



Learning Together

Mellor St Mary CE Primary School

Science Curriculum Statement 2020

Through our Christian Faith, we acknowledge our responsibility to all, to enrich lives and show love and respect within our school family.

We believe in lifelong learning aiming to equip our children to live life today and for tomorrow rooted in Christian love.

For with God nothing shall be impossible (Luke 1:37)

Mission:

Our school is the church on the hill; the light that brings Jesus into the lives of all in our community.

Upon this rock I will build my church (Matthew 16:18)

Intent:

The 2014 National Curriculum for Science aims to ensure that all children:

- 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 skills required to understand the uses and implications of science, today and for the future. We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this.

At Mellor St Mary we encourage children to be inquisitive throughout their time at the school and beyond. We aim to foster and develop our pupils' curiosity in the subject, whilst also helping them to fulfil their potential. Science encourages a healthy curiosity about our universe and promotes respect for the living and non-living.

We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Our children will acquire and develop key knowledge as well as the application of scientific skills. We ensure that the Working Scientifically skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings. Investigative work will include individual and collaborative learning experiences promoting a positive growth mind set, a sense of responsibility and challenges that take children beyond the classroom in-line with our whole school vision that 'with God nothing is impossible'.

Moreover, we aim to prepare our pupils for life in an increasingly scientific and technological world. We intend learning in science to be through systematic investigations of the physical, chemical and biological aspects of their lives that rely mainly on first hand experiences, leading to them being equipped to answer scientific questions about the world around them. It is our intention that, through investigative science, pupils at Mellor St. Mary Primary School will continue to deepen their respect for the natural world and all its phenomena and increase their care and appreciation of it.

Implementation:

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following:

Science will be taught in planned units and in most cases we combine the scientific study with work in other subject areas; at other times the children study science as a discrete subject. We appreciate the value of making cross curricular links where possible to enable the achievement of a greater depth of knowledge. At the start of each topic, teachers take time to find out what our children already understand and want to find out. Our teachers use this to adapt and extend the curriculum to match children's interests and needs, current events, the use of any support staff and the resources available.

Through our planning, we involve problem solving opportunities that allow children to find out for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons to aid understanding of

conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess children regularly to identify those children with any gaps in learning, so that these children can be supported.

We build upon the learning and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence. Wherever possible, teachers are encouraged to engage in real science research including investigations and collecting data (e.g for BBC Terrific Scientific and RSPB).

Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.

Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning when appropriate.

Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class. We particularly encourage visits from parents or community members with a science background to share their expertise and enhance learning.

Events, such as STEM week, Environment Week, Big Bird Watch or project days, allow pupils to come off-timetable, to provide broader provision and the acquisition and application of knowledge and skills. These events often involve families and the wider community.

Effective learning characteristics include: being curious; being adventurous; rich collaboration; and creating connections between topics. These will all drive effective teaching and learning in Science at Mellor St Mary.

The expected standard at the end of Key stage 1 are as follows:

Working scientifically

The pupil can, using appropriate scientific language from the national curriculum:

- ask their own questions about what they notice
- use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions: observing changes over

time, noticing patterns, grouping and classifying things, carrying out simple comparative tests and finding things out using secondary sources of information

- communicate their ideas, what they do and what they find out in a variety of ways.

Science content

- name and locate parts of the human body, including those related to the senses

and describe the importance of exercise, a balanced diet and hygiene for humans

- describe the basic needs of animals for survival and the main changes as young animals, including humans, grow into adults

- describe the basic needs of plants for survival and the impact of changing these and the main changes as seeds and bulbs grow into mature plants

- identify whether things are alive, dead or have never lived

- describe and compare the observable features of animals from a range of groups

- group animals according to what they eat [year 1], describe how animals get their food from other animals and/or from plants, and use simple food chains to describe these relationships

- describe seasonal changes

- name different plants and animals and describe how they are suited to different habitats

- distinguish objects from materials, describe their properties, identify and group everyday materials and compare their suitability for different uses.

The expected standard at the end of Key stage 2 are as follows:

Working scientifically

The pupil can, using appropriate scientific language from the national curriculum:

- describe and evaluate their own and others' scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources

- ask their own questions about the scientific phenomena that they are studying, and select the most appropriate ways to answer these questions, recognising and controlling variables where necessary (i.e. 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)

- use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate

- record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

- draw conclusions, explain and evaluate their methods and findings, communicating these in a variety of ways
- raise further questions that could be investigated, based on their data and observations.

Science content

- name and describe the functions of the main parts of the digestive [year 4], musculoskeletal and circulatory systems; and describe and compare different reproductive processes and life cycles in animals
 - describe the effects of diet, exercise, drugs and lifestyle on how the body functions
 - name, locate and describe the functions of the main parts of plants, including those involved in reproduction and transporting water and nutrients
 - use the observable features of plants, animals and micro-organisms to group, classify and identify them into broad groups, using keys or other methods
 - construct and interpret food chains
 - describe the requirements of plants for life and growth and explain how environmental changes may have an impact on living things
 - use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved ; and describe how fossils are formed and provide evidence for evolution
 - group and identify materials, including rocks , in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties
 - describe the characteristics of different states of matter and group materials on this basis; and describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle
 - identify and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components
 - identify, with reasons, whether changes in materials are reversible or not
 - use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects, and the formation, shape and size of shadows
 - use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard
 - describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source
 - describe the effects of simple forces that involve contact (air and water resistance, friction), that act at a distance (magnetic forces, including those between like and unlike magnetic poles), and gravity

- identify simple mechanisms, including levers, gears and pulleys, that increase the effect of a force
- use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams
- describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the sun across the sky in terms of the Earth's rotation and that this results in day and night

Impact

Our approach at Mellor St Mary results in a fun, engaging, high-quality science education, that provides children with the foundations and knowledge for understanding the world. Children learn through varied and first-hand experiences of the world around them and we try to use our school grounds and local environment as often as possible. Through various workshops, trips and interactions with experts, children have the understanding that science has changed our lives and that it is vital to the world's future prosperity.

Children learn about the possibilities for careers in science, as a result of our community links (e.g. With BAE) and connection with national agencies (e.g. STEM learning and STEM First) ensuring that children have access to positive role models within the field of science from the immediate and wider local community. Children at our school overwhelmingly enjoy science and this results in motivated learners with sound scientific understanding.

At the end of each key stage, our children will know, apply and understand the skills, knowledge and processes specified in the National Curriculum for science.

Our children will have a confident and valid set of science skills and knowledge supported by Christian values which can be used to not only further their education but help them in their life's journey. They will have learnt more, remembered more, enjoyed and developed creatively, spiritually, socially and emotionally, enabling them to be ready for the next stage of their education.