

**"Like learning to count or to read, learning how to 'do' science is a lifelong process" - Peggy Ashbrook, *Science Is Simple*.**

### Our rationale

At Airedale Junior School, we believe that a high-quality science education provides the foundations for understanding the world through the specific subjects of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity. Therefore, all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science.

Children are naturally fascinated by everything in the world around them and science makes a valuable contribution to their understanding. Children learn by playing with things in their world. They pick up clues about what they see, touch, smell, taste and hear in order to make sense of it all. Eventually they come to conclusions which they match up with all the experiences they have had. Pupils at Airedale Junior School, should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes and it is our role to provide a broad and balanced Science curriculum that meets the needs of all pupils to enable them to achieve their full potential and make progress in their learning.

### Aim: Intent

The national curriculum for science aims to ensure that all pupils:

- develop lively, enquiring minds and the ability to question.
- learn scientific skills and knowledge.
- build on their natural curiosity and enable them to understand and care for the world in which they live.
- are provided with an environment where they can work in an investigative way and can communicate their findings in a variety of ways.
- Can use equipment safely and sensibly.
- develop the potential scientific links with all other areas of the curriculum.
- 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.

### Curriculum and Subject Content: Implementation

The programmes of study for science at Key Stage 2 are set out in the National Curriculum. Class teachers are responsible for ensuring that all of the relevant

statutory content is covered within the school year. The school's 'Science Curriculum Map' (shown on page 2) outlines the units to be taught.

**In Lower Key Stage 2 (Years 3 and 4) pupils at Airedale Junior School will be taught to:** broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and environments. They should begin to 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. Pupils will understand the meaning of a fair test and learn how to carry out fair test whilst making predictions and drawing simple conclusions. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge

**In Upper Key Stage 2 (Years 5 and 6) pupils at Airedale Junior School will be taught to:** develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. They should 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. Pupils should 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. Pupils should read, spell and pronounce scientific vocabulary correctly.

Science Curriculum Map

		Term 1.1	Term 1.2	Term 2.1	Term 2.2	Term 3.1	Term 3.2
Year 3	Working Scientifically  (For coverage see page 3/4)			Healthy Eating	Rocks and Soils	Magnets and Springs	Light
Year 4		Animals Inc. Humans		Electricity	Plants Sound	States of Matter	All Living Things
Year 5	Working Scientifically	Properties and changes of materials	Properties and changes of materials		Animals including humans	Forces Earth and Space	All living things

Year 6	(For coverage see page 3/4)		Electricity  Light			All living things	Animals including humans  Evolution and inheritance
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### Working Scientifically within the Curriculum

Class teachers must ensure that there are frequent opportunities for pupils to 'work scientifically' within the curriculum. 'Working scientifically' specifies the understanding of the nature, processes and methods of science. Pupils are required to work scientifically within all areas of the science curriculum.

The following skills are statutory:

#### Years 3 and 4

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.

### **Years 5 and 6**

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 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.

### **Cross-curricular skills and links**

Science pervades every aspect of our lives and we will relate it to all areas of the curriculum. Lessons will make effective links with other curriculum areas and subjects, especially English, Mathematics and Computing. We will also ensure that pupils realise the positive contribution of both men and women to science and the contribution from those of other cultures. We will not only emphasise the positive effects of science on the world but also include problems, which some human activities can produce.

### **Monitoring and evaluation: Impact**

Throughout the term/year a range of monitoring activities are conducted in-line with the schools monitoring calendar such as: lesson observations/drop-ins, book/work scrutiny, pupil voice and display audits alongside data analysis. This enables the Science Leader to constantly monitor their subject area, identify needs for CPD and/or peer support, while keeping abreast of standards in science across school.

### **Assessment**

Assessment in science is based upon scientific knowledge and understanding. At Airedale Junior School we use a range of assessment materials to ensure that children are making appropriate progress, including assessment tasks, observations and experiments. Pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programmes of study.

**Assessment should:**

- Be formative and summative
- Be used to inform the teacher for future planning
- Promote continuity and progression
- Form the basis for reporting to parents
- Be based on observation, participation and written outcomes

Class teachers are responsible for recording achievement of children working below at, or above age related expectations for their age. All staff at Airedale Junior School strive to ensure that our children reach their full potential in science and that they understand and enjoy their experiences. They ensure that tasks are differentiated appropriately to match the needs of all pupils, including those with Special Educational Needs. We have a tracking system within school, to follow and accelerate pupils' progress. The school Science Leader monitors progress through the school by sampling children's work at regular intervals. Children who are not succeeding, and children who demonstrate high ability in science, are identified and supported.

**Safety**

Pupils safety at Airedale Junior School is paramount. Teachers must plan safe activities for science and complete a risk assessment if necessary. Teachers and teaching assistants need to be aware of health and safety procedures when using equipment/food in science lessons. Pupils must be aware of the need for personal safety and the safety of others during science lessons.

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