

1 Aims and objectives

- 1.1** Our chief aim is that science will stimulate and excite children's curiosity about phenomena and events in the world around them. Because science links direct practical experience with ideas it can engage learners at many levels.
- 1.2** A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. It aims to stimulate a child's curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate creative thought. Children learn to ask scientific questions and, in Key Stage 2, follow a line of enquiry to answer these raised questions. Science is split into two sections –Scientific Skills and Scientific Knowledge. Science starts with knowledge. By approaching common misconceptions of this knowledge, children will develop the skills required to undertake investigations and enjoy practical activities to underpin the Science curriculum.
- 1.3** The aims of science are to enable children to:
- know and understand the life processes of living things;
 - know and understand the physical processes of materials, electricity, light, sound and natural forces;
 - know about the nature of the solar system, including the earth;
 - ask and answer scientific questions;
 - plan and carry out scientific investigations, using equipment, including computers and data loggers, correctly;
 - evaluate evidence and present their conclusions clearly and accurately.

2 Teaching and learning style

- 2.1** The principles of good primary science teaching are/have:
- Knowledge focused
 - Good understanding of common misconceptions
 - dependent on children's prior knowledge
 - a clear investigative element
 - opportunities for children to be involved in making science safe
 - opportunities to promote care and respect for living things
 - a strong emphasis on scientific language
 - high expectations
 - inclusive to all learners
 - a broad and balanced science coverage
 - personalised to the questions raised by the children
- 2.2** We use a variety of teaching and learning styles in science lessons. Our principal aim is to develop children's Science knowledge, understanding and skill. 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, images and

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photographs. They use ICT in science lessons where it enhances their learning. They engage in a wide variety of problem-solving activities. Wherever possible, we involve the pupils in 'real' scientific activities, for example, researching a local environmental problem or carrying out a practical experiment and analysing the results.

2.3 We recognise that there are children of different scientific abilities in all classes 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 by:

- setting common 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) when it will make a difference;
- 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 e.g. ICT facilities differentiated measuring equipment etc.;
- using classroom assistants to support the work of individual children or groups of children.
- sensory experiences that include all children.

3 Science curriculum planning

3.1 A scheme of work has been devised that follows the national curriculum. The schemes are adapted to the local circumstances of the school in that we make use of the local environment in our fieldwork and through residential visits (locations which are different to our local surroundings) and time spent in the school woodlands, taking advantage of the habitats available on school grounds. We utilise local companies, such as Fiddlers Ferry, Sellafeld Ltd, Manchester/Liverpool museums, to name a few as well as working alongside the feeder High School in science and engineering projects. We also have local companies visiting school such as Adrian Bowden, Stockley Birds of Prey and Knowsley Safari.

3.2 We carry out our curriculum planning in science in three phases (long-term, medium-term and we then lesson plans which the teacher's tweak and change to match the needs of their class). The long-term plan maps the scientific topics studied in each term during the key stage. The science subject leader works this out 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 and Early Years; at other times the children study science as a discrete subject, although cross curricular and topic links are encouraged.

3.3 Our medium-term plans, which we have based on the national curriculum 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 Individual teachers then take their medium term plans and adapt them to match the needs of their class, taking into account missed learning due to the pandemic and their class's needs.

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- 3.5** 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 knowledge and skills 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** During Key Stage 1 pupils observe, explore and ask questions about living things, materials and phenomena. They begin to work together to collect evidence to help them answer questions and to link this to simple scientific ideas. They evaluate evidence and consider whether tests and comparisons are fair. They use reference material to find out more about scientific ideas. They share their ideas and communicate them using scientific language, drawings, tables and charts.
- 3.7** During Key Stage 2 pupils learn about a wider range of living things, materials and phenomena. They begin to make links between ideas and to explain things using simple models and theories. They apply their knowledge and understanding of scientific ideas to everyday things and their personal health. They begin to think about the positive and negative 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 to follow a line of enquiry, often to find an answer to a scientific question they have raised themselves. They use a range of reference sources in their work, including ICT. They talk about their work, its significance, and communicate ideas using a wide range of scientific language, conventional diagrams, charts and graphs.

4 Foundation Stage

- 4.1** We teach Science in reception classes as an integral part of the topic work covered during the year. As the reception class is part of the Early Years Foundation Stage (EYFS), we relate the scientific aspects of the children's work to the objectives set out in the Early Years Foundation Stage which underpin the curriculum planning for children aged three to five. Science makes a significant contribution to the development of a child's knowledge and understanding of the world e.g. through investigating what floats and what sinks when placed in water. At this stage, children are given opportunities to observe everyday objects and events, making use of all their senses, asking questions, looking for similarities and differences and developing the skills of sorting and classifying. They use the vocabulary of science in discussions. They ask and answer questions and use role-play to explore experiences in each other's lives.

