

SCIENCE POLICY

The Importance of Science

“Science stimulates and excites pupils’ curiosity about phenomena and events in the world around them. It also satisfies this curiosity with knowledge. Because Science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical and creative thought. Through Science, pupils understand how major scientific ideas contribute to technical change – impacting on industry, business and medicine and improving quality of life. Pupils recognise the cultural significance of science and trace its worldwide development. They learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world.”

(DfEE, 1999, The National Curriculum for England, Science QCA, London)

There are four main purposes to this policy:

- It establishes an entitlement for all pupils;
- It establishes expectations for the standards to be achieved;
- It builds on what pupils have learned previously and promotes continuity and coherence across the school;
- It states the school’s approaches to their subject in order to promote public, and particularly parents’ and carers’, understanding of the curriculum.

This policy forms the basis around which we will deliver the statutory orders for Science at Seaton Primary School. It will influence how we will plan our activities and investigations in order to deliver the programmes of study for each attainment target across Key Stage 1 and 2. The ultimate test of the success of the policy is that it is observed throughout the school.

For young children science is an introduction to the world of living things, materials and energy. It is a largely practical subject which develops a spirit of enquiry by encouraging curiosity and reason.

Scientists have revealed vast amounts of knowledge about our world by using skills of observation, prediction, investigation and interpretation.

Each child needs to enjoy the experiences associated with science by increasing and developing their knowledge and by starting to use the skills associated with scientific methods of investigation.

Working with others, learning how to persevere and learning how to ask questions are attitudes which encourage work to be carried out in a scientific way.

At KS1 pupils observe, explore and ask questions about living things, materials and physical phenomena. They begin to work together to collect evidence to help them answer questions and to link this to simple scientific ideas. They begin to evaluate evidence and consider whether tests or comparisons are fair. They use reference materials to find out more about scientific ideas. They share ideas and communicate them using scientific language, drawings, charts and tables with the help of ICT if it is appropriate.

At KS2 pupils learn about a wider range of living things, materials and physical phenomena. They make links between ideas and explain things using simple models and theories. They apply their knowledge and understanding of scientific ideas to familiar phenomena, everyday things and their personal health. They think about the effects of scientific and technological developments on the environment and in other contexts. They carry out more systematic investigations, working on their own and with others. They use a range of reference sources in their work. They talk about their work and its significance, using a wide range of scientific language, conventional diagrams, charts, graphs and ICT to communicate their ideas.

Expectations

By the end of Key Stage 1, the performance of the great majority of the pupils should be within the range of levels 1 to 3. Most pupils are expected to achieve level 2.

By the end of Y4, the performance of the great majority of pupils should be in the range of levels 1 to 4. Most pupils are expected to achieve level 3.

By the end of Key Stage 2, the performance of the great majority of the pupils should be within the range of levels 3 to 5. Most pupils are expected to achieve level 4.

The aims of science and how these contribute to the school's aims

The school aims to:

- Stimulate and excite pupil's curiosity about changes and events in the world;
- Satisfy this curiosity with knowledge;
- Engage pupils as learners at many levels through linking ideas with practical experience;
- Help pupils to learn to question and discuss scientific issues that may affect their own lives;
- Help pupils develop, model and evaluate explanations through scientific methods of collecting evidence using critical and creative thought;
- Show pupils how major scientific ideas contribute to technological change and how this impacts on improving the quality of our everyday lives;
- Help pupils recognise the cultural significance of science and trace its development.

Strategy for Implementation

Entitlement and curriculum provision

Science is a core subject of the National Curriculum and pupils undertake some science activity every week at both key stages. The work covered in Key Stage 1 builds on the nationally recognised curriculum for pupils aged under five. Pupils in Reception develop their knowledge, understanding and skills through play activities and direct teaching from which the pupils undertake planned tasks.

Science is allocated ten percent of the taught time at both key stages and this amounts to about 80 hours per year at Key Stage 1 and about 90 hours per year at Key Stage 2.

Science is taught as a discrete subject. The school follows the QCA scheme of work arranged into a rolling programme across two years. Reception classes work mainly on skills needed for the units of work they will be covering in Year 1. Planning from QCA document takes into account that the school places a high emphasis on the development of pupils' skills of scientific enquiry (Sc1). In the substantial majority of lessons the skills for Sc1 are taught alongside the knowledge and understanding in life processes and living things (Sc2), materials and their properties (Sc3) and physical processes (Sc4). In this way there is an equivalent emphasis on Sc1 as there is on Sc2/3/4 together.

