

OAK FARM JUNIOR SCHOOL

SCIENCE POLICY



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Oak Farm Junior School Science Policy

Introduction

At Oak Farm Junior School, we believe that the science curriculum forms an extremely important role in the education of our children as it enables them to develop an understanding of the natural and physical world around them.

The new National Curriculum 2014 states why we teach science in our schools:

‘A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world’s future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.’

At Oak Farm Junior School, we understand that the framework of ideas regarded as ‘scientific knowledge’ is constantly changing and being extended by new discoveries and insights. This demands understanding, flexibility of thought and a willingness to modify ideas in the light of new information. Science, however, is not simply an acquired body of knowledge, it demands a curious, questioning attitude that leads to scientific investigation and thought in order to learn and understand.

Aims of the Science Curriculum

At Oak Farm Junior School, we aim to provide a science curriculum to meet the needs of all pupils, developing their knowledge and understanding of science and their ability to think and act scientifically. We also aim to prepare our pupils for a life in an increasingly scientific and technological world. In order to do this, we aim to provide a breadth of study to address the following:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- Enable pupils to apply their knowledge and understanding of key concepts to new situations, to solve problems with increasing confidence and independence and to develop their ability to reason their ideas and theories with others.
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.

- Ensure the pupils are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.
- Develop and encourage an enjoyment of science and a sense of curiosity about the world around them.
- Develop a respect for living things and the environment and to promote health education and well-being.
- Encourage a respect for other points of view and develop collaborative and independent work and learning.
- Develop the ability to work scientifically and understand how to plan and carry out investigations with an increasing awareness of fair testing.
- Support and develop pupil's literacy, numeracy and computing skills within a scientific concept.

Teaching and Learning

At Oak Farm Junior School, we intend to achieve the aims of the science curriculum by:

- Delivering high quality, interesting and engaging science lessons using a range of teaching and learning styles.
- Developing and extending pupils' scientific knowledge and understanding.
- Developing pupils' ability to work scientifically and involve pupils in planning, carrying out and evaluating investigations.
- Developing their questioning, predicting, observing, measuring and interpreting skills and how to work collaboratively in pairs, groups and/or individually.
- Developing pupils' scientific vocabulary and ability to articulate scientific concepts clearly and precisely.
- Learning about science, where possible, through first-hand practical experiences and by using the outdoor learning environment.
- Develop their research skills through the appropriate use of secondary sources;
- Teaching them how to record their work in a variety of ways e.g. writing, diagrams, graphs, tables.
- Teaching science in a global and historical context; including the contributions of significant scientists from a range of cultures.
- Using scientific contexts to develop and consolidate cross curricular skills in literacy, Maths and ICT.
- Ensuring that all pupils are appropriately challenged to make good progress in science and as they progress, they take on increasing responsibility and independence with their learning.
- Using engaging and interactive science displays, which include key vocabulary and relevant questions, to motivate and inspire pupils.

Organisation of the Science Curriculum

At Oak Farm, the science curriculum follows the key objectives and learning outlined within the new National Curriculum. Within the Key Stage, each year group is organised into five separate units of work. All year groups must also incorporate the key objectives and principles of the 'working scientifically' programme of study within each unit. The focus of some units build upon prior knowledge obtained from previous learning, allowing for consolidation and progression of the key principles and scientific knowledge.

The National Curriculum Guidelines

- Lower Key Stage 2 Curriculum (Years 3 and 4)

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

- Upper Key Stage 2 Curriculum (Years 5 and 6)

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

Scientific Enquiry

At Oak Farm, Science is taught, where appropriate, with an emphasis on the pupils engaging in practical enquiry to support and develop their understanding of scientific concepts and skills. Teachers use a range of strategies including: exploration, investigative enquiry and illustrative enquiry. Children are encouraged to record their investigations using the relevant enquiry skills including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

At Oak Farm, we utilise a range of teaching techniques and skills. A variety of collaborative work, individual study and whole class teaching are used as appropriate. Groups for collaborative work are often of mixed ability. Groupings take into account age, gender, ability, interest and friendships. Class discussion enables scientific principles to be clarified. Classroom assistants may be used to support group activities and / or individual children. Areas of the school grounds, such as the pond garden, are used as a vital resource when appropriate, particularly for work on habitats and living things. Visits to places outside school are also used to support the curriculum, for example Kew Gardens and The Science Museum. Scientific visitors also come to Oak Farm to inspire science within the children, e.g. Quantum Theatre for Science, The Space Dome.

