



Forest Federation Science Policy 2015-16

*“Somewhere, something **incredible** is waiting to be known. ...The **important** thing is to not stop questioning.”*

Carl Sagan (Astronomer, Cosmologist, Astrophysicist, Astrobiologist.....and Scientist!)

Introduction

Science is an integral part of modern society. A working understanding of key scientific concepts coupled with an enthusiasm for the subject is important for every child and something that we are keen to foster within our federation of schools. The main areas for scientific study within our science curriculum will be determined by the updated National curriculum (September 2013).

Aims

- To develop pupils interest in, and enjoyment of all aspects of scientific study.
- To foster a deep intellectual curiosity regarding the scientific world through;
 - a.) Engaging units of work that are experiment led where possible.
 - b.) A knowledge of key scientific figures and concepts.
 - c.) An ability to ask scientific questions about concepts that interest them and think about how answers could be obtained.
 - d.) A knowledge of important scientists and an appreciation of why their breakthroughs are so important.
- To familiarise children with basic scientific vocabulary.
- To develop pupils’ practical scientific skills through experimentation and an introduction to concepts such as fair testing, formulating hypotheses, pilot studies and using control groups as they progress up the school.
- To ensure children receive a scientific education in line with the expectations of the National Curriculum. This will cover the breadth of the national curriculum, going into depth where possible, especially where children’s interest lie.

Key Principles of Teaching and Learning

Differentiation and Promoting a Love of Learning.

Science will be planned to ensure it is accessible and engaging for all pupils within the class-room. Work will be differentiated to support SEN pupils whilst being differentiated accordingly to allow all

pupils to challenge themselves at all ability levels. Children's interests within a scientific topic will be pursued and explored further wherever possible to foster children's enjoyment of science and emphasise the relevance of science as a key skill for everyday life. In addition to this, extra-curricular activities and trips will be organised, wherever possible, to foster an intellectual interest in science in general.

Depth and Balance

All staff will have a clear understanding of the scientific concepts being taught, with class teachers being able to respond to in depth questions regarding scientific concepts. Where this is not possible, teachers will collaborate, aide and assist with research. This will promote research skills, in depth scientific understanding and an investigative and inclusive ethos where children feel it is ok not to know the answers and delight in researching and understanding more challenging scientific ideas, alongside their peers and teachers.

Children will cover scientific concepts outlined for their year group by the National Curriculum using their interests, experiments and their research as a catalyst to promote in depth scientific understanding and enjoyment. Teachers will build on the 'Snap Science' scheme of work which provides a strong foundation for primary science in accordance with the new National Curriculum. This will ensure children are enthused and engaged and receive full coverage of the National Curriculum areas for their year group. The Snap Science scheme of work has been written by a team of primary science specialists, led by the Primary Science Quality Mark director Jane Turner and provides excellent and engaging coverage of the national curriculum's areas of study.

Key teaching principles

As a teaching team we feel 'snap science' aides us in developing a strong foundation of scientific understanding. It helps us with some of our key principles by;

- 1.) **Developing a 'spirit of enquiry'**- through practical investigations and research that will inspire all children.
- 2.) **Making tricky concepts meaningful for pupils**- It provides practical examples that scaffold and develop children's understanding of complex concepts (such as finding coloured string 'worms' on grass to develop children's understanding of natural selection and camouflage.) The scheme also provides 'real life' examples of more abstract or tricky concepts to allow the children to see the relevance of their newly gained scientific knowledge.
- 3.) **Providing clear progression and differentiation**- This allows children of all ability levels to be supported, enthused and challenged by the scientific concepts explored in lessons. This in turn helps all children to be supported and move forwards with their understanding in each session.

Cross-curricular links

Science has close links with a wide range of other subjects. As such it is important to emphasise this. Science almost always needs key literacy and numeracy skills. Within our school, we feel it is also key to highlight the fact that science often links itself closely to other academic disciplines. This may be through discussion, or using key literacy skills in report writing or numeracy skills in simple data analysis. This may also occur through multi-disciplinary topic based sessions, such as when looking at insulating materials when studying Inuit lifestyles.

Continuity and Progression

Foundation Stage- Foundation Stage children will investigate science through the Early Years Curriculum, specifically through the 'knowledge and understanding of the world' area of learning. At an early age we are keen to promote children's enthusiasm when it comes to science and showcase science as a multi-disciplinary subject area. Alongside this, we want children to view the subject as a discipline in which they can investigate and explore areas which they are interested in and view science as a means to sate their curiosity. Within the Forest Federation we are in a strong position to do this due to our topic based learning approach and our practitioners using children's interests to lead their exploration of the EYFS curriculum.

