



Leominster Primary School

The Intent, Implementation and Impact of our Science Curriculum

INTENT

At Leominster Primary School it is our intention that every pupil, irrelevant of needs, develops such a passion for science that they harness their natural excitement and curiosity and in turn this aspires them to pursue scientific enquiry. We wish that every child is excited by scientific ideas and wants to learn to explain and analyse phenomena, make predictions and solve problems. We encourage children to be inquisitive throughout their time at the school and beyond. The Science curriculum fosters a healthy curiosity in children 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. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group, 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.

In conjunction with the aims of the National Curriculum, our Science teaching offers opportunities for all 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 curriculum is well structured and sequenced to enable knowledge and skills to be revisited throughout the school. Prior learning, future learning and key vocabulary are clearly identified within our Progression of Skills document. Where possible links are made to our themed topics e.g. 'Where has it gone?' topic in year 5 strongly links with 'Properties and Changes of Materials'. In order to raise curiosity we encourage lessons to be driven through a 'key question' linked to the relevant learning objective.

We aim to provide all children with a practically led curriculum, driven through the essential scientific enquiry skills to deepen their scientific knowledge. Our main emphasis is to develop children's independence when 'Working scientifically'. By the end of Key Stage 2 we aim that children will be able to:

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs



- use test results to make predictions to set up further comparative and fair tests
- report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- identify scientific evidence that has been used to support or refute ideas or arguments.

We aim to address all needs and we deliver the science curriculum to all pupils including SEND and EAL through a broad and balanced approach. Where possible, children will be supported with word banks and additional writing frames to support their learning. We encourage a range of ways for children to record their verbal responses (diagrams, talking tins, photographic etc).

Children have weekly lessons in Science throughout Key Stage 1 and 2, using various programmes of study and resources. In Early years, science is taught through the children learning about the world around them in their learning through play.

We ensure that all children, especially those disadvantaged, have engaging opportunities within science, to enable them to achieve their full potential. Examples of enrichment activities have included: The Explorer Dome, Science fairs in school and educational visits linked to the science curriculum, such as visits to Bodenham lakes and Waterworks Museum, Hereford, Madley Environmental Centre, EMC link (High school) Techniquet. Tropical Inc Farm Day hatching chickens, tadpoles. Where possible we encourage outdoor learning within our wonderful school grounds and garden.

We endeavour to ensure that the Science curriculum we provide will give children the confidence and motivation to continue to further develop their skills into the next stage of their education and life experiences.

IMPLEMENTATION

Our skills based progression allows for teachers to be clear of end goals, build on what has been taught previously and ensure complete coverage of the curriculum. Knowledge and understanding (substantive knowledge) is taught in blocks of work/topics, aiming with a new topic each term/half term. Working scientifically (disciplinary knowledge) is integrally taught within all lessons. We teach concepts and skills through key questions. There are opportunities each term for children to develop their investigative skills focusing on different aspects of enquiry. Where possible links are made with other subjects to enrich learning. We will incorporate the use of technology where appropriate. Lessons are to be practically led as much as possible. Teachers use TAs to help support children when needed. Pre-teaching of scientific vocabulary at the start of each topic is encouraged, so it can be used in the following lessons. Children are provided with a range of engaging resources to enable the children to carry out fun and exciting experiments to deepen their learning and develop their understanding of the concept that is being taught. We ensure that there are opportunities for paired, group and class discussion/debate to consolidate learning.

Teachers plan a series of differentiated lessons, adapted to build on areas previously taught in other year groups that show progression. Pupils will be engaged through the use of engaging resources and use of media to carry out practical sessions. Coordinators organise a whole school Science day/Fair (generally to



coincide with British Science Week) once a year, where we provide opportunities for children to be further inspired into STEM. Through these events, children are made aware of a range of influential scientists. We support, encourage, foster and nurture a love of Science by inviting local experts to engage, motivate and inspire the children (Science Show, Wye Valley falconry, farmers, fire service, Trevor Hill animal experience).

Children are supported through a range of ways: Extra time may be given for learning vocabulary for EAL and SEN pupils in order for them to join in with discussion. Work may be differentiated so that all children can meet the Learning Objectives. Experiment resources will be checked to ensure they are safe and can be used with the children.

Children are challenged in a variety of ways: Work may be differentiated to give certain children a further challenge. Questions can be asked to children to further their individual knowledge and work on the extra information they may know. Children to be given leading roles during team activities and experiments. Homework challenges/competitions encourage families to engage with learning.

We ensure that all children can access the curriculum through: Providing children who have SEN or EAL needs with access to science vocabulary word banks prior to/at the start of the topic. Seating children alongside good role models to support one another. Providing visual/practical prompts. Teaching lessons using a range of different techniques to appeal to different learning styles e.g. videos, drama, artefacts, texts etc.

IMPACT

We measure impact through:

- Knowledge and understanding (physics, chemistry and biology) assessed and tracked at the end of each topic
- Working scientifically is continually assessed within lessons and tracked within y1&2, y3&4, y5&6
- Prior understanding assessed before teaching topics (through a range of quick quizzes...STEM/Rising Stars, mind maps, KWL grids etc) then again assessed at end of topics.

Observation of teaching and learning show:

- Teachers have a good level of subject knowledge
- Confident children developing their independence in their learning, often posing their own questions and hypothesis for investigation (Y5&6)
- Marking and feedback- encourages 'deeper' thinking for greater depth understanding
- Formative assessment through questioning during lessons and investigations
- Confident and curious children who can eagerly talk about their science lessons and discoveries they have made
- Children are able to use and explain the meaning of scientific vocabulary
- Teachers use a range of questioning to explore children's understanding



- Children are keen to complete challenging 'science' related homework tasks
- Children's misconceptions are addressed through oral and written feedback
- Children are prepared to take risks