

Science

National Curriculum Programme of Study

'A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. 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.'

Our curriculum in science aims to ensure that all pupils:

- *develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics;*
- *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 them;*
- *are equipped with the scientific knowledge required to understand the uses and implications of science, today and in the future.*

Year 5 - Autumn Term

Key knowledge	Key skills
Safety and measurement	
Pupils will learn: • What safe working practices are in a laboratory; • Key equipment and what they are used for (bunsen burner, microscope); • Key units of measurement for time, length, temperature, mass, volume and force; • Key features and uses of a microscope; • What pH is and what it is used for; • Definitions and features of independent variables, dependent variables and control variables.	Pupils will learn how to: • Work safely in the laboratory; • Identify and draw equipment; • Measure time, length, temperature, mass, volume and force accurately with the relevant equipment; • Use a bunsen burner safely to heat water; • Use a microscope to observe a range of objects; • Measure the pH of common substances using universal indicators;
Properties of materials	
Pupils will learn: • The three states of matter: solid, liquid, gas; • Properties of materials: transparency, thermal, conductivity, hardness and solubility; • Which materials conduct heat and which 'insulate' (keep warm); • Definitions and features of thermal conductivity; • Definitions and features of electrical conductivity; • Definitions and features of 'flexibility'; • Definitions and features of 'absorbency'; • Definitions and features of 'viscosity'.	Pupils will learn how to: • Classify substances according to 'states of matter'; • Identify materials which conduct heat; • Identify materials which 'insulate' heat - thermal conductivity (keep substances warm); • Identify the 'flexibility' of different materials; • Identify the 'absorbency' of different materials; • Identify if a material is a conductor or insulator (electrical); • Identify the viscosity of different materials; • Present a range of information in the form of a graph.

Year 5 - Spring Term

Key knowledge	Key skills
Space:	
Pupils will learn: • The size and position of the earth in the universe; • Geocentric and heliocentric models, including the history; • The positions, shape and structure of the planets in the solar system; • Features and definitions of 'day' and 'night and why they occur'; • How seasons are a result of the position of the Earth in space; • The phases of the moon;	Pupils will learn how to: • Observe and document the phases of the moon throughout a complete lunar cycle;
Forces:	
Pupils will learn: • Key forces in operation in the physical world - Earth (gravity, friction, water resistance, air resistance); • How you measure forces (newton meters), including the unit of measurement (newtons); • The impact of gravity on different objects (guinea and feather); • The impact of different surfaces on 'friction'; • Key forces in operation in water; • Impact of different shapes on water resistance; • Key information about Sir Isaac Newton and his influence on science through the ages; • Definitions, features and uses of levers, pulleys and gears in relation to forces.	Pupils will learn how to: • Use newton meters to measure different forces; • Use an experiment to test different variables; • Identify and adapt variables to measure key forces; • Use spinners and autogyros to explain and model aspects of different forces; • Measure mass in water.

Year 5 - Summer Term

Key knowledge	Key skills
Light:	
Pupils will learn: • Where light comes from (light sources); • How we see light; • Definitions and features of luminous and non-luminous objects; • Definitions and features of transparent, translucent and opaque materials; • How we see light; • How light travels (straight lines); • How light is reflected; • How and why shadows are created.	Pupils will learn how to: • Identify luminous and non-luminous objects; • Classify transparent, translucent and opaque materials; • Use ray boxes to show how light travels; • Test reflective properties of different materials; • Demonstrate the impact of different variables on shadow length.
Living things and their habitats:	
Pupils will learn: • The life-cycles of mammals and birds; • The life-cycles of insects and amphibians; • Features and definitions of 'human development'; • The structure and function of plants; • Definition and features of germination; • Key features of photosynthesis and conditions for growing; • Key features of plant reproduction - pollination, fertilisation, types of seed dispersal • What a food chain and food web are.	Pupils will learn how to: • Use and construct 'keys' or 'legends'; • Label the parts of a plant. • Demonstrate the features of plants through observation of a bean that has been planted; • Chart the progress of a germinating bean; • Use a 'key / legend' to classify organisms living in the pond.

Enrichment

- Bunsen burner certificate.
- Moon diary.
- Germinate runner beans and grow them at home or in the Parkfields vegetable garden.
- 'Signs of Spring' enrichment.
- STEM club.
- Environmental area: gardening and growing.