Much Marcle CE PRIMARY SCHOOL

Policy for Science

Reviewed and Updated: September 2024

Date for Review: September 2027

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This policy should be read in conjunction with the following school policies:

- Assessment Policy
- Marking and Feedback Policy
- Equalities Policy
- SEND Policy
- Homework Policy

What Science looks like at Much Marcle C of E Primary School.

As with all of our subjects, within the science curriculum our drivers are at the heart of everything we do. Through our science lessons we promote:

1. Perseverance

2. Confident Communicators

3. Healthy Body, Healthy Mind

4. World Citizens

At Much Marcle our intent for science education is to ignite a lifelong curiosity about the natural world and to equip our pupils with the skills, knowledge, and understanding necessary to engage in scientific inquiry. We aim to foster critical thinking, creativity, and resilience in our learners, enabling them to ask questions, hypothesise, and draw conclusions based on evidence.

Our science curriculum is designed to be broad and balanced, ensuring that all key concepts across the disciplines of biology, chemistry, and physics are covered. We recognise the importance of relevance and context; therefore, we strive to connect scientific learning to real-world applications and the immediate environment of our pupils. This approach not only enhances their engagement but also illustrates the significance of science in everyday life and potential career paths.

Intent – What are we trying to achieve?

- Children become confident, competent and independent scientists
- Develop children's ability to articulate, discuss and explain their thinking using appropriate scientific vocabulary
- 'Mistake friendly' classrooms where children see mistakes as learning tools – there is an emphasis placed upon developing the power to 'think' rather than just the 'do'
- Children develop into resilient and inquisitive learners – skills needed to become life-long scientists

- Deliver an inspiring and engaging science curriculum, taught by highly-enthusiastic staff, which sparks curiosity and excitement and which nurtures confidence in science
- Children develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Children 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
- Children 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.

Implementation – How is our vision translated into practice?

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science.

In order to meet our aims above and the requirements set out in the EYFS framework and the Primary National Curriculum, we will implement the following:

EYFS

Play underpins the delivery of all the EYFS. In playing, children behave in different ways: sometimes within their play, they may describe and discuss what they are doing and may be more reflective as they play. Within a secure and challenging environment with effective support, children can explore, develop and experiment as they play to help them make sense of the world. The EYFS strand 'Understanding the World' leads directly to scientific elements of the curriculum and leads to more formalised Science learning in KS1 and then KS2.

Lesson Planning

Science will be taught in planned and arranged topic blocks by the class teacher. Through our planning, we involve problem solving opportunities that allow children to apply their knowledge, and find out answers 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. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning.
We build upon the knowledge 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.
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.
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 and workshops with experts.
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.
Regular events, such as Science Week or project days allow all pupils to come off-timetable, to provide broader provision and the acquisition and application of knowledge and skills.

Classrooms

All classrooms have a science working wall. This displays the unit theme, the scientific vocabulary (which is updated and referred to during the lesson), the common, corrected Marvellous Mistakes that have been made by the children (See Marvellous Mistakes in Lesson Structure), and examples of key learning from each lesson.

Lesson Structure

Each lesson will follow a specific structure

- Elicitation task (Only at the beginning of a unit)
- Flashback 4
- Teacher input – (using a range of resources from agreed schemes)
- Independent application/ investigation
- Plenary

Teaching Strategies

- Ping Pong method
- My Turn Your Turn
- Reasoning embedded throughout
- All children work towards same learning objective with differing levels of support
- Learning partners
- Stem sentences

Elicitation tasks - At the beginning of a unit of work, the children complete an elicitation task in pencil. This provides the teacher with evidence of each child's understanding at the start of a sequence, indicating gaps and misconceptions. The teacher or TA may scribe for those not yet able to record their scientifc thinking.

Ping Pong – The teacher orchestrates a continuous back and forth dialogue with the children using questions, shorts task, explanations, demonstrations and discussions. This enables the teacher to vary the pace and the direction of the lesson if necessary and to continuously monitor the progress of the class.

Differentiation – Children are taught as a whole class and each child is given access to the same lesson content. Appropriate support is available for any child who might need it and there are opportunities to deepen learning through the provision of more challenging activities. No assumptions are made before the lesson about which children might need more support nor which ones will likely move on to the more difficult tasks.

Conceptual variation - Children are presented with carefully chosen examples and non-examples. Children are given time to think and discuss with their classmates and the teacher supports the class to listen to each other's ideas, to agree and disagree and to improve until we reach a consensus.

