

# Science at Chesterfield



At Chesterfield, we want our children to be curious scientists. In line with our curriculum driver, developing aspirations and possibilities for all, we want children to have no limits to what their ambitions are and grow up wanting to be doctors, engineers, astronauts and forensic scientists. We encourage children to learn from, be inspired by the work of great scientists, and understand the contribution science has made to society, both past and present.

Our goal for Science education is that children become scientifically literate citizens who understand the world around them, by developing:

- the ability to ask meaningful questions based on their experiences
- the ability to effectively communicate their scientific thoughts using relevant vocabulary
- the use of scientific enquiry skills; and
- enjoyment of exploring, discovering and creating meaningful connections with the world.

We believe that it is important for children to have as many memorable hands-on scientific opportunities across their school career. Our Edible Playground is a vibrant outdoor teaching garden that inspires hands-on learning and gets children excited about growing and eating healthy food. It also helps to improve the children's health and wellbeing whilst providing a fun outdoor learning environment that supports cross-curriculum teaching.

Our curriculum drivers of communication, oracy, reading, aspirations and inclusion for all shape every aspect of Science, are embedded in teaching and learning and develop the child as a whole.

## At Chesterfield, we are scientists:

*By the end of their primary education our children will:*

- Have a developing sense of curiosity about the world around them and how they impact this world.
- Have a strong scientific vocabulary created through active discussion.
- Begin to understand why and how living things change, recognising some of the causes and consequences of these changes.
- Begin to understand everyday concepts such as sight, sound, gravity, friction and electricity.
- Learn to appreciate how diverse the world is, the intricacies of the human body and the differences between animal species.
- Know how to predict, experiment and form valuable scientific conclusions from their own investigations.
- Understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Together with this knowledge and understanding we want the children to be skill rich: competent, keen and enthusiastic scientists in the making.

## Science in the EYFS:

- In the EYFS children are provided with opportunities to explore, problem solve, observe, predict, think, make decisions and talk about the world around them. They develop scientific knowledge through experimental play.
- Asking key 'how' and 'why' questions children are given the opportunity to discuss basic scientific principles in a fun and stimulating way.
- Children learn about their bodies, healthy eating and basic human and animal needs, linking in to an uncomplicated approach to learning biology.
- Animal workshops give the children the opportunity to learn about animal needs and care in a safe and stimulating environment, developing a sensitivity and empathy towards animals as well as increasing their scientific knowledge.

## How do we implement our science curriculum:

- Our long-term science plan allows children to revisit their learning across the year, to build on their knowledge and enable them to firmly embed the scientific principles in the specific disciplines of biology, chemistry and physics.
- Alongside the working scientifically strands of the National Curriculum, there is clear progression across the 5 enquiry types, helping children to improve their investigative skills year on year.
- Carefully selected skills are chosen to best match each unit of work and progress year on year. Opportunities to practise and embed skills are planned for so that they are revisited and refined over time.
- Each unit of learning has a strong foundation in new knowledge – linked to prior knowledge – that will support the children to understand increasingly complex scientific phenomena and processes.
- Scientific vocabulary is mapped and taught rigorously to ensure that children can recognise, understand and use scientific terminology accurately and confidently.
- Opportunities to learn outdoors and explore our natural environment are embedded throughout our science curriculum.
- Our Edible Playground gives our pupils the chance to plant, care for and eat their own fruit and vegetables; experiences particularly valuable for not just our school pupils but the whole community.
- Museum visits, fieldwork visits and interactive workshops are planned within the science curriculum to develop a deeper understanding of the topic studied and to inspire the children to question and delve further into complicated scientific principles.
- We participate in science week each year to celebrate all sciences and their importance in our everyday lives.
- We use a variety of teaching and learning styles in science lessons. Our principal aim is to develop children's knowledge, skills, and understanding through the use of key concepts that are returned to by every year group. Sometimes we do this through whole-class teaching, while at other times we engage the children in an enquiry based research activity.
- We believe children learn best when they are provided with the following opportunities:
  - use a variety of data, such as statistics, graphs, pictures, and photographs
  - use computing in science lessons where it enhances their

