



# Science Policy

Summer 2008

Review date: 2012

## **Introduction**

This is a statement of the aims, principles and strategies for the teaching and learning of Science at Cavendish School.

We are guided by the view of Science outlined in the National Curriculum:

“Science stimulates and excites pupils’ curiosity about phenomena and events in the world around them. It also satisfies their 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 technological change – impacting on industry, business and medicine and improving the quality of life. Pupils recognise the cultural significance of Science and trace its world-wide 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.” (National Curriculum 1999 p.76)

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 2 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.

## **Curriculum**

In the nursery and reception classes the Early Years Foundation Stage Guidance is followed. The

children are given opportunities to find out about the world in which they live through exploration and experimentation. Activities are planned to encourage the natural interest and curiosity of the children allowing them to use all of their senses to notice similarities, differences and change.

In KS1 and 2 we follow the QCA exemplar scheme of work for Science. This scheme of work provides teachers with long- and medium term planning and also provides some aspects of short-term planning. The exemplar scheme is underpinned by assumptions about the aims and purposes of teaching Science at Key stages 1 and 2, which also underpin the National Curriculum programme of study. Within each unit, staff are not only expected to develop the children's scientific knowledge and understanding, process skills and attitudes to Science, but also to support the progression of other areas of the child's development. The scheme also ensures children make progress in Science by providing opportunities for them to do so as they move through Key stages 1 and 2.

Science is allocated ten percent of the taught time at both key stages, and this amounts to approximately 80 hours per year at Key Stage 1 and about 90 hours per year at Key Stage 2. It is expected that Science will be taught a minimum of 1 ½ hours in KS1 and 2 hours in KS2.

Although the Science curriculum is organised as a discrete subject, there are many potential cross-curricular activities.

Making links between areas of learning deepens children's understanding by providing opportunities to reinforce and enhance learning.

Learning is enhanced by:

- Giving further opportunities to practise taught skills through purposeful use in other curriculum areas;
- Providing real experiences, context and meaning for the development of core scientific skills;
- Assisting memory through providing opportunities for children to use skills in a different context;
- Providing opportunities for the application of knowledge in new contexts, to involve children in higher order thinking skills, such as reasoning, evaluation and analysis;
- Building concepts by providing children with opportunities to meet the same or related information in different ways, adding to the richness of their experience.

The school's Science curriculum map (appendix 1) shows how the QCA units are distributed across the years in a sequence which promotes curriculum continuity and progression in children's learning.

Medium term planning ensures that the sequence of units promotes continuity and progression.

Short term planning is the responsibility of individual teachers who build on the medium term plan by taking into account the needs of the children in their particular class. Before teachers plan they carry out an assessment task for the forthcoming unit, so that they can plan for the needs of the class.

The QCA units provide teachers with a clear knowledge and skills focus. We follow the guideline that in KS1 there should be a balance of 50% subject knowledge and 50% skills and KS2 60% subject knowledge and 40% skills.

Many of the QCA units include opportunities for children to carry out the whole process of investigating an idea by 'planning experimental work', 'obtaining evidence' and 'considering evidence'. Units which provide opportunities for whole investigations are shaded in yellow (see

appendix 1). We use pupil planning proformas, for KS1 (see appendix 2) and KS2 (see appendix 3).

In line with suggestions made in 'Excellence and Enjoyment' (DFES 2003), individual teachers are expected to annotate their unit plans, when doing they should identify the following:

- ❑ which learning objectives are to be addressed in a particular lesson and how these relate to the work in previous lessons;
- ❑ whether these objectives need to be modified for particular children or groups of children in light of their existing knowledge, skills and understanding;
- ❑ what resources are needed;
- ❑ how to divide up time during lessons;
- ❑ how to introduce the activities;
- ❑ how to organise the activities;
- ❑ what will show what children have learnt;
- ❑ what to look for in the children's responses;
- ❑ how to draw the lesson together at the end and to evaluate whether the children are ready to move on.

(QCA 2000)

### **The learning environment**

All classrooms should have a Science learning wall. A poster should be displayed on this wall which includes information about what the children are learning about (knowledge) and what they are learning to do (skills) (see appendix 4 for an example). The key vocabulary should also be displayed. Resources for the unit of work being covered should be appropriately accessible. Other sources of information should be available, e.g. ICT, reference books, equipment etc. Wherever possible the school makes use of the outside learning environment and the local area to support scientific teaching.

### **End of unit assessment and record keeping**

We follow the assessment recommendations of QCA:

"Learning outcomes in each unit show how children might demonstrate what they have learnt. The learning outcomes themselves will serve as a record for classes working on each unit. It is not necessary to make detailed records for each child in relation to these outcomes. The end of unit expectations provide broad descriptions of achievement within each unit and should help teachers to decide where a child's progress differs markedly from that of the rest of the class. Teachers may wish to make a note of this, and of the reasons for the difference to pass on to the next teacher." (QCA )

Teachers ongoing annotations of their plan, can provide evidence which can be used by the teacher to make judgements of the children against the unit expectations. Those children meeting expectations will be graded as **E**, those above as **A** and those below as **B**. For those children who have been graded **A** and **B**, further explanations will also be required. Teachers are provided with assessment proformas to record their judgements on (appendix 5-8). These completed proformas need to be copied at the end of each unit and handed to the Subject Leader for analysis. These proformas will not only provide receiving teachers with valuable information but can be used by class teachers to assist end of year reports. Teachers are to also record children's national curriculum levels each term and record these in termly tracker. At the end of the year, assessments will be passed on to the next teacher.

## **Inclusion**

### **Children with SEN and/or learning difficulties or disabilities**

Where possible, through the use of appropriate support and differentiation, children with SEN will be working towards the same learning objectives as their peers. From time to time, those working well below the level of the whole class may be working towards related objectives chosen from the relevant aspect of learning from an earlier year.

Those children with special needs may be given additional support or extra teaching in small groups to help them achieve their targets. Lower attaining pupils should have access to a wide range of practical resources to help develop thinking and understanding in the subject.

### **Children who are gifted and talented**

Children who are working well above the overall level of the class will be given a range of experiences designed to broaden or deepen their learning while working on the same learning objectives as their peers. This may be done by providing more demanding questions and investigations, often with a more open-ended approach. From time to time they may also be accelerating the pace of their learning by working towards objectives chosen from the relevant aspect of learning from a later year.

### **Children learning EAL**

Children learning English as an additional language may need support in developing language and concepts. Care is taken to ensure that pupils are grouped according to their ability and not on their stage of language acquisition. Through the use of appropriate support and differentiation EAL pupils experience the same level of cognitive challenge as their peers. Some pupils may receive additional support from the Hounslow Language Service teacher to understand the necessary technical vocabulary.

### **Equal Opportunities**

All children have an equal opportunity regardless of gender, race or ability, to progress and succeed in their learning and understanding. We pay particular attention to ensuring there is no gender bias in tasks or materials or in access to resources, including ICT. Teachers should pay attention to the equal distribution of their questions across all groups. Any displays and references to Science in society should show positive role models of gender, race, ethnicity and disabilities.

### **The role of the science co-coordinator**

- To monitor standards in Science in the school by observing lessons, scrutinizing children's books and analyzing test results and report findings to the governing body.
- To take the lead in policy development and lead the production of schemes of work designed to ensure progression and continuity in Science throughout the school.
- To support colleagues in their development of detailed work plans, their implementation of the scheme of work and in assessment and record keeping activities.

- To take responsibility for the purchase and organisation of central resources for Science.
- To keep up-to-date with developments in Science education and disseminate information to colleagues as appropriate.
- To identify opportunities for staff training needs.
- To be aware of how ICT can help develop Science.

### **Resources**

Science resources are centrally stored. Equipment is stored in labelled trays in large open cupboard units. The responsibility for organising, setting up and maintaining this area is that of the Subject Leader. However, the whole staff are responsible for ensuring a record is kept of borrowed items (in borrowing book) and that broken or used up equipment is reported to the Subject Leader so that, repairs, replacements or new orders can be made. It is also the borrower's responsibility to return items to the correct storage area when no longer required.

N.B. Under NO circumstances are children allowed access to the Science resource area.

### **Health and Safety**

Science is taught in line with our general school Health and Safety Policy.

Science in our school is very safe. However, when children are engaged in a variety of practical activities, included open-ended investigations, there is always the possibility that something could go wrong, therefore, vigilance is needed.

Individual teachers will need to undertake their own specific risk assessment.

The QCA units point out specific health and safety issues in relation to each lesson, these are generally consistent with advice given in 'Be Safe! Some aspects of safety in Science and Technology for key stages one and two' (ASE 2001).

The governing bodies code of practice for Health and Safety in Primary Science is encompassed in the booklet 'Be Safe!'. Copies of this booklet are kept in the Science resource area and the staff room. All staff are expected to be familiar with its contents and to follow its guidance.

The LEA maintains a subscription to CLEAPSS school Science service (Brunel University, Uxbridge) This organisation produces a termly newsletter, Primary Science and Technology and a wide range of guides about primary Science, especially resources (see appendix 3). They also provide a helpline number: 01895 814372 which teachers can use for health and safety advice and other issues concerning Science.

Using the above advice it is up to the individual teacher to do their own risk assessment.

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