

Eccleston Mere Primary School

Science Policy



Approved by: V. Atherton / R Mugan

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**Next review due
by:** January 2023

Introduction

At Eccleston Mere, our aim is for children to be active learners who feel confident and positive about their learning experience in Science, and who develop independence, determination and perseverance. Through the delivery of a high-quality curriculum, and carefully planned lessons, we aim to equip our children with the key skills required to increase their scientific knowledge and to develop their investigative skills.

Science stimulates and excites pupils' curiosity about phenomena and events in the world around them. It also satisfies this curiosity with knowledge. Because 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.

Through Science, pupils understand how major scientific ideas contribute to technological change – impacting on industry, business and medicine and improving quality of life. Pupils recognise the cultural significance of Science and trace its worldwide development. They learn to question and discuss Science-based issues that may affect their own lives, the direction of society and the future of the world.

Primary Science is an Aladdin's cave full of sparkling experiences and discoveries made by children as they learn through practical tasks. It is essentially about learning through practical activity and ultimately the children will be able to plan and execute their own investigations.

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

At Eccleston Mere School these aims are expanded as follows:

Knowledge and Understanding

Children should:

- be curious about things they observe, and experience and explore the world about them using all their senses
- use this experience to develop their understanding of key scientific ideas and make links between phenomena and experiences
- begin to think about models to represent things they cannot directly experience
- try to make sense of phenomena, seeking explanations and thinking critically about claims and ideas

Processes and Skills

Children should:

- acquire and refine the practical skills needed to investigate questions safely

- develop skills of predicting, asking questions, making inferences, concluding and evaluating based on evidence and understanding and use these skills in investigative work
- practise mathematical skills, eg. *drawing and interpreting graphs* in real contexts

Language and Communication

Children should:

- think creatively about Science and enjoy trying to make sense of phenomena
- develop language skills through talking about their work and presenting their own ideas using sustained and systematic writing of different kinds
- use scientific and mathematical language including technical vocabulary and conventions, and draw diagrams and charts to communicate scientific ideas
- read non-fiction and extract information from sources such as reference books and IT

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.

EYFS

The area of learning in the Foundation Stage that contains Science is called ‘Knowledge and Understanding of the World’. In this area of learning, children are developing the crucial knowledge, skills and understanding that help them to make sense of the world. This forms the foundation for later work in Science, as well as other subjects such as Geography and Computing.

By the end of the Foundation Stage at Eccleston Mere School, children will have had the opportunity to:

- solve problems, make decisions, experiment, predict, plan and question in a variety of contexts
- explore and find out about their environment, people and places that have significance in their lives

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.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1.

Lower key stage 2 – 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. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

Upper key stage 2 – 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. Pupils should read, spell and pronounce scientific vocabulary correctly.

Programmes of Study

Year 1 Plants, Animals including Humans, Everyday Materials and Seasonal Changes.

Year 2 Living things and their habitats, Plants, Animals including Humans and Uses of everyday materials

Year 3 Animals including Humans, Rocks, Plants, Light and Forces & Magnetism

Year 4 Living things and their habitats, Animals including Humans, States of Matter, Sound and Electricity

Year 5 Living things and their habitats, Animals including Humans, Properties and Changes of Materials, Earth and Space and Forces

Year 6 Living things and their habitats, Animals including Humans, Evolution and Inheritance, Light and Electricity

Working scientifically

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

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.

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 a 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

Computing

At Eccleston Mere Primary School, Computing is used to enhance the Science Curriculum. Computing helps pupils learn in Science by giving access to information and ways to measure and analyse variables. Methods of investigation and visualisation are increased and the collation of data is made easier. Computing in Science offers pupils new ways to communicate their findings.

Using Computing can help pupils to:

- access, select and interpret information
- recognise patterns, relationships and behaviours
- model, predict and hypothesise

- test reliability and accuracy
- review and modify their work to improve the quality
- communicate with others and present information
- evaluate their work
- improve efficiency
- be creative and take risks
- gain confidence and independence

Safety

In primary schools Science is very much and should be, an open-ended activity. It is impossible to predict all the problems which could occur. All lessons are highly supervised; however, in the unlikely event of an accident or other emergency, the school has a plan of action with which all members of staff are familiar. In the event of an accident, normal school policy will be adhered to. Best practice in Science is taken from 'Be Safe: Health & Safety in School Science & Technology for Teachers of 3-12 Year Olds' published by the Association of Science Education.

Evidencing

Work is evidenced in Science books and displays. Books are monitored each term by the subject lead and the SLT. Staff are given feedback on strengths and areas for development. This in turn feeds into the Subject Action Plan and the development plans for the school. Pupil voice provides additional evidence for the learning of Science.

Assessment

In Science, a pre-learning assessment takes place at the start of each topic to indicate focus areas which may take the form of a discussion or more formal task. A post-learning assessment is then used to identify progress made and any gaps that may need addressing. Along with Teacher assessment gathered during practical investigations, data is entered into the school's assessment system (FFT). Both of these are used to monitor progress and inform pupil progress meetings which identify children who need targeting for additional support within class or who need a more focused intervention.

Marking and Feedback

Work is marked according to the school marking policy. Where possible, this takes place during the lesson to give immediate feedback and to assess learning. All work should be marked as soon as possible after the lesson to identify any misconceptions that need addressing prior to the start of the next lesson. There should be opportunities for self and peer marking. Marking should include positive comments. If the lesson objective has been met, the 'I can' statement should be ticked. Where needed, teacher guidance should be given to address errors or misconceptions. These may be addressed at the start of the next lesson if appropriate.

SMSC/Cultural Capital/British Values

Through the Science curriculum at Eccleston Mere children are encouraged to:

- work both independently and with others, listening to others’ ideas and treating them with respect;
- develop respect for evidence and evaluate critically ideas which may or may not fit evidence available
- develop a respect for the environment and living things and for their own health and safety
- develop their cultural awareness and understanding and appreciate the value of difference and similarities;
- develop an understanding that all people are equal regardless of age, race, gender or ability and that there needs to be alternative solutions to meet the needs of individuals and groups of people.

Learning Environment

Children have access to a range of learning support resources in each classroom. These are age and learning need appropriate and children are encouraged to use them independently. Each classroom should have science working wall or display table, which includes key vocabulary, examples of methods and skills and topic related information. Challenge questions add interest and engagement.

Special events and Science

Within any one school year there are always many “special events” taking place at Eccleston Mere which impact upon the children’s learning in Science. The Science Week is one such event. During the year there are numerous visitors to school which also extend and enhance the children’s scientific learning.

Signed.....Member of the Governing Body

Signed.....Headteacher

Date of the next review: