

Science Curriculum

Science Curriculum Intent, Implementation and Impact Overview

At Waverley Academy, children come first and our priority is to deliver high quality teaching and learning whilst at the same time providing rich and truly enjoyable learning experiences for our community of children. Everything we do as a school is to ensure that the children achieve their very best, and that they are socially and emotionally ready for academic success. We are deeply aware that children only get one chance at their primary education and it is our job to ensure that they all reach for the highest levels of personal achievement and development. The vision of the curriculum at Waverley Academy is to give all pupils the knowledge and skills they need to succeed in life. The Waverley Curriculum ethos aims to create a thirst for learning, through first hand experiences and stimulating hooks, that broaden horizons and pushes expected boundaries. Children will leave Waverley Academy successful, with a love of learning that remains with them for their next phase in education.

The intent of our Science curriculum is to deliver a curriculum which is accessible to all and that will maximise the outcomes for every child so that they know more, remember more and understand more. As a result of this they will

- develop scientific knowledge and conceptual understanding through the specific disciplines of Biology, Chemistry and Physics;
- develop understanding of the nature, processes and methods of Science through different types of science enquiries that help them to answer scientific questions about the world around them;
- be equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.
- Develop an enthusiasm and enjoyment of scientific learning and discovery.

School has identified key intentions that drive our Science curriculum. At Waverley Academy our Science curriculum intentions are:

Intent	Research Link	Implementation	Impact
<p>We intend to provide a high-quality science education that provides the foundations for understanding the world through the subjects of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils will be taught essential aspects of the knowledge, methods, processes and uses of science.</p> <p>Through building up a body of key foundational knowledge and concepts, pupils will be encouraged to recognise the power of explanation and develop a sense of excitement and curiosity about natural phenomena. They will be encouraged to understand how science</p>	<p>The Thinking Doing Talking Science Project (2012) aims to make science lessons in primary schools more practical, creative and challenging. The project found pupils made three additional months' progress, on average, in science, with a particularly positive effect for girls and pupils with low prior attainment. The programme appeared to have a positive impact on attitudes towards Science</p>	<p>Knowledge Walls Science Knowledge Walls throughout school focus on key knowledge, vocabulary and questions and exemplify the terminology used throughout the teaching of science in school and other aspects of life including recent scientific discoveries and experiments.</p> <p>Subject specific vocabulary Identified through knowledge organisers and knowledge wall and highlighted to the children at the beginning of lessons and revisited through cold and hot assessments.</p> <p>Provision in EYFS Children are given a secure grounding in the Prime Areas of learning, ensuring they have a good foundation on which to build through the specific areas, including understanding the World.</p>	<p>Children will understand the relevance of what they have learnt in science in relation to the world around them. Children will have an enjoyment of science and will be able to discuss what they have learnt and how they have gone about their learning with confidence.</p> <p>Progress will be clearly seen through looking at children's books as well as through positive data increases using the school's data tracker.</p> <ul style="list-style-type: none"> ➤ The large majority of children will achieve age related expectations in Science.

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<p>can be used to explain what is occurring, predict how things will behave, and analyse causes.</p> <p>We intend to make regular links to past and future learning not just in science but across our whole school curriculum.</p>	<p>and supported inquiry based learning.</p>	<p>Areas of provision are enhanced to ensure vocabulary understanding and extension, and develop understanding of themselves and the world around them.</p> <p>Books Children will have constant access to a wide variety of subject specific fiction and non-fiction books, available as part of science displays to relate to the different topic areas as well as online resources to support and engage.</p> <p>Fair testing/ bias We aim for children to recognise that bias can exist in science experiments particularly those conducted without thinking about variables. Children will be expected to recognise and comment on the validity of their tests and some will be able to explain why a fair test is important.</p> <p>Assessment Cold and Hot assessments. Teachers track this data and it is then put on the whole school data tracker.</p> <p>Outdoor learning We recognise that children learn in a variety of ways, and so where appropriate, children will learn Science outside the classroom.</p> <p>Approaches to teaching A wide variety of teaching approaches are used in science lessons to ensure children make good progress, and all learning styles are catered for. Class teachers ensure there is a good balance of whole class, group work, as well as time for children to express ideas individually. All classes will have at least 1 science experiment every half term.</p> <p>Consistent teaching sequence</p>	<p>➤ As scientists' children will learn lessons from science to influence the decisions they make in their lives in the future. (STEM careers and opportunities)</p>
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		<p>Science lessons will follow a clear and consistent teaching sequence, including putting the learning in the context of the topic and current time.</p> <p>An emphasis on past and future learning to reconnect with old topics, embed current learning and set up new learning. Specifying new key vocab and using it throughout the learning. Correct modelling of using specific science equipment to not only ensure safety, but also to ensure experiments are carried out properly with children able to recognise and control certain variables.</p> <p>Learning environment</p> <p>The learning environment is designed to ensure children develop their Science knowledge, and continue to know more and remember more. Knowledge walls and practical engaging experiments are key drivers to this, with teachers making reference to them during lessons and at other regular times during the term, including plenaries and starters.</p> <p>Research:</p> <p>Each class will use a termly homework project to undertake a research project focusing on their current science topic. This will support independent learning as well as allowing children to improve their working scientifically skills.</p> <p>Basic skills</p> <p>English, Maths and ICT skills are taught during discrete lessons but are revisited in science so children can apply and embed the skills they have learnt in a purposeful context.</p> <p>Cultural Capital</p> <p>Each class will take part in a yearly science visit focusing on one of the topics they have covered in that year. We will also use outside resources to come into school and connect the kids with science in a different context to school. We will also provide children with</p>	
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		links to STEM careers and opportunities as well as inviting STEM ambassadors in to school to speak with the children.	
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Pedagogy

In Science, like all other subjects, we recognise the importance of the methods and practice of teaching (the pedagogy) we choose to use in enabling pupils to know more, understand more and remember more. In Science, the following approaches will be used, and be evident in pupils' books, in order to ensure that the Science learning opportunities are as effective as possible and that pupils progress throughout the year and across year groups during their science experiences in school:

Teaching Sequence in Science	<ul style="list-style-type: none"> ➤ Using recap at the start of all lessons to revisit and review prior learning that links with current learning. ➤ Specify key vocabulary to be used and its meanings discussed with children and embedded throughout learning. ➤ Conduct scientific experiments using a range of age appropriate and skill level equipment. ➤ Interpret their findings using scientific methods/ linking to maths to find averages in data and construct graphs and charts. ➤ Communicate their scientific knowledge 	Possible pedagogical Approaches used in Science	<p>Behaviourism- Direct teacher instruction; modelling of skills and techniques; modelling of correct use of equipment as well as specific scientific writing techniques.</p> <p>Demonstration Constructivism- Inquiry-based learning; outdoor learning/ practical experiment based learning.</p> <p>Social Constructivism- Teacher modelling; questioning; mix of individual, paired and group Instruction</p> <p>Liberationism- Pupil-led learning; opportunities to showcase learning- science fairs/ and displaying work around class and school.</p> <p>Learning, working and talking like a Scientist - Being introduced to the key vocabulary that a Scientist would use; defining the key vocabulary that a scientist would use; high expectations of pupils 'talking' like a scientist; high expectation of pupils researching, interpreting and presenting like a scientist. Emphasis on working safely In the classroom as a scientist would in their lab.</p>	
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	<p>and understanding appropriately</p> <ul style="list-style-type: none">➤ Evaluate their learning and compare with other experiments/learning throughout the year			
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