Teaching and learning

All lessons have clear learning objectives which are shared and reviewed with the pupils effectively. A variety of strategies, including questioning, discussion and marking, are used to assess progress. The information is used to identify what is taught next.

Activities inspire the pupils to experiment and investigate the world around them and to help them raise their own questions such as "Why...?", "How...?" and "What happens if...?". Activities develop the skills of enquiry, observation, locating sources of information, selecting appropriate equipment and using it safely, measuring and checking results, and making comparisons and communicating results and findings.

Lessons make effective links with other curriculum areas and subjects, especially literacy, numeracy and, more increasingly, information and communications technology (ICT). Activities are challenging, motivating and extend pupils' learning.

Pupils have frequent opportunities to develop their skills in, and take responsibility for, planning investigative work, selecting relevant resources, making decisions about sources of information, carrying out activities safely and deciding on the best form of communicating their findings.

Assessment and recording

Teacher assessment and assessment activities are carried out at the end of each unit. The assessment of Sc1 relies on observation and/or the collection of written evidence of investigating skills. Teachers analyse pupils' progress and skills of investigation in order to complete the annual report to parents. This report takes the form of a summary of the teachers' observations of the pupils at work, thus giving parents a view of what their children know, understand and can do.

Inclusion

Planning at all levels ensures that the interests of boys and girls are taken into account. At Key Stage 1 the pupils are grouped in mixed ability and gender groups for all activities. In Years 3, 4, 5 and 6 pupils are grouped by ability.

The pupils work individually, in pairs, as part of a small group and as a whole class each term. They use a variety of means for communicating and recording their work.

Educational support staff work as directed by the teacher. They are able to refer to a planning sheet for the particular group they are working with. Where educational assistants are assigned to pupils with special educational needs, they are well briefed beforehand.

All pupils, including those with special educational needs, undertake the full range of activities. Teacher assessment determines the depth to which individuals and groups go during each unit work.

Weekly planning shows how activities have been adapted or extended for the needs of all pupils and, where appropriate, how they relate to Individual Education Programmes (IEPs).

Curriculum

Long Term planning: The programmes of study are covered by following the QCA units of work over a two year rolling programme.

Medium Term planning: there are planning sheets for each unit. They are adapted from the QCA scheme of work. Each unit contains programmes of study; objectives; pupils learning outcomes and assessment opportunities.

Weekly planning: This is carried out in Yr 1/2, Yr 3/4, Yr 5/6 planning meetings. It contains elements from the Medium Term planning broken down into steps appropriate for the stage of the pupils and the ability group they are in. This planning also contains any details about risk assessment and how the needs of all pupils are met, referring to IEPs if appropriate.

Learning Resources

Most resources are kept in a central store except those which are considered general classroom resources. The subject leader is responsible for the maintenance of this area.

The scheme of work covers training the pupils in the safe and considerate use of animals, plants and equipment. They should be taught not to be careless and to use consumables efficiently. A small number of expensive items are kept separately by the subject leader.

Pupils should be taught how to locate and replace resources properly. Teachers should make sensible decisions, based on the age and stage of pupils, in relation to whether the teacher, the pupils under the guidance of an adult, or the pupils independently, should collect and replace resources.

In the resources area some resources are organised in boxes which are linked to units of work. These resources should be returned in this way.

The Learning Environment

Classrooms should have displays of current science in hand. Its profile should reflect its place as a core subject. Resources, for the unit of work being covered, should be appropriately accessible. Other sources of information should be available.

From time to time teachers at both key stages may decide to keep a science interest display, which encourages the pupils to be curious about the world in which they live. At Key Stage 1 this might involve something to look at carefully using a hand lens. At Key Stage 2 this might involve a recent newspaper article about a scientific discovery which builds on, or contradicts, the work of a famous scientist in history.

Safe Practice

Safe practice must be promoted at all times. The ASE publication, "Be Safe!", has been adopted by the governing body as the school's safety policy in science. A copy is available in the staff room. Teachers must also take into account the school's Health and Safety policy. Particular attention must be given to avoiding the use of anything that aggravates individual pupils' allergies. Safety Issues have been identified in medium term planning and Risk Assessments must be completed in weekly planning when activities are identified that are unusual and beyond the scope of normal safety practice.

Extra Curricular Activities

Medium term planning identifies the fieldwork, visits to places of scientific interest and visitors to support the learning objectives for units of work where relevant. Teachers should plan to undertake those which are incorporated into this planning.

Homework

No specific homework is set at Key Stage 1, although teachers may choose to involve the pupils, parents and carers in small investigations related to the work in hand. In years 3 and 4, pupils may expect one or two homework activities in each unit of work. In Years 5 and 6, pupils receive homework once a week related to their current units of work.

The contribution of Science to Other aspects of the Curriculum

The teaching of literacy, numeracy and ICT is promoted strongly in science as part of this school's drive to maintain standards in English and Mathematics. Medium term planning identifies where teachers should make explicit links with English, Mathematics and ICT PoS. Science is used to extend and enable the pupils to practise the skills of language and literacy and numeracy.

Literacy

In particular, at Key Stage 1, the pupils are encouraged to use their speaking and listening skills to describe what they see and explain what they are going to do next. At Key Stage 2 the pupils are encouraged to develop their skills of writing to record their planning, what they observe and what they found out. In science, they should be applying their literacy skills at levels similar to those which they are using in their English work.

Numeracy

At both key stages the pupils are expected to use their knowledge and understanding of measurement and data handling at appropriate levels. In science, they should be applying their numeracy skills at levels similar to those which they are using in their maths work.

Information and Communications Technology

The pupils' ICT skills are applied as identified in the medium term planning. At both key stages this involves the pupils using ICT to: locate and research information (CD ROM, internet); record findings (using text, data and tables); log changes to the environment over time (sensing equipment); gain confidence in using calculators, VCR, Video Camera, digital camera, and tape-recorder as well as the computer. The use of this equipment is indicated in medium term planning and must be used. It forms an important part of the entitlement of all pupils in ICT.

Spiritual development

Spiritual development is encouraged through reminding pupils of the wonder of science and the effect of scientific discoveries on the modern world. Topical scientific issues are also discussed as appropriate.

Personal, Social and Health Education

The school has a separate Health Education Policy.

LEADERSHIP AND MANAGEMENT

Staff Development

The subject leader provides summary feedback to teachers at least once a term on the results of all formal and informal monitoring procedures about standards across the school.

This identifies staff development needs and, where appropriate, these are built into the school's staff development programme. The needs of individual members of staff (teaching and non-teaching) are identified as a result of the school's performance management programme. Staff attending training are expected to share the useful points with the rest of the staff by presentation and/or documentation at a staff meeting. The subject leader attends DCS science conferences.

Leadership and Management Roles and Responsibilities

The science subject leader is responsible for the direction of the subject across the school. Time is allocated for the subject leader to monitor the standards and quality across the school. The subject leader is expected to keep the curriculum under review and keep the headteacher informed about changes to requirements and the national and local levels.

The subject leader keeps the link governor informed about developments in science. The subject leader organises at least two meetings with the governor during the school year to provide an evaluation of progress in science. A written report is provided for governors by the end of the spring term incorporating evaluation of the school's PANDA and other assessment information. This report may be written partly or wholly by the deputy head in consultation with the subject leader.

How Science is Monitored and Evaluated

All teachers are responsible for monitoring standards but the subject leader, under the direction of the headteacher takes the lead in this.

Monitoring activities are planned across the year. They may consist of:

- Termly staff meeting to analyse samples of pupils' science work to evaluate standards (attainment and progress);
- Subject leader to analyse teachers' weekly planning files once per term to monitor coverage and balance of curriculum planned;
- Subject leader to use three monitoring days per year to undertake lesson observations;
- Subject leader to discuss with named governor the school's planning and developments twice per year. (These discussions arise from governors' planned visits.);
- Subject leader monitors ongoing displays and work in hand in classrooms by termly visits, outside of lesson time.
- Subject leader to prepare a short summary for the governing body once per year;
- Subject leader and headteacher to analyse annual teacher assessments to sample the reliability of these in each class using the schools' portfolio once per year.
- Subject leader and headteacher to monitor results of statutory assessments annually;
- The headteacher to monitor annual reports to parents.

Agreement and Review

The staff and the governing body agreed this policy in May 2001. This policy is reviewed periodically in line with the school's policy review programme. The subject leader is responsible for reporting to the governors' curriculum committee about the quality of its implementation and its impact on standards. In the light of this, policy amendments may be made.