

Stradbroke CE Primary School

Science Curriculum Statement



Aims and objectives

The aim of science teaching is for children to learn the skills, knowledge and understanding they need to question and understand the phenomena that occur in the world around them and to equip them with the motivation to seek explanations for these.

The aims of teaching science in our school have been written with reference to the aims of the National Curriculum. Our aims are:

- To enable children to ask and answer scientific questions;
- To enable children to plan and carry out a range of scientific enquiries to help them to answer scientific questions about the world around them;
- To enable children to evaluate evidence and present their conclusions clearly and accurately;
- To enable children to know and understand the life processes of living things (Biology);
- To enable children to know and understand the physical processes of materials, electricity, light, sound and natural forces (Physics);
- To enable children to know about materials and their properties (Chemistry);
- For children to be equipped with the scientific knowledge required to understand the uses and implications of science today and for the future.
- For children to read, spell and pronounce scientific vocabulary correctly.

Scientific knowledge and conceptual understanding

The programmes of study set out in the National Curriculum describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

Through our Science curriculum children should:

- Be able to describe scientific processes and key characteristics in common language;
- Be able to use, technical terminology accurately and precisely;
- Build up an extended specialist vocabulary;
- Apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data;
- Be given opportunities to learn about science through a range of different contexts within the wider school curriculum;
- Be engaged and motivated to study science.

The nature, processes and methods of science

This requirement is outlined in the 'working scientifically' section of the National Curriculum. It should not be taught as a separate strand but should be embedded within the biology, chemistry and physics content taught. Pupils should learn to use a variety of approaches to answer relevant scientific questions.

Types of scientific enquiry should include:

- Observing over time;
- Pattern seeking;

- Identifying, classifying and grouping;
- Comparative and fair testing (controlled investigations);
- Researching using secondary sources.

Pupils should be taught to answer questions through collecting, analysing and presenting data.

Spoken Language

Spoken language is hugely important for pupil development across the whole curriculum. To be able to develop their scientific vocabulary and articulate scientific concepts clearly and precisely, children need to hear and use a variety of high quality language in all areas of their learning. Teachers should enable children to build secure foundations by using discussion to identify and correct misconceptions. Teachers must model to children how to make their thinking clear to themselves and others.

Science Curriculum Planning

In order to ensure that a broad and balanced science curriculum is taught to all children, our science topics are mapped out on our whole school long term plan which is available on our website. We also have a subject specific long term plan for science which identifies which year group objectives are to be taught each year depending on class structure, teaching in previous years and, in some cases, a need to introduce some concepts before they appear on the National Curriculum (e.g. States of Matter introduced in Year 2/3 to support learning in Year 4). This can also be found on our website. More detail with regards to the content taught for each year group can be found in our science curriculum which is adapted each year to suit the current class structures at the time. Our science curriculum is available to see on request.

Teachers write medium term plans for each science topic giving careful thought to the scientific knowledge children will learn. Reference is made to the requirements of the National Curriculum. Teachers think carefully about the sequencing and progression of teaching, the key vocabulary within each topic and how the impact of learning will be measured in each topic. Teachers consult with the science subject leader to ensure that they are planning and delivering a science unit which ensures all children gain new scientific knowledge, make links to prior learning and develop their skills of working scientifically.

Early Years Foundation Stage (EYFS)

We teach science in Reception as an integral part of the topic work covered during the year. As the Reception class is part of the Foundation Stage of the National Curriculum, we relate the scientific aspects of the children's work to the objectives set out in the Early Learning Goals (ELGs) which underpin the curriculum planning for children aged three to five. Science makes a significant contribution to developing a child's knowledge and understanding of the world, for example through investigating what floats and what sinks when placed in water.

Key Stage 1

The main focus of science teaching in Key Stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should develop their understanding of scientific ideas by using different types of scientific enquiry. They should 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. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Pupils should read and spell scientific vocabulary at a level consistent with their reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2

The main focus of science teaching in Lower Key Stage 2 is to enable pupils 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 familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should 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. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' must always be taught through and clearly related to substantive Science content in the programme of study.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing reading and spelling knowledge.