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. Some of the texts that the children study in English are of a scientific nature. The children develop oral skills in science lessons through discussions (for example of the environment) and through recounting their observations of scientific experiments by asking and answering questions. They develop their writing skills through writing reports, explanations, flow charts and projects and by recording information.

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 develop the skills of accurate observation and recording of events. They use numbers in many of their answers and conclusions. The children handle data and use data loggers, databases, charts and tables.

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 use ICT to record, present and interpret data and to review, modify and evaluate their work and improve its presentation. They may also use e-mail to communicate their findings with other children in other schools and countries. Some of the children's work is put onto the school website. Children are involved in practical and investigative activities throughout the school year. They are encouraged to record and report results of investigations in a variety of ways including ICT. They may use multimedia sources to make comparisons, use sensors to detect temperature, light and movement, use a database or spreadsheet to analyse data, use microscopes, visualisers attached to PC's and use flipcams to record.

5.4 Relationship and Health Education (RHE)

Science makes a significant contribution to the teaching of Relationship and health education. 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 people recycle material and how environments are changed for better or worse. Secondly, children benefit from the nature of the subject in that it gives them opportunities to take part in debates and discussions. Science promotes the concept of positive citizenship and healthy wellbeing. We actively promote links with external sources such as oral health and the school health adviser.

Reference should also be made to the health and sex education, healthy eating and drugs education policies.

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.

When planning teachers set high expectations and provide opportunities for all children to achieve including boys, girls, children with special educational needs and children from different social, cultural and ethnic backgrounds

6 Teaching Science to children with special educational needs

- 6.1** At our school we teach science to all children, whatever their ability. 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 progress. We do this by setting suitable learning challenges and responding to each child's different needs. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels.
- 6.2** 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. This ensures that our teaching is matched to the child's needs using the children's Pupil Passports.

We enable pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the classroom, for example, 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.

7 Assessment and recording

- 7.1** We assess children's work in Science by making informal judgements as we observe them during lessons. On completion of a piece of work, the teacher marks the work and comments as necessary. At the end of each units of work, the children receive a knowledge test, based on objectives direct from the curriculum and that on their knowledge organiser. The teacher will also make a summary judgement about the work of each pupil in relation to being above, at or below national expectation. Science skills progress is assessed at the end of each topic, focusing on the focus skill and other taught skills during the topic. In KS2, this is taught through a working scientifically test. In KS1, working scientifically skills are assessed at the end of the year and is based on teacher judgement.
- 7.2** Teachers make an assessment of the children's work in science at the end of Key Stage 1 and Key Stage 2. The results of these assessments are reported to parents and to the Local Authority. The government carry out sample testing at the end of Key Stage 2 in 10% of schools and schools are notified in the Spring term if they are to be included in the sample.
- 7.3** The science subject leader observes samples of children's work during book scrutinises and uses these to demonstrate what the expected level of achievement is in science for each age group in the school. Where possible, these pieces of work will be moderated across other schools in Warrington to agree assessed standard is correct during network meetings.

8 Resources

- 8.1** 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. Regular use is made of the ICT facilities, visualisers and data loggers and the ICT resource bank of science activities.

9 Health and Safety

- 9.1** It is the class teachers' responsibility to risk assess all scientific experiment conducted inside and outside of the classroom. Explicit reference should be made in each lesson to health and safety so that all children are aware of the risks, for example do not taste the liquids and powders in the lesson, safe use of scientific equipment. Reference should be made to current guidance and legislation through the ASE (Association of Science Education) BeSafe materials and guidance from CLEAAPS.

10 Monitoring and review

- 10.1** 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 gives the Head Teacher a summary report in which s/he evaluates strengths and weaknesses in the subject and indicates areas for further improvement.

11 Equality of Opportunity

- 11.1** In this school we recognise that each individual has the right to equality of opportunity regardless of gender, race, cultural background, religion, age, disability, intellectual ability or financial circumstances.

12 Staff Roles of Responsibility

- 12.1** It is the role of the co-ordinator for Science Policy, with the head and deputy head, to help other members of staff to effectively implement the Science Policy of the school. It is the role of individual members of staff to implement the agreed Science Policy to ensure the continued and successful development of the subject throughout the school.

13 How the Policy was Developed

The policy was drafted by the co-ordinator for Science using the agreed format. It was considered by the entire staff at a full staff meeting. Reference was made to the National Curriculum document for Science and the statutory assessment and reporting guidance.

13 Conclusion

This policy also needs to be in line with other school polices and therefore should be read in conjunction with the following school policies:

- Assessment
- Responding to pupils' work / Feedback / Marking policy
- Special Educational Needs Policy
- ICT Policy
- Equal Opportunities Policy

This policy was presented to the governors on _____

Signed: _____ Governor

_____ Head Teacher

Date: