



# THE CARLTON JUNIOR ACADEMY

## Science Policy

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## **Introduction:**

We understand the importance for every child to develop their scientific and enquiry skills, as a vital element of all subjects, as well as a subject in its own right. This document is a statement of our aims, values and strategies for the teaching and learning of Science at The Carlton Junior Academy. Science is a core subject and in each lesson, we stimulate curiosity, discussion and investigation. This policy follows the statutory requirements for the teaching and learning of Science, documented in the National Curriculum.

## **Vision and Aims:**

We believe that Science is a body of knowledge built up through experimental testing of ideas. We achieve success by our aims to stimulate a child's excitement and curiosity in finding out why things happen in the way they do. In line with the National Curriculum, children will cultivate methods of enquiry and experiments which stimulate creative thought, they will also gain the ability to be able to investigate and answer their questions, make predictions about their ideas and know how to test these out independently. We factor in children's prior knowledge and build this into Science planning through pre-teaches and our memory and recall activities to promote 'sticky knowledge'. All planning follows the subject leader's sequences of learning, to ensure high quality planning and teaching and allowing children to develop their current skills and inhabit new skills.

## **Intent:**

We aim to spark curiosity and encourage questioning so that children gain a strong understanding of the world around them and achieve specific skills of investigation, for today and for the future. Our lessons are carefully planned, embedding scientific enquiry skills within each topic studied. These topics are revisited and developed throughout their time at school, ensuring children have a secure understanding. When asked, our children explain their passion for Science and the enjoyment they feel when completing a vast range of scientific activities and experiments.

Children are encouraged to read in science lessons through first and secondary research. This allows them to make links across many areas of the curriculum. Maths links are made through Science by improving data handling skills, independently creating graphs as well as being able to develop the recording of scientific experiments. Computing links are made through the use of Data Loggers and conducting scientific research. Ultimately, we want children to enjoy learning all three areas of science. Many topics will be covered on more than one occasion throughout their schooling in order to embed their knowledge.

Our curriculum allows all children to develop and use a range of skills including observation, planning and investigation, as well as being encouraged to question the world around them and become independent learners in exploring possible answers for their scientific based questions. This supports effective communication of ideas and opinions. Scientific vocabulary is taught through focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. Some examples of how we promote cultural capital: STEM ambassadors completing workshops with classes; we also celebrate World Science Day, British Science Week and National Space Day.

### Our children are taught to work scientifically, which involves:

- Developing an understanding of science through enquiry and investigation.
- Observing, measuring and undertaking a variety of tests.
- Developing curiosity and asking scientific questions.
- Reading and using scientific vocabulary.
- Testing and developing ideas.
- Making decisions.
- Developing independence and teamwork skills.
- Analysing functions, and relationships and interactions.
- Answering Science questions using different types of scientific enquiry.
- Using scientific equipment (including ICT and data loggers) appropriately and correctly to answer questions.
- Increasing children's awareness and inspiration for further study and careers in science.
- Using and applying their learning to understand the uses and implications of Science, today and for the future.
- Planning, writing and concluding an investigation.
- Developing an enjoyment and fascination of Science.

### Science in the Curriculum:

Science is important to us because it influences each aspect of our lives and allows us to make sense of the world we live in. Statutory requirements for the teaching and learning of Science are set in The National Curriculum in England Framework Document for Teaching, September 2014. We ensure each year group has met the objectives outlined in the National Curriculum. When planning in Lower Key Stage Two, we build on the skills children have learned during Key Stage One. *During Key Stage one, pupils observe, explore and ask questions about living things, materials and the world around them. Children work together to collect evidence to help them answer questions, find patterns, classify and group objects, research using a variety of sources and carry out fair testing. Children also begin to work scientifically by learning the various elements of investigations: making predictions, planning simple methods, looking at the results and making simple conclusions.* By building and working on these skills in Lower Key Stage Two, children gain a sense of independence and begin to gain a secure understanding of how to plan an investigation independently, preparing them for Upper Key Stage Two. The Science lead is in regular contact with KS1 and KS3 Science teachers to ensure children are ready for their next journey. Other enrichment experiences are brought into the curriculum to encourage a passion for Science and allow children to build on an extensive range of skills for future use.

Children are encouraged to extend scientific questions they ask, answer about the world around them and carry out a range of scientific enquiries, including: observations over time, pattern seeking, classifying, grouping and researching using other sources. Children also learn to plan Science investigations in further detail and independently, by only changing one variable to make it a fair test.

