Science at Harvills Hawthorn

Intent

The intention of the science curriculum at Harvills Hawthorn Primary School mirrors the underpinning vision and mission shared by all at the school. Our vision intends for all pupils and staff to be the very best they can be while our mission challenges us to prepare our pupils for their future lives and enable them to be able to contribute positively to society. The ambitious science curriculum we follow is designed with the intent that each child, from EYFS to Year 6, will become competent scientific thinkers and investigators who will encounter awe and wonder through exciting, memorable and first-hand scientific investigative experience.

We all champion primary science and our intent is to make sure that every child has a positive, memorable and first-hand experience of science throughout their primary school education, where our children make concrete links to prior knowledge and build their scientific schema through key experiences and deliberate practice.

Learning is a journey; all children are at different points on their learning journey. As facilitators, experts and coaches in the classroom, we focus on motivating the children and building the knowledge and understanding across our science curriculum. Teachers tailor their teaching in science to meet the needs of the learners within the classroom and engage them in the process of learning to enable them to excel as a scientist. Children are encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. It provides opportunities for the critical evaluation of evidence and rational explanation of scientific phenomena. Furthermore, the children are given the opportunity to apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

Children will be immersed in key scientific vocabulary, which supports the acquisition of scientific knowledge and understanding. At Harvills Hawthorn, we are committed to high quality teaching, learning and education in science, which ultimately stems from the science curriculum we implement. It is through this curriculum that we raise standards of achievement for all children, which leads to exceptional outcomes in science.

We place great emphasis on offering our children an exceptional science education that underpins National Curriculum content and offers the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. The curriculum we currently follow for science promotes specific competences including knowledge, enquiry and the working scientifically based skills. We intend for our children to develop an understanding of the nature, processes and methods of science through different types of scientific enquiries that help them to answer scientific questions about the world around them. In addition, they develop their knowledge and understanding of important scientific ideas, processes and skills and relate these to everyday experiences.

We also equip children with the scientific knowledge required to understand the uses and implications of science, today and for the future. Within our school we aim to develop mini-scientists. We do this by encouraging attitudes of originality, co-operation, perseverance, open mindedness, self-criticism, responsibility and independence in thinking. We inspire children to retain and develop their natural curiosity about the world around them through the asking and answering of scientific questions. In addition, we aim to develop children's scientific skills through enjoyable and interesting experiences that are vocabulary rich and encompass a range of enquiries.

Creative pathways to learning have been planned for so that children can make links to prior knowledge, enabling children to build their scientific schema through key experiences and deliberate practice. With these, we champion our children to develop depth in knowledge, vocabulary and skills within science that are rich, stimulating and challenging with the aim of enabling children to master learning with knowledge and experiences that will remain with them for the rest of their lives.
At Harvills Hawthorn Primary School, the science curriculum we follow has been designed to allow each pupil to:

1. Achieve the best possible standards and achievements, whatever their starting point.
2. Have high levels of engagement, enjoyment and personal development in science.
3. Connect and build on prior knowledge, leading to progression and depth through first- hand, practical and memorable learning experiences.
4. Access a rich, broad and wondrous science curriculum that allows high levels of personalisation that plays to their strengths and develops specialisms.
5. Ignite a spark for future aspirations and careers (engineering, medicine) within the world of science.

Implementation

At Harvills Hawthorn Primary School, we pride ourselves on the consistent approach to teaching and learning that can be observed across all phases of school. This is achieved through our commitment to cutting edge, research-based CPD in addition to quality-first teaching on a daily basis. Expectations of staff and pupils are high, resulting in good or outstanding progress in all phases. There is a universal understanding of what great teaching, learning and assessment should entail. These strategies are consistently used throughout school and it is the expectation of leadership that all lessons will include a variety of these to enable learners to reach their full potential. Active learning is essential in all aspects of the lesson. All staff use the same terminology so that learners develop a knowledge and understanding of the different ways they learn.

At Harvills, we believe great teaching, learning and assessment must include the following:

- Understanding the Content

- Creating a Supportive Environment
- Maximising Opportunities to Learn
- Activating Hard Thinking (building ratio)

Each lesson begins with 'Rapid Retrieval' designed to improve children's retrieval skills. The purpose of this is to revisit prior learning in order to improve long term memory. Teachers ensure that Rapid Retrieval includes both recent learning and learning from previous topics.

We are working hard to promote our pupils' English and ensure that they all achieve to the very best of their ability. Pupils are encouraged to read widely and often. English is fundamental to all subjects. Consequently, we believe that all stakeholders have a role to play in supporting and developing our pupils' English skills to ensure they can communicate effectively in today's society. All children are expected to follow our school's non-negotiables for presentation. This includes a focus on learning to write in the cursive script.

