



Castlecroft Primary School



Science Policy

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(This policy cannot be seen in isolation but must be read in relation to the school's Curriculum policy and Marking policy.)

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Science at Castlecroft

We encourage children to be curious throughout their time at Castlecroft and beyond, and to build on their confidence and love of science. The science curriculum encourages children to have a healthy curiosity about our universe and to appreciate both living and non-living things. Science, in our opinion, entails the development of knowledge, concepts, abilities and good attitudes. The pupils will acquire and develop key knowledge identified within each unit and across each year group, as well as the application of scientific abilities, throughout the study programmes. We ensure that the children's Working Scientifically skills are built on and developed throughout their school years so that they can confidently apply their science knowledge when using equipment, conducting experiments, constructing arguments, explaining concepts, as well as continue to ask questions and be curious about their surroundings.

How this policy was developed:

The Science subject leader established this policy with the support of the local authority network and senior leadership. Before the policy was established by the whole governing body, it was discussed with staff and governors. At least every two years, the policy will be reviewed and presented to the board of governors, but more frequently if significant modifications are made.

Key roles in Science:

The Science coordinator is responsible for:

- ✓ This policy and its implementation including supporting staff in the delivery of Science.
- ✓ Ensuring that the governing body is kept up to date with any actions and initiatives that are relevant to the subject.
- ✓ Writing the relevant part of the School Improvement Plan (SIP) and providing the Head Teacher and Governing Body with regular reviews of the SIP.
- ✓ Conducting activities to check science quality and use this information to identify staff training requirements and organise or provide CPD.

The Governing body are responsible for:

- ✓ Ensuring delivery of the National Curriculum in Science by ensuring the school's Science curriculum is delivered effectively.
- ✓ Identifying a link governor to liaise with the Science coordinator and update the governing body with regular link governor reports annually.

Intent:

At Castlecroft, we intend for all pupils to become competent scientific thinkers and investigators who will encounter awe and wonder through first-hand scientific investigative experiences and approaches, which activate learning for all children. With great emphasis on providing children with a high-quality science education that offers the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Our curriculum design for Science promotes specific competencies including knowledge, enquiry and the working scientifically based skills. Creative pathways to learning are planned for so that children can make links to prior learning. This develops depth in key skills within Science that are rich, stimulating, challenging and real life with the aim of enabling children to master learning with skills, knowledge and experiences that will remain with them for the rest of their lives.

We encourage all our children to reach their full potential and be aspirational. Through an exciting and challenging, carefully planned Science curriculum our pupils will:

- ✓ Foster a positive attitude to Science through practical activity, exploration and discussion.
- ✓ Have the ability to recall age appropriate facts rapidly and accurately.
- ✓ Develop the ability to think clearly and logically, with confidence, flexibility and independence of thought.
- ✓ Develop a deeper understanding of science through a process of enquiry and investigation.
- ✓ Develop the ability to apply knowledge, skills and recalled facts to a range of scientific problems and situations.
- ✓ Become aware of the uses of science in the wider world and appreciate the contribution made by many cultures to the development and application of the subject.
- ✓ Develop the ability to use correct vocabulary as a means of articulating their reasoning and scientific thinking.
- ✓ Develop the appropriate attitude and motivation to work both alone and cooperatively to solve problems.
- ✓ Develop personal qualities such as perseverance, independent thinking, cooperation and self-confidence.
- ✓ Develop a practical understanding of how information can be gathered and presented.

We encourage all our children to reach their full potential and be aspirational. Through an exciting and challenging, carefully planned Science curriculum our pupils will:

- ✓ Investigate their environment by observing, exploring, investigating and recording
- ✓ Demonstrate a secure understanding of the big ideas and concepts of science

- ✓ Make sense of evidence collected and presented in a scientific manner
- ✓ Recognise the impact science makes on their lives, on the lives of others, on the environment and on culture
- ✓ Express opinions and make decisions on social, moral, ethical, economic and environmental issues informed by their knowledge and understanding of science.

Our long term plan indicates what is to be taught in each year group. (See Below)

Science Mapping

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Everyday Materials	Human Senses	Seasonal Change		Plant Parts	Animal Parts
Year 2	Human Survival	Habitats	Uses of Materials	Plant Survival	Animal Survival	
Year 3	Animals Nutrition and the Skeleton Systems		Forces and Magnets		Plant Nutrition and Reproduction	Lights and Shadows
			Rocks – Cover through cross circular link in Geography.			
Year 4	Food and the Digestive System	Sound	States of Matter	Grouping and Classifying	Electrical circuits and Conductors	
Year 5	Forces and Mechanisms	Earth and Space	Human Reproduction and Ageing		properties and Changes of Materials	
Year 6	Circulatory Systems		Electrical Circuits and Components		Light theory	Evolution and Inheritance

Implementation:

Science is taught at Castlecroft Primary School in units of work that cover all relevant topics of biology, chemistry, and physics. Children will be exposed to all aspects of the scientific curriculum throughout each phase, including 'plants,' 'adaptation and evolution,' 'forces (both touch and non-contact),' 'space (in UKS2), and materials. Each phase will also include opportunity to inquire about these topics over an extended period of time. At Castlecroft, the most important purpose of scientific education is to excite, foster, and sustain our pupils' curiosity, wonder, and questioning.

