Science Knowledge and understanding

By the end of EYFS, children will:

- have had an opportunity to make sense of their physical world and their community through opportunities to explore, observe and develop their knowledge and sense of the world around them;
- develop the crucial knowledge, skills and understanding that help them make sense of the world;
- engage in activities based on first-hand experiences that encourage exploration, observation, problem solving, prediction, critical thinking and decision-making and discussion;
- experience a wide range of activities, indoors and outdoors, including adult focused, child-initiated and independent play;
- be stimulated, interested and curious;
- observed by adults and learning is recorded in a variety of ways.

By the end of Key Stage 1, children will:

- experience and observe phenomena, looking more closely at the natural and humanly constructed world around them;
- be encouraged to be curious and ask questions about what they notice;
- 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;
- 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;
- carry out first-hand practical experiences;
- use appropriate secondary sources, such as books, photographs and videos to support their learning;
- work scientifically;
- read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1.

By the end of lower Key Stage 2, children will:

- broaden their scientific view of the world around them;

- explore, talk about, test and develop ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions;
- ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information;
- draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out;
- work scientifically;
- read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

When working scientifically, by the end of lower Key Stage 2, children will:

- ask relevant questions and use different types of scientific enquiries to answer them;
- set up simple practical enquiries, comparative and fair tests;
- make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, include thermometers and data loggers;
- gather, record, classify and present data in a variety of ways to help in answering questions;
- record findings use simple scientific language, draw, label diagrams, keys, bar charts, and tables;
- report on findings from enquiries, include oral and written explanations, displays or presentations of results and conclusions;
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions;
- identify differences, similarities or changes related to simple scientific ideas and processes;
- use straightforward scientific evidence to answer questions or to support their findings.

By the end of upper Key Stage 2, children will:

- enable pupils to develop a deeper understanding of a wide range of scientific ideas;
- explore and talk about their ideas; ask their own questions about scientific phenomena; and analyse functions, relationships and interactions more systematically;

- encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates;
- recognise that scientific ideas change and develop over time;
- select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information;
- draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings;
- read, spell and pronounce scientific vocabulary correctly.

When working scientifically, by the end of upper Key Stage 2, children will:

- plan different types of scientific enquiries to answer questions, include recognise and control variables where necessary;
- take measurements, use a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate;
- record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs;
- use test results to make predictions to set up further comparative and fair tests;
- report and present 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;
- identify scientific evidence that has been used to support or refute ideas or arguments.