

Science Policy

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Science Vision and Intent

At Meadlands, we deliver a high-quality science education, providing the foundations for understanding the world. Science teaches an understanding of natural phenomena. It aims to stimulate a child's curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate creative thought. Children learn to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national, and global level. We encourage children to recognise the power of rational explanation and develop a sense of excitement and understanding of how science can be used to explain what is occurring, predict how things will behave, and analyse causes.
At Meadlands we teach science through 'hands on' investigations and utilize our award winning outdoors as much as possible. We focus on providing the children with key knowledge and concepts at each key stage, including scientific skills and specific terminology. We address misconceptions as they arise, through fair testing, research and experimentation. This policy outlines the purpose, nature and management of the science taught at Meadlands.

We live in an increasingly scientific and technological age where children need to acquire the knowledge, skills and understanding to prepare them for life in the 21st century. Through the framework of the National Curriculum 2014, science aims to:

- To stimulate children's interest and enjoyment in the area of science
- Equip children to use themselves as starting points for learning about science, and to build on their enthusiasm and natural sense of wonder about the world.
- Develop through practical work the skills of observation, prediction, investigation, interpretation, communication, questioning and hypothesising, and increased use of precise measurement skills and ICT.
- Encourage and enable pupils to offer their own suggestions, and to be creative in their approach to science, and to gain enjoyment from their scientific work.
- Enable children to develop their skills of co-operation through working with others, and to encourage where possible, ways for children to explore science in forms which are relevant and meaningful to them.
- Encourage children to collect relevant evidence and to question outcome and to persevere.
- To encourage children to raise questions and learn how to investigate and explore these using both first-hand experience and secondary sources.
- To help children understand the nature of scientific ideas and to obtain and test the evidence for them.
- To help children recognise and assess risks and hazards to themselves and to others when working with living things and materials and to take action to control them.
- To acquire a body of scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- To ensure that every child enjoys a sense of awe and wonder of the natural and man-made world and understand the need to treat them with care, respect and sensitivity.
- To make good use of the school grounds and habitats and foster links with the wider community and places of scientific interest
- To ensure that all of our children are equipped with the scientific knowledge required to understand the use and implications of science, today and for the future

The school adopts school-wide *Principles for Teaching and Learning Science,* which have been created through an amalgamation of contributions from governors, staff, parents and pupils, and are displayed in each classroom.

Links to our school intent

Language

- Vocabulary is carefully selected for each unit and included on the Knowledge Organiser and in children's books in KS2 where children have to write definitions for key terminology.
- Vocabulary is included on class displays.
- Vocabulary spotlight slides investigate the etymology of key words.

Memory

- Rich experiences planned for each unit encourage more information to pass into the children's long-term memory.
- Making connections to other subjects and to the children's own lives also encourages memories to be stored.
- Recap activities to assess what children have retained. These are planned within the unit and once the unit has concluded.
- End of unit assessments are used not only to assess learning but also to support long-term memory.

Wellbeing

- Studying science offers opportunities for discussion, debates, exploration and discovery which promotes a sense of fun and fulfilment.
- Carrying out investigations using science resources supports the understanding of key concepts.
- Science offers opportunities for extracurricular experiences such as trips and visits.
- Science is about all of us and as such is inclusive in its very nature.

Implementation

Science is a core subject in the National Curriculum 2014. All the children will be given the opportunity to cover the programmes of study for KS1 and KS2 within the Science curriculum taught at Meadlands. Pupils are also given ample opportunity to use literacy and mathematics skills within science lessons, taking a cross curricular approach. They are also taught key features of scientific enquiry, so that they may learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources.

Planning

We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Through the Programmes of Study in the Science National Curriculum 2014, children will acquire and develop these skills throughout their Primary years.

We believe that science promotes communication in a specific and precise language involving mathematical and logical thinking. It allows children to develop ways of finding out for themselves and gives them practice in problem solving.

In science, pupils are encouraged to be open-minded and to try and make sense of what they see and find out. Where possible Science skills are taught and developed through cross curricular and topic links. At Meadlands we recognise the importance of children finding things out for themselves

and developing skills. Each topic starts with a re-cap of prior knowledge which may take the form of a concept cartoon, and a vocabulary list. Each lesson is taught with two learning challenges. One with be knowledge based, and the other will challenge children to learn skills to allow them to 'work scientifically'. We aim to explore each objective in an investigative way where possible.

Foundation Stage: Children in Nursery and Reception classes will access Science through The Early Years Foundation Stage curriculum. In the foundation stage, children are encouraged to explore scientific ideas which draw attention to the world around them. The foundation stage is taught through the Specific areas of learning; Understanding of the World, Technology and People and Communities. The children will be guided to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment. Meadlands aims to create a scientific learning environment that encourages the children to explore and question. We teach Science in the EYFS as an integral part of the topic work covered during the year.

KS1 and KS2: At Meadlands, teachers devise medium term plans based on the national curriculum. Teachers include key knowledge and skills, as well as cross-curricular links, vocabulary, retrieval opportunities and key questions.

When planning science teachers include:

- Planned experimental work, obtaining, considering and presenting evidence.
- Written investigations to follow: Prediction, Method, Diagram, Results, Conclusion.
- Scientific enquiry comprising of observations over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing and research using secondary sources.
- Use of ICT where appropriate.
- Opportunities to draw conclusions and evaluate their work.
- Taking part in investigative activities both in the local and wider environment.
- Undertake trips and visits where appropriate.

Planning comprises:
Knowledge Organisers
Mid-term planning: to detail a sequence of lessons, knowledge, skills (working scientifically), key vocabulary, key questions, cross curricular links, investigations.
Slide planning: to include pink slides to address misconceptions, re-cap and retrieval opportunities, vocabulary.

See curriculum map for science topics.
Science has strong links with other curriculum areas such as Computing (through communication and data handling), Literacy (through reading and recording), Numeracy (through data handling and measures) and D.T (through application of scientific principles). We aim to inform children of these links, highlighting them in the course of their everyday lives. Teachers will be committed to linking the children's learning in science to other curricular areas. Speaking and listening will be actively promoted during scientific investigations.

Oracy

- Lessons are devised and structured to provide ample time for pupils to discuss their predictions, findings and observations
- Pupils are given regular opportunities to work in groups. Within these groups, they are able to plan investigations, make predictions and conjectures, and discuss their findings

- Each lesson will be structured to include open questioning, which in turn promotes discussion and debate
- Pupils are encouraged to speak about their personal experiences of scientific phenomena

Resources

Every effort is made to ensure that adequate resources are readily available and accessible to both pupils and staff. Resources are stored in the science cupboard, and organised by topic. It is the responsibility of both staff and pupils to ensure that the resources are used appropriately and remain in good condition. It is the responsibility of the Science Co-ordinator to audit the resources on a regular basis and order new resources when necessary to ensure that the school is fully equipped. Children will have access to resources, within health and safety limitations, which they will be taught to use with respect. The outdoors are a key resources at Meadlands.

IMPACT

Assessment and Recording

At Meadlands we see science assessment as a means of evaluating the effectiveness of teaching and learning. Pupils' scientific knowledge, understanding and skills are also assessed formatively through interaction with our children whilst they are working (listening, observing and questioning.) We believe that the ongoing observation, monitoring and assessment of skills and concepts gathered is essential. We also make use of 'End of Topic' assessments created by the class teachers. Children's progress is discussed at parents evening and shared with parents in their annual report. In year progress is recorded in the same way as other core subjects, on Pupil Progress Tracker. Teachers will make a formal overall Level assessment of the children's work in science at the end of Key Stage 1 and Key Stage 2.

Health and Safety

At Meadlands all children are made aware of the importance of health and safety considerations when undertaking work in science. The teaching staff ensure that children receive demonstrations of how to use any specialist equipment. All equipment is maintained in good condition and stored safely. Staff will always warn children of any foreseen dangers and take necessary precautions but will also be encouraged to assess and identify risks for themselves. At Meadlands we expect our pupils to learn to take responsibility for the safety of themselves and their peers. A risk assessment will be made, as part of the planning process, before any potentially dangerous scientific activity is undertaken, such as working with chemicals, micro-organisms or a flame.

Equal Opportunities

At Meadlands Primary School we are committed to providing all children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or class. Provision is made for different ages and levels of ability.

Children are given opportunities to:

- Take increasing responsibility for their work.
- Work independently and in groups, and to be involved in peer assessment.
- Be involved in tasks of varying duration.
- Undertake teacher directed and child initiated tasks.

Additional Educational Needs

At Meadlands, we believe that all of our children should have the opportunity to access the science curriculum. We are committed to providing a curriculum in which all the children can take part at a

level that is appropriate to them. If necessary, the teaching methods or materials will be modified to prevent any restrictions to each child's learning experience and thus enabling each child to reach their full potential. Extension activities are utilised to challenge able children at every available opportunity.

Monitoring

Opportunities will be taken for staff to undertake training in Science to develop and reinforce knowledge and skills and to review the latest developments. Where appropriate staff expertise from within the establishment or from other schools or the Advisory Service will be used to support staff development. All staff will be formally observed teaching science regularly and there will be regular book looks. These usually happen termly. Governors are also involved in the monitoring of science. The attainment and progress of science is also monitored at pupil progress meetings, data analysis meetings and communicated to parents at parent consultations. The Science Leader will be responsible for the monitoring of the curriculum at each Key Stage, overseen and supported by the Curriculum Leader.