The Role of the Co-ordinator

Planning

The outline for the new scheme of work for science was developed by the curriculum leader. Planning ideas, suggested activities and links to the effective planning and lessons from the previous curriculum were introduced to the staff. Year group plans were then produced by the year group team members which incorporated the ideas and activities suggested and any additional ideas.

Monitoring and evaluating

The curriculum leader is responsible for monitoring and evaluating the curriculum plans. As the plans are revised on a yearly basis by the new year group teams, it is essential that the plans are monitored to ensure that the specific learning objectives are being taught and achieved.

The curriculum leader also receives questionnaire feedback from each year group. Year group planning meetings facilitate monitoring of the delivery of the curriculum across the year team. Analysis of children's work is undertaken by the coordinator to inform planning.

The curriculum leader is also responsible for:

- Managing, maintaining and purchasing resources.
- Developing teachers' skills, knowledge and understanding through staff meeting and training day sessions.
- Provide year group and individual support when needed.
- Share information acquired on appropriate courses.
- Attending appropriate courses and meetings.

Assessment

A new format for the formal assessment of the science curriculum has been introduced this year which provides consistency alongside the foundation subjects. Teachers continually use a variety of formative and summative methods of assessment as appropriate. All teachers complete an assessment sheet for each individual unit of work assessing the children against each of the statutory objectives. Additionally, each child completes a self-assessment against these objectives at the end of each unit of work. All assessments made are also used to inform future learning and allow the teacher to adjust the planning for subsequent lessons, if required.

Special Needs Provision

At Oak Farm, we teach science to all children, regardless of their ability. Teachers' plans identify work appropriate to the age, ability and maturity of the children, with differentiation by role, task and response. Teachers provide learning opportunities matched to the needs of children with learning difficulties.

Equal Opportunities

At Oak Farm, every effort is made to ensure that science is interesting and motivating to all children, regardless of their sex, gender, culture or home background. All children will have equal access to the science curriculum appropriate to their age and ability and planning will take account of any necessary adaptation of science curriculum activities for children with physical disabilities.

Health and Safety

Teachers will have considered the safety aspects for each science investigation and take steps to minimise risk where appropriate. Children are encouraged to consider health and safety aspects of their learning as an element of the over-arching requirements of the National Curriculum.

Resources

The science resources are mainly located in HUT 1B although some, more general year group specific resources are stored within the related year group corridors. In Hut 1B, the resources are organised into topic areas, E.g. Electricity, Materials. Within each topic area, all of the text books, information books and apparatus for practical investigations and experiments are stored. There are also general resources for experimental and investigative science. The resources are monitored and are replaced, if required.

Cross-curricular Links and PSHE

The science curriculum can contribute to and also benefit from the development of the pupils' skills in literacy, numeracy, the creative curriculum and in the use of I.C.T. When appropriate the science curriculum may provide a context for these skills. There are also specific links with the P.S.H.E. curriculum and consultation has ensured that these links are reflected in the schemes of work. Year group planning actively looks for extended writing opportunities within science lessons. Where possible these will build on previously taught skills within English lessons and allow for assessment opportunities within both subject areas.

External Links

The science curriculum is designed to build upon the pupils' experiences and learning in the infant school and consultation between individual teachers and curriculum leaders helps to ensure this. The curriculum leader is also able to liaise with other curriculum leaders through leading the science Long Lane collaborative.