Mulberry Academy Woodside

Science

Curriculum Overview 2023 - 2024

Curriculum intent statement:

The Science department at Mulberry Academy Woodside aims to deliver a curriculum which encourages students to develop a love of Science and lifelong learning. The curriculum will help students to develop their scientific capital by developing their understanding and skills and exposing them to a range of different viewpoints

We want students to be able to:

- **Think critically about the latest developments in Science and the effects that these developments may have on themselves and the wider world**
- **Develop the skills and knowledge to be able to carry out scientific enquiry and transfer these skills to other disciplines**
- **Take an interdisciplinary approach and realise that Science covers a breadth of different subjects outside of Biology, Chemistry and Physics**

KS4 Edexcel		AUTUMN TERM		SPRING TERM		SUMMER TERM	
		TERM 1A	TERM 1B	TERM 2A	TERM 2B	TERM 3A	TERM 3B
YEAR 10	KNOWLEDGE	**Chemistry Paper 1:** *Unit 1: Key Concepts in Chemistry* • Atomic Structure • Empirical and Molecular formulae • Periodic Table • Ionic Bonding • Electrolysis • Covalent Bonding • Metallic Bonding • Metal Extraction and Recycling *Unit 2: Particles and Reactions* • Particle Model • Separating Techniques • Solution Calculations • Calculations with Moles • Dynamic Equilibrium • Acids and Alkalis		**Biology Paper 1:** *Unit 1: Key Concepts in Biology* • Cells and Microscopes • Enzymes • Transport Processes (including diffusion, osmosis, and active transport) *Unit 2: Cells and Genetics* • Mitosis • Meiosis • Growth in Animals and Plants • Stem Cells • The Nervous System and Reflexes • DNA • Inheritance and Variation *Unit 3: Evolution* • Theory of Evolution by Natural Selection • Classification • Genetic Engineering • Artificial Selection • Human Evolution *Unit 4: Health and Disease* • Non-communicable Diseases • Communicable Diseases • Pathogens • Barriers to Infection • Immune System Response • Antibiotics		**Physics Paper 1:** *Unit 1: Forces and Motion* • Vectors and Scalars • Speed, Velocity, and Acceleration • Newton's Laws of Motion • Momentum *Unit 2: Energy* • Energy Stores and Transfers • Energy Efficiency • Kinetic and Gravitational Potential Energy • Energy Resources *Unit 3: Waves and the EM Spectrum* • Properties of waves • Wave speeds • Refraction • Electromagnetic Spectrum • Use and Dangers of the Electromagnetic Spectrum *Unit 4: Radioactivity* • Atomic Structure • Background Radiation • Radioactive Decay • Types of Radiation • Half-Life • Hazards of Radioactivity	
	SKILLS	**Practical skills:** • Lab safety • Identifying risks and hazards • Use of a Bunsen burner		**Practical skills:** • Manipulating lab equipment • Measuring accurately • Planning an experiment		**Practical skills:** • Lab safety • Identifying and managing biological hazards	

		• Manipulating lab equipment • Planning an experiment • Writing conclusions • Evaluating results • Evaluating experimental techniques **Mathematical skills:** • Calculations and rearranging equations • Using standard form • Significant figures and decimal places • Calculations using moles (H) • Calculating numbers of subatomic particles • Use of percentages in calculating relative atomic mass (Ar) and percentage composition • Use of ratios in calculating empirical and molecular formulae • Use of positive and negative numbers in relation to ions • Use of logarithmic scales (pH scale) **Literacy Skills** • Meanings and use of words that are central to understanding scientific concepts • Identifying common prefixes and suffixes to decode keywords	• Writing conclusions • Evaluating results • Evaluating experimental techniques • Using a data logger **Mathematical skills:** • Calculations and rearranging equations • Use of mathematical symbols (e.g. delta, Δ) • Unit conversions and the use of SI prefixes • Using standard form • Significant figures and decimal places • Drawing half-life graphs **Literacy Skills** • Meanings and use of words that are central to understanding scientific concepts • Identifying common prefixes and suffixes to decode keywords	• Use of a microscope • Manipulating lab equipment • Planning an experiment • Writing conclusions • Evaluating results • Evaluating experimental techniques **Mathematical skills:** • Calculations and rearranging equations • Using standard form • Unit conversions and the use of SI prefixes • Significant figures and decimal places • Identifying anomalies • Drawing graphs • Identifying and describing trends • Rate calculations **Literacy Skills** • Meanings and use of words that are central to understanding scientific concepts • Identifying common prefixes and suffixes to decode keywords
YEAR 11	KNOWLEDGE	**Biology Paper 2** *Unit 1: Plant Biology* • Photosynthesis • Plant Transport Processes • Plant Cell Adaptations *Unit 2: Hormones* • Hormones • The Menstrual Cycle and Hormones • Control of Blood Glucose by Hormones • Type 1 and Type 2 Diabetes *Unit 3: Respiration* • Aerobic Respiration • Adaptations of the Respiratory System • The Circulatory System *Unit 4: Ecosystems*	**Physics Paper 2:** *Unit 1: Energy and Forces* • Work and Power • Interacting Fields • Vector Diagrams *Unit 2: Electricity and Magnetism* • Circuits • Current, Potential Difference, and Resistance • Transferring Energy • Electrical Safety • Magnetism • Electromagnetism • Motor Effect • Transformers	**Chemistry Paper 2:** *Unit 1: Groups in the Periodic Table* • Group 1 Elements • Group 7 Elements • Group 0 Elements *Unit 2: Rates of Reaction* • Rates of Reaction • Factors Affecting Rates of Reaction • Catalysts • Endothermic and Exothermic Reactions *Unit 3: Hydrocarbons* • Crude Oil • Fractional Distillation • Combustion • Cracking • Earth's Early Atmosphere

		• Ecosystems • Human Impacts on Ecosystems • Material Cycles	*Unit 3: Particle Theory* • Kinetic Theory and Density • Specific Heat Capacity and Specific Latent Heat • Kelvin Temperature Scale • Springs and Extension	• Climate Change
	SKILLS	**Practical skills:** • Lab safety • Identifying and managing biological hazards • Use of a microscope • Manipulating lab equipment • Planning an experiment • Writing conclusions • Evaluating results • Evaluating experimental techniques **Mathematical skills:** • Calculations and rearranging equations • Using standard form • Unit conversions and the use of SI prefixes • Significant figures and decimal places • Identifying anomalies • Drawing graphs • Identifying and describing trends • Rate calculations **Literacy Skills** • Meanings and use of words that are central to understanding scientific concepts • Identifying common prefixes and suffixes to decode keywords	**Practical skills:** • Manipulating lab equipment • Measuring accurately • Planning an experiment • Writing conclusions • Evaluating results • Evaluating experimental techniques • Using a data logger **Mathematical skills:** • Calculations and rearranging equations • Use of mathematical symbols (e.g. delta, Δ) • Unit conversions and the use of SI prefixes • Using standard form • Significant figures and decimal places • Selecting the correct equation from a given list • Constructing vector diagrams to scale **Literacy Skills** • Meanings and use of words that are central to understanding scientific concepts • Identifying common prefixes and suffixes to decode keywords	**Practical skills:** • Lab safety • Identifying risks and hazards • Use of a Bunsen burner • Manipulating lab equipment • Planning an experiment • Writing conclusions • Evaluating results • Evaluating experimental techniques **Mathematical skills:** • Calculations and rearranging equations • Using standard form • Significant figures and decimal places • Calculations using moles (H) • Calculating numbers of subatomic particles • Calculating rates of reaction • Identifying and describing trends • Use of positive and negative numbers in relation to calculating energy changes in reactions **Literacy Skills** • Meanings and use of words that are central to understanding scientific concepts • Identifying common prefixes and suffixes to decode keywords