

Toll Bar Primary School **Science Policy**

1 Rationale

- 1.1 Science teaches our children to understand our own world. We aim to stimulate a child's curiosity in finding out why things happen in the way they do. Science teaches methods of enquiry and investigation to stimulate creative thought. Children learn to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national, and global level. It is therefore an integral part of many aspects of learning across the curriculum.

2 Aims and Objectives

- 2.1 The majority of our children will learn best from concrete situations. We must therefore science should be taught, as far as possible, through first hand experience so that our children will learn from their own curiosity.
- 2.2 The over-riding aims of science are to enable children to:
- ask and answer scientific questions;
 - plan and carry out scientific investigations, using equipment, including computers, correctly;
 - know and understand the life processes of living things;
 - know and understand the physical processes of materials, electricity, light, sound and natural forces;
 - know about the nature of the solar system, including the earth;
 - evaluate evidence and present their conclusions clearly and accurately.

We must also aim to develop the following skills:
observing through first hand experiences using all five senses and a range of observational aids
use of observation to sort, compare, predict and hypothesis
to seek and identify patterns and to classify, evaluate and question findings
designing and setting up fair tests and experiments. Explain results and predict further approaches to testing
asking and raising questions in a form that can be investigated.
developing a scientific vocabulary and appreciating that ways of recording can enhance an investigation and presentation
use of ICT to aid knowledge
research using secondary resources
analysing and drawing conclusions
developing mathematical and scientific knowledge and tools to enable accurate measurements

We must arrange science work to develop the following attitudes:
curiosity
open mindedness
co-operation
responsibility
perseverance

appreciation of the need to care for others and the environment

3 Teaching and learning style

- 3.1** We use a variety of teaching and learning styles in science lessons to develop children's knowledge, skills, and understanding. Sometimes we do this through whole-class teaching, while at other times we engage the children in individual or group activities. 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 engage in a variety of problem-solving activities. Wherever possible, we involve the pupils in 'real' scientific activities, for example carrying out a practical experiment and analysing the results.
- 3.2** We recognise that there are children of widely different scientific abilities in all classes and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways by:
- setting common tasks which are open-ended and can have a variety of responses;
 - setting tasks of increasing difficulty (we do not expect all children to complete all tasks);
 - grouping children by ability in the room and setting different tasks for each ability group;
 - providing resources of different complexity, matched to the ability of the child;
 - using classroom assistants to support the work of individual children or groups of children.
- 3.3** Our teaching must be based on TALK – DO – TALK (See attached guidelines)

4 Science curriculum planning

- 4.1** The basis of our curriculum planning is the QCA units as set out in the LCP scheme. The scheme needs to be adapted to cover for the mixed aged classes the school.
- 4.2** We carry out our curriculum planning in science in three phases (long-term, medium-term and short-term). The long-term plan maps the scientific topics studied in each term during the key stage. The science co-ordinator works this out in conjunction with teaching colleagues. In some cases we combine the scientific study with work in other subject areas, especially at Key Stage 1; at other times the children study science as a discrete subject.
- 4.3** Our medium-term plans give details of each unit of work for each term. The science subject co-ordinator keeps and reviews these plans. As we have some mixed-age classes, we do our medium-term planning on a two-year rotation cycle. In this way we ensure complete coverage of the National Curriculum without repeating topics.
- 4.4** The class teacher is responsible for writing the daily lesson plans for each lesson (short-term plans). These plans list the specific learning objectives of

each lesson. The class teacher keeps these individual plans, and s/he and the science co-ordinator often discuss them on an informal basis.

- 4.5** We have planned the topics in science so that they build upon prior learning. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit and we also build progression into the science scheme of work, so that the children are increasingly challenged as they move up through the school.

5 Foundation Stage

- 5.1** We teach science in the nursery and reception classes as an integral part of the topic work covered during the year. 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 the objective in the ELGs of developing a child's knowledge and understanding of the world, e.g. through investigating what floats and what sinks when placed in water.

6 The contribution of science to teaching in other curriculum areas

6.1 English

Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Some of the texts that the children study in the Literacy Hour are of a scientific nature. The children develop oral skills in science lessons through discussions (for example of the environment) and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

6.2 Mathematics

Science contributes to the teaching of mathematics in a number of ways. The children use weights and measures and learn to use and apply number. Through working on investigations they learn to estimate and predict. They develop the skills of accurate observation and recording of events. They use numbers in many of their answers and conclusions.