EYFS Science

To enhance their knowledge and comprehension of the world around them, the children in Nursery have the chance to investigate, question, and react to scientific inquiries via play, discourse, and experiences using a variety of equipment and the outdoor environment.

Children in Reception experience a dedicated Science slot during which they are guided to investigate, question, and react to scientific inquiries through play, discussion, and experiences with a variety of equipment. Additionally, throughout each session and throughout the balance of the unit, increased provision opportunities are laid out for the pupils to access and deepen their knowledge and comprehension.

KS1 AND KS2 Science

Science is taught at Key Stages 1 and 2 using the Curriculum Maestro Scheme of Learning. Each unit of study has a clear structure that pupils understand and that allows them to connect scientific inquiries by investigating difficulties and questions in order to broaden their scientific understanding of the world around them. Each unit advances through the major phases, demonstrating progression (see progression maps) and the development of knowledge and vocabulary. There are 4 or 5 science units in each year group that must be taught to achieve the minimal requirements. We intend to spend one Science session each week in Key Stage 1 and two hours per week in Key Stage 2 but some classes tend to block their Science lessons.

In addition, we provide a language-rich atmosphere, therefore at the beginning of each lesson we provide 3 or 4 key vocabulary words linking to each lesson that children should know by the end. We also provide a variety of materials that help our pupils to strengthen their scientific thinking skills. They're encouraged to observe changes in their surroundings, look for patterns, and comment about what they see. Through positive interactions, we want our children to become good problem solvers and demonstrate interest in the world around them. When it comes to establishing a love for Science, pupils must be confident and enthusiastic in order to express themselves and learn. In Science, we use a sensitive questioning strategy, effective modelling, and scaffolding to help children develop and build on their skills.

Each new unit of work begins with a question which enables teacher's opportunity to amend groupings to meet the needs of their children. Groupings are therefore flexible and determined by these assessments. Children are grouped in three differentiated levels:

'Silver' is for those children requiring extra support in that particular unit of work.

'Green' is for children expected to meet their Age Related Expectations (ARE) in that unit.

'Purple' is for children expected to exceed their Age Related Expectations (ARE) in that unit.

Teaching and Learning Strategies

Our policy is to aim to ensure the use in Science of art, drama, thinking skills, speaking and listening activities, visits, posters, photographs, videos, ICT use, display work and other active learning strategies. Cross curricular work is encouraged, in line with whole school policy on teaching and learning. For example; in year 3 we teach Rocks through our Geography topic 'Rocks, Relics and Rumble' which covers all National Curriculum statements for Science. We recognise the importance of teaching to the National Curriculum in a creative, knowledge-rich, broad and balanced way.

We have a wide selection of resources to support our Science teaching, which we are constantly improving. The scientific cupboard contains the resources, which should be returned after usage. The Science Subject Leader conducts a regular resource audit in order to maintain our collection up to date.

The scientific knowledge and understanding of children is increased by carefully selected and organised school trips or visitors to school for various year groups. Reception, for example, visit Dudley Zoo to reinforce the children's understanding of animals, while Year 2 visit Kingswood. Furthermore, the usage of the surrounding environment enhances children's scientific knowledge and understanding, and we provide opportunities for them to observe and record information around the school grounds. Year 1 participate in a sound walk, Year 4 participate on a leaf classification walk, and Year 5 explore the school grounds and surrounding region.

Impact:

At Castlecroft, we aim for all pupils to leave as knowledgeable scientists who are able to think and work scientifically. Evidence of this is shown through our children's problem solving skills, their ability to talk about their science work, their understanding of the environment and the work evident in their science books.

Discussion with pupils reveals their enthusiasm for the subject as well as their understanding of the scientific concepts taught. Pupils are engaged and enthusiastic about their science learning, as seen by their enthusiasm when talking about science and their learning behaviours in class.

Within the safe learning atmosphere offered by staff, children are given the opportunity to learn and challenge themselves.

Assessment :

Assessment for learning is continuous throughout the planning, teaching and learning cycle. Key Science knowledge is taught to enable and promote the development of children's skills. Assessment is supported by use of the following strategies:

- ✓ Observing children at work, individually, in pairs, in a group and in class during whole class teaching.
- ✓ Using a range of carefully planned, differentiated, open-ended questions that require children to explain their understanding and using supplementary questions to deepen their thinking further.
- ✓ Book moderation and monitoring of outcomes of work, to evaluate the range and balance of work and to ensure that tasks meet the needs of different learners.
- ✓ Marking: Teachers use a developmental feedback system to mark the children's work. The ABC system, as it is known in school, ensures that children quickly know whether they need additional support (A), have achieved all of the LO and success criteria, (B) or whether they have corrections to do (C) Where children receive an A, teachers plan targeted intervention and re-teach activities to address the pupils' misconceptions in a smaller group.
- ✓ Teachers make summative end of term 'age related' judgements based on their formative data. These are recorded on the Curriculum Maestro trackers at the end of each lesson. To assist teachers in making these data judgements.
- ✓ Summative assessment judgements are monitored and books are scrutinised in work trawls.

Children's attainment in Science is reported to parents in termly parents' evenings and in the end of year report which also includes end of Key stage results.

Contribution of Science to teaching in other curriculum areas:

Mathematics

In a variety of ways, science contributes in the teaching of mathematics. Weights and measures are used, and the youngsters learn to utilise and apply numbers. They learn to estimate and forecast by working on investigations. They improve their ability to see and report events accurately. Many of their answers and conclusions are based on numbers.

Computing

When it is suitable, children incorporate computers in science lessons. They learn how to discover, select, and analyse information on the Internet to support their scientific work. ICT is used by children to record, present, and understand data, as well as to examine, change, and evaluate their work and enhance the presentation of it.

Personal, social and health education (PSHE) and citizenship

Science plays an important role in the delivery of personal, social, and health education. This is primarily due to two factors. For example, the topic lends itself to discussions about citizenship and social welfare. Children, for example, observe how people recycle materials and how landscapes are altered both positively and negatively. Secondly, children gain from the subject's nature in that it allows them to participate in debates and conversations. The concept of positive citizenship is promoted by science.

Spiritual, moral, social and cultural development

Science education provides pupils with numerous opportunities to investigate some of life's most fundamental questions, such as the evolution of living things and how the planet was created. Children develop a sense of wonder and wonder about the nature of our world as a result of many of the fascinating processes that effect living things. Many social and moral issues are raised by science. Children have the opportunity to debate the impacts of smoking and the moral issues involved in this issue through the teaching of science. We provide pupils the opportunity to consider how people care for the planet and how science can help us manage the Earth's resources.

Equal opportunities :

At Castlecroft Primary School we are committed to providing a teaching and learning environment which ensures equal access to our Science curriculum regardless of social class, gender, ethnicity, culture, home background, special need or disability. We are committed to enabling all pupils to reach their full potential.

Inclusion:

Every pupil has the right to participate in the Science curriculum at a level that is appropriate for their needs and ability. To guarantee full accessibility and sufficient challenge for everybody, teachers plan carefully and employ a variety of tactics. The school makes excellent use of additional adults to ensure that our curriculum is accessible to all pupils.

To ensure inclusion:

- ✓ As a school with a VI base we are committed to ensure full inclusion for our VI pupils who are taught in class alongside their peers. These pupils are only withdrawn for specific needs such as mobility lessons. One to one support in lessons as appropriate, alongside quality modified resources ensures that these pupils make good progress and attain well.
- ✓ Pupils or groups of pupils with additional needs or those who are under-achieving are identified through our assessment system and appropriate intervention carefully planned and monitored for impact.
- ✓ Teachers and teaching assistants are all aware of disadvantaged pupils ensuring that they are targeted for support in lessons ensuring that they perform in line with non-disadvantaged pupils in the same ability band.
- ✓ Our number of EAL children is significantly below the national average however advice is sought and support and intervention used where necessary to ensure good progress and attainment for these pupils. .

Monitoring, Evaluation and Review

At Castlecroft it is important to us to monitor and review the Science curriculum. We regularly review our practice. Links with schools in the city, who are models of good practice, help to shape next steps and affirm good practice.

We do this by:

- ✓ Reviewing children's work and the quality of teaching in Science. This will be done by the subject coordinator.
- ✓ The subject leader is involved in supporting colleagues in the teaching of science, being informed about current developments in the subject.
- ✓ Children will be responsible in taking part in self-assessment activities.
- ✓ The subject coordinator annually reviews the teaching and learning of Science in schools for the School Development Plan.
- ✓ Staff training will take place where teachers work together collaboratively to assess Science involvement and teaching in school.