



Great Missenden C of E Combined School
Science Policy Document
November 2008

DEFINITION

Science: the systematic study of the nature and behaviour of the material and physical universe, based on observation, experiment and measurement.

AIMS

The aims of science teaching at Great Missenden are to enable children to:

- Develop knowledge and understanding of important scientific ideas, processes and skills and relate these to everyday experience;
- Have enthusiasm and interest for learning about the diversity of the world in which they live;
- Learn about ways of thinking, finding out about and communicating ideas;
- Recognise and value the contribution science can make to other areas of learning;
- Study the practical applications of science and the ways they are changing the nature of our society and our economy;
- Look for and describe in words; patterns and relationships in data presented in a variety of forms;
- Use appropriate scientific vocabulary to make their ideas explicit.

OBJECTIVES

Children should:

- Be encouraged to be curious about things they observe, and experience and explore the world about them with all their senses;
- Use this experience to develop their understanding of key scientific ideas and make links between different phenomena and experiences;
- Begin to think about models to represent things they cannot directly experience;
- Try to make sense of phenomena, seeking explanations and thinking critically about claims and ideas;
- Acquire and refine the practical skills needed to investigate questions safely;
- Develop skills of predicting, asking questions, making inferences, concluding and evaluating based on evidence and understanding and use these skills in investigative work;
- Learn why numerical and mathematical skills are useful and helpful to understanding.

- Think creatively about science and enjoy trying to make sense of phenomena;
- Develop language skills through talking about their work and presenting their ideas using a sustained and systematic writing of different kinds;
- Use scientific and mathematical language including technical vocabulary and conventions, and draw diagrams and charts to communicate scientific ideas;
- Read non-fiction and extract information from sources such as reference books, CD-ROMs and the internet.
- Work with others, listening to their ideas and treating these with respect;
- Develop respect for evidence and evaluate critically ideas which may or may not fit evidence available;
- Develop a respect for the environment and living things and for their own health and safety.

TEACHING STRATEGIES

Where possible an emphasis should be on investigation; by teaching children strategies to discover for themselves they are learning vital 'life skills'.

Foundation Stage and Key Stage 1: Children should be learning mainly through first hand experience about their immediate surroundings. They should be involved in direct interaction with materials and objects in their environment, gaining information by wide-ranging observation using all senses in ways which are safe and appropriate. At the same time they should be encouraged to raise questions, and when appropriate become involved in finding answers to them through investigation. Their findings should be communicated either verbally or non-verbally as appropriate to the child and the task.

Key Stage 2: Emphasis should continue to be given to exploration and investigation.

From their observations children should be encourage to:

- Question
- Propose enquiries
- Devise investigations
- Make predictions
- Organise data and find patterns in results
- Reason systematically
- Draw conclusions
- Apply their learning

Through their enquiries, children should gain confidence in the selection of materials and apparatus, and in measuring carefully with appropriate degrees of accuracy. Children are expected to communicate their findings in a variety of ways, appropriate to the material and the audience. In both written and oral accounts they should be encouraged to present information in an ordered manner, using appropriate scientific language. They should be introduced to

the conventions involved in using diagrams, tables, charts, graphs, symbols and models.

SCHEMES OF WORK

We use the QCA exemplar Schemes of work throughout the school and teachers adapt and enhance these schemes of work when writing their plans. The curriculum map shows the order of units covered across the school.

Progression

To ensure children make progress in science, teaching should provide opportunities for children, as they move through Key Stages 1 and 2, to progress:

- From using everyday language to increasingly precise use of technical and scientific vocabulary, notation and symbols;
- From personal scientific knowledge in a few areas to understanding in a wider range of areas and of links between areas;
- From describing events and phenomena in terms of their own ideas to explaining phenomena in terms of accepted ideas or models;
- From participating in practical science activities to building increasingly abstract models of real situations;
- From unstructured exploration to more systematic and fair investigation of a question;
- From using simple drawings, diagrams and charts to represent and communicate scientific information to using more conventional diagrams and graphs.

LINKS WITH OTHER AREAS OF THE CURRICULUM

Each unit within the scheme offers children opportunities to develop their use of language. Both Language development and children's understanding of scientific ideas are reinforced and clarified by;

- Speculating, discussing,
- Explaining and comparing;
- Listening and reading;
- Predicting, sequencing ideas and suggesting alternatives.

Numeracy

Science contributes significantly to the teaching of Mathematics in a number of ways. The children use weights and measures and learn to use and apply number. Working on investigations they learn to estimate and predict. The skills of accurate observation and recording of data are enhanced as they use numbers when measuring and present their data in a variety of forms.

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 CD-ROMs. Children use ICT to record, present and interpret data and to review, modify and evaluate their work and improve presentation.

Personal, social and health educations (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 matters of citizenship and social welfare. For example, children study the way people recycle material and how environments are changing for better or worse. Secondly, children benefit from the nature of the subject in that it gives them the opportunities to take part in debates and discussions. Science promotes the concept of positive citizenship.

Spiritual, moral, social and cultural development

Science teaching offers children many opportunities to examine some of the fundamental questions in life and develops a sense of awe and wonder with the world. Science raises many social and moral questions. Children have the opportunity to discuss, for example, the effects of smoking and the moral questions involved in this issue. Children are given the chance to reflect on the way people care for the planet and how science can contribute to the way the earth's resources are managed. 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.

Many units provide opportunities for links with other areas of the curriculum and these are made explicit.

DIFFERENTIATION

Differentiation is the matching of work to the differing capabilities of pupils in order to extend their learning. Although the scheme of work allows for differentiation by outcome, some of the teaching activities will need to be adapted further to ensure that children with special educational needs may participate fully and demonstrate their achievements.

EQUAL OPPORTUNITIES AND SPECIAL NEEDS

We believe that all pupils regardless of culture, gender or ability should have the opportunities to develop their scientific skills and knowledge. All activities, both within and outside the classroom are therefore planned to include the full and active participation of all class members. This will be achieved through the use of a range of teaching styles, resources and styles of presentation appropriate to the needs of the children concerned and to the desired learning outcomes.

ASSESSMENT AND RECORDING

We currently assess our pupil's scientific knowledge and skills both formally and informally. We use the 'Mini SATs' assessment papers to test science knowledge at the end of each unit. The levels for each unit of work are combined to find an average level of attainment for every child at the end of the year. This type of assessment also highlights areas of individual weakness as well as assisting teachers in identifying aspects of scientific understanding that the class may find difficult. Subsequently this assessment improves teachers' future planning.

However to gain a thorough ideas of children's investigative skills in science we also keep a running record of their attainment in AT1 of the science

curriculum. AT1 objectives for each level can be found in every child's science books and the teacher highlights objectives as and when they are displayed by the child. This also enables every child to be aware of what level they are working towards and the objectives they need to meet in order to achieve the next level.

By combining these methods of assessment and looking closely at the level descriptors, by the end of each academic year teachers should decide upon a level in science, for every individual, using the 'best fit' approach. This information will then be passed on to and discussed with the pupil's next teacher.

Parents are kept informed of their child's progress via twice-yearly parent-teacher consultations and an annual written report.

HEALTH AND SAFETY

Lessons will be planned with due regard for potential hazards and risks of injury that may be encountered during them. Appropriate steps will be taken to avoid injury and ensure safety at all times. Children will be trained in the correct and safe use of all equipment before being allowed access to it. When engaged in practical science work children are expected to behave in a responsible and considerate manner, showing respect for other people and the equipment. During lessons children are encouraged to discuss safety matters concerning themselves and others. The Health and Safety policy gives clear guidance on the response to and reporting of all incidents. When in doubt of whether an activity can be carried out or a particular resource used staff should speak to the co-ordinator who will get in contact with the Consortium of LEAs for the Provision of Science Services (CLEAPSS). They are a national source of safety advice for school science and Buckinghamshire County Council agrees with advice given by this organisation.

RESOURCES

All science resources are currently stored in the 'resources cupboard' adjacent to the main hall. Some resources, specific to units taught in one year group, have been distributed by the co-ordinator to the year group leader and are kept in their classroom cupboards.

THE ROLE OF THE CO-ORDINATOR

The co-ordinator for science will:

- Advise on planning, teaching and learning approaches, assessment and resources
- Monitor progression, continuity and differentiation within the subject through review of half-termly teaching plans, moderation of children's work, and lesson observations
- Prepare and update documentation relevant to the teaching and learning of the subject
- Manage the resources relating to science; monitor distribution and condition, ensure adequate provision and order new equipment
- Keep up to date with new ideas and developments in the teaching of science
- Attend courses to develop personal expertise in the subject

- Keep abreast of current legislation and thinking in the subject
- Consult with those providing support for the subject beyond the school
- Ensure there is enthusiasm in the teaching and learning of science

M.Close November 2008