



L.E.A.D. Academy Trust

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# Forest Lodge Academy

# Science

# Policy

**Review frequency:** Annually

**Approval:** Governing Body

Date: April 2018

## **Aims and objectives**

Science teaches an understanding of natural phenomena. It aims to stimulate a child's curiosity about the world around them, 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 the different ways they can find their own answers, making predictions, analysing results and forming conclusions. They will also begin to appreciate the way in which science will affect the future on a personal, national and global level.

The aims of this policy are:

- to establish and emphasise the entitlement for all children
- to reflect the ethos we create for the teaching and learning of Science at Forest Lodge
- to discover and promote the philosophy that Science is a fun activity
- to let children explore and discover the world around them through working scientifically

Our objectives in the teaching of science are for all our children:

- to develop an enquiring, investigative approach to science
- to develop the skills of hypothesising/predicting
- to plan and carry out scientific investigations, with the correct use of equipment (including computers)
- to develop a questioning attitude to their environment
- to share and communicate their knowledge of scientific ideas using scientific language, drawings, diagrams, charts, graphs and tables, with the aid of ICT as appropriate
- 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 use their experiences to develop understanding of key scientific ideas
- to make informed decisions based on evidence and their own experiences, and be able to apply scientific knowledge to new situations.

## **Teaching Science**

Teaching Science at Forest Lodge is a balance between child-led learning through asking questions and carrying out investigations and teaching subject knowledge which children can then apply in various contexts. This allows all children to access the curriculum, with scaffolds and supports being available to ensure they can. Children also have opportunities to deepen their learning through asking questions and investigating these further. They can also apply their knowledge and working scientifically skills through “Wow Science” experiments and the annual British Science Week event where they work on their own projects.

The children have frequent opportunities to develop their skills in, and take responsibility for:

- planning investigative work
- observing with care and precision, using a range of measuring equipment
- exploring and sharing ideas with each other
- selecting relevant resources
- making decisions about sources of information
- carrying out activities safely
- deciding on the best form of communicating their findings
- being reflective about their own work.

## **Science curriculum planning**

Science is a core subject in the National Curriculum. Science planning and teaching at Forest Lodge Primary School is derived from the New National Curriculum (2014), taking the statutory and some non-statutory objectives and creating lessons around these. It is supported through reference to a range of teacher resources, including Internet based ones such as Twinkl and those found on the STEM website.

We carry out our curriculum planning in science in two phases (long-term and medium-term). The long-term plan maps the scientific topics studied in each term during the Key Stages to ensure the coverage of each. These are also linked as best as they can be to the topic focus, allowing topic work to be cross curricular and taught within a context. In this maths and English skills will be taught through Science as well as children applying their scientific knowledge through a context, making it more relevant to their lives, and hopefully, inspiring them to become passionate about Science as a topic. Medium term plans are then formed using the working scientifically milestones documents and national curriculum objectives. Within this, differentiation and opportunities for investigations are planned for.

All teachers are responsible for the medium and short term planning and delivery of Science to their own class which is completed with year group partners. The plans are collected centrally and the science subject leader reviews these, ensuring coverage of the curriculum is met.

As previously mentioned, science units are taught within topics (where possible), connecting them to other areas of the curriculum. Prior to the topic children can discuss what they know or want to learn- this can take the form of concept maps, KWL grids or discussion with the children. From this it should also be noted what the children want to learn so topics can be tailored to the children's interests as well as meeting the learning objectives specified. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each topic, 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.

Science planning is focused on learning through scientific enquiry, getting children to discover for themselves and to develop their skills of questioning the world they live in for themselves. Thus, planning must be adaptable to follow the children's questions. Within this however, some knowledge based lessons are required but these should be minimal and equally engage children. Children then have opportunities to apply their working scientifically skills through unrelated, exciting experiments which is resourced by the science coordinator.

Another aspect when planning is to focus on a scientist from that area, living or deceased, to give children knowledge of the work people have done throughout history and also to introduce careers within Science.

## **The Foundation Stage**

Science activities are planned in line with current Curriculum Guidance for the Foundation Stage- mostly taken from the “Understanding the World”. Science is incorporated into topic planning and includes opportunities for experimenting and investigating. Children participate in Science Week and have hands on activities to engage them and promote questioning.

