

# Science

## Kimbolton St James

### Primary School

A high-quality science education provides the foundations for understanding the world. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

National Curriculum in England: Science programmes of study

### Curriculum Intent for Science

#### What does Science look like in our school?

Through our Science teaching we aim to ensure opportunities for **enjoyment** and **exploration**, delivering **excellence** in this curriculum area.

We aim to:

- Develop scientific knowledge and conceptual understanding.
- 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 us.
- Ensure pupils are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Throughout the school our science topics and teaching provide rich opportunities for children to be inspired to develop a love of science.

- We ensure topics provide opportunities for enjoyment and exploration, and incorporate **environmental** links wherever possible, to deliver excellence.
- We want our children to have a knowledge of the world around them and how and why things happen.
- Children work alone, with partners and in groups to develop key scientific skills. See our Working Scientifically and Science Progression Maps alongside our Knowledge Maps to see how this is broken down by area and key stage.
- Knowledge and skills progression across year groups ensures that children know more and remember more as they progress through our school.

**By the end of reception pupils will:**

- Know the key knowledge, vocabulary and concepts as outlined for their key stage.
- Know about similarities and differences in relation to places, objects, materials and living things.
- Talk about the features of their own immediate environment and how environments might vary from one another.
- Make observations of animals and plants and explain why some things occur, and talk about changes.

**By the end of KS1 pupils will:**

- Know the key knowledge, vocabulary and concepts as outlined for their key stage.
- Observe closely, using simple equipment.
- Gather and record simple data.
- Use observations and ideas to suggest answers to questions.
- Ask simple questions and recognise they can be answered in different ways.
- Perform simple tests.
- Identify and classify

**By the end of lower KS2 pupils will:**

- Know the key knowledge, vocabulary and concepts as outlined for their key stage.
- Ask relevant questions and use different types of scientific enquiries to answer them.
- Set up simple practical enquiries, comparative and fair tests.
- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment.
- Gather, record, classify and present data in a variety of ways to help in answering questions.
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Use 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.
- Use straightforward scientific evidence to answer questions or to support their findings.

**By the end of upper KS2 pupils will:**

- Know the key knowledge, vocabulary and concepts as outlined for their key stage.
- Plan different 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, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.
- Identify scientific evidence that has been used to support or refute ideas or arguments.

## Curriculum Implementation for Science

### How is Science taught?

- Science is taught in a variety of ways across our school to maximise pupil learning and cross curricular links wherever possible.
- We allow teachers the flexibility to block or spread lessons as they choose.
- We aim for our lessons to be as practical and engaging as possible.
- Curriculum Progression Grids and Knowledge maps are used by each year group to plan lessons and the series of lessons. This ensures full coverage of our curriculum over the academic year.
- By the time children leave our school they will have covered a broad range of scientific concepts using all of the skills and knowledge set out by the national curriculum.

### How do teaching staff ensure a high-quality experience in Science?

- Plan lessons based on the Curriculum Progression Grids and Knowledge Maps for their key stage.
- Create a learning environment that stimulates children's interest in the topics studied, using practical resources where possible.
- Plan visits and trips, where possible, to inspire children's imaginations and connections to their learning.
- Biannual review of our science curriculum by the co-ordinator to include: lesson observations, work scrutiny, staff and pupil interviews.
- Opportunities for stakeholders to come into the classroom to share in the learning of science with pupils.

### How do we support children and ensure they can access the Curriculum?

- Work may be differentiated to allow children to meet the learning objective. This could take the form of additional adult support, the use of supportive additional resources, peer support or the differentiation of the work to be completed.
- We use live teacher-assessment and self-assessment to quickly identify those who may need more help in specific areas.
- For pupils with specific SEN or EAL needs a variety of approaches maybe used including: pre-teaching of specific vocabulary, seating children alongside role-models, providing visual practical prompts, adult support and adaptation of activities to ensure engagement.

### How we provide challenge?

- Work maybe differentiated to allow children to go beyond the year group's objective. This could take the form of additional independent work, the use of resources, peer mentoring or the differentiation of the work to be completed.
- We use live teacher-assessment and self-assessment to quickly identify those who may need more challenge in specific areas.

## Curriculum Impact for Science

### What you might see in Science.

- Happy, engaged and self-motivated learners

- Children who can work independently or work successfully in pairs and small groups
- Children posing questions before during and after scientific enquiries.
- Children discussing, interpreting and reflecting upon their learning
- Children making comparisons between different scientific concepts
- Children exploring and experimenting with resources
- Children recalling and recapping learning from a previous topic
- Trips and visitors coming into school to provide children with an insight into a particular topic or scientific concept
- A 'hook' to inspire and capture the children's imagination

#### **How do we know that children are making progress in Science?**

- Teachers assess progress using our **assessment system**, recording a summative judgement at the end of each topic covered.
- For those exceeding the objective and those working below the expected level evidence will be provided in support of the teacher judgements.
- Feedback from adults and peers.
- Science books will record the key learning for each child, showing exemplars of work at the expected level. A unit of work may be evidenced through the use of photographs, explanations of tasks and of learning strategies undertaken.
- Subject leaders monitor the coverage and progression of pupils within their subject on a biannual basis.
- Regular benchmarking/ moderation with other schools who have achieved well in their SIAMs/ Ofsted inspections.

#### **How do measure the impact of our Science provision?**

- Inquisitive, reflective learners who know more, understand more and remember more.
- Positive feedback from children on their Science lessons.
- Children who are able to weigh up evidence and form an opinion about different scientific concepts.
- Children who are prepared to share what they have learned in a variety of ways.
- Children who are able to challenge another's opinion in a respectful and assertive way.