a range of scientific experiences;
- b start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;
- c recognise when a fair test is necessary;
- d help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used;
- set up and carry out simple comparative and fair tests.

Upper KS2 Science National Curriculum

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

Using test results to make predictions to set up further comparative and fair tests.

Children can:

- a with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences;
- b with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;
- c explore and talk about their ideas, raising different kinds of scientific questions;
- d ask their own questions about scientific phenomena;
- e select and plan the most appropriate type of scientific enquiry to use to answer scientific questions;
- f make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them;
- g plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary;
- h use their test results to identify when further tests and observations may be needed;
- i use test results to make predictions for further tests.

Observing and Measuring

KS1 Science National Curriculum

Observing closely, using simple equipment.

Children can:

- a observe the natural and humanly constructed world around them;

Lower KS2 Science National Curriculum

Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.

Upper KS2 Science National Curriculum

Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.

Children can:

	<ul style="list-style-type: none"> b observe changes over time; c use simple measurements and equipment; d make careful observations, sometimes using equipment to help them observe carefully. 	<p>Children can:</p> <ul style="list-style-type: none"> a make systematic and careful observations; b observe changes over time; c use a range of equipment, including thermometers and data loggers; d ask their own questions about what they observe; e where appropriate, take accurate measurements using standard units using a range of equipment. 	<ul style="list-style-type: none"> a choose the most appropriate equipment to make measurements and explain how to use it accurately; b take measurements using a range of scientific equipment with increasing accuracy and precision; c take repeat readings when appropriate; d understand why we take an average in repeat readings.
Identifying, Classifying, Recording and Presenting Data	<p>KS1 Science National Curriculum</p> <p>Using their observations and ideas to suggest answers to questions.</p> <p>Children can:</p> <ul style="list-style-type: none"> a notice links between cause and effect with support; b begin to notice patterns and relationships with support; c begin to draw simple conclusions; d identify and discuss differences between their results; e use simple and scientific language; f read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; g talk about their findings to a variety of audiences in a variety of ways. 	<p>Lower KS2 Science National Curriculum</p> <p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Children can:</p> <ul style="list-style-type: none"> a draw simple conclusions from their results; b make predictions; c suggest improvements to investigations; d raise further questions which could be investigated; e first talk about, and then go on to write about, what they have found out; <ul style="list-style-type: none"> report and present their results and conclusions to others in written and oral forms with increasing confidence. 	<p>Upper KS2 Science National Curriculum</p> <p>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.</p> <p>Children can:</p> <ul style="list-style-type: none"> a notice patterns; b draw conclusions based in their data and observations; c use their scientific knowledge and understanding to explain their findings; d read, spell and pronounce scientific vocabulary correctly; e identify patterns that might be found in the natural environment; f look for different causal relationships in their data; g discuss the degree of trust they can have in a set of results; <ul style="list-style-type: none"> independently report and present their conclusions to others in oral and written forms.

Drawing Conclusions, Noticing Patterns and Presenting Findings	<p>KS1 Science National Curriculum</p> <p>Identifying and classifying.</p> <p>Gathering and recording data to help in answering questions. Children can:</p> <ul style="list-style-type: none"> a use simple features to compare objects, materials and living things; b decide how to sort and classify objects into simple groups with some help; c record and communicate findings in a range of ways with support; d sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables. 	<p>Lower KS2 Science National Curriculum</p> <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Children can:</p> <ul style="list-style-type: none"> a talk about criteria for grouping, sorting and classifying; b group and classify things; c collect data from their own observations and measurements; d present data in a variety of ways to help in answering questions; e use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; f record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. 	<p>Upper KS2 Science National Curriculum</p> <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Children can:</p> <ul style="list-style-type: none"> a independently group, classify and describe living things and materials; b use and develop keys and other information records to identify, classify and describe living things and materials; c decide how to record data from a choice of familiar approaches; d record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.
Using Scientific Evidence and Secondary Sources of Information		<p>Lower KS2 Science National Curriculum</p> <p>Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Children can:</p> <ul style="list-style-type: none"> a make links between their own science results and other scientific evidence; b use straightforward scientific evidence to answer questions or support their findings; c identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; d recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. 	<p>Upper KS2 Science National Curriculum</p> <p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Children can:</p> <ul style="list-style-type: none"> a use primary and secondary sources evidence to justify ideas; b identify evidence that refutes or supports their ideas; c recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; d use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; e talk about how scientific ideas have developed over time.

Rolling Programme ~ see individual class pages for science planned across each term

Impact

The successful approach to Science at Harbertonford results in a fun, engaging, high-quality Science education, that provides children with the skills and foundations for understanding the world. Our engagement with the local environment through Forest School and National Surveys ensures that children learn through varied and first hand experiences of the world around them. Using the Practical Action resources, children are able to link the Science directly to global issues and develop a deeper understanding of how Science is vital in developing solutions to problems that affect people's everyday lives. Through engagement with Stem Ambassadors, children are increasing their Science Capital and seeing possibilities for careers in

Science. Workshops, trips and the interactions with experts they provide children help children to see the bigger picture and how Science has a role to play in our everyday lives. Pupil voice is used to further develop the Science curriculum, through questioning of pupils' views and attitudes to Science to support the children's enjoyment and ownership of Science and to motivate their learning

