



Lickey Hills Primary School and Nursery

Science

It is the aim of the Governing Body of Lickey Hills Primary School and Nursery to support the implementation of policies and procedures which support the vision of:

'Dream together, Believe together, Achieve together'

Introduction

At Lickey Hills Primary School and Nursery we have developed a bespoke Science curriculum incorporating the dual National Curriculum requirements of progressing scientific knowledge and developing pupils' scientific methodology whilst also very much centred around our unique surroundings of native woodland, heath and hillside, including within our own site. Fostering children's interest in their natural surroundings and a respect for their local environment is a key part of our curriculum and is reflected in a focus on native flora and fauna as much as possible.

In addition, our belief is that understanding of science is best gained from hands-on engagement with the subject and therefore a practical approach is used wherever possible to allow children to lead their own scientific learning and have a greater understanding of science and its wider application in their everyday lives.

Policy created by: R Fishwick, November 2022

Next review due: October 2024

Intent

We intend to help our pupils understand the world by equipping them with the essential aspects of the knowledge, methods, processes and uses of science. We will develop key foundational knowledge and concepts, through exploration and investigation of the main scientific disciplines, and encourage pupils to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. Our aim is for our pupils to experience a sense of excitement and curiosity about natural phenomena and to have a scientific view of, and respect for, the world around them.

Implementation

Our children will develop their scientific knowledge of biology, chemistry and physics through seven core threads of 'animals, including humans'; 'living things and their habitats'; 'plants'; 'materials'; 'forces, electricity and magnetism'; 'light and sound'; and 'our planet'.

Intertwined with this and developed through a regular and broad range of science enquiries, our children will develop their understanding of scientific methodology and seven key skills of questioning, classifying, enquiry, observation, presenting data, drawing conclusions, and using evidence.

Impact

Our pupils will be equipped with the scientific knowledge and conceptual understanding to better understand the world around them. They will recognise the nature and methods of working scientifically and be equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

National Curriculum and Early Learning Goals Coverage

The national curriculum for Science aims to ensure that all pupils:

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

At Lickey Hills we teach and develop the methods of scientific enquiry simultaneously with building an understanding of the specific disciplines and not as standalone enquiries. Investigations are therefore both relevant to and support conceptual understanding. Investigations are also related to real-world situations where possible to allow pupils to see how Science is relevant to their everyday lives

The whole school overview and progression documents support the teaching of Science and ensure pupils cover all requirements from the Early Years Foundation Stage (EYFS) through to Year 6 in way that allows them to return to, use and build on prior learning.

In the Early Years, science is introduced through a mix of discussion, practical problems and child-led enquiry, with a focus on keeping healthy, exploring how the world changes through the seasons and beginning to understand the natural world.

In KS1 and KS2, the teaching of scientific enquiry is supported by the use of consistent language and terminology, all be it expanded at the beginning of Year 3 reflecting the greater requirements of the National Curriculum in KS2. This is grouped under what is known as our 'Science Investigation Tree'.

Science Investigation Tree

The Science Investigation Tree is a tool we use to plan and carry out investigations throughout the school and it reflects the cyclical approach of enquiry leading to further questions. Opportunities are provided for children to contribute suggestions and have control over stages in the process although usually they will be scaffolded through the process by being provided with some stages, such as the initial question, before children consider how they might go about answering it or deciding what equipment they want to use.

In KS1, the Science Investigation Tree is worded:

- What do you want to find out?
- How are you going to do it?
- What do you need?
- What do you think will happen?
- What happened in our experiment?
- Were our predictions correct?
- What have we found out?

In KS2, more formal terms are introduced for the scientific method:

- Our Enquiry (Key questions to lead our enquiry...)
- Our Question (We are investigating...)
- Equipment (We will need...)
- Method (We will...)
- Fair Test (We will make our test fair by...)
- Evidence (We will observe/measure...)
- Hypothesis (We think or predict that...)
- Conclusion (We found out that...)
- Explanation (This tells us that...)
- Evaluation* (We could get more accurate results by... We could also investigate...)

*Note that evaluation can then be seen to be leading back into further questions and paths of investigation although these may or may not be the subject of further lessons.

Planning

Planning is supported by Science Curriculum Overviews for each year group from Reception to Year 6. This set out when topics are being taught, each lesson objective and how each requirement of scientific knowledge or skills is covered across that topic (lesson-by-lesson.) Key scientific vocabulary for each topic is also set out ensuring staff reinforce the use of and meaning of subject specific terminology.

This is further supported by topic knowledge mats for each topic, which are shared with pupils at the start of the topic, ensuring pupils are aware of the objectives and act as a reference point for key vocabulary and ideas.

A practical approach is used wherever possible to allow children to lead their own scientific learning, for example an investigation of how different surfaces affect the force needed to move an object across it reinforces the concepts of friction, pulling/pushing forces and the size of forces, whilst also allowing children to engage with measuring and relating it to real world problems.

Resources

The use of resources is integral to our practical curriculum. We have a wide variety of good quality equipment and resources, both physical and virtually-based, to support our learning and teaching. However, it may require children to work in small groups when using more limited resources; in this case cooperation and the use of roles within the group is encouraged. In particular, the use of good quality measuring equipment in Science is essential to help promote mathematical skills.

Cross Curricular Opportunities

Science provides many opportunities to develop and apply mathematical skills in a way that children can engage with as being relevant to a real situation. Most notably, this includes measurement as well as recording and presenting data in the form of tables, charts, and graphs. The Mathematics curriculum provides a good guide to where children should be working at in terms of measurement accuracy (e.g. using decimal places) and familiarity with different types of data presentation.

Science also allows children the opportunity to engage with technology such as data logging (Computing), solving and analysing engineering problems (Design and Technology) and making close observations (Art).

Pupil Support and Differentiation

We aim to encourage all children to reach their full potential through the provision of varied opportunities and remove barriers to scientific learning and understanding. Differentiation can be thought of as children doing tasks differently, rather than children doing different tasks, for example the questioning and scaffolding individual pupils receive in class may differ. In particular, wherever possible reading and writing ability should not hinder the children's ability to demonstrate their scientific understanding and skills. Class discussions and effective questioning is as important, if not more so, for assessing pupils as recorded work. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed at the earliest possibility. Planning takes common misconceptions into consideration and highlights them directly, emphasising the correct idea or concept.

At the same time, pupils are challenged appropriately and opportunities are provided for all pupils to demonstrate a deeper understanding, drawing on prior learning and applying their learning independently.

Pupil understanding of scientific knowledge may be assessed through exit quizzes, consistent with other subjects at Lickey Hills. However, this may not always be relevant to all lessons and it is recognised that this is not a requirement. Other forms of assessment, such as labelling diagrams, may be more appropriate.

Inclusion

Inclusion is about every child having educational needs that are special and the school meeting these diverse needs in order to ensure the active participation and progress of all children in their learning. Inclusive practice in Science should enable all children to achieve their best possible standard; irrespective of gender, ethnic, social or cultural background, home language or any other aspect that could affect their participation in, or progress in their learning.

Health and Safety

At all times the physical and psychological wellbeing of the pupils in the class is paramount. We aim to teach and learn in as safe an environment as possible. Health and Safety guidelines are followed at all times and where necessary the relevant risk assessments are completed.

- We ensure that all tasks that the pupils undertake are safe and identify risks in the plans. Particular attention is drawn to the use of materials, food safety (e.g. allergies) and outdoor activities such as bug hunting and pond dipping (e.g. hygiene) (see Risk Assessment Policy).

- Educational visits are seen as an important way of enhancing the curriculum, and the risk-benefit of all such visits will be assessed (see Educational Visits Policy).
- In upper KS2, staff should be aware of the Sex and Relationship Education Policy before teaching about reproduction in the 'Life Cycles' topic.

Subject Leader

The role of the Subject Leader is to provide professional leadership and management in Science in order to secure high quality teaching, effective use of resources and high standards of learning and achievement for all pupils. They will achieve this by affecting the following key areas:

- Learning and teaching (including planning and marking and presentation)
- Leading and managing staff
- Leading CPD
- Monitoring
- Efficient and effective deployment of staff and resources.

Related Documents

Accompanying this policy are:

- Science Curriculum Overview Whole School
- Science Curriculum Progression Document
- Year Group Overviews (EYFS - Year 6)
- Language Base adapted curriculum (to ensure that Language Base pupils not taught Science in mainstream lesson encounter topics in a progressive order, a mixed Year 3/4 curriculum is used. This avoids topics from the Year 4 curriculum being taught before relevant Year 3 ones.)