Toll Bar Primary School

Science Policy

1 Aims and objectives

We live in an increasingly scientific and technological age where children need to acquire the knowledge, skills and attitudes to prepare them for life in the 21st century. We, at Toll Bar Primary School, believe that the teaching of science develops in children an interest and curiosity about the world in which they live, and fosters in them a respect for the environment. Through the framework of the National Curriculum, science aims to:

- Equip children to use themselves as starting points for learning about science, and to build on their enthusiasm and natural sense of wonder about the world.
- Develop through practical work the skills of observation, prediction, investigation, interpretation, communication, questioning and hypothesizing, and increased use of precise measurement skills and ICT.
- Encourage and enable pupils to offer their own suggestions, and to be creative in their approach to science, and to gain enjoyment from their scientific work.
- Enable children to develop their skills of co-operation through working with others, and to encourage where possible, ways for children to explore science in forms which are relevant and meaningful to them.
- Teach scientific enquiry through contexts taken from the National Curriculum for science.
- Encourage children to collect relevant evidence and to question outcome and to persevere.
- Encourage children to treat the living and non-living environment with respect and sensitivity.
- Stress the need for personal and group safety by the correct usage and storage of resources.
- To enable children to appreciate that we do not always know the answers and results when carrying out scientific enquiry.
- To develop pupil's enjoyment and interest in science
- To enable pupils to effectively communicate scientific ideas by using scientific vocabulary

2 Teaching and learning style

2.1 We use a variety of teaching and learning styles in science lessons. Our principal aim is 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 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 because it enhances their learning, including videos and demonstrations. 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 real scientific activities, e.g. investigating a local environmental problem, or carrying out a practical experiment and analysing the results with an emphasis on children developing the skills that will allow them to ‘become’ scientists.

2.2 We recognise that in all classes, children have a wide range of scientific abilities, 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:

- setting 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 Science curriculum planning

3.1 The school uses the national scheme of work for science as the basis of its curriculum planning. The national scheme has been adapted to the local circumstances of the school in that we make use of the local environment in our fieldwork, although we choose

a locality where the physical environment differs from that which predominates in our immediate surroundings.

3.2 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 skills/ knowledge to be covered each term during the Year. The science subject leader works this out in conjunction with teaching colleagues in each year group. Where appropriate, we combine the scientific study with work in other subject areas, in particular the topics being undertaken by the class, at other times, the children study science as a discrete subject.

3.3 Our medium-term plans, which we have based on the national expectations for the teaching of Science, give details of each unit of work for each term. The science subject leader keeps and reviews these plans. As we have some mixed-age classes, we review our medium-term planning on a two-year rotation cycle. In this way, we ensure complete coverage of the National Curriculum, without repeating topics/skills if unnecessary.

3.4 The class teacher is responsible for writing the unit plans which develop and expand the learning goals/skills for each individual lesson (short-term plans). These plans list the specific learning objectives and expected outcomes of each lesson. The class teacher keeps these individual plans, and s/he and the science subject leader often discuss them on an informal basis.

3.5 We have planned the topics in science so that they build on prior learning. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit, and have modified our planning to enable progression
The objectives have been ordered in each column progressively to support the sequential nature of the skills being taught, though some of these may require further breaking down to teach, alternatively a few skills may be taught in a single session, so as to best suit the pupils. In some cases (mixed age classes) two year group objectives may have been placed together, the intention being to allow for fuller coverage as well as extension where necessary. The areas taught could be altered to suit topics taught, however it is important that the objectives/skills are taught in sequence (e.g year 4 Solids, Liquids and Gases taught before Year 5 Gases around us)

3.6 In Ks1 children also take part in one full cycle Scientific Investigation per term, practicing the skills for investigation discretely in other Science lessons, such as prediction, observation and interpreting results. In KS2 the frequency of full-cycle investigations is increased to once every half term.

4 The Foundation Stage

4.1 Science is taught in the Foundation Stage according to the Curriculum guidance for the Foundation Stage. It is incorporated in the Early Learning Goal 'Knowledge & understanding of the world' in which pupils develop the crucial knowledge, skills and understanding that helps them make sense of their world, applied to their topics and ongoing areas of study.

