

# RAVENS COTE JUNIOR SCHOOL

## SCIENCE POLICY

2024 - 2025



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## Science Policy

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## **INTRODUCTION**

“Science stimulates and excites pupils’ curiosity about phenomena and events in the world around them. It also satisfies their curiosity with knowledge. Because science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical and creative thought. Through science, pupils understand how major scientific ideas contribute to technological change – impacting on industry, business and medicine and improving the quality of life. Pupils recognise the cultural significance of science and trace its world-wide development. They learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world.” National Curriculum. Ultimately, at Ravenscote Junior School, we believe science will lead to a better understanding of ourselves and the world.

## **AIMS OF SCIENCE TEACHING**

Science is a way of thinking, leading to a way of working, which helps in our understanding of the world around us and natural phenomena. We give the children the basic skills of numeracy and literacy and through science we give them the essential thinking and reasoning skills. The question ‘why?’ must play a key role in the children’s science teaching and learning. Practical activities are normally the best medium for understanding science and the children are encouraged to investigate for themselves as well as follow a more structured approach.

Science teaching will offer opportunities for children to:

- develop knowledge and understanding of important scientific ideas, processes and skills and relate these to everyday experiences;
- learn about ways of thinking; and of finding out about and communicating ideas;
- help children develop, model and evaluate explanations through scientific methods of collecting evidence using critical and creative thought;
- explore values and attitudes through science in particular curiosity, teamwork and cooperation, perseverance, humility, scepticism, integrity and honesty and open mindedness and respect.

## **INTENT**

At Ravenscote Junior School, the intent is to teach the National Curriculum and to ensure the pupils apply that knowledge to explain and explore the world around them. In turn, this will encourage and foster a growing sense of curiosity and will stimulate them to question the world and discuss scientific issues that may affect their own lives and the lives of other.

## **IMPLEMENTATION**

We have used the recommended research from the ASE that is approved by Ofsted and the ASE association to create a well sequenced and progressive curriculum map containing the key concepts children need in order to think and work scientifically.

Science pedagogy is based on the development of these key scientific concepts which are outlined in each science lesson:

- conceptual understanding
- processes
- skills of enquiry



- scientific attitudes

The scientific method at Ravenscote is about developing and evaluating explanations through experimental evidence and modelling which is the ignition to critical and creative thought.

### KNOWLEDGE AND UNDERSTANDING

Children should:

- be curious about things they observe, and experience and explore the world about them with all their senses;
- use this experience to develop their understanding of scientific ideas and make links between different phenomena and experiences;
- begin to think about models to represent things they cannot directly experience;
- try to make sense of phenomena, seeking explanations and thinking critically about claims and ideas.

### SCIENCE LESSONS

Good science lessons should:

- give a learning objective at the start, which is referred to throughout the lesson and evaluated at the end;
- give opportunities for speaking and listening;
- have questions of different levels and styles, with opportunities for children to confer and discuss their ideas;
- have interesting and varied activities;
- aim to present science in the practical context which is relevant to the children's experience;
- encourage collaboration
- encourage children to investigate their own questions.

### PROCESSES AND SKILLS

Children should:

- acquire and refine the practical skills needed to investigate questions safely;
- develop skills of predicting, asking questions, classifying, communicating, researching, making inferences, concluding and evaluating based on evidence and understanding and use these skills in investigative work;
- practise mathematical skills *eg. counting, ordering numbers, measuring to an appropriate number of decimal places, drawing and interpreting graphs and bar charts* in real contexts;
- learn why numerical and mathematical skills are useful and helpful to understanding.

### LANGUAGE AND COMMUNICATION

Children should:

- think creatively about science and enjoy trying to make sense of phenomena;
- develop language skills through talking about their work and presenting their own ideas using sustained and systematic writing of different kinds;
- use scientific and mathematical language including technical vocabulary and conventions, and draw diagrams and charts to communicate scientific ideas;



- read non-fiction and extract information from sources such as reference books and the Internet.

### VALUES AND ATTITUDES

Children should:

- work with others, listening to their ideas and treating these with respect;
- develop respect for evidence and evaluate critically ideas which may or may not fit evidence available;
- develop a respect for the environment and living things and for their own health and safety.

### SOCIAL, MORAL, SPIRITUAL & CULTURAL DEVELOPMENT

Across the topics taught in each year group, all the scientific skills for investigation and enquiry are explored. It is very important to us that children recognise the cultural significance of science and trace its worldwide development. One element of this (Assessment Focus Strand 2) considers the children's understanding of the implications and applications of science. Within this area of focus, the children look at the feelings and opinions of scientific or technological phenomena, considering its impact in society. As the children progress in their scientific understanding, they will begin to consider the ethical and moral issues linked with science, consequently developing their moral, social and cultural understanding. Furthermore, Science plays an important role in economic wellbeing, identifying job roles in society and inspiring the children to make an impact in the future. This is most evident in our science curriculum days when guest speakers are invited in to share how science is used in their jobs.

During each year in KS2, the children learn about different elements of life processes, particularly considering the surrounding world and the scientific questions it presents. Throughout the many topics covered, the children are encouraged to respect the values and opinions of others, whilst reflecting upon and questioning their own opinions. Due to its practical nature science encourages children to use investigational skills including the ability to collect, analyse, evaluate, and communicate data. Most importantly we encourage the children to work collaboratively to investigate the world around them, asking questions and respecting the answers.

Keeping healthy is an integral part of the science curriculum. In each year, the children learn about different aspects of the human body.

Science, as a highly practical subject, has an element of risk. CLEAPSS guides are available to staff in the science cupboard and a BE SAFE booklet is available to all in the staff room. Each science team member has a copy in their new science folders. Children are made aware of the risks and their responsibilities in each topic- this enables them to make sensible choices being aware of their own safety and that of those around them.



## INCLUSIVE EDUCATION

### GIFTED AND TALENTED PUPILS

Gifted and Talented children will be challenged and motivated by adapted work given by the teacher appropriate to his or her needs. Teachers will also use questions that allow the gifted and talented child to maintain their involvement in the lesson and demonstrate their knowledge and abilities. Teachers will aim to identify those children who are gifted and talented in science so that they are given the opportunity to follow an individualised programme with more challenging concepts to tackle in science and many other areas of the curriculum. The use of this symbol is used to demonstrate a deeper thinking question:



### SPECIAL EDUCATIONAL NEEDS AND INCLUSION

Science lessons are appropriate for all children as the teacher will adapt as necessary for those children with additional needs. Liaison with the Inclusion Assistant Headteacher may sometimes be necessary. Teachers will include all children in science lessons by ensuring the skills are the same for all learners but the journey to the same end point may be different. The use of the 5 a day principles (explicit instruction, cognitive and metacognitive strategies, scaffolding, flexible grouping and using technology) are apparent in lessons to enable pupils to develop knowledge and build on knowledge from previous years. For example, inclusion pupils are given topical word banks to refer to when explaining scientific processes and learning is scaffolded through adaptations in resources. All children will benefit from aspects of the lesson, such as discussion and other children communicating and sharing ideas.

### EQUAL OPPORTUNITIES

It is important when planning work in science that the teacher pays close attention to equal opportunity in respect of sex, race, the needs of the most able children and those children with special educational needs. We live in a multi-cultural society. The science work done by children in school should, where possible, reflect this.

### HEALTH AND SAFETY

It is important that all teachers are aware of the responsibility they have regarding health and safety both inside and outside the classroom. Teachers need to take account of both the children's and their own health and safety when involved in science activities.

Further information on health and safety issues and safety points specific to individual science investigations, teachers should refer to the following sources;

CLEAPPS booklet (displayed in the staffroom)



## CROSS-CURRICULAR SCIENCE

### SCIENCE AND ENGLISH

It is crucial that, despite the practical element of science, the children are encouraged to develop their literacy skills in science, particularly when writing up investigations. Features of writing, such as instructions for methods and reports for conclusion are referred to when writing up experiments. In addition to this, teachers address misspelt words in their marking, particularly topic specific words.

### SCIENCE AND MATHS

Whilst data handling and drawing graphs is covered in maths, high expectations are set in science too. The children are expected to apply their mathematical knowledge when presenting and interpreting data. The practical nature of science is recognised. Science plays an important role in the development of investigative skills and draws upon strong mathematical links, e.g. measurement, pattern recognition, graphical skills (which in Year 6 includes a line of best fit) and data handling.

### SCIENCE AND COMPUTING

ICT is an important tool in the recording and communicating of information. Children are encouraged to use various peripherals are used to support their learning, including: logits, digital cameras, the internet, laptops (graph and chart software) and digital microscopes.

### SCIENCE AND PSHE

Keeping healthy is a crucial part of the science curriculum; this is linked to the PSHE curriculum. In addition to this, the children learn about the human body and the changes which it undergoes.

### ECO SCHOOLS

Children are encouraged to take care of their environment through the science curriculum, every encouragement is given to the children to apply the principles of energy efficiency, water conservation, waste reduction and recycling and litter control. Recycling is actively encouraged throughout the school and every classroom has notices encouraging this. The school actively promotes the 3 Rs (Reduce, Reuse and Recycle) in partnership with local and national organisations. Additionally, there are many opportunities within science and other areas for children to learn about the choices they have and the impact that they can make on their environment.

### SCIENCE CURRICULUM (whole school overview):

	Autumn	Spring	Summer
Year 3	Scientific inquiry Forces and magnet	Light Rocks	Animals including Humans Plants
Year 4	Scientific inquiry Sound	Electricity Animals including humans ( <del>Marwell</del> trip)	All living things States of matter
Year 5	Animals including humans Properties and changes of materials	Forces Plants	Earth and Space All living things
Year 6	All living things Electricity	Animals including humans Light	Evolution and inheritance Year 7 transition



## **RESOURCES**

Larger resources for science are stored in the Science and DT cupboard next to the staff room. Each year group has access to this cupboard with clearly labelled resources.

## **PROGRESSION**

We promote a balanced science education which enables progression and continuity between classes. We aim to continuously develop the scientific capability of our children by moving them:

- from everyday language to precise scientific vocabulary, notation and symbols;
- from describing events to explaining events;
- from explaining phenomena in their own terms, to explaining phenomena in scientific models;
- from participating in adult lead investigations, to undertaking their own scientific investigations;
- from their disciplinary knowledge in each year group.

## **MONITORING**

At Ravenscote, monitoring of the standards of children's work and of the quality of teaching in science is the responsibility of the science coordinator to ensure continuity and progression throughout the school. The role of science coordinator also involves being informed about current developments in the subject and providing a strategic lead and direction for the subject in school. An annual summary of science is made in which strengths and weaknesses in the subject evaluated and an action plan to address any issues arising in formulated.

## **ASSESSMENT**

Assessment will take place at three levels: short-term, medium-term and long term. These assessments will be used to inform teaching in a continuous cycle of planning, teaching and assessment:

Short-term assessments

- is an informal part of every lesson to check the children's understanding and give the teacher information to adjust future lessons.

Medium-term assessments

- takes place at the end of every unit of work. The teacher will assess the children using a task which focuses on a specific skill, which the children have used throughout that topic, and scientific knowledge

Long Term assessments

- takes place towards the end of the year. Teachers will draw upon their end of unit assessments to produce an overall sub -level based on "secure fit" National Curriculum levels. This will be recorded and children will be tracked throughout the school.

