



Work Hard – Be Kind

Intent, Implementation & Impact

I am a Scientist

Intent:

I am a scientist. I seek to explain the world around me. I build my theories based on evidence collected, by making observations in the natural and physical world. These theories are supported, modified or replaced as I find new evidence. My search for evidence in science occurs through an inquiry process that blends my curiosity, imagination, logic and serendipity. I am strongly influenced by the ideas which people currently hold. I understand that scientific knowledge is provisional: Although reliable and durable, scientific knowledge is subject to change as scientists learn more about phenomena. I learn about the theories and models that are used to describe the natural and physical world. These simplified theories or models help to describe the way the natural and physical world works. I use these models or theories to make predictions, test these predictions through experimentation and observation and use my results to revise and improve the models.

Our school's vision for Science education is to provide all pupils with a solid foundation of scientific knowledge, skills and conceptual understanding, enabling them to have a lifelong curiosity about the world and develop a scientific mindset. We envision pupils becoming critical thinkers and confident problem-solvers, equipped with the scientific literacy necessary to make informed decisions and engage effectively in a rapidly advancing technological society.

Our aims for Science education include:

- To ignite pupils' fascination and love for Science by introducing them to inspiring concepts and investigations.
- To develop pupils' scientific knowledge and understanding of key concepts, scientific laws, and theories across a broad range of topics.
- To enhance pupils' scientific inquiry skills through engaging practical investigations, encouraging them to ask questions, make predictions, and critically analyse results.
- To nurture pupils' ability to think critically and independently, encouraging them to evaluate evidence and draw well-reasoned conclusions based on scientific principles.
- To support pupils in developing a strong understanding of the relevance and impact of Science in their daily lives, society, and the wider world.
- To promote positive learning behaviours towards the scientific method linked to Gem Learning Powers, including collaboration, resilience, problem-solving and focus.

Curriculum Design

Our Science curriculum is designed to provide a progressive and iterative learning journey for pupils, building on prior knowledge and enabling them to develop a deep understanding of scientific concepts. For example, children learn magnets can attract some things but not other in Year 1, which prepares them for learning in Year 3 that this force can be exerted without contact. The curriculum is

carefully structured and ensures a coverage of the National Curriculum, including Biology, Chemistry, and Physics, with opportunities for interdisciplinary links. The shared and curated curriculum is coherent and ambitious; it fosters children's sense of self, place and self-agency.

The curriculum design includes:

- Key disciplinary knowledge so that all students can be stretched as they develop at all key stages.
- Key concepts, skills, learning checkpoints, vocabulary and potential misconceptions within well-planned and logically sequenced units of work, incorporating a balance between scientific knowledge acquisition and practical investigations.
- Opportunities for extended writing within our Authors curriculum and scientific vocabulary development.
- Collaborative activities that foster teamwork, communication, and problem-solving skills.

Implementation:

Science units begin with an elicitation activity, e.g. 'concept maps' to demonstrate their current understanding of that area. Children then annotate these 'concept maps', either collectively or individually, at the end of a unit to show their developed understanding. It is essential that children are exposed to scientific vocabulary so that they can access the curriculum and discuss ideas and observations in a scientific way. We will teach our children the vocabulary needed at an early stage in the unit and during each lesson and will support them to use and retain it through supporting materials such as word banks and by making links with other curriculum areas such as through guided and whole-class reading. Children will contribute to scientific investigations and plan them, with support in KS1 and then with increasing independence across KS2.

The skills and knowledge covered in each topic are progressive reflecting the children's different levels of skill and knowledge as they progress through the Key Stages. Children are encouraged to supplement their learning with their choice of non-fiction reading texts during weekly book clubs and when using the class reading area. Children will develop knowledge in their topic area through practical investigations involving paired, group and whole class work but will also have ample opportunity to show their individual understanding through recorded work in their Scientists books. Practical and oral work may be recorded through photographs and collective pieces of work. Our aim is for this to inform teacher assessment and planning to ensure progression and appropriate challenge across the school.

Teaching and Learning Strategies

Our teaching and learning strategies prioritise oracy, active engagement, practical and hands-on experiences, as well as rich contextualised learning opportunities. These strategies include:

- Activation of learning through the 'review' part of the lesson in order to support schema building and conceptual understanding
- Frequent and deliberate teaching of vocabulary
- Structured and interactive whole-class teaching, carefully scaffolded to meet the needs of all pupils.
- Practical investigations that encourage active participation, observation, measurement, recording, and analysis.
- Opportunities for independent and group work, preparing pupils for future scientific study and real-world problem-solving.

- Regular formative assessment in lessons and through mind maps and termly summative teacher assessment processes to gauge pupil progress, inform teaching, and provide timely and constructive feedback.

Environment and Resources

Our Science learning environment is well-equipped, providing access to a wide range of resources and materials, including:

- Relevant scientific equipment and apparatus which KS1 and KS2 team members book through our Science department with specialist advice available where needed
- Opportunities for lab-based sessions with Secondary specialist colleagues
- A variety of science-related non-fiction and fiction books available in the Lower School and Middle School libraries alongside unit-related books available in class reading areas
- Enrichment resources and opportunities, such as visits from subject specialist, on-site visits and trips (e.g. ZooLab, The Explorer Dome, Bristol Zoo Project, David Shepherd Wildlife Foundation) and enrichment days/weeks to enhance pupils' scientific experiences and contextualise learning.

EYFS

In Reception, children work scientifically through the Understanding of the World curriculum strand. There is a balance of adult-led and child-initiated learning opportunities which enable children to make sense of the physical world and explore some of the key scientific concepts and skills that they will build on in Y1 and beyond when working as Scientists. Vocabulary from the CLF Y1-6 curriculum is matched to the EYFS Understanding of the World curriculum strand and in their interactions with children, adults build important scientific knowledge and familiarity with words. Children's learning is recorded in Learning Diaries where appropriate to support assessment and teacher's knowledge of each child's understanding in this domain.

Impact

Children at King's Oak Academy are excited and engaged during their Science learning and will see themselves as Scientists, investigating the world around them. Our pupils' 'I am a Scientist' books evidence both individual and collaborative learning, showcasing their conceptual understanding, their growing substantive knowledge and skills when they are working scientifically. When learning as scientists, children pose questions that help them understand the natural and physical world; they collaborate to plan investigations and fair tests, take measurements and collect data to enable them to make conclusions, predictions and answer questions.

Our Science provision contributes to pupils' overall well-being and positive attitudes towards learning, as it nurtures a growth mindset, encouraging pupils to embrace challenges, persevere, and bounce back from setbacks. It promotes a sense of achievement and self-confidence through successful scientific inquiry, experimentation, and problem-solving and develops transferable skills, such as critical thinking, collaborative working, communication, and resilience, benefiting pupils across the curriculum and in their future studies and careers.