Upper Key Stage 2

The main focus of science teaching in Upper Key Stage 2 is to enable pupils 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. At Upper Key Stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry. 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.

'Working and thinking scientifically' must always be taught through and clearly related to substantive science content in the programme of study.

Pupils should read, spell and pronounce scientific vocabulary correctly.

Teaching & Learning Style

At Stradbroke CE Primary School, our principal aim is to develop children's knowledge, skills, and understanding, as well as a sense of enjoyment in science. Sometimes we do this through whole-class and small group teaching, while at other times we engage the children in an enquiry-based research activity. We encourage the children to ask, as well as answer, scientific questions. They have the opportunity to use a variety of data, such as statistics, graphs, pictures, and photographs. They use ICT in science lessons where it enhances their learning. They take part in role-play and discussions and they present reports to the rest of the class. They engage in a wide variety of problem-solving activities. Wherever possible, we involve the pupils in practical activities as these increase enthusiasm and motivation and provide first-hand experience.

When teaching, staff model learning how to make links with prior learning. They provide Knowledge Organisers (where appropriate) to help make children's learning clear to them and children are encouraged to refer to these to help them provide scientific explanations using the correct scientific vocabulary.

Practical activities provide the children with a range of contexts allowing safe exploration of the world without the need to master facts and theories. By taking part in practical activities children with special educational needs are given the opportunity to develop fine motor skills and co-ordination. Knowledge and skills can be developed in small steps through practical work. Sequencing of written work becomes easier after practical experiences.

We recognise the fact that there are children of different abilities and we provide suitable learning opportunities for all children by:

- Setting common tasks which are open-ended and can have a variety of responses.
- Setting tasks of varying difficulty, enabling all children to work to their full potential.
- Providing a range of challenges using different resources.
- Using teaching assistants to support the work of individual children or groups of children.

Cross Curricular Links and Wider Learning Opportunities

Where relevant and appropriate, meaningful links are created between science and other curriculum subjects. Encouraging children to make these links strengthens their learning by giving them a variety of contexts to apply it to. Links to other subject areas are made clear on teachers' medium term planning.

Wider learning opportunities are used thoughtfully and to great effect in science to help bring a subject to life or to make learning clearer for our children. These opportunities are referred to in our individual class entitlement documents which are completed each year to ensure all children receive a variety of learning experiences as part of a broad and balanced curriculum.

Personal, Social and Health Education (PSHE) and Citizenship

Through the study of science, there are many areas of PSHE which can be taught. Concepts such as perseverance, working together and accepting other people's views and opinions are all an important part of developing our children to be good citizens.

Spiritual, Moral, Social and Cultural Development

When teaching science, we contribute to the children's spiritual, moral, social and cultural development where possible. We look at how beliefs have changed over time making reference to religious teachings as well as scientific teachings. We consider the impact on society of science and also consider the importance of science in our local and wider culture.

Equal Opportunities

We will ensure that all children are provided with the same learning opportunities whatever their social class, gender, culture, race, disability or special educational needs (SEN). As a result, we hope to enable all children to develop a positive attitude towards others. All pupils have equal access to science lessons. Resources for SEN children and gifted & talented will be made available to support and challenge appropriately.

Assessment

Teachers assess children's work in science by making assessments as they observe them working during lessons. They record the progress that children make by assessing the children's work against the aims of the national curriculum and learning objectives within the lesson. Teachers will use a range of tools to assess children including discussion and questioning, observations, quizzes and recaps and, where appropriate, summative assessments. This allows the teacher to make termly assessments of attainment and progress for each child.

Resources

There are sufficient resources for all science teaching units in the school. An audit of science resources is carried out regularly. We use a range of websites to support children's learning.

Monitoring and Review

The science subject lead is responsible for monitoring the standard of the children's work and the quality of teaching in history. The science subject lead is also responsible for supporting colleagues in the teaching of science, for being informed about current developments in the subject, and for providing a strategic lead and direction for the subject in the school.

This guidance is monitored by all teaching staff with the leadership team. It will be reviewed when changes are made to the curriculum.