Scraptoft Valley Primary School

Raising Standards
Teaching & Learning
Appendix AA
Science

Mission Statement

Working together to give every child an excellent education in a caring environment

Rationale

Science plays a crucial role in developing our understanding of the world around us. 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. Our science teaching helps us to prepare children for their life through experiences and exploration through the world in which they live in. Children can discover, explain and develop skills of enquiry through working scientifically.

Aims

This area of learning contributes to the achievement if the curriculum aims for all young people:

- To develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- To develop understanding of the nature, processes and methods of science through different types of science enquiries that helps them to answer scientific question about the world around them.
- To become equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

National Curriculum Coverage

Our school curriculum is developed from the National Curriculum 2014 and the EYFS Framework. The programmes of study describe a sequence of knowledge and concepts. Pupils should be able to describe associated processes and key characteristics in common language but they should also be familiar with and use technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important, but generally, they are taught most appropriately within the wider school curriculum. Teachers will use different contexts to maximise their pupils engagement with and motivation to study science.

1. Essential Knowledge

By the end of each key stage pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

2. Key Skills

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. Focus is on scientific enquiry so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing; and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

Key skills and all programmes of study will be delivered through topics covered in each Module.

3. Breadth of learning

Foundation Stage

Science in EYFS is embedded in the learning area 'Understanding of the World' and is delivered through a range of child-initiated, adult – initiated and adult directed activities in the indoor and outdoor learning environment. Pupils will have the opportunity to:

- Ask questions about why things happen.
- Investigate a wide range of objects/materials in the natural and man-made world.
- Learn about themselves and living things.
- Look closely at similarities/differences, pattern and change.
- Talk about their observations and sometimes record them.

Key Stage 1

Key skills

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions.

Year 1 Topics	**Year 2 Topics**
Plants	Living things and their habitats
Animals, including humans	Plants
Everyday materials	Animals, including humans
Seasonal changes	Uses of everyday materials

Lower Key Stage 2

Key Skills

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer
- them setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate,
- taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.

Year 3 Topics	**Year 4 Topics**
Plants	Living things and their habitats
Animals, including humans	Animals, including humans

Rocks
Light
Forces and magnets
States of matter
Sound
Electricity

Upper Key Stage 2

Key Skills

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- Identifying scientific evidence that has been used to support or refute ideas or arguments.

Year 5 Topics

Living things and their habitats
Animals, including humans
Properties and changes of materials
Earth and space
Forces

Year 6 Topics

Living things and their habitats
Animals, including humans
Evolution and inheritance
Light
Electricity

4. Curriculum Progression

KEY STAGE 1

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

LOWER KEY STAGE 2

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

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.

Cross-curricular studies

Children will have opportunities to develop their scientific skills through a range of subjects including Numeracy, Literacy, computing and non-core lessons.
All children will have opportunities to use computing in ways that will enhance their learning in science.

Planning

Teachers plan on a six week modular basis using the programmes of study.

- Long Term – Yearly module planning sheet
- Medium Term – Six week modular planning
- Short Term – Weekly planning sheet with other subjects including differentiation, assessment and evaluation.

Assessment and progression

Assessment for learning is continuous throughout the planning, teaching and learning cycle and is used to inform future planning. Children's ability to work scientifically will be assessed using a variety of methods:

- Observing children at work, individually, in pairs, in a group and in classes.
- Questioning, talking and listening to children.
- Considering work, materials, investigations produced by the children together with discussion with them.

Children's progress is continually monitored and tracked throughout their time at our school. Target Tracker will be used to assess children at the end of each programme of study. Assessment of Science within the school will be monitored by the Science Co-ordinator (see role of Co-ordinator).
Progress is recorded in children's books and in their Records of Achievement Folders.
Parents are provided with information on the progress of their children at Parents' Evening and Annual School Report at the end of each academic year.

Differentiation

Teachers will use a range of teaching and learning approaches and a variety of activities to engage and motivate pupils of all abilities. This process includes differentiation by:

- Adjusting tasks
- Providing different tasks
- Use of a wide range of resources/materials which are selected to meet pupils' needs
- Support offered to pupils
- The response to work and learning given by the teacher
- Appropriate grouping of children

Equal Opportunities

Access to learning experiences will be ensured for every child regardless of age, disability, gender, sexual orientation, nationality, race, religion, status or socio-economic background. This will be achieved by creating effective learning environments in which stereotypical views are challenged and pupils learn to appreciate and view positively differences in others. We will ensure that:

- all forms of bullying and harassment, including racial harassment, are challenged and dealt with appropriately
- there is differentiated work to support the learning of children of all abilities
- all children are encouraged to answer questions and take part in discussions by creating an atmosphere in which they feel secure
- there are good adult role models in school.

Inclusion

Every child at Scraptoft Valley Primary School has the right to be included in all learning opportunities. Although this may be explicit in Special Educational Needs (SEN) and Equal Opportunities Policies, our approach in any curriculum area is to prepare every child with the necessary skills, knowledge and attitudes to equip them for a positive role within society. Inclusion should create in every learner, self-confidence and self-esteem so they can facilitate their own development.

Special Educational Needs and Disability(SEND)

Science is a core subject within the National Curriculum, and each child at Scraptoft Valley Primary School regardless of age, race or gender has an entitlement to be taught at an appropriate level to fulfil their potential in this area.

Children are taught Science from the Foundation Stage onwards. Children with SEND are identified as early as possible and their needs addressed in accordance with the school's SEND Policy and with reference to the SEND Code of Practice.

Role of Co-ordinator

The Science Co-ordinator will:

- Maintain an overview of Science aims and objectives ensuring coverage of statutory requirements
- Ensure balance, continuity and progression within Science
- Review and monitor planning

- Monitor, evaluate and review the implementation of new initiatives to identify any INSET requirements and resource implications
- Provide help, ideas and support to address the needs of individual teachers and whole staff
- Maintain resources and give advice on their use with reference to the Health and Safety Policy

Resources

Science resources are located:

- Resource room in KS 2 – Teacher resources, pupil resources, materials, tools and equipment.
- Both Key Stage libraries.
- Design and Technology room – Materials, tools and equipment.

Health and Safety

- Children and staff are taught about Health and Safety issues and care of resources
- All Health and Safety issues will be in accordance with the School's Health and Safety policy

EQUALITY AND DIVERSITY STATEMENT

(Please refer to our Single Equality Policy and equality objectives)

As a school we welcome our duties under the Equality Act 2010. The general duties are to:

- eliminate discrimination,
- advance equality of opportunity
- foster good relations

We understand the principal of the act and the work needed to ensure that those with protected characteristics are not discriminated against and are given equality of opportunity.

A protected characteristic under the act covers the groups listed below:

- age (for employees only),
- disability
- race (includes ethnic or national origins, colour or nationality)
- gender (including issues of transgender)
- gender reassignment
- maternity and pregnancy
- religion and belief (includes lack of belief)
- sexual identity
- Marriage and Civil Partnership (for employees)

We also welcome our duty under the Education and Inspections Act 2006 to promote community cohesion.

We recognise that these duties reflect international human rights standards as expressed in the UN Convention on the Rights of the Child, the UN Convention on the Rights of People with Disabilities, and the Human Rights Act 1998.

In fulfilling our legal obligations we will:

- Recognise and respect diversity
- Foster positive attitudes and relationships, and a shared sense of belonging
- Observe good equalities practice, including staff recruitment, retention and development.
- Aim to reduce and remove existing inequalities and barriers.
- Consult and involve widely
- Strive to ensure that society will benefit

Review

This policy will be reviewed every three years or revised in the light of any new legislation.