

Highwood Primary School



*"Preparing today's children
for tomorrow's world"*

Science Policy

September 2014



1. INTRODUCTION

Science teaches an understanding of natural phenomena. It aims to stimulate a child's curiosity in finding out why things happen in the way they do. Since science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical and creative thought. Science changes as human understanding and experience changes. Through science, pupils understand how major scientific ideas contribute to technological change – impacting on industry, business and medicine and improving the quality of life. It is an ongoing process as our ideas about the world around us are constantly developed and revised. Through science children learn to question and discuss science based issues that may affect their own lives, the direction of society and the future of the world.

2. AIMS

The national curriculum for science aims to ensure that all pupils:

- develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics
- 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
- are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.

As a school we aim to:

- stimulate and excite pupils' curiosity about changes and events in the world and satisfy this curiosity with knowledge
- engage pupils as learners at many levels through linking ideas with practical experience
- help pupils to learn to question and discuss scientific issues that may affect their own lives
- help pupils develop, model and evaluate explanations through the scientific methods of collecting evidence using critical and creative thought
- show pupils how major scientific ideas contribute to technological change and how this impacts on improving the quality of our everyday lives
- help pupils recognise the cultural significance of science and trace its development

We aim that pupils will:

- ask and answer scientific questions
- plan and carry out scientific investigations, using equipment, including computers, correctly and safely
- 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
- evaluate evidence and present their conclusions clearly and accurately.

3. STATUTORY REQUIREMENTS

Statutory requirements for the teaching and learning of science are laid out in the Science sections of the National Curriculum in England Key Stages 1 and 2 Framework Document (2013) and in the Understanding the World (Specific Area) sections of the Statutory Framework for the Early Years Foundation Stage (2014).

In the Early Years Foundation Stage (Nursery and Reception) children are given opportunities to:

- become immersed in an environment rich in opportunities to explore how the world works
- encounter creatures, people, plants and objects in their natural environments and in real life situations
- learn to use a range of tools safely
- undertake practical 'experiments'
- work with a range of materials.

Understanding the world involves guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment.

By the end of the Reception year most children will:

- be able to talk about similarities and differences in relation to objects, materials and living things
- know about the features of their own immediate environment and how environments might vary from one another
- make observations of animals and plants and explain why some things occur
- be able to talk about changes

At Key Stage One (Years 1 and 2) pupils observe, explore and ask questions about living things, materials and physical processes. They begin to work together to collect evidence to help them answer questions and to link this to simple scientific ideas. They begin to evaluate evidence and consider whether tests or comparisons are fair. They use reference materials to find out more about scientific ideas. They share ideas and communicate them using scientific language, drawings, charts and tables with the help of ICT if it is appropriate.

By end of Key Stage 1 most children will be able to:

- explore the world around them and raise their own questions
- use different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions
- use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, begin to notice patterns and relationships
- ask people questions and use simple secondary sources to find answers
- use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out
- record and communicate their findings in a range of ways and begin to use simple scientific language

At Key Stage Two (Years 3-6) children learn about a wider range of living things, materials and physical processes. They make links between ideas and explain things using simple models and theories. They apply their knowledge and understanding of scientific ideas to familiar phenomena, everyday things as well as their personal health. They think about the 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. They use a range of reference sources in their work. They talk about their work and its significance, using a wide range of scientific language, conventional diagrams, charts, graphs and ICT to communicate their ideas.

By the end of Lower Key Stage 2 (Y3 and Y4) most children will be able to:

- explore, talk about and test ideas about everyday phenomena and the relationships between living things and familiar environments
- begin to develop their ideas about functions, relationships and interactions
- 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
- draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out
- read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

By the end of Upper Key Stage 2 (Y5 and Y6) most children will be able to:

- explore, talk about, test and develop their ideas
- ask their own questions about scientific phenomena
- analyse functions, relationships and interactions more systematically
- encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates
- recognise that scientific ideas change and develop over time
- 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
- 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
- read, spell and pronounce scientific vocabulary correctly.

4. SUBJECT ORGANISATION

Early Years Foundation Stage

In the EYFS children have opportunities to develop their understanding of the world on a daily basis in both adult led and child initiated activities indoors and outdoors. Children are encouraged to investigate and share their interests so that practitioners can plan and build in opportunities to extend the learning.

Key Stage 1 and Key Stage 2

In Key Stages 1 and 2 the curriculum topics and themes are based around the programmes of study as set out in the National Curriculum in England Key Stages 1 and 2 Framework Document (2013). As a core subject science forms the basis of many of the half termly themes and is visited weekly when it is not the central subject of a theme.

All lessons have clear learning objectives which are shared and reviewed with the pupils effectively. A variety of strategies, including questioning, discussion, concept mapping and marking, are used to assess progress. The information is used to identify what is taught next. Activities inspire the pupils to experiment and investigate the world around them and to help them raise their own questions such as "Why...?", "How...?" and "What happens if...?". Activities develop the skills of enquiry, observation, locating sources of information, selecting appropriate equipment and using it safely, measuring and checking results, making comparisons and communicating results and findings. Lessons make effective links with other curriculum areas and subjects, especially literacy, numeracy and ICT. Activities are challenging, motivating and extend pupils' learning. Pupils have frequent opportunities to develop their skills in, and take responsibility for, planning investigative work, selecting relevant resources, making decisions about sources of information, carrying out activities safely and deciding on the best form of communicating their findings.

All Key Stages make use of the extensive outside environments around the school to enhance the learning. The pond, wild flower area and numerous trees and open spaces provide a rich and stimulating environment to extend and enhance children's scientific learning.

5. THE CONTRIBUTION OF SCIENCE TO OTHER ASPECTS OF THE CURRICULUM

Literacy

In particular, at Key Stage 1, the pupils are encouraged to use their speaking and listening skills to describe what they see and explain what they are going to do next. With help they may record some of their findings. At Key Stage 2 the pupils are encouraged to develop their skills of writing to record their planning, what they observe and what they found out. In relation to science, they should be applying their literacy skills at levels similar to those which they are using in their English work.

Mathematics

At both key stages the pupils are expected to use their knowledge and understanding of measurement and data handling at appropriate levels. In science, they should be applying their numeracy skills at levels similar to those which they are using in their mathematics lessons.

Computing

At both key stages this involves the pupils using ICT to: locate and research information, record findings (using text, data and tables); log changes to the environment over time (sensing equipment); gain confidence in using equipment such as calculators, cameras, computers and I pads.

Spiritual Development

Spiritual development is encouraged through reminding pupils of the wonder of science and the effect of scientific discoveries on the modern world. Topical scientific issues are also discussed as appropriate.

Personal, Social and Health Education

Health education is taught as part of the units entitled 'Animals including Humans' across the school.

Other Foundation Areas

Science is linked to other curriculum subjects wherever appropriate e.g. researching the history of particular scientists or scientific concepts, exploring the environment in geography or using a science topic as a stimulus for an art or technology project.

6. PLANNING

The school uses the National Curriculum in England Key Stages 1 and 2 Framework Document (2013) and the Statutory Framework for the Early Years Foundation Stage (2014) as the basis of its curriculum (See Appendix below for an overview of topics from the programmes of study). Teachers adapt and develop them into teaching sequences suitable for classes or groups. We carry out our curriculum planning in science in two phases (long-term curriculum mapping and short term session plans). The long term planning tries to make links between areas of the curriculum so that the children experience a connected curriculum that gives science a purposeful setting.

The class teachers are responsible for writing the session plans for these lessons.

7. ASSESSMENT, RECORDING AND REPORTING

Assessments are made in line with the school assessment policy. Marking is in line with the school's policy.

Children are assessed at the end of their Reception Year using the Foundation Stage Profile and are formally assessed at the end of each Key Stage.

Teachers use assessment to ensure planning is based on prior attainment and that pupils know what they are to do to achieve the next step.

Parents are invited to discuss their child's progress twice a year and are sent an annual end of year report.

All pupils are expected to make 1 or 2 sub-levels (2- 4 APS points progress) each academic year. It is expected that pupils will achieve between levels 1 and 3 at the end of Key Stage 1 with the aim that most pupils will reach level 2b or above in science.

It is expected that pupils will achieve between levels 3 and 5 at the end of Key Stage 2 with the aim that most pupils will achieve level 4b or above in science.

8. MONITORING AND REVIEW

It is the responsibility of the class teachers, Phase Leaders, Global Dimensions Team, SLT and a Representative Governor to monitor the standards of children's work. The Global Dimensions Team monitors the quality of teaching in science and 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. Having identified priorities, the Global Dimensions Team constructs an action plan which forms part of the School Development Plan. This will form the basis for monitoring and will identify how this is to be implemented. Science is monitored in accordance with the school's monitoring policy.

9. INCLUSION

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. Opportunities are found for more able children to extend their understanding.

When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors or barriers to

learning: classroom organisation, teaching materials, teaching style, differentiation and the child – 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. 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 museum, we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils. More able pupils are planned for in line with our Inclusion Policy. This is supported by our Equal Opportunities Policy.

10. EQUAL OPPORTUNITIES

It will be ensured that equal opportunities in science are addressed as follows: pupils with special needs have equal access to the science curriculum through the use of differentiated learning strategies and tasks. These are based on individual needs. Specific teaching strategies are used to maximize access to the curriculum for pupils learning EAL.

11. PARENTAL/COMMUNITY INVOLVEMENT

We value parent involvement in children's development of science and promote a home school partnership in the following ways:

- Sharing information – newsletters, parent consultation evenings, Parentview meetings, parents' leaflets, email, reading diaries, home learning grids and books
- Celebrations – assemblies, school performances, displays, Open Evening, Monthly Book Looks
- Home Learning- half termly grids offer at least one science project to be carried out at home
- Parent helpers

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Appendix
New National Curriculum Map: Science

Term	Y1	Y2	Y3	Y4	Y5	Y6
Autumn 1	Animals including humans	Uses of everyday materials			Forces	Living things and their habitats-classification
Autumn 2		Animals including humans	Rocks	Animals including humans-digestive system, teeth, food chains	Animals including humans: Human life cycle	Animals including humans-functions of organs & health
Spring 1	Everyday Materials	Living things & their habitats	Animals including humans-nutrition & skeleton	Electricity	Properties and changes of materials	
Spring 2		Plants	Plants – growth & structure	Living things and their habitats-keys & environments		Evolution and inheritance
Summer 1	Plants		Forces & Magnets	Sound	Earth & space	Electricity
Summer 2	Seasonal Changes		Light	States of matter	Living things and their habitats-Animal life cycles	Light