

Elston Hall Learning Trust

Science Curriculum Overview

Our children are exposed to the working scientifically process once they have embedded required knowledge:

Ask questions and plan enquiry

Set up enquiry

Observe and measure

Record

Interpret and report

Evaluate

Intent

Our science curriculum is designed with the intent that all children will become a competent scientist who are inquisitive about the world around them. We intend to provide children with first-hand scientific investigative experiences which inspires children's curiosity and builds their science capital. Our thematic lessons will provide children with numerous opportunities to take their learning across year groups by pre-teaching and revisiting skills and knowledge. This progression within our science curriculum ensures that children can make links to prior learning, develop deeper knowledge of key skills, and master their learning with repetition through stimulating and challenging experiences.

When designing our curriculum, we carefully embedded the Curriculum Drivers to help our children succeed at Pheasey and beyond.

Possibilities - We encourage pupils to be aware of all opportunities available to them and to have high aspirations for their future, regardless of their gender or background. Career links are made where possible to show our students what science careers they could follow in the future, should they wish to.

Resilience - We encourage pupils to have the courage to bounce back from any set-backs or challenges and maintain a positive outlook on the scientific process. They understand that repeated experiments, readings and reflections may be required.

Diversity - We achieve this by regularly teaching diverse scientists. For example, LKS2 meet a female marine biologist (Texa Sim) prior to starting their 'Living things and habitats' topic. In Y5, children are introduced to Mae C. Jemison alongside Neil Armstrong.

Implementation

Core scientific concepts will be taught during **discrete** science lessons each week. However, there will be further opportunities through our thematic curriculum for pupils to demonstrate their science understanding.

The curriculum provided through both the discrete science sessions and the topic sessions allow pupils to embed and recall the key scientific knowledge principles and working scientifically skills needed for pupils to achieve the end of year expectations. The topic session provides opportunities for teachers to pre-teach some aspects of knowledge and skills before moving onto the core unit of science or in some instances it may be a revisiting session. Using both discrete sessions and topic sessions for the teaching of science, ensures we are providing clear progression by allowing the children to look back on previous learning and apply what they have learnt to new situations. This approach directly coincides with Ofsted's inspection framework which states:

"People learn new knowledge when new concepts are connected in their minds with what they have already learned. It is more appropriate, therefore, to understand the way knowledge is stored as a complex, interconnected web or 'schema'. Every time a pupil encounters a word they have previously learned, but applied in a new context, it adds to the complexity of their understanding of that concept. In other words, they develop a deeper understanding of that concept and enhance their capacity to use that concept in their own thinking"

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This curriculum is underpinned by working scientifically skills including:

Comparative/fair testing

Observation over time

Research

Pattern Seeking

Identifying, grouping and classifying

Problem solving

Pre-teaching:

Our cross-curricular approach touches on elements of science learning, creating memorable experiences that can be referred to in older year groups. Outdoor learning that builds on science capital is encouraged: for instance, in Year 2, children watch the life cycle of a butterfly and release them which introduces the key understanding that animals have offspring which grow into adults. Later, in Y5, children will recall this linked Y2 experience before moving on to their key learning: describing the changes as humans develop to old age. Children are offered a wide range of extra-curricular activities such as trips, visits and visitors to complement and broaden the curriculum.

Reviewing

Cross-curricular links enable our children to recap their science knowledge and retain what they have learnt. For instance, in year four, while learning about human impact on the environment, the children read the English text Flotsam which explores plastic pollution and its impact on society. They apply their learning by writing to a local supermarket to persuade them to reduce their plastic use. This allows children to apply their science learning in a meaningful way. Links, where possible and appropriate, are made throughout the curriculum.

Progression documents

Our new progression document clearly shows staff what prior learning has occurred before new concepts are taught and the key knowledge and skills children need to secure by the end of the year. Our common misconceptions document highlights some key areas where children may have misconceptions so that teachers can plan to address these, should they arise. Vocabulary is also progressive throughout the school and each year group has been allocated key terms to embed throughout their teaching. This will enable staff to pitch lessons correctly and challenge pupils beyond the curriculum where necessary, ensuring a deeper understanding of key concepts. Preassessment activities will continue, however, they will show more evidence of prior learning as children can dip into the memorable experiences they have had previously.

Differentiation

Teachers use precise questioning in class to test conceptual knowledge and skills and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up. Children with specific needs such as EAL and SEND will have the task tailored to suit their specific need: examples include but are not limited to allowing the children to present their findings in different ways such as a picture, photograph, post-it note or on the online floorbook; using Edtech to support the child's access to the lesson; providing word banks and definitions in books to scaffold and support their understanding and ensuring they have the access to resources that aid their specific needs.

Furthermore, children are challenged through 'deepening understanding' tasks once they have secured their learning within that lesson. Within these tasks, children are encouraged to reason and problem solve, or will be given an open-ended question to consider independently.

Science Curriculum Overview

Our children will:

Record learning in a
variety of ways

Develop resilience and
independence when working as a
scientist

Be curious and ask
questions

Learn about scientists

Investigate through hands-
on practical experiments

Enjoy learning!

IMPACT

The science curriculum is designed to ensure pupils are able to recall and embed scientific skills and knowledge throughout their time at primary school and prepare them for the future. The progression document provides clear end points for pupils at each stage of their learning and enables teachers to provide opportunities for pupils learning which are pitched appropriately.

In order for teachers to be able to plan and adapt learning to meet the needs of pupils they regularly assess the pupils recall of their knowledge during starter lessons, quizzes and key questioning. Pupil's 'knowledge' understanding is teacher assessed at the end of **term**. Teachers use the age-related expectations to establish whether in the knowledge aspect of the unit children are working below, at the expected level or above. Current teachers will then use these assessments to inform and adapt their planning of further Science knowledge and skills and to address any misconceptions. This is then shared with the receiving teachers at the end of the year to ensure future planning is reflective of pupil's knowledge especially when units are revisited.

Scientific enquiry is the aspect of the science curriculum that we use as the key indicator to assess pupils' science ability. This is embedded in all science units. Teachers collate evidence from a variety of sources such as electronic evidence, science books, questioning, marking and planning to make teacher assessment judgements **each term**. There are also opportunities across the Trust and within school for shared moderation sessions to ensure the accuracy of these judgements and that future planning is pitched appropriately.

However, alongside the summative assessments, teachers use daily formative assessment to identify and address any misconceptions. This is reflected through marking, questioning and differentiated activities where teachers will offer further support to pupils who require further reinforcement but also provide challenge to those pupils who need activities which require them to apply 'deeper thinking' in order to apply their learnt skills and knowledge in a variety of ways. The common misconceptions document helps teachers to identify where misconceptions may arise.

By the time pupils leave Key Stage 2, their Science Capital will be developed sufficiently for them to gain an understanding of future opportunities and careers.