



Science Policy

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Science Policy

The National Curriculum

Our strategic plan for teaching, learning and assessment states that we will 'promote even more opportunities for pupils to extend their learning through questioning, creativity and innovation'. We strive to enable each child to reach his or her potential academically by establishing an ethos of high expectations, with a strong emphasis on excellence and enjoyment and high quality teaching and learning of Science across the school.

Key skills, knowledge and understanding are taught according to the National Curriculum (2014). Working scientifically is taught through contexts taken from the science content in the programme of study for each year group.

The teaching of Science will be based on the investigation of the physical, chemical and biological aspects of the world we live in and beyond. It will rely on firsthand experiences and on other sources of information.

Statement of intent

To encourage children to progressively develop their understanding of the nature, processes and methods of Science by asking and answering questions about the physical and natural world through the five enquiry skills.

Aims for Science at Midfield

In our vision for primary science education, we aspire to cultivate a generation of curious minds and enthusiastic learners. Our approach centers around the development of essential enquiry skills that not only unlock the wonders of the natural world but also lay the foundation for a lifelong journey of discovery.

We envision a learning environment where students actively engage in hands-on investigations, ask thought-provoking questions, and collaborate to explore the marvels of science. By fostering a deep sense of curiosity, we aim to instill in each child a genuine passion for understanding the world around them.

Our commitment extends beyond rote memorisation; we strive to nurture critical thinking, problem-solving, and communication skills. Through the lens of scientific enquiry, students will develop the ability to analyse, interpret, and communicate their findings effectively. This empowers them not only as scientifically literate individuals but also as confident communicators in an ever-evolving world.

In embracing primary science with enquiry skills, we aim to bridge the gap between theoretical knowledge and real-world application. By integrating hands-on experiences, we seek to create an educational landscape that goes beyond textbooks, allowing students to make connections between science and their everyday lives.

As we embark on this educational journey, our vision is to inspire a new generation of scientists, engineers, and thinkers who are not only well-versed in scientific principles but are also equipped with the skills and mindset to contribute meaningfully to the global community. Together, we strive to cultivate a lifelong love for learning, curiosity, and a deep appreciation for the beauty of science in our students.

Aims for Early Years Foundation Stage (Year R)

At Foundation stage, Science is within the area of learning, 'Understanding the World' and in the sub-section 'The Natural World'.

Children's knowledge, skills and understanding are developed in areas that help them make sense of the world around them. This helps to create a foundation for later work in many other areas of the curriculum. They are:

Early Learning Goal (2023):

Children at the expected level of development will:

- Explore the natural world around them, making observations and drawing pictures of animals and plants;
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

The work carried out in the Foundation Stage is built upon in later study in Science and in other foundation subjects, for example Geography and ICT.

Aims for Key Stage 1 (Year 1 and 2)

During KS1, pupils observe, explore and ask questions about living things and materials. They begin to work together to collect and evaluate evidence to help them answer questions and to link this to simple scientific ideas. They use a range of reference materials to find out more about scientific ideas. They experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions.

Across the Key Stage, pupils will study:

- Seasonal change
- Plants
- Animals, including humans
- All living things and their habitats
- Everyday materials

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.

Aims for Key Stage 2 (Year 3, 4, 5 and 6)

During KS2, pupils learn about a wider range of living things, materials and phenomena. They begin to make links between ideas and to explain things using models and theories. They apply their knowledge and understanding of scientific ideas to familiar phenomena, everyday things and their personal health.

They begin to think about the positive and negative 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 wider range of reference sources in their work. They talk about their work and its significance, and communicate ideas using a range of scientific language, conventional diagrams, charts and graphs.

Across the Key Stage, pupils will study:

- Forces and magnets
- Light
- Rocks
- Animals, including humans
- Plants
- Sound
- States of Matter
- Electricity
- Earth and space
- Properties and changes of materials
- Evolution and inheritance

Working scientifically:

During years 3 and 4, pupils are taught to use the following practical scientific methods, processes and skills:

- 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 are taught to use the following practical scientific methods,

processes and skills:

- 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.

Curriculum and Organisation

Between 2021 and 2023, Midfield has been actively involved in the ENTHUSE Partnership, with a focus on raising the science capital for all our children, closing the gap with disadvantaged children, and, ultimately, leading to higher attainment in science and other STEM subjects (including technology and maths). Working with leaders in the field and other outstanding schools sharing best practice, this has led us to evolve our curriculum away from an off-the-shelf scheme to a tailored set of plans. The new planning, written in partnership with the other Trust Science Leads and Enthuse experts, ensures full coverage in line with the National Curriculum, progression of skills between year groups, effective assessment for learning (AfL) and the opportunity to identify and address misconceptions.

Each lesson starts with a quick quiz, to consolidate what the children already know. New vocabulary is introduced throughout the unit where children create actions to match the words to embed new topic-specific vocabulary. Cold and hot tasks are used across the topic to assess understanding and identify misconceptions, and the year's planning allows tricky topics to run over into the following term to ensure that children have sufficient time to fill any gaps and revisit areas as needed before moving on. There is a focus on hands-on investigation, working outside the classroom, explicit links to maths, and the use of talking points to encourage questioning support oracy skills. Children are confident with the core 'Working Scientifically Skills', and suggest which are the best approaches to answer their questions.

Knowledge Organisers are used to introduce each topic, explicitly outlining key knowledge and vocabulary. These are referenced across the topic and are a valuable reference for children and teachers.

Cross-Curriculum and ICT

Science in Years 1-6 is taught as a discrete subject with a focus on hands-on investigation, questioning and key vocabulary, but cross curricular links will be made to other subjects and topic themes where possible. Learning in Literacy and Mathematics are used to support a variety of science topics, providing good opportunities for speaking and listening, non-fiction reading and writing as well as opportunities for using weights and measuring, data collection and handling in Mathematics.

Children are encouraged to use ICT opportunities wherever appropriate, especially in

collecting, recording and presenting data and graphs, including the use of digital photography, word processing, data logging, data handling programs and the Internet.

Assessment

Formative assessment activities, such as the use of Big Questions and cold tasks, offer information on strengths or misconceptions, and these are used to inform the unit and to encourage children to consider the questions they have about the new topic. Learning is revised each lesson to ensure confidence and secure understanding through quizzing activities. Summative assessments may be included at the end of discrete lessons and at the end of the topic, e.g. in the form of hot tasks. The results are used to provide information to support yearly reports and parent discussions. Links to prior learning are made throughout the year and in future years to ensure there is a progression of skills and knowledge.

Inclusion and Differentiation

The study of Science is planned to give pupils a suitable range of differentiated activities appropriate to their age and abilities. Tasks will be set which challenge all pupils, including the most able.

● **Special Education Needs**

Where necessary, tasks will be adjusted or pupils with additional needs may be given extra support to enable them to access the curriculum as independent learners.

● **Greater depth**

Children who are working well above their expected level are given suitable challenges to allow them to think creatively and make links with other knowledge as well as develop their independent learning and enquiry skills.

● **Equal Opportunities**

Curriculum planning will ensure that all pupils have an equal opportunity to take part in all Science teaching regardless of gender, identity, cultural background or disability.

Health and Safety

At Midfield, we follow the guidelines as outlined by CLEAPSS through their website and telephone information service. During practical investigations in Science, health and safety is an important consideration and pupils are taught:

- about hazards, risks and risk control;
- to recognise hazards, assess consequent risks and take steps to control the risks to themselves and others;
- to manage their environment to ensure the health and safety of themselves and others;
- To explain the steps they take to control risks.

