Moorsway Federation

Science

At the Moorsway Federation, being a good scientist means that our children are curious investigators, asking questions and persevere when digging deeper to understand the world around them. We want our children to be independent learners, critical thinkers and show passion for science that is relevant now and to their lives beyond school.

Intent:

At Moorsway Federation, we aim to ignite pupils' curiosity and encourage them to confidently explore and discover the world around them, so that they develop a deeper understanding of the world in which they live. A strong understanding of scientific principles is vital to the world's future prosperity and will enable children to flourish in a fast-paced and ever changing climate.

Through our practical and enjoyable curriculum, we aim to inspire and excite our children and foster a thirst for knowledge. In addition, the teaching of science will promote and develop transferable skills such as observation, communication and teamwork and allow mathematical skills to be applied.

We offer a rich and varied science curriculum filled with many opportunities for investigative skills and for children to pose their own questions. Our rolling programme (split into KS1, LKS2 and UKS2) is designed to ensure that prior knowledge is built upon within each block of learning, with an emphasis on children being able to pose their own questions. Key vocabulary is planned for in each block of science to equip children with the language that they need to explain and understand ideas and concepts. It is expected that the children use this specific vocabulary within their work and discussions. Alongside our rolling programme, teachers choose which strand of working scientifically they will focus on in each block of science to match the needs of their children and the subject knowledge. These are selected from our science progression of skills document and tracked to ensure coverage throughout the year.

Children at KS1 develop an understanding of the variance in plants and animals and what they need to survive and flourish. They study the materials in the natural world around them and begin to make conscious choices about which materials to use based on their scientific properties (e.g. durability or

strength) and whether or not they would be fit for purpose. Additionally, they observe and explain the changes in seasons and their effect on the environment and the various food chains within them.

As they move into KS2, the key knowledge and understanding children require widens with the breath of topics now covered. Each child explores how different rock types are formed and their uses, how and why animals have evolved over time, the differing states of matter and develop an understanding of space and the solar system. Throughout KS2, in every year group, the children gain a deeper understanding of the human body, focusing on a particular area of human anatomy via teeth, skeletal structure, the digestive system and reproduction and puberty. They also visit and then re-visit topics like 'Electricity' and 'Light' to ensure they build upon previous learning and in-depth knowledge in fundamental areas of the curriculum to then make a smooth transition into secondary schooling.

Implementation:

When teaching science, teachers ensure to 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. Vocabulary is taught throughout the block of work and revisited frequently to empower children to use this themselves. Through the progressive nature of our rolling programme, prior knowledge is built upon and misconceptions are addressed to ensure a secure understanding for all children.

Assessment: Elicitation tasks are carried out at the beginning of each topic to assess understanding and inform planning; both pupil and teacher assessment is carried out. The children complete a 'knowledge organiser quiz' at the start and the end of the sequence where they answer precise questions, allowing us to assess their subject knowledge. Assessment for learning is used continually throughout the block of work and precise questioning is used in class to test conceptual knowledge and allow us to adapt teaching to meet the needs of the pupils. The children are also given the opportunity to present their new knowledge at the end of the block of learning in a creative way. This may be through a presentation, information text or another strategy chosen by the teacher to meet the needs of the children.

At the end of the block of science, the teacher records those who are meeting, exceeding or below year group expectations; this is then passed on to the next teacher to inform future planning when a topic is taught again in a later year. https://www.ase.org.uk/plan can be used to support teacher assessment of pupils' learning with exemplifications of every topic in each year group. This may also be used to support moderation across the three schools in the federation.

Planning and resourcing: Teachers planning must match the rolling programme for science and show clearly where all learning intentions will be met. Teachers are able to source their own resources as appropriate using their professional judgement; we do not follow a scheme. However, it is important that teachers do not rely heavily on resources from websites such as twinkl as accuracy and curriculum matching is unreliable, and that resources chosen allow for secure understanding of key scientific concepts. The subject leader can be consulted at any time to assist with planning, resourcing or support with subject knowledge. The PLAN matrices https://www.ase.org.uk/resources/plan-matrices can be used to support planning in depth coverage of each objective, identifying key vocabulary for each topic and suggestions for further learning applications suitable for discovery learning.

The work in children's books will match closely with planning, with a clear learning objective linked to scientific learning and skills. Children will have the opportunity to record their ideas in a variety of ways and are expected to apply vocabulary taught within the topic.

Enquiry: Each topic covered must include working scientifically lessons which match the science progression of skills for the year group. Although each strand will be touched upon within each block of science, teachers will choose one aspect of working scientifically to focus on for each topic which will be covered in depth that meets the needs of their children and the topic.

Scientific enquiry should be question-led and (over the academic year) must include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing; and researching using secondary sources. Curiosity is celebrated within our classrooms where children are encouraged to ask their own questions and suggest ways to answer them using research and their scientific skills.

Timetabling: Science must be taught discretely each week. Curriculum content should not be blocked into intensive 'science days' or 'science week'. To meet the needs of our rolling programme, careful timetabling is essential to allow children to swap classes in order to be taught the appropriate content.

Impact:

Learners at Moorsway Federation are enthusiastic and passionate about science, asking questions to deepen their understanding. Throughout the school, learners are proactive and apply a range of investigative skills not only in science but to other aspects of the curriculum. They develop a detailed knowledge of the world in which they live and feel empowered to challenge and ask questions to

further their understanding. Progress is at least good with children showing a secure understanding of key concepts and it is clear where misconceptions have been addressed.

Our engagement with the local environment where appropriate to the topic ensures that children learn through varied and first-hand experiences of the world around them. Through workshops, trips and interactions with experts and local companies, children have the understanding that science has changed our lives and that it is vital to other world's future prosperity.

Science in the Early Years:

Science is explored through the children's understanding of the world and elements of technology. Our outdoor learning environment is key to enhancing child-led learning. We provide opportunities for children to question, wonder, explore, discover, experiment and observe through direct experiences. The children are introduced to scientific vocabulary to help them further their understanding and are asked open-ended questions so that they can make predictions and have opportunities to question. Our Early Years provision ensures that children have access to a range of materials that work in different ways for various purposes. Children can use resources and the environment around them to notice similarities and differences, changes over time such as growing plants in our vegetable patch and discuss their point of view with their peers.