



## Key Stage 1 and Key Stage 2 Curriculum Policies

### SCIENCE

#### **1 Aims and objectives**

- 1.1 Science teaches an understanding of natural phenomena. It aims to stimulate a child's curiosity in finding out why things happen in the way that they do. It teaches methods of enquiry and investigation to stimulate creative thought. Children learn to ask scientific questions and begin to appreciate the way in which science will affect the future on a personal, national and global level.
- 1.2 Our objectives in the teaching of science are for all our children:
- to ask and answer scientific questions;
  - to plan and carry out scientific investigations, with the correct use of equipment (including computers);
  - to know about life processes;
  - to know about materials, electricity, light, sound and natural forces;
  - to know about the nature of the solar system, including the earth;
  - to know how to evaluate evidence and to present conclusions both clearly and accurately.

#### **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. 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.
- 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 Science is a core subject in the National Curriculum. The school uses the national scheme of work for Science as the basis of its curriculum planning. The national scheme will be adapted to the local circumstances of the school in that, where possible, 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). Our long-term plan maps topics studied in each term during each key stage, taking into account integration opportunities within the Jewish calendar and general Jewish topics of study. The subject leader and Head of Kodesh draw up this curriculum map in conjunction with teaching colleagues in each year group. 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.
- 3.3 Our medium-term plans, which we have based on the national scheme of work in Science, give details of each unit of work for each term. The Science subject leader keeps and reviews these plans. In this way, we ensure complete coverage of the National Curriculum, without repeating topics.
- 3.4 The class teacher is responsible for writing the daily lesson plans for each lesson (short-term plans). These plans list the specific learning objectives 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 we also build progression into the Science scheme of work, so that the children are increasingly challenged as they move up through the school.
- 3.6 Wherever possible and appropriate, we integrate Numeracy and kodesh subjects. For example, investigating plant growth in Tu B'Shvat season.

### **4 The Foundation Stage**

- 4.1 We use the document "Curriculum Guidance for the Foundation Stage" (DfEE/QCA) to inform planning in the Nursery and Reception classes.
- 4.2 We teach Science in our Foundation Stage 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 (Knowledge and Understanding of the World) 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 e.g. through investigating what floats and what sinks when placed in water.
- 4.3 Our Foundation Stage curriculum policy, **Knowledge and Understanding of the World** as well as our Foundation Stage policy **Care Learning and Play** contain more detailed information regarding Science teaching and learning in our Foundation Stage classes.

### **5 The contribution of Science to teaching in other curriculum areas**

#### **5.1 Literacy**

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 (e.g. about the environment) and

through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

## 5.2 Numeracy

Science contributes to the teaching of Numeracy 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 on matters of concern to them, such as helping poor or homeless people. 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. It also offers ways of impacting on learning which are not possible with conventional methods. Software is used to animate and model scientific concepts, and to allow children to investigate processes which it would be impracticable to do directly in the classroom. Data loggers are used to assist in the collection of data and in producing tables and graphs. Children use ICT to record, present and interpret data, to review, modify and evaluate their work, and to improve its presentation. 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.

## **8 Assessment for learning**

- 8.1 Teachers will assess children's work in Science by making informal judgements during lessons. On completion of a piece of work, the teacher assesses it and uses this assessment to plan for future learning. Written or verbal feedback is given to the child to help guide his/her progress. Older children are encouraged to make judgements about how they can improve their own work.
- 8.2 At the end of a unit of work, s/he makes a summary judgement about the work of each pupil in relation to the National Curriculum levels of attainment. The teacher records the attainment grades in a mark book. We use these grades as the basis for assessing the progress of each child, and we pass this information on to the next teacher at the end of the year.
- 8.3 Teachers make an assessment of the children's work in Science at the end of Key Stage 1. Children take the national tests in Science at the end of Key Stage 2. We report the results of these tests to parents, along with the teacher assessments which we make whilst observing children's work throughout the year. We use annual practice Science tests in Key Stage 2 to assess children's progress.
- 8.4 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.
- 8.5 Our policy 'Pupil Assessment and Record Keeping, KS1 and KS2, Core Subjects' has a more detailed explanation of how we assess and record pupil progress within Science.

## **9 Resources**

- 9.1 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.

**10. Equal Opportunities (please refer further to our Equal Opportunities / Racial Equality policy)**

- 10.1 We believe that every pupil should have the opportunity to achieve the highest possible standards.
- 10.2 We ensure that all children, irrespective of their ethnicity, attainment and ability, age, disability, gender or background, have equality of access to learning.
- 10.3 The curriculum we offer in the school encourages children to develop positive attitudes about themselves as well as to people who are different from themselves. It encourages children to empathise with others and to begin to develop the skills of critical thinking.
- 10.4 We recognise that children have different learning styles, making appropriate provision within the curriculum to ensure each child receives the widest possible opportunity to develop their skills and abilities.
- 10.5 We ensure that children learning English as an additional language have full access to the curriculum and are supported in their learning.

**11 Monitoring and review**

- 11.1 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.
- 11.2 This policy will be reviewed at least every two years.

**Signed: Sara J. Harris (Headteacher) (Chair of Governors) Eddy Breuer-Weil**

**Date: June 2007**