Moorside Primary School and Nursery

Science Intent

Intent

At Moorside Primary School and Nursery we strive to ensure that all our children become confident and resilient scientists, proficient in problem solving and communicating effectively. In conjunction with the aims of the National Curriculum, our Science teaching offers opportunities for children to:

- 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;
- be equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.

Our Science intent is echoed through our **school vision**:

-A culture of success and achievement for all
-An aspirational and inspirational curriculum
-Strong relationships between the school, families, pupils and our community
-A whole school inclusive and nurturing ethos
-High expectations for all stakeholders, surrounding our children with the best educators and specialists

It is important that pupils make progress, and develop secure understanding of each key block of knowledge and concepts in line with their end of year expectations. At Moorside, our children will acquire and develop the key knowledge and vocabulary that has been identified within each unit of learning and across each year group, as well as within the application of scientific skills. This ensures that skills are built progressively from year to year.

In the Early Years, Science is taught through learning about ourselves and the world around us. 'Understanding of the World' and 'Health and Self-care' cover the main strands of science in the EYFS. Activities are planned to ensure the children have experiences to help them understand concepts, develop skills and glean understanding of the objectives set out in the Development Matters document at the appropriate stage for their age or level of development.

We aim to ensure that all children achieve the Early Learning Goals by the end of EYFS. The relevant Early Learning Goals are:

- Children know the importance for good health of physical exercise, **and a healthy diet, and talk about ways to keep healthy and safe.** They manage their own basic hygiene and personal needs successfully, including dressing and going to the toilet independently.

- Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.
- Exceeding - Children know that the environment and living things are influenced by human activity. They can describe some actions which people in their own community do that help to maintain the area they live in. They know the properties of some materials and can suggest some of the purposes they are used for. They are familiar with basic scientific concepts, such as floating, sinking, experimentation.

Children have weekly lessons in Science throughout Key Stage 1 and 2, using National Curriculum objectives and our progression document (including working scientifically skills), which ensures key skills and vocabulary are revisited and built upon throughout the year. All lessons begin with a recap of knowledge and vocabulary, focusing on our five finger facts. Lessons, where possible, are linked to our termly themes, to provide a creative scheme of work. All children at Moorside have access to Forest School lessons throughout the year. This rich opportunity in the outdoors allows children to have 'hands on' scientific experiences and interactions as part of their development as investigators and problem solvers. For example, materials, living things and their habitats and animals including humans. This provides a purpose for learning in our local area, which might be further developed independently through their own play and the Forest school provides a nurturing environment for children to question.

Our progression grid focuses on working scientifically, which is applied at the appropriate age and stage across the topic areas, which work on a two-year rolling programme. This allows children to revisit knowledge and skills to recap and develop throughout the primary phase.

Our curriculum strands of learning; people, environment, comparison and aspiration are most prominently linked through the following subject areas:

People:

Famous scientists, animals including humans, evolution and inheritance, seasonal changes.

Environment:

Evolution and inheritance, living things and their habitats, Earth and Space, plants, seasonal changes, light and sound.

Comparisons:

Comparisons are interwoven through the progressive skills in working scientifically: Research through secondary sources, observing over time, comparison and fair testing, identifying, classifying and grouping and pattern seeking.

We encourage the children to develop their understanding through the 'Working Scientifically' strand of the curriculum by using 5 Scientific Superheroes: (Roger research, Scrutin-eyes, Fair Flo, Commander Classify and Pattern Man) to give them a purpose for learning and support them to pose questions themselves. These superheroes are on display in each classroom.

Implementation

In ensuring high standards of teaching and learning in science at Moorside, we implement a curriculum that is progressive throughout the whole school. CPD is disseminated via the subject leader.

Planning for science is a process in which all teachers are involved, to ensure that the school gives full coverage of, 'The National Curriculum programmes of study for Science 2014' and, 'Understanding of the World' in the Early Years Foundation Stage. The Working Scientifically and knowledge objectives are taken from the National Curriculum and are written at the beginning of our MTP (Medium Term Planning) alongside the relevant North Yorkshire 'expected and beyond' statements which ensure greater depth is planned for. Planning also includes prior knowledge so staff can build on what children have learnt in previous years to ensure progression. Each lesson lists the 'Working Scientifically' skill to be covered and planning is supported by the knowledge matrices document from the 'PLANassessment' website. The Medium-Term Planning format ensures that cross curricular links are made to the termly theme with a specific focus on oracy and the acquisition of scientific language through reading. In most terms throughout the year, a key literacy text is linked to the area of science being taught, for example Wonder (Y5/6 Evolution and Inheritance), Orion and the dark (Y3/4 Light), The Street Beneath My Feet (Y3/4 Rocks and Soils), Wild (Y2 Animals and their Habitats), Beegu (Y1 Materials), Bog baby (Y1 Animals including Humans) and Mabel's Magic Garden (Y2 Plants). Reading puts the science topics into a context and inspires children to carry out further research because of their interest and aspiration to understand the subject area in depth. The texts provide a purpose for learning as well as a purpose for scientific writing across the curriculum, which enables pupils to apply their science vocabulary and literacy skills.