At Harvills, the curriculum we follow is White Rose Science. This science curriculum delivers full coverage of the National Curriculum and provides progression of knowledge from EYFS to year 6. It is built around the principle of greater learner involvement and it requires deep thinking, encouraging our children to learn and discover using questions and prior knowledge as their starting point.

Our children do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them: observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They draw simple conclusions and use scientific language to talk and write about what they have found out. Children will be able to build on prior knowledge and link ideas together, enabling them to question and become enquiry based learners.

Memorable knowledge and skills have been identified for each of the units to provide progressive acquisition of knowledge. This is supported by the use of key vocabulary which is displayed within the learning environment. Teachers regularly refer to this knowledge and key vocabulary with meanings so that it 'sticks'. This enables children to readily apply knowledge and vocabulary to their written and verbal scientific communication. Children are also asked to review their learning at the end of each unit. These 'reflection' opportunities provide children with an opportunity to share their learning more widely through a variety of means.

Each scientific unit will enable our children to grow up understanding how to work scientifically whilst fostering positive attitudes such as curiosity, perseverance, striving for accuracy. They will have the knowledge they need to succeed in all science subjects (biology, chemistry and physics) in further and higher education; develop important life-skills in relation to the world they live in; and have high aspirations for their future careers.

Science lessons are taught discretely on a weekly basis. Such lessons will be taught by the class teacher and, where appropriate, will be linked to practical experiences. Where possible, we implement visits or hooks, visitors or real life experiences to bring the subject to life. In Early Years, children will work from the Understanding of the world curriculum and framework. This aims to develop children's crucial knowledge, skills and understanding that helps them make sense of the world. It provides opportunities for the children to explore scientific vocabulary and learning opportunities based on first hand experiences that encourage exploration, observation, problem solving, prediction, critical thinking, decision making and discussion. It provides the foundations and knowledge for the KS1 and then the KS2 science curriculum. The science units of work for KS1 and 2 continue to build connections on knowledge, concepts and process skills and ensure that all the programmes of study are constantly being reflected on, visited and developed as each science unit of work is taught. Teachers will use the planning and resources provided by White Rose.

Our teachers use a variety of teaching methods to ensure children receive not only the best possible lesson but also to ensure all learning styles are catered for. As children progress through the school, topics will be re-visited but expanded and developed upon. Children and teachers are encouraged to make cross-curricular links where possible and to record scientific conversations as notes in science books as this is often where the real learning in science is captured. Every classroom will have a science display that contains key vocabulary for their current topic and investigative language relevant to the levels of the children within the class. The development and monitoring of science is managed by the subject leader, which includes termly monitoring of learning and yearly monitoring of teaching. Findings of monitoring are reported to Governors and the relevant members of SLT. Areas for development form an action plan and are fed into the school improvement plan and subject evaluation form.

Assessment is an integral part of high quality teaching and learning; we believe that it lies at the heart of the learning. Assessment is inextricably linked to planning and opportunities for assessment are planned for within the White Rose Curriculum. All assessments in science are used to inform future lessons in order to impact on future teaching and learning.

Formative assessment is continually ongoing in the form of observations, in the moment marking and feedback. These assessments are linked to the key learning objectives for the lesson. At termly intervals throughout the year, teachers are expected to assess the attainment of their year group's science objectives using their own professional judgment. They will use their knowledge of the children and the children's learning to indicate whether they are emerging, developing or secure within the knowledge and skills within their year group.

In Early Years, learning is captured and recorded and summative assessments are completed to show the children's achievements and progress. For each Key stage 1 and Key stage 2 unit of work, day-to-day formative assessments are used across science lessons to enable children to take ownership of their learning as well as enable staff to assess what each child has achieved in line with national

expectations. All assessments inform future teaching and create future starting points to lessons.

Impact

We aim for the children of Harvills Hawthorn Primary School to leave our care with a love for the subject of science. Children will be confident, resilient, self-motivated, independent learners, with a thirst for challenge and depth of understanding of scientific skills and concepts.

However, we want them to not only have acquired the appropriate age related knowledge linked to the science curriculum, but also skills which equip them to progress from their starting points and within their everyday lives. Ultimately, we want our children to leave Year 6 with a richer scientific vocabulary that will enable them to articulate their understanding of taught concepts, a wider understanding of a variety of skills linked to both understanding and inquiry and high aspirations which will see them through to further study, work and a successful adult life. Our school motto is ‘I believe I can fly’ and through our curriculum we enable this to happen.