Science Long Term Plan

Brookvale Academy

Science Intent:

At Brookvale Academy, we promote curiosity, confidence and engagement through practical, relevant and accessible learning experiences. Rooted in the National Curriculum, the curriculum builds upon pupils' prior knowledge and introduces key concepts from biology, chemistry and physics in manageable, sequenced steps. Through the study of science, pupils develop an understanding of the world around them and recognise how science influences everyday life, future careers and global developments.

Scientific enquiry sits at the heart of the curriculum. Pupils develop the skills to ask questions, make predictions, plan and carry out investigations, use equipment safely and accurately, record observations and analyse results. As they progress, they become increasingly confident in identifying patterns, evaluating evidence, drawing conclusions and communicating their findings using appropriate scientific vocabulary.

Science learning also supports wider curriculum development. Pupils strengthen their numeracy skills by measuring, estimating, calculating and presenting data through tables, charts and graphs. Opportunities to use technology and digital tools further enhance learning, enabling pupils to explore simulations, collect data and investigate scientific concepts in engaging and practical ways.

By the end of KS3, pupils will have developed a secure foundation of scientific knowledge, practical skills and enquiry processes that prepare them for KS4 qualifications and future pathways. They will be equipped with the confidence, curiosity and resilience needed to explore the world scientifically and engage positively with the opportunities and challenges of modern society.

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Pathway ONE

Priorities: Increased attendance, develop positive relationships, Develop simple learning behaviours

Pupils develop their *Working Scientifically* skills through engaging, hands-on investigations that encourage curiosity and active participation. They learn to ask testable questions, with support plan fair tests, record and present data and discuss results.

This approach supports Pathway 1 priorities by increasing attendance through enjoyable, practical learning, fostering positive relationships through teamwork and communication, and promoting simple learning behaviours such as following instructions, working safely, and reflecting on progress. Through scientific enquiry, pupils build both academic understanding and the social and behavioural skills needed for successful learning.

Pathway TWO

Priorities: Increased attendance, improved engagement and participation in lessons, develop wider relationships, progress in literacy/numeracy

Through developing their *Working Scientifically* skills, pupils ask testable questions, plan and carry out fair investigations, record and present data accurately, analyse results, and evaluate evidence. Practical, hands-on learning promotes increased attendance and improved engagement, while opportunities for discussion, teamwork, and communication help pupils develop wider relationships. Recording, interpreting, and presenting data support progress in literacy and numeracy, ensuring pupils build both scientific understanding and essential cross-curricular skills.

Pathway THREE

Priorities: consistently high attendance, consistently positive engagement and participation in lessons, appropriate positive social interactions, Academic progress.

Through developing their *Working Scientifically* skills, pupils demonstrate consistently positive engagement in science lessons. They ask relevant scientific questions, plan and carry out fair tests safely, and record and present data accurately. Analysing and evaluating results encourage critical thinking and reflection, supporting sustained focus and academic progress. Collaborative investigations promote appropriate, positive social interactions, while the practical, purposeful nature of science fosters enjoyment and motivation, contributing to consistently high attendance and continued academic achievement.

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Key stage 3

Autumn		Spring		Summer	
Cells & Organisation	**Particles and Materials**	**Forces and Motion**	**Simple chemical reactions**	**Energy and Electricity**	**Ecology and the Environment**
Pupils will be able to: 1. Describe the structure and functions of plant, animal and microbial cells. 2. Use a microscope safely to observe cells and produce labelled scientific drawings. 3. Explain how cells are organised into tissues, organs	**Pupils will be able to:** 1. Describe solids, liquids and gases using the particle model and explain changes of state 2. Explain how mixtures can be separated using filtration, evaporation, distillation and chromatography 3. 4. Distinguish between physical and chemical changes and describe common	**Pupils will be able to:** 1. Define a force and explain the difference between contact and non-contact forces. 2. Describe and compare forces such as gravity, friction, air resistance and upthrust using appropriate scientific terminology. 3. Predict and explain the effects of unbalanced forces on motion, including	**Pupils will be able to:** 1. Describe the structure of atoms and distinguish between elements, compounds and mixtures. 2. Use the periodic table to identify elements and recognise simple patterns in their properties. 3. Explain how chemical reactions form new substances and represent them using word equations.	**Pupils will be able to:** 1. Identify different forms of energy and describe how energy is transferred between stores. 2. Explain energy changes in everyday situations and carry out simple energy calculations. 3. Draw and interpret simple electrical circuits using	**Pupils will be able to:** 1. Describe the roles of producers, consumers and decomposers within ecosystems. 2. Construct and interpret food chains and food webs, showing the flow of energy. 3. Explain how biotic and abiotic factors affect the distribution of organisms.

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and organ systems. 4. Plan and carry out investigations, collect data, and draw conclusions from evidence. 5. Use digital tools to record, present and analyse scientific results. **Enrichment Opportunity:** • Visit the Space Centre to celebrate World Space Week and explore developments in space	chemical reactions. 5. Plan and carry out investigations, identify variables, and draw conclusions from data. 6. Use digital tools to record, present and analyse scientific results.	acceleration, deceleration and changes in direction. 4. Measure forces accurately using a Newton meter and record and present findings in tables and graphs. 5. Analyse and interpret distance-time and velocity-time graphs, describing patterns of motion and identifying changes in speed. **Enrichment Opportunity:** • Attend the Raleigh Trust Science week annual event.	4. Identify exothermic and endothermic reactions and recognise signs of chemical change. 5. Explain how the reactivity of metals affects their reactions with acids, water and oxygen.	standard circuit symbols. 4. Measure and explain current, voltage and resistance in electrical circuits. 5. Compare series and parallel circuits and predict the effects of changing components.	4. Describe how human activities can impact ecosystems and biodiversity. 5. Use sampling techniques and data analysis to investigate habitats and draw conclusions about biodiversity. **Enrichment Opportunity:** • Visit to Yorkshire Wildlife Park

science and technology					

Core Key stage end points

Pupils will be able to:

1. **Ask scientific questions that can be investigated through practical enquiry.**
2. **Plan and carry out fair tests, identifying variables and working safely.**
3. **Record and present data using appropriate tables, graphs and charts.**
4. **Analyse results, identify patterns and explain findings using scientific knowledge.**
5. **Evaluate evidence by considering accuracy, reliability and improvements to methods.**