Windmill Hill Primary School

*Windmill Hill is committed to lifelong learning within a caring environment. Together we make a difference."*

# Subject Information

# Science

**The skills of a great science student - children:**

- Discover for themselves through trial and error - taking risks, designing own investigations, answering questions/hypotheses and persevering to solve problems.
- Understand and use the correct scientific vocabulary.
- Communicate effectively to ask questions and formulate explanations.
- Record their learning in a variety of different ways to demonstrate their understanding.
- Work together and support each other - showing effective collaboration.

**Our vision for science:**

We know good science teaching and learning happens when:

- Teachers are confident and enthused about what they are teaching.
- Teachers make links and use of relevant analogies and models that children can relate to.
- Learning takes place both inside and outside of the classroom.
- Children make links to and apply their learning in science, right across the curriculum.
- Children do not want the learning to stop!

**Science at Windmill Hill:**

The **three main aims of the science National Curriculum** are for all pupils to:

- Develop scientific knowledge and conceptual understanding through the three specific disciplines of biology, chemistry and physics.
- Develop understanding of the nature, processes and methods of science through participation in 5 different types of scientific enquiries, enquiries that

help them to ask and answer questions relating to the world around them.
- Be equipped with the scientific knowledge required to understand the importance, use and implications of science, today and for the future.

*"A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes."*

**Science Intent**

The Science Curriculum at Windmill Hill Primary aims to:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics in National curriculum objectives.
- 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 think scientifically and understand the uses and implications of science, today and for the future.
- To see the impact of Science in the modern world, seeing how it has changed our lives and the impact it will have on the future.
- To understand where science could take them in the future, providing them with aspirations and dreams.

**Science Implementation**

As part of the planning process, teachers plan the following:

- A theme planner that outlines the knowledge and vocabulary that all children need to learn.
- The theme planner outlines misconceptions, scientists, key vocabulary, opportunities for working scientifically and cross curricular links that can be taught in each science topic.
- A cycle of lessons for each topic, which carefully plan a sequence of lessons that meet the aims of the National Curriculum.

- Pre, mid and post assessment gives opportunities to address any misconceptions that children have.
- Open questioning in lessons gives opportunities for children to demonstrate their understanding.
- Practical investigations and experiments allow children the opportunity to write up scientific elements (As appropriate to the Key Stage) - aim, predictions, results, conclusions etc.
- Science displays are evident in each class to support understanding.
- STEM learning training for all staff, providing new and exciting ideas and resources to implement in science lessons.
- Trips and visits from experts who will enhance the learning experience and celebrate science events.

**Science Impact**

Our Science Curriculum is high quality, well thought out and is planned to demonstrate progression. If children are keeping up with the curriculum, they are deemed to be making good or better progress. In addition, we measure the impact of our curriculum through the following methods:

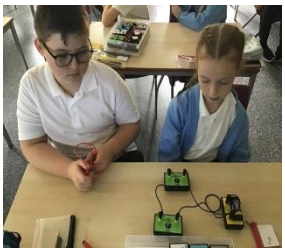
- A reflection of standards (book reviews, learning walks etc.) achieved against the planned outcomes.
- Pre, mid and post assessments that track knowledge learned and understanding.
- Pupil discussion about their learning.

**Working Scientifically:**

Pupils at Windmill Hill are encouraged to develop their scientific skills through the five types of scientific enquiry which include:

1. **Observation over time** - The children are encouraged to observe how our Seasons change and affect the daily weather. How all living things grow and change throughout different stages of life including plants, animals and humans. How materials may change state over time when affected by cold, heat, or being mixed with a different material.
2. **Pattern seeking** – Observing, measuring, collecting and interpreting data from a range of sources. The children are encouraged to collect the evidence they need and look for patterns to help investigate questions such as 'Do taller people have longer arms?' 'Where do plants grow well?' or 'Does the size of a planet affect the length of its orbit?'
3. **Identifying Classifying and Grouping** - Making sense of how the world is organised. All children across the school are given the opportunity to explore, identify and sort. This is key to developing the key vocabulary for the relevant topic in each year group.

4. **Comparative and Fair testing** - These are similar types of testing however 'Fair Tests' are more scientific and are carried out with our KS2 children. 'Fair test' investigations observe and measure the effect changing one variable has on another whilst keeping all other variables the same. During 'Comparative testing' the children have less control over the variables e.g. which tissue is best for soaking up water? We can control the amount of water and the size of the tissue but have no control over the thickness or design of the tissue paper.



5. **Research using secondary sources** – This is when we encourage children to find information to answer questions that are difficult to answer through classroom investigation. This may include using reference books, photographs, internet searches or interview visitors who have been asked to come into school who have some expertise in a specific subject.

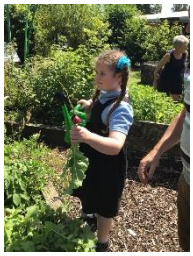
Working scientifically helps our children practise and develop the skills needed to become a good scientist. We encourage the children to explore, question and problem solve in order to develop curiosity and carry out independent investigations to gain a deeper understanding of their world.

**Additional resources**

https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study

https://www.stem.org.uk/primary/resources/collections/science
https://www.outstandingscience.co.uk/free-primary-science-resources

**How parents can support the learning of science at home.**



You don't have to be an expert in science! One of the most supportive things you can do is to be a partner in your child's investigations and thinking. Think out loud or describe what you are doing as you do it, whether it is cooking, fixing something, taking care of pets, or other housework. Ask questions, even when you do not know the answer!

Support your child’s reasoning using "talk prompts" for investigation (from this more general resource). You can ask your child questions, like “what do you notice? Why do you think that’s happening? What can you teach me about this?”
Many activities you regularly do can support meaningful science learning!