

SCIENCE EDUCATION AT COLPAI: INTENT, IMPLEMENTATION AND IMPACT

INTENT

At COLPAI, we want our children to become confident, excited and inquisitive scientists! We believe that every child deserves a broad and balanced Science curriculum which enables them to confidently explore and discover their surroundings, so that they have a deeper understanding of the world we live in. With the help of the digital platform 'Developing Experts' and our bespoke planning, we equip each child with the specific skills and knowledge they need to help them think scientifically. Thus, they gain an understanding of scientific processes and the uses and implications of science, both today and for the future.

We promote our school values of **aspiration** and **creativity** by creating a sense of excitement and curiosity around Science, developing learners who are able to question, investigate and come to their own conclusions about the world around them. By expanding our children's cultural capital through carefully planned opportunities to actively carry out different types of scientific enquiries, we encourage them to be aspirational, considering a range of career choices within the field of Science. At COLPAI, we develop our children's ability to empathise with the world around them, encouraging them to care for their environment and the plants and animals within it. We challenge them to consider the materials that we use in everyday life, the sustainability of these and the impact they have on the habitats around them.

IMPLEMENTATION

By ensuring high standards of teaching and learning in Science, we implement a curriculum that is progressive throughout our school, using the digital platform 'Developing Experts'. Science teaching at COLPAI involves adapting and extending the curriculum to match all pupils' needs. Teachers are provided with a scheme of work and teaching sequence to follow, with resources readily available. Teachers are empowered to adapt the planning to suit the needs of their children's need and incorporate their own pedagogy and modelling into the lessons.

All our lessons contain a balance of the different 'Working Scientifically Skills' and 'Scientific Enquiry' types, so that the children practise a broad range of skills. We promote the importance of an investigative approach through regular 'hands-on' experiences. Children regularly work scientifically and collaboratively, developing skills and investigating different concepts and ideas. This encourages resilience, determination, perseverance, communication, collaboration and questioning. We blend the content knowledge and investigation skills needed to solve science problems and make decisions and predictions based on what they have learned. Our lessons also allow our pupils to practise their Mathematics and Literacy skills whilst developing their reasoning and problem-solving skills. By linking Science concepts to everyday life, our pupils grow to understand the world around them in a scientific way. This enables pupils to have transferable skills across other subject disciplines, without impacting on the collection of specific scientific knowledge and skills, ensuring that pupils retain knowledge that will readily prepare them for secondary school.

We have developed scientific assessments, which are completed both at the beginning (pre-assessment) and end (post-assessment) of a topic to gauge prior knowledge and assess newly-developed knowledge and understanding.

In Science at COLPAI, we ensure that:

- Every year group builds upon the learning from prior year groups, therefore developing depth of understanding and facilitating progression of skills.
- Key vocabulary is introduced and reinforced throughout every lesson.
- Children explore, question, predict, plan, carry out investigations and observations, as well as conclude their findings.
- Children present their findings and learning using Science specific language, observations and diagrams.
- Children are supported in their ability to 'know more and remember more'; there are opportunities to review the learning taken place in previous topics and year groups as well as previous lessons.
- Teachers can access a range of resources from the digital platform 'Developing Experts'. They also have access to all the physical resources required for modelling and 'hands-on' learning.

- Effective modelling by teachers ensures that children are able to achieve their learning objectives, with misconceptions addressed within it.
- Adaptive teaching is supported by senior leaders, including the SENCO/inclusion lead, and implemented by teachers, to ensure that each pupil can access the Science curriculum.
- Teachers and pupils make links between Science and other subjects.

Key Stage One

In Key Stage One, pupils are exploring and making sense of the world around them; naming things and understanding how they fit in their environment. Our curriculum applies the National Curriculum programmes of study by helping children to identify what makes, animals and humans, materials and their uses, plants and seasonal change. There is a clear progression pathway from Year One to Year Two and children are encouraged to work scientifically, investigating, observing, recording and sharing, using simple equipment increasing their curiosity for their surroundings. Our emphasis on vocabulary in every lesson reinforces their learning and understanding. In each lesson, our planning explains concepts and relates them to the world outside home and education, enabling children at a young age to begin to form the relationships of the working world within their own conceptual understanding

Key Stage Two: Lower

Having established the foundational scientific concepts, we now add depth to their understanding of the areas from Key Stage One and broaden the range of topics and concepts studied: rocks, human impact on living things (conservation and pollution) and eventually, states of matter, sound, and electricity. Children are immersed in and progressively build on their foundational scientific knowledge and vocabulary. Children become more conversant with the world of work through our expert dialogue that applies STEM knowledge to the professional context. We continue to encourage children to be inquisitive through real life experiences where possible.

Key Stage Two: Upper

We ensure topics are visited at each key stage progressively, adhering to the National Curriculum; this is reinforced through revisiting each topic and strand. By Years Five and Six, pupils are becoming confident and independent young scientists. Through exploration, they raise questions, make simple hypotheses that they test, collect data for, then subject to analysis and report from. The breadth of study now includes the solar system, forces, light and evolution. They have developed their language and communication through their study of our key words and the dialogue of our experts in the field

IMPACT

At COLPAI, the children's engagement evident in their curiosity and enthusiasm for learning. They take pride in their work and demonstrate excellent learning behaviours in Science and all other lessons. Children enjoy their learning and this is reflected in excellent attendance. Children understand where their scientific knowledge fits into the outside world and why it is important to learn about all the different areas of the curriculum. They are able to demonstrate knowledge through pupil voice and also across wider subjects. Children are able to articulate themselves using acquired vocabulary from across the curriculum. Children are able to apply their scientific enquiry skills to solve new problems and explain how and why they solved them.

Our Science curriculum is well thought-out and planned to demonstrate progression in knowledge, working scientifically skills and enquiry types (different types of experiment).

The impact of our Science curriculum is that by the time they leave COLPAI in Year Six, pupils can:

- Demonstrate knowledge and scientific vocabulary in the core areas of Science taught each year.
- Recall, make links to and build upon previously taught Science vocabulary and knowledge.

- Use scientific vocabulary and skills to help them to work scientifically when planning, conducting, recording, reporting and understanding (evaluating) scientific enquiries (experiments).
- Know about Science and scientists in real life.
- By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

We measure and capture the impact of our curriculum through the following methods:

- Formative assessments, using pre- and end of unit checks and quiz questions created by the students and carried out at the end of units.
- Images and videos of the children's practical learning.
- Interviewing the pupils about their learning (pupil voice).
- Annual reporting of standards across the curriculum.
- Marking of written work in books.