**These topics will be covered for each year group:**

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Year 3</b>	Rocks and Soils		Animals including Humans	Light	Plants	Forces and Magnets
<b>Year 4</b>	States of Matter	Sound	Animals including Humans		Living Things and Their Habitats	Electricity
<b>Year 5</b>	Properties and Changes of Materials		Forces and Gravity	Earth and Space	Living Things and Their Habitats	Animals including Humans
<b>Year 6</b>	Evolution and Inheritance		Animals including Humans	Living Things and Their Habitats	Light	Electricity

**Science coverage in Lower Key Stage 2:**

- Developing working scientifically skills from KS1.
- Pupils will work individually or collaboratively, in pairs or small groups.
- Specific children are targeted to further and deepen their current knowledge and necessary time or support is available to enable the pupils to carry out their investigations.
- Set up simple practical enquiries; comparative and fair tests.
- Children will learn how to ask relevant questions in relation to their learning, to deepen their understanding. From this, children can then use straightforward scientific evidence to answer questions or to support their findings.
- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Gather, record, classify and present their data in a variety of ways.
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- Report findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Identify differences, similarities or changes related to simple scientific ideas and processes.

**Science coverage in Upper Key Stage Two:**

- Plan types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

- Use test results to make predictions to set up further comparative and fair tests.
- Report and present findings from enquiries, including conclusions, relationships and explanations of, and degree of trust in results, in both oral and written forms such as displays and other presentations.
- Identify scientific evidence that has been used to support or refute ideas or arguments.

Learning these skills prepares children for Key Stage Three, where they will develop scientific knowledge and conceptual understanding through specific disciplines of Biology, Chemistry and Physics. At TCJA, children develop an understanding of the nature, processes and methods of science through different types of science enquiries, to help them to answer scientific questions about the world around them. Children are equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.

#### **Relationships to other policies at TCJA:**

- Computing
- Health and Safety
- TCJA Remote Education Plan
- PSHRE (see below)

#### **NC Animals including Humans:**

##### **Year 3:**

- Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.
- Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

##### **Year 4:**

- Describe the simple functions of the basic parts of the digestive system in humans.
- Identify the different types of teeth in humans and their simple functions.
- Construct and interpret a variety of food chains, identifying producers, predators and prey.

##### **Year 5:**

- Describe the changes as humans develop to old age.
- In line with TCJA's PSHRE policy, children:
  - Learn about the changes experienced by male and female in puberty.
  - Work scientifically by researching the gestation periods of other animals and compare them with humans, by finding out and recording the length and mass of a baby as it grows.
  - Research foetal development and how a baby changes.
- Identify mental and physical changes from adulthood to old age, and create a timeline of a human.

### Year 6:

- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
- Describe the ways in which nutrients and water are transported within animals, including humans.

### Recording, Assessment and Reporting:

- Children's progress is continually monitored each lesson, which is then used by class teachers to inform future planning, teaching and learning. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study as set out in the National Curriculum. We achieve this through scaffolding, regular assessments, identifying and addressing gaps and supporting our children through our high-quality Science teaching.
- Children receive effective feedback through teacher assessment, both orally and through written feedback in line with the success criteria. Children are guided towards achievement of the main objective. Learning objectives are written in the form of a question, which provides children with a secure understanding of what they're going to achieve by the end of the lesson.
- When assessing children, we look at each child as an individual. When children are teacher assessed, class teachers look at the following:
  - Can children raise questions, take part in discussions and listen to their peers?
  - Can children work individually, in pairs, in a group, and in classes?
  - Can children produce written investigations and provide an accurate conclusion?
  - Can children set up their own tests?
  - Can children gather, record, classify and present data?
  - Can children use equipment to measure accurately?
  - Can children use and understand scientific vocabulary?
- Each year group's teachers regularly meet to discuss how the learning is being achieved, how it can be taken further and how the criteria will be incorporated into the following lesson. Extending on from this, Lower and Upper teacher teams will discuss the variation and progress from each year group for their classes/year groups. The Science Lead regularly evaluates the sequences of learning and updates these when appropriate. The Science Lead will share updates with staff. The Science Lead completes informal 'book-looks' and regularly speaks to pupils for pupil voice.
- Pre and Post teaches for each Science topic are completed prior to teaching the topic, to provide teachers with a good understanding of the needs of their children. Year Three teachers look at the end of Year Two assessments and evaluate how to adapt their teaching to meet the needs of all children.
- All assessments are recorded on EAZ MAG, where all teachers can see the assessments of each child and their progress from past and present years. Each term, teachers will assess children based on the National

Curriculum objectives and identify which children need more support in achieving which objectives. Staff then identify how they will support these children the following term/year.

- An impact report is written by the Subject Leader and Data Leader to identify strengths and identify gaps in vulnerable groups. This allows the Subject Leader to address areas for development.

### **Inclusion:**

At The Carlton Junior Academy, every child has equal access to science lessons in order to develop their personal attainment. We ensure lessons are fully inclusive for all children regardless of gender, disability, ethnicity, social class or educational need by:

- Careful and considerate planning which ensures that hands-on experience is equitable.
- Teachers liaising with the SENDCO to improve SEND children's involvement in the curriculum, ensuring they reach their full potential.
- Providing wider educational experiences, such as visits and visitors in the academy.
- Sharing children's high-quality Science work on each classroom's working wall.
- Ensuring there is a balance in activities provided to encourage collaborative work, as well as competitive activities to suit different learning styles.

### **Differentiation:**

Our curriculum planning ensures that all pupils are provided with an equal opportunity to participate in each aspect of the science curriculum.

### **Use of resources:**

- We have sufficient, high-quality resources which are found in the stock room, organised into labelled boxes.
- Working walls are used in each lesson in classrooms and 'good learning' is displayed on these.
- ICT resources and Data Loggers are located in the stock room, next to the ICT equipment.
- The Science Lead regularly checks resources, ensuring the Science area is tidy and organised and that the necessary equipment is available. More resources are ordered in by Science Lead when required.
- The Education Library Service provides a wide range of engaging texts that are used to support teacher explanations and allow pupils to conduct secondary research themselves.

### **Roles and Responsibilities:**

The Head teacher, Governors and SLT will be responsible for ensuring that:

- The Subject Lead has created an appropriate and achievable action plan and those targets are met by the end of the year, then reviewed.

- The Science Action Plan is incorporated into the Academy Improvement Plan to ensure necessary resources are available for its implementation.
- There is sufficient provision of teaching support for Science.
- Staff receive necessary training to continue their scientific professional development.
- The Learning and Teaching of Science at The Carlton Junior Academy is monitored.

**Science Subject Leader is responsible for:**

It is the responsibility of the Subject Lead to monitor the standards and presentation of children's work. This is achieved through regular book monitoring across all classes and year groups, following discussions with the class teachers. The Subject Lead is also responsible for supporting staff in their teaching, being informed about current developments in the subject, and providing a strategic lead and direction for Science in our academy. The Subject Lead monitors the resources, sequences of learning, science topics and books visits and workshops to support learning when appropriate. The Subject Lead also fulfils the tasks of reviewing samples of children's work, training, liaising with other subject leaders from other schools/academies and organising Science Week. Using pupil voice, the Science Lead monitors how Science is taught across the academy and ensures National Curriculum objectives are being met. From this, the Subject Lead prepares and creates the yearly Science Action Plan, SEF and identifies the training needs of staff and supports them with this.

**Class Teachers are responsible for:**

- Planning and delivering high-quality, differentiated lessons that take into account individual children's abilities.
- Promoting a love and passion for Science.
- Inspiring children to better and further their learning and providing them with purposeful teaching so they can develop their Science skill set.
- Ensuring children receive equal opportunities to develop Science knowledge.
- Supporting specific needs of children who may need further provision to have a secure understanding of a concept and still achieve their learning objective.
- Assessing and recording children's abilities and capabilities according to the assessment criteria set out in the National Curriculum 2014 programmes of study.
- Providing opportunities for the development of scientific skills.
- Identifying Science progression and the efforts of each child within their yearly written school report.
- Engaging in CPD to develop practice.

**Support Staff and Teaching Assistants will be responsible for:**

- Obtaining planning from teachers/being briefed on the lesson.
- Supporting children with their learning, discussing the activities/lesson with them.
- Reporting back to teachers on children's progress and where the activity did not meet the needs of children (if applicable).



- Recording the progress of any children as required.

#### **Health and Safety:**

- Our Academy has a Health and Safety Policy, which is available in a separate policy. This is reviewed yearly.
- There is a 'Health and Safety' team within the Trust, the Science Lead is also a member of this committee, who meet regularly and discuss any important Health and Safety updates and review our procedures. Relevant information is then passed onto staff members.

#### **Monitoring and Review:**

- There will be an annual review of this policy by the Science Subject Lead during the Autumn Term of 2024.