Key stage 1- Pupils within key stage 1 will be introduced to science through focused investigations, research and exploration of the world around them. These aspects will aim to inspire children and further fuel their enthusiasm for science, building on the strong foundations established in our foundation stage settings. Again, where possible children's interests within topic areas will be explored further, through a mixture of experimentation, observation and research. Children will gain an understanding of some key scientific concepts and will be able to experiment to explore these concepts further and see them in action with their own eyes. Children will also be introduced to some key scientists, where relevant to their area of study, as outlined by the National Curriculum. Pupils will also gain a basic understanding of key skills such as scientific report writing, interpreting data using basic graphs, fair testing and independent scientific experimentation and research as they progress through key stage 1.

Key stage 2- Within key stage 2 children will gain a greater breadth of scientific understanding, exploring new concepts such as genetics and inheritance in year 6. They will also gain a more in depth scientific understanding exploring concepts like forces, electricity, food chains and plants in more detail. KS2 students will also gain an understanding of key scientists and an appreciation of how they have furthered scientific understanding within the field they are looking at. Again scientific investigations and how a subject area is explored will be influenced by the children's interests allowing children to develop and subsequently sate their scientific curiosity, whilst developing a spirit of scientific enquiry. As children progress through KS2 they will gain key skills such as fair testing, numerical analysis of scientific results and report writing in more depth. They will also be introduced to new skills such as conducting pilot studies, control groups and formulating basic hypotheses. It is key to note children will also be given the chance to design their own experiments to explore scientific questions within KS2, thus developing the children as independent scientists in their own right.

Equal Opportunities

All children are entitled to access to the Science Curriculum in line with the schools policy for equal opportunities. Children who show a particular ability and flair for Science, who work more quickly through the levels of the National Curriculum are extended through the use of more challenging problems and investigations, whilst those that find science more challenging will be supported accordingly to ensure they enjoy the subject and gain an understanding of fundamental concepts.

Resources and Health and Safety

Central resources in Science are the responsibility of the Science coordinator and Class Teachers who need the resources. Science equipment will be audited annually. Consumables are replaced and discussions with staff determine if there are any other pieces of equipment required in order to enhance the teaching and learning of Science. All Science equipment is stored in containers kept in a secure and safe location in line with school policy. Children are encouraged to value and take care of

all equipment. Children are shown how to use equipment safely during all practical activities, whilst any risks predicted in experiments are assessed and planned for to eliminate them (for more severe risks) or make the risk minimal (for smaller potential incidents) for all involved.

Assessment

Formative assessment is used to guide the progress of individual pupils in Science. It involves identifying each child's progress in each area of the Science curriculum, determining what each child has learnt and what therefore should be the next stage in his/her learning. Teachers in the course of their teaching usually carry out formative assessment informally.

Tasks include:

- Small group discussions, usually in the context of a practical task.
- Specific arrangements for particular pupils.
- Individual discussions in which children are encouraged to approve their own work and progress.
- Marking of and next steps (in the form of an experiment, task or question) of children's work.

Summative assessment may take place at the end of each term and will take place at the end of each academic year, when a representation of the child's attainment is given. This assessment may be carried out through discussion and/or assessment sheets. At the end of Key Stage 2 science assessment may be carried out through SATs in accordance with the revised science curriculum and government policy. For Year 6 children this will consist of a formal written testing, in addition to teacher assessment.

Wherever possible experimental and investigative work should form the basis for the teaching of Science. Children should be given as many opportunities as possible to carry out investigations and experiments. During each term an investigation to assess children's skills when working scientifically should be carried out.

The Role of the Science Coordinator

The Science coordinator is to:

- Take the lead in policy development and the implementation of the Scheme of Work.
- Support colleagues in their development of work plans, and implementation of the Scheme of Work.
- Monitor the resources in Science and advise the Head Teacher of any action needed.
- Take responsibility for the purchase and organisation of central resources for Science.
- Keep up to date with developments in Science education and disseminate information to colleagues as appropriate.
- Monitor the teaching and learning of Science throughout the school.

Review

This policy will be reviewed in full at the end of the 2015/16 academic year by the Science Coordinator. It will also be looked at and amended in light of any changes to the Forest Federation, the National Curriculum or if another relevant reason should arise. Amendments and changes will be passed on to the senior leadership team for approval, and will be updated electronically within 2 working weeks.

Signed (science coordinator) _____ Date _____

Signed (Head teacher) _____ Date _____

Reviewed (science coordinator) _____ Date _____