## **The contribution of science to other aspects of the curriculum**

### **Cross Curriculum Topic**

Science is now taught through cross curricular topics. Each year group has set topics, which teachers have planned themselves. These have been including the new science objectives, given to them by the Science Coordinator. This approach embeds Science into all subjects and teaches it within an engaging concept. There is also a whole week of science with cross curricular links based around British Science Week.

### **English**

Throughout the school, from Foundation Stage up, children are encouraged to use their speaking and listening skills to describe their observations, predict what may happen and explain their findings. Some of the texts that the children study in Literacy are of a scientific nature thereby contributing to their knowledge and understanding. From Key Stage 1 and increasingly through Key Stage 2, children are encouraged to develop their speaking and writing skills through recording of their planning, observations, relevant information and explanations. Children are also encouraged to write biographies, explanation texts and non-chronological texts involving Science, as well as improving reading skills through comprehension and note taking. The language of prediction and explanation are used, taken from Tower Hamlets Speaking and Listening Document.

### **Maths**

Children are expected to use their knowledge and understanding of measurement and data handling at appropriate levels. They develop accuracy in their observation and recording of events. Children are encouraged to present their data using graphs, both hand drawn and using ICT.

### **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. Health education is also taught as part of several topics, e.g. teeth and eating, keeping healthy and life cycles.

### **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.

### **ICT**

ICT is used in various ways to enhance the teaching and learning of science in our school. It also offers ways of impacting on learning which are not possible with conventional methods, particularly through the use of the interactive whiteboard. In addition, teachers use some internet based resources which allow for effective teaching of Science, including virtual experiments, interactive games and multimedia clips. 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. Children learn how to find, select, and analyse information on the Internet and on other media.

## **Science and inclusion**

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. 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.

Lessons are differentiated to ensure all children are able to access the topic and achieve. This can be done in a number of ways from adult support, using scaffolds and word banks or the level of challenge.

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.

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;
- working in mixed ability groups during investigative work so that children can share their ideas learn from each other;
- providing resources of different complexity, matched to the ability of the child;
- using teaching assistants to support the work of individual children or groups of children.

Able, gifted and talented children are supported and challenged through developing analysis, investigative and evaluative skills. Teachers use questions that allow the more able child to maintain their involvement in the lesson and demonstrate their knowledge and abilities.

## **Assessment for learning**

Short-term assessments are an informal part of every lesson to check the children's understanding and to give the teacher information to adjust future lessons. 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.

Nationally, teachers are required to make an assessment of the children's work in science at the end of Key Stage 1 and Key Stage 2. These assessments are based on working scientifically objectives, which can be found in the New National Curriculum 2014.

At the beginning and end of each topic of work, children complete a Rising Stars test to show progress and assess their understanding. Teachers also make a termly assessment for each child (Y1 to Y6) based on National Curriculum level descriptors for Working Scientifically, deciding whether children are working towards, within, or beyond their age expectation- currently using the six steps on Target Tracker, where this is also recorded. This data is then analysed termly by the science coordinator, to track any trends and ensure progress is being made across the school.

## **Health and Safety**

In their planning of activities, teachers anticipate likely safety issues. Children are taught essential life skills to enable them to participate confidently and safely in scientific enquiry. When children are engaged in investigations they are taught to consider health and safety issues and consequences. They are taught to operate in a safe manner. Reference should be made to the whole school Health and Safety policy and to the 'Be Safe' publication.

## **Resources**

The majority of practical science resources are kept in a central store, accessible by all teachers and teaching assistants. There is an ongoing programme to replenish and extend these resources with specific regard to investigations. In addition, there is a computer based selection of web-based resources for each topic as well as a school login for the STEM database. There is also the WOW Science box, which has many resources for safe practical experiments for children to complete.

## **Monitoring and review**

The Science Leader monitor planning, teaching and learning and assessment in all year groups, regularly. This includes observations of lessons, work sampling, audits of resources, reviewing planning against year group expectations and analysing assessments. This is to ensure that the standards of Science are high at Forest Lodge and constantly improving and developing to the children's needs.

This policy will be reviewed in May 2019.