5 The contribution of science to teaching in other curriculum areas

5.1 English

Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Children are encouraged to access information from a range of sources and reading forums; informational websites, non fiction texts, interactive websites etc. Children are also encouraged to demonstrate their Scientific knowledge through a range of recording strategies; websites, news reports, comic strips, newspapers, letters etc.

5.2 Mathematics

Science contributes to the teaching of mathematics in a number of ways. When the children use weights and measures, they are learning to use and apply number. Through working on investigations, they learn to estimate and predict. They develop accuracy in their observation and recording of events. Many of their answers and conclusions include numbers.

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

Science makes a significant contribution to the teaching of PSHE and citizenship. 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 in which people recycle material and how environments are changed for better or worse. Secondly, the subject gives children numerous opportunities to debate and discuss. They can organise campaigns of matters of concern to them, such as helping protect and prevent damage to the environment and sustainable living. Science thus promotes the concept of positive citizenship.

5.4 Spiritual, moral, social and cultural development
Science teaching offers children many opportunities to examine some of the fundamental questions in life, e.g. 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 in which 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.

6 Science and ICT

6.1 ICT enhances the teaching of science in our school significantly, because there are some tasks for which ICT is particularly useful. Pupils are taught to use a range of ICT equipment to enhance their scientific learning. E.g. cameras to record investigations, data loggers for accurate measurements of temperature and digital microscopes for close observation. Programs such as Excel are used to create graphs and charts to record results. Pupils are taught and encouraged to use and choose a range of recording strategies to communicate their ideas and scientific findings.. Children learn how to find, select, and analyse information on the Internet and on other media. They also use e-mail to communicate on their scientific findings with children in other schools and countries.

7 Science and inclusion

7.1 At our school, we teach science to all children, whatever their ability and individual needs. 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 good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts and talents, and those learning English as an additional language, and we take all reasonable steps to achieve this. For further details, see individual whole-school policies: Special Educational Needs; Disability Discrimination; Gifted and Talented Children; English as an Additional Language (EAL).

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. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. This ensures that our teaching is matched to the child's needs.

7.3 Intervention through School Action and School Action Plus will lead to the creation of an Individual Education Plan (IEP) for children with special educational needs. The IEP may include, as appropriate, specific targets relating to science.

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

Assessment for learning

Assessment for learning in our School takes the following forms;

- Observing children at work, individually, in pairs, in a group, and in classes.
- Questioning, talking and listening to children
- Considering work/materials / investigations produced by children together with discussion about this with them.

When planning and assessing Units teachers endeavour to ensure coverage of attainment targets 2-4. At the end of a Unit key test questions based upon QCA for pitch and expectation and assessing children's understanding. This is also used to give a level for the area and is passed on to the subject leader for tracking and moderation purposes, aswell as identifying gaps in learning and therefore used as an aid for future planning/teaching. Science assessment ladders to be handed in every even term which identify the levels achieved for each topic/area covered, based upon teacher observation and assessment. Sc1 skills are assessed and monitored on a lesson to lesson basis, for tracking and target setting. Children also can share in this process using the produced 'At1 I can' statement booklet. In this way children become partners in assessment in Science, linking it to afl and making assessment an active part of the daily Science lesson, rather than an add on.

The science subject leader keeps samples of children's work in a portfolio, and uses these to demonstrate the expected level of achievement in science for each age group in the school.

9 Resources

We have sufficient resources for all science teaching units in the school. We keep these in a central store, where there is a box of equipment for each unit of work. There is also a collection of science equipment which the children use to gather weather data. The library contains a good supply of science topic books and computer software to support children's individual research. Resources have been inventoried with a view to allocating appropriate resources to particular Scientfic topic areas, which also aids linkages to cross-curricular topic planning.

10 Monitoring and review

The coordination and planning of the science curriculum are the responsibility of the subject leader, who also:

- supports colleagues in their teaching, by keeping informed about current developments in science and providing a strategic lead and direction for this subject;
- gives the headteacher an annual summary report in which s/he evaluates the strengths and weaknesses in science and indicates areas for further improvement;
- uses specially allocated regular management time to review evidence of the children's work, and to observe science lessons across the school.

This policy will be reviewed at least every two years.

Date of Review: Jan 2013
Date of Next Review: Jan 2015

Signed:
Date: