



Science Policy

1 Aims and objectives

1.1 Our aim at John Hampden School is to promote the children's natural curiosity about the world around them. They will be encouraged to ask questions, explore their ideas and Big Questions and make discoveries for themselves. Children will be provided with a stimulating environment where practical activities are meaningful and challenging. We endeavour to provide a broad and balanced National Science Curriculum which is well suited to the children's abilities and aptitudes. The curriculum will draw from the children's interests and build upon their experiences, encouraging children to find out why things happen so that they can begin to appreciate the way science will affect their future on a personal, national and global level. Where possible we aim to bring science to the school via whole school science weeks, visits from scientists and external visits to foster a wider understanding of science in everyday life.

1.2 The aims of science are:

- to enable children to ask and answer scientific questions;
- to develop the confidence of each child to plan and carry out scientific investigations, using equipment, including computers, correctly;
- to know and understand the life processes of living things;
- to know and understand the physical processes of materials, electricity, light, sound and natural forces;
- to know about the nature of the solar system, including Earth;
- to evaluate evidence and present their conclusions clearly and accurately.

2 Teaching and learning style

2.1 At John Hampden School we use a variety of teaching and learning styles in science lessons. Our principal aim is to develop children's knowledge, skills, and understanding. We organise science lessons that offer children opportunities to learn in different ways. These include:

- Whole class teaching
- Group work including Kagan activities
- Paired work
- Independent work
- Role play and discussions
- Use of the ICT resources (Computer, T.V., visualisers, Interactive White Board, internet, data loggers)
- Field work and educational visits
- Experimental investigation and problem solving
- Research and explorative work
- Bright Ideas discussion points

2.2 We adopt a growth mind set approach to lessons encouraging every child to reach their potential. To do this we ensure that we provide a suitable learning environment for all children by putting in place a variety of teaching techniques to allow every child to excel. We achieve this in a variety of ways by:

- Setting common tasks which are open-ended and can have a variety of responses/outcomes;
- Using the Kagan group approach;
- Asking Big Questions and using the Explorify approach to scaffold discussion at a deeper level;
- Setting tasks of increasing difficulty (encouraging children to think deeper about their understanding and justifying their ideas);
- Careful consideration of the grouping of children with the purpose of creating a strong working environment where children hypothesise, predict and justify;
- Providing resources of different complexity, matched to the ability of the child;
- Using focus groups to allow teachers or teaching assistants to support the work of individual children or groups of children;
- Increasing pupil input into investigational work via pupil-led questions and experimentation;
- Encouraging children identified as exceeding to develop their understanding and scientific explanation skills by mentoring those less confident - in KS2 in particular.

3 Science curriculum planning

3.1 For curriculum planning, the school uses the programmes of study laid down by the 2014 National Curriculum for science,

3.2 We carry out our curriculum planning in science in two phases (long-term and short-term). The long-term plan maps the scientific topics studied in each term across the year. The science subject leader oversees these long-term curriculum maps in order to ensure that our science topics are diverse, progress from year group to year group, and to ensure full coverage of the National Curriculum. In some cases we use a cross-curricular approach to combine scientific study with work in other subject areas, such as history or geography. At other times the children study science as a discrete subject.

3.3 A progression map for both 'Working Scientifically' and 'Units of Work' is kept on the One-drive so that every teacher can see an overview of science within the school.

3.4 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 programmes of study, so that the children are increasingly challenged as they move up through the school.

3.5 The class teacher is responsible for writing the individual lesson plans for each lesson (short-term plans). These plans list the specific learning objectives of each lesson as well as the teaching and learning techniques that will be employed to ensure these are met.

3.6 Each year a science week is run to raise the profile of science and scientific enquiry. Whenever possible outside specialists are invited in to support the given theme.

4 Foundation Stage

4.1 We teach science in the Nursery and Reception classes as an integral part of the topic work covered during the year and with regard to the learning objectives set out within the Early Years Foundation Stage curriculum. We relate the scientific aspects of the children's work to the objectives set out in Development Matters which contribute to the assessment of the Early Learning Goals (ELGs) at the end of the Reception year. Science makes a significant contribution to the 'Understanding the World' strand in the EYFS developing children's early scientific understanding, e.g., through investigating what floats and what sinks when placed in water.

5 The contribution of science to teaching in other curriculum areas

5.1 English

Science contributes to the teaching of English in our school by actively promoting the skills of reading, writing, speaking, listening, discussion and debate. Some of the texts that the children study in English are of a scientific nature and some forms of writing such as explanation, instruction and information texts, can be linked to scientific knowledge and understanding. The children develop oral skills in science lessons through in-depth discussions and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

Conversely, we are careful to ensure that we use a variety of recording skills in science to ensure that literacy is not a barrier to the acquisition of science skills and knowledge.

5.2 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 use tables, graphs and charts to record and interpret data. They develop the skills of accurate observation and recording of events. They use numbers in many of their answers and conclusions.

5.3 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. Children may use ICT to record, present and interpret data and to review, modify and evaluate their work and improve its presentation.

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

Science makes a significant contribution to the teaching of personal, social and health education, predominantly in the following three areas:

- Raising awareness of citizenship and social welfare. For example, children study the impact of our actions on the planet and steps we can take to reduce these (e.g. global warming and recycling).
- Secondly, science gives children opportunities to take part in debates and discussions and for children to develop their own opinions and viewpoints on important global matters.
- Children also learn about their bodies, how they work and how they can keep them healthy.

5.5 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.

6 Assessment and recording

6.1 We assess children's work in science by making informal judgements as we observe them during lessons. Feedback is given verbally to ensure that children have a full understanding and do not develop misconceptions. Work is monitored in children's books and marked regularly. Further feedback may be given in the children's books if required. Children are given time to check back on marked work and to carry out any corrections or extension activities.

6.2 Teachers also carry out a mixture of more formal assessments throughout each unit of work across the year. These include the use of the Thame Partnership science assessment grids, TAPS focused assessment plans and end of unit assessments. These assessments are used to inform further planning, grouping, support and intervention where necessary. These assessments are also used to inform an end of year judgement for each child. Target Tracker is used to record this assessment of the overall performance of the child, set against the learning objectives of the year and also forms the basis for the science element of a child's annual school report.

6.3 Teachers make an assessment of the children's work in science at the end of Key Stage 1 & 2 which is reported to parents and the local educational authority. Parents are informed of their child's progress against the National Curriculum at parents' evenings and in the annual report.

7 Resources

7.1 We have a range of resources for the teaching of science. We keep these in a central store where there is a box of equipment for each unit of work. The science leaders review the stock needs on a regular basis and replenish, replace and update the equipment where needed.

8 Monitoring and review

8.1 It is the responsibility of the science subject leader to monitor the standards of children's work and the quality of teaching in science. The science subject leader 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 subject leader completes an annual action plan for science.

9 Safety

9.1 It is important that children are taught appropriate safety rules when

undertaking experiments and investigation, particularly when a topic involves using potentially dangerous equipment such as electrical components.

Materials and equipment need to be handled sensibly and all staff should be aware of the guidelines within the document published by the Association for Science Education - 'Be Safe'. A copy is available from the science coordinator. It is the teacher's responsibility to make sure that all helpers (TAs, parents etc.) are aware of safety implications connected with any science activity they are undertaking.

9.2 We enable pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside of the school grounds, such as 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. All external visit risk assessments are overseen by the educational trips coordinator and must be signed by the Headmaster.

Signed:

Date: Autumn 2020