Questions - Teachers use questioning throughout every lesson to check understanding and to challenge thinking. A variety of questions are used such as:

Explain how you know? Why is that correct? Why is that incorrect? Can you prove it? Are you sure? What's the same/different about? Can you explain that? What does your partner think? What do you notice? Where have you seen this before? What do you already know about this?

Children are expected to listen to each other's responses and may be asked to explain someone else's ideas in their own words, or if they agree/disagree etc. All responses are collected by the teacher and recorded on the board. Children are then given time to self-correct, notice mistakes and prove that their response was correct, before the correct answer is agreed upon. Children are also encouraged to ask their own questions

Stem Sentences and Scientific Vocabulary- Generic Stem sentence starters are displayed around the interactive whiteboard to encourage responses to be in full sentences. Topic specific Stem sentences are displayed on the Working Wall. All Stem sentences are modelled by teachers and are used by the children to help make sense of the structure of science.

Reasoning – Staff facilitate scientific thinking through their careful planning of open-ended, low threshold/high ceiling activities. Children who require extra scaffolding are guided through the reasoning by a teacher or TA and specific questions are chosen for the children to focus on, to allow for them to really explore and understand the questions. Children use the language of reasoning (which is

displayed in each classroom or in books) when talking about science, challenging each other and the adults in their class as well as justifying their thinking.

Marvellous Mistakes (MM) - The children are encouraged to experiment with science. As part of this, taking risks is encouraged and therefore mistakes are inevitable. MMs are celebrated and the children are encouraged to identify why the mistake was made, how they can learn from it and what they can do to overcome it. Some MMs are shared with groups or the whole class as a learning point for all children. Common MMs are recorded on the science working wall. You may see MM written next to an incorrect answer in a child's book and the child will be expected to correct the mistake as well as explaining what they did wrong.

Marking – Marking in science follows the schools marking policy.

Assessment - Throughout the school, teachers will assess whether children are working at/above or below the expected level for their age based on their understanding and application of the content of the National Curriculum 2014. Teachers will use the statements on ScholarPack to record and support them to make an overall judgement of children's scientific ability. Progress and attainment is reported to parents through parents' evenings and end of year reports.

SEND pupils – may be supported by additional adults, different resources or differentiated activities. They may also complete additional activities outside of the science lesson. NB: We do not label our children. We have high expectations of all children and strongly believe that all children are equally able to learn science. Some may take longer to grasp concepts and may need careful scaffolding or extra time/support (guided groups, same day catch-up, additional homework, pre-teaching, intervention groups etc), but when concepts are presented in the right way all children can learn.

Challenge – Within each mixed age class, the same objective and activity is taught to all children. Higher ability and higher age group children are challenged using effective questioning (this could be written or verbal), by providing support to their learning partner and through extension questions that deepen their understanding. In science the lower year group should be extended with the challenge question and the higher year group should be extended with the next step question.

Impact – What is the impact of our curriculum?

The successful approach at Much Marcle results in a fun, engaging, high-quality science education, that provides children with the foundations and knowledge for understanding the world. Our engagement with the local environment ensures that children learn through varied and first-hand experiences of the world around them. Frequent, continuous and progressive learning outside the classroom is embedded throughout the science curriculum. 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. From this exposure, all children feel they are scientists and capable of achieving. Children at Much Marcle enjoy science and this results in motivated learners.

Role of the Subject Leader

1. Ensure teachers understand the requirements of the National Curriculum and support them with lesson planning ideas.

2. Lead by example by setting high standards in their own teaching.

3. Lead and signposts CPD opportunities.

4. Lead the whole school monitoring and evaluation of teaching and learning in science by observing lessons, modelling lessons, analysing data, conducting book scrutiny and engaging in pupil conferencing.

5. Take responsibility for managing own professional development by participating in external training, private study, engagement in educational research and reading.

6. Keep parents/carers informed about scientific issues.

7. Keep the school policy for science under regular review.

8. To work closely with the Headteacher / SLT to further develop and monitor the teaching science.

9. Work with the Herefordshire Science Hub to enhance our curriculum for the children at Much Marcle.

Monitoring and Evaluation Monitoring and evaluation will be carried out by:

- Headteacher
- Science Subject Leader
- External advisors
- Colleagues from other schools

The monitoring of progress is against age related expectations so that pupils falling behind or exceeding targets are swiftly identified and intervention is then provided.

Classroom Observations

The Headteacher, Science Subject Leader and colleagues are responsible for classroom observations and feedback to teachers, to provide professional development and develop further outstanding teaching and learning.

CPD and Staff Development

Professional discussion regularly takes place within staff meetings on the teaching of science to enable confident scientists. The Science Subject Leader will regularly liaise with the Herefordshire Science Hub and keep abreast of developments and opportunities within science community