

Teaching and Learning

It is recognised that a high-quality of primary school science education provides the foundations for understanding the disciplines of biology, chemistry, and physics in secondary school. **At Sir Henry Fermor we are inspiring future scientists!** Science changes lives and is vital to the future prosperity of the world. Building key foundational knowledge and concepts will encourage pupils to recognise the importance of rational thought, whilst developing a sense of excitement and curiosity about natural phenomena. Pupils are to be encouraged to understand how key knowledge and concepts can be used to explain what is occurring, predict how things will behave and analyse causes.

Our aims in teaching science include the following:

1. Fostering a positive attitude and a greater curiosity towards science.
2. Preparing our children for life in an increasingly scientific and technological world.
3. Fostering concern about, and active care for, our environment.
4. Encouraging every child to investigate, question and discuss so they can acquire scientific knowledge, understanding and skills.
5. Encouraging children to hypothesise and to find ways of testing their ideas to provide evidence to support their ideas.
6. Teaching scientific vocabulary and many ways to present the results of their investigations.
7. Promoting cross curricular links wherever possible through:
 - Literacy – communicating facts, ideas, and opinions.
 - Mathematics – application of number through collecting, considering, and analysing data.
 - ICT – through using a wide range of ICT.
 - RHE - Providing opportunities to learn about aspects of personal, social and health education and citizenship.
8. Ensuring children recognise hazards and risks (and associated signs for these where applicable) when working with living things and materials and following agreed safety rules.
9. Providing opportunities that engage the children in relevant, interactive first-hand experiences.
10. Encouraging children to work co-operatively and collaboratively, developing their confidence communicating ideas.

We will fulfil these aims by:

1. Using the rich and stimulating environment that surrounds our school to enable us to provide opportunities for learning about life processes and living things, through observation, questioning and wonder. These include our own forest school facilities.
2. Providing a wide range of interactive, practical activities for individual and group work to encourage the children to explore, find out and develop their understanding of key scientific ideas and make links between different experiences.
3. Developing the children's investigative skills and understanding of science through use of questioning and giving them opportunity to express their findings and ideas to their peers and a wider audience.
4. Planning opportunities to develop skills of predicting, asking questions, making inferences, drawing conclusions, and making evaluations based on evidence and understanding.
5. Teaching scientific and mathematical language, including technical vocabulary and conventions, and drawing diagrams and charts to communicate scientific ideas.
6. Planning opportunities to extract information from sources such as reference books or ICT as well as through science visits and visitors to school.
7. Working collaboratively in pairs or groups, listening to ideas, sharing ideas, and treating these with respect.

The Teaching and Learning Process at Fermor

The National Curriculum provides a clear framework for science. Using this document, scientific skills are planned for and taught with progression of skills developing from EYFS (Early Years Foundation Stage) through to Year 6. These skills are continually revisited to ensure each child can use them in a range of contexts. Planning is a collaborative process, and each class teacher plans with their year group partner.

In EYFS, Science is not taught as a discrete weekly lesson as it is in the rest of the school, it is taught within the seven areas of the early learning goals. Science is embedded in learning experiences when and where appropriate.

Teachers begin units of study by encouraging children to think about what they already know about the topic and what they want to know (which helps to guide teachers' planning throughout the unit of study). Teachers carefully consider the sources which they will present to children, alongside materials produced to support the school's knowledge-based curriculum, as these sources are what children draw knowledge from and begin to form their understanding and evaluation of the topic.

Children are encouraged to reflect on their work and knowledge through a range of methods: they complete a self-evaluation at the start and the end of a unit of study and are encouraged to dive deeper into their learning through the considered feedback of teachers during and after lessons. Teachers also allow children the opportunity to peer-evaluate and self-evaluate work produced. Class and peer discussions, where further questions are generated is actively encouraged. Science must be a subject that evokes awe and wonder.

The Fermor Four in Science

<u>Relevance</u> Children should be able to explain what they have learned in a science lesson and relate it back to the world around them. Children should be able transfer the skills they learn within science to other subject disciplines as well.	<u>Engagement</u> Children should be ready to listen and learn in lessons, during investigations or activities and while on trips. Children can show their engagement in science by asking questions, working to make connections to other learning and by continually striving to be accurate and to improve work.
<u>Questioning</u> Children should continually be asking questions throughout science learning and should start to engage in the circle of inquiry: as children find the answer to one question, what more could they learn based on this new knowledge?	<u>Articulate</u> As children become versed in Scientific skills, knowledge, and language, they should be able to articulate their thinking and opinions using learned vocabulary. When all students can do this, Scientific discourse and debate can take place within the classroom leading to deep, meaningful learning.

Health & Safety

Care should be taken when conducting investigations and giving demonstrations in school. Children will be taught to use scientific equipment safely during practical activities. Class Teachers, Teaching Assistants, and the Subject Leader will check equipment regularly and report any damage; removing defective equipment and replacing as appropriate. All electrical appliances in school are PAT tested when required. The School Policy for Health and Safety will be integrated into science teaching. Proper procedures will be following when teachers design any educational visits, including carrying out adequate risk assessments for all possibilities travelling to, and at, the location of the visit.

Inclusion

In reflection of our school vision, no child should be left behind in the study of science. Scientific concepts can be condensed to basic themes which all learners should be able to access. However, Scientific concepts and skills can also be delved into and pushed deeper for learners working beyond the Age-Related Expectation. The historical events that led to the development of science should be sequenced chronologically and referred to, to ensure

children understand how the subject has evolved and progressed over time. Teachers plan to differentiate work to a level which allows all learners to access the material, grasp the concepts being taught, and thrive with new learning. Teachers at Sir Henry Fermor ensure that they provide opportunities for all children regardless of race, gender, or disability.

The Role of Parents

Parental involvement is actively encouraged at Sir Henry Fermor. Parents can be involved in their child's development in science. When it is appropriate, tasks may be sent home for the child and parent to work on together, thereby involving the parent in the child's learning.

Assessment

The progress of children in their science journey is regularly monitored and assessed to enable teachers to evaluate and adjust their lesson plans and resources, ensuring they are most appropriate to the needs of all children.

Whenever a new science topic is started, children complete an initial True/False quiz in which they indicate their current understanding of the topic area. The statements assessed include key learning points that will be covered during the term alongside common misconceptions which may need to be addressed.

When the unit has been completed, children revisit the initial quiz and complete it again, this enables the teacher to observe how understanding has changed across the class whilst assisting in planning for further study of the topic area in future.

Throughout science lessons there are regular class discussions, opportunities for individuals to share ideas and for children to work in pairs to discuss and develop their knowledge. This provides vital insight for teachers to informally assess the progress of the class enabling them to make informed decisions about lessons which may need adapting to address a misconception that has arisen, or to consider an area in greater depth if appropriate.