Year 10 Curriculum Plan
Science

	Autumn Term		Spring Term		Summer Term	
PRIOR LEARNING	**Radioactivity**: atomic structure, subatomic particles, and their links to health and lifestyle. **Immunity**: organisms, body systems (respiration), cell biology, and organisation. **Quantitative Chemistry**: symbolising elements/compounds, mass conservation, solubility, hazard identification, acid-base properties, and neutralisation reactions. **Electricity**: circuit components, their relationships with voltage/cells, and basic circuit diagrams. **Energy Changes**: identification of chemical changes, temperature measurement, equipment usage, and differentiating exothermic/endothermic reactions.		**Rates of Reactions**: chemical change identification, temperature measurement, equipment usage, reaction rate calculations, and catalyst effects. **Electromagnets**: electrical/magnetic basics and charge, current, voltage, resistance. Electricity generation/distribution. **Forces**: Deepens understanding of force direction, effects of various forces, calculations involving speed, weight, units, and distance-time graphs. **Plants**: plant cell functions, diffusion, photosynthesis, and material movement across different biological scales.		**Hydrocarbons**: non-renewable resources, mixture separation, and proper scientific equipment usage. **Homeostasis and the Nervous System**: organism hierarchy, diffusion, specialised cells, and hormonal involvement in puberty/menstrual cycle. **Chemical Analysis**: pure substances and mixtures, identification methods for pure substances, and industrial identification/calculations. **