Our science is planned around a two-year cycle and teachers work together to ensure skills are built upon from year to year, which ensures progression. As the children's knowledge and understanding develops, 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. Knowledge is acquired, revisited and embedded through the reinforcement of the 'five finger facts', which are emphasised throughout each science topic. At the start of a topic the children's prior knowledge is assessed using the progression document and the PLAN knowledge matrices to ensure the correct starting point. The children are then re assessed at the end of each topic.

Each year we celebrate 'Science Week', where children have the opportunity to investigate problems, learn how science works and discover why science matters in the world. This gives children a chance to apply their knowledge and skills in fun and practical ways. Where possible, we invite specialists into school, such as 'Science Boffins'. Trips are offered to compliment the curriculum, often linking with science, for example, a visit to Eureka museum. These provide a deeper learning experience and brings further purpose to learning and knowledge acquisition in school.

Each class has a science working wall, which is up to date with the current topic. All working walls include the relevant subject specific vocabulary, which is shared with the children at the start of every lesson. Working walls are added to as the topic progresses, which demonstrates the developing knowledge and understanding of the children. In line with the Using and Applying part of the curriculum, each working wall has a set of the characters or 'superheroes.' and children use them when developing a scientific approach themselves as they encounter problems or questions to investigate.

Moorside has a Stem club after school each week, which is extremely popular, providing children with an extra-curricular opportunity to explore and investigate science in the world around us, which ultimately further enriches learning.

Impact

We measure the impact of our science teaching and learning half termly, to ensure that children not only acquire the appropriate age-related knowledge linked to the science curriculum, but also skills which equip them to progress from their starting points. Tools and strategies that we use are, assessment of five finger facts, outcomes in books and lessons and mini assessment tasks, as well as observations. This is

logged on Target Tracker so that gaps are identified and children are targeted for scaffolded support through Wave 1 teaching, to develop and embed the intended knowledge and skills.
Progress is measured by the % children working at the expected standard and above in each year group and comparative data provides information about different pupil groups and whether their progress and outcomes is in line with Reading, Writing and Maths.

Teachers have been introduced to the Association for Science Education website, which enables them to have a clearer understanding of National Curriculum expectations. The 'ASE' website contains annotated collections of children's work, providing examples of what working at the expected standard for primary science might look like for the knowledge and conceptual understanding statements of the programmes of study (POS). This allows teachers to be confident in their judgements. At Moorside we use North Yorkshire's 'Expected and Beyond' document which allows staff to understand what 'greater depth' looks like. This is referred to on our planning documents, so we can evidence knowledge and understanding at greater depth. The intended impact is that children are equipped with the knowledge and skills to build on their learning beyond Key Stage 2 and understand scientific concepts within their everyday lives.

Providing a purposeful catch up curriculum in Science

As part of our offer for remote learning, our children were exposed to a range of Science topics. The topics linked with those in our long-term plan and guidance and resources were provided through learning packs. Some lessons required teacher input and Class Teachers delivered zoom sessions to explain and teach in greater depth. Class Teachers also took part in online learning (CPD) to ensure they were up to date with subject knowledge and assessment as well as developing enquiry and working scientifically. As part of our Covid recovery curriculum, we continue to offer a balanced curriculum and have reviewed our planning to include the recommendations from the guidance from the DfE in July 2021, 'Teaching a Brad and Balanced Curriculum for Education Recovery
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1003469/Teaching_a_broad_and_balanced_curriculum_for_education_recovery.pdf

The specific guidance from this document for Science is,

The first step in adjusting the science curriculum is to identify the content in biology, chemistry and physics that is most important for enabling pupils to build up their knowledge of key scientific concepts.

At key stage 1: • an example of content which will support future study is knowledge about herbivores because it allows pupils to learn about food chains in key stage 2. This, in turn, enables them to understand ecosystems in key stages 3 and 4.

At key stage 2: • concepts that are beneficial to future study include, but are not limited to, forces, electricity, magnetism, materials and substance, reactions, nutrition, evolution and inheritance, ecosystems, properties and changes of materials.

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