6.3 Information and communication technology (ICT)

Children use ICT in science lessons where appropriate. They use it to support their work in science by learning how to find, select, and analyse information on the Internet and on CD-ROMs. Children use ICT to record, present and interpret data and to review, modify and evaluate their work and improve its presentation. They also use e-mail to communicate their mathematical findings with other children in other schools and countries.

6.4 Personal, social and health education (PSHE) and citizenship

Science makes a significant contribution to the teaching of personal, social and health education. This is mainly in two areas. Firstly, the subject matter lends itself to raising matters of citizenship and social welfare. For example, children study the way people recycle material and how environments are changed for better or worse. Secondly, children benefit from the nature of the subject in that it gives them opportunities to take part in debates and discussions. They

organize campaigns on matters of concern to them, such as helping the poor or homeless. Science promotes the concept of positive citizenship.

6.5 Spiritual, moral, social and cultural development

Science teaching offers children many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things and how the world was created. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. Through the teaching of science, children have the opportunity to discuss, for example, the effects of smoking and the moral questions involved in this issue. We give them the chance to reflect on the way people care for the planet and how science can contribute to the way we manage the earth's resources. Science teaches children about the reasons why people are different and, by developing the children's knowledge and understanding of physical and environmental factors, it promotes respect for other people.

7 Teaching science to children with special educational needs

7.1 At our school we teach science to all children, whatever their ability. Science forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our science teaching we provide learning opportunities that enable all pupils to make progress. We do this by setting suitable learning challenges and responding to each child's different needs. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels.

7.2 When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, differentiation – so that we can take some additional or different action to enable the child to learn more effectively. This ensures that our teaching is matched to the child's needs.

7.3 We enable pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the classroom, for example, a trip to a science museum, we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

8 Assessment and recording

8.1 We assess children's work in science by making informal judgements as we observe them during lessons. On completion of a piece of work, the teacher marks the work and comments as necessary. At the end of a unit of work s/he makes a summary judgement about the work of each pupil in relation to the QCA expectations. The teacher records the attainment grades in individual profiles. We pass this information on to the next teacher at the end of the year.

8.2 Children take the national tests in science at the end of Key Stage 2. Teachers make an assessment of the children's work in science at the end of Key Stage 1. We report the results of these tests to parents as part of the annual written report in Years 2 and 6.

- 8.3** Assessment should:
- Be planned into medium term planning
 - Show what a child has learned and mastered
 - Involve children in self assessment where possible
 - Be part of the teaching programme and not simply be end of topic activity
 - Help teachers plan the next stage of work
- 8.4** Assessment should be based on a variety of tasks, not just work sheets. There are many ways in which children can express and record what they have found out and done. These include:
- Drawing a picture
 - Making a model
 - Doing an assembly
 - Keeping a record
 - Making a poster
 - Drawing a diagram
 - Drawing graphs
 - Making a newspaper
 - Telling their peers
- 8.5** When assessing AT1 progress means getting better at:
- Using knowledge and understanding to say and explain what might happen
 - Selecting what to keep and what to change in investigations
 - Choosing and using measuring instruments
- 8.6** Effective planning and assessment will help us in:
- Preventing duplication of work
 - Provide information in progress and attainment
 - Evaluate the effect of our science teaching
 - Match children's work to their abilities
 - Identify children's learning difficulties
- 8.7** See the attached guidelines for further assessment details.

9 Resources

- 9.1** Science work must be as practical as possible. Lists of required resources should therefore always be made and checked against those available as part of medium term planning.
- 9.2** Science equipment and the master copies of the scheme are kept in a central storage area in the library. Videos are kept on the resource room wall shelves.
- 9.3** Use must be made of the local environment, visits to Austerfield Study Centre and other outlets, e.g. Rockware recycling centre

10 Equal Opportunities

- 10.1** We aim to ensure that all children are given equal access to all science experiences whatever their gender, ability or ethnic group.

11 Reporting to parents

- 11.1** Science, as a core subject, is to be part of the annual written report to parents and should describe pupils' progress by clear reference to science skills and knowledge acquired.

12 Monitoring and review

- 12.1** It is the responsibility of the science co-ordinator to monitor the standards of children's work and the quality of teaching in science. Release time for classroom observations will be on a rolling programme with other subjects. The science co-ordinator 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. The science co-ordinator must also give the headteacher and governors an annual summary report in which s/he evaluates strengths and weaknesses in the subject and indicates areas for further improvement.
- 12.2** This subject will be reviewed every three years or earlier if initiatives need including.

Originally written	November 1994
Last review	March 2000
Next review	March 2003

In the absence of a co-ordinator, this policy was amended to include references to the LCP scheme and ELG in October 2001.