	<p>learning</p> <ul style="list-style-type: none"> <li>- roleplay and discussions where they present reports to the rest of the class</li> <li>- engage in a wide variety of problem-solving activities. Wherever possible, we involve the pupils in 'real' scientific activities, for example, researching a local environmental problem or carrying out a practical experiment and analysing the results.</li> </ul>
<p><b>Planning:</b></p> <ul style="list-style-type: none"> <li>• The science curriculum map identifies the units to be covered each term alongside the assessment pieces.</li> <li>• Teachers link prior knowledge to the new learning to deepen children's thinking. They plan sequences of lessons across the unit that will build on and develop the children's knowledge and skills.</li> <li>• We use short term plans to set out the learning objectives for each lesson as well as the activities and resources that will be used to achieve the LO.</li> <li>• Consideration is given to how greater depth will be challenged within each lesson, as well as how learners will be supported in line with the school's commitment to inclusion. Adaptation and challenge is evident and planned for in every lesson.</li> <li>• Teachers are able to use the Kent scheme of work as well as the Association for Science documents to support their planning, resourcing and subject knowledge.</li> <li>• We have high-quality science resources to aid and support the teaching of all units and topics taught from EYFS to Y6. We keep these in a central store, where they will be labelled and easily accessible to all staff.</li> <li>• We also have a selection of science topic books to support children's individual research.</li> </ul>	<p><b>Teaching:</b></p> <ul style="list-style-type: none"> <li>• Science is taught in weekly lessons and is also delivered through cross-curricular links in other subjects.</li> <li>• There is an emphasis on scientific investigations and practical activities that are based on real world scenarios.</li> <li>• Scientific work is recorded in a variety of ways appropriate to the age of the children and their individual needs in each key stage. This can include teacher observations, photographs, drawings, tables, graphs, written accounts and formal write ups.</li> <li>• Flexible groupings are used during lessons e.g. mixed ability groups, paired work, guided and independent work and whole class work.</li> <li>• At the start of the lesson, children will take part in a short retrieval 'flashback' task where they will be required to retrieve previously gained knowledge. The children may have acquired this knowledge in a previous lesson, unit of work or even a previous year group. This task is designed to strengthen our pupils' memories of key knowledge, enabling them to permanently remember and make progress across the curriculum.</li> <li>• Opportunities to develop core English skills are exploited through research and reporting as well as the learning of new vocabulary.</li> <li>• Relevant vocabulary is explicitly taught, is evident in the classroom and is used in discussion and reasoning.</li> <li>• Learning is further developed through our science learning walls where children can find information, key vocabulary and examples of previous learning to further embed and help recall what has been learnt.</li> <li>• Secondary sources of information such as books, photographs, graphs, diagrams, models and ICT are used to enhance learning.</li> <li>• Wherever possible science work will be related to the real world and everyday examples will be used.</li> </ul>
<p><b>Assessment and feedback:</b></p> <p>Assessment for learning is continuous throughout the planning, teaching and learning cycle. Assessment is supported by use of the following strategies:</p> <ul style="list-style-type: none"> <li>• Outcomes in science books to assess on-going attainment and progress.</li> <li>• Effective feedback, which has caused thinking to take place.</li> <li>• Knowledge quizzes at the end of each unit to show progress and identify key knowledge that has been learnt.</li> <li>• Assessment tasks planned within each science topic.</li> </ul> <p>Class teachers then use the children's class learning and assessments, along with observations of their skills when carrying out experiments and investigations, to make a judgement as to whether each child is working towards, at or above the expected level.</p> <p><b>Feedback:</b></p> <ul style="list-style-type: none"> <li>• Children's work should always be looked at and assessed before the next lesson.</li> <li>• Children to self/peer assess all aspects of the science work.</li> <li>• Scientific vocabulary to be corrected in green pen alongside common exception words for that year group.</li> <li>• Teachers should conference with each child in science to address</li> </ul>	<p><b>How do we evaluate learning in science?</b></p> <ul style="list-style-type: none"> <li>• Chesterfield provides engaging, high-quality science learning that ensures our children understand the world and are equipped with scientific skills and knowledge that will enable them to be ready for the curriculum at Key Stage 3 and to support future careers which will undoubtedly involve scientific processes.</li> <li>• The impact of our Science curriculum can clearly be seen in the children's books.</li> <li>• Our rich science curriculum is also evident in the texts that we have selected for our children to read, science displays and class assemblies where children share their knowledge with their parents.</li> </ul> <p>The Deputy Head and the science subject leader monitor the impact of the science curriculum using a variety of strategies.</p> <ul style="list-style-type: none"> <li>- Scrutiny of books</li> <li>- Progress within assessment tasks/quizzes</li> <li>- Pupil voice</li> <li>- Learning walks</li> <li>- The priorities set out in the science action plan are monitored and the targets set are reported upon to ensure</li> </ul>

<p>misconceptions or to extend the children’s learning. Children indicate this with ‘PC’.</p>	<p>the desired impact upon our pupils is achieved.</p> <ul style="list-style-type: none"><li>- Moderation staff meetings where pupil’s books are scrutinised and there is the opportunity for a dialogue between teachers to discuss the impact of our science curriculum.</li></ul> <p>All of this information is gathered and reviewed. It is used to inform further curriculum developments and provision is adapted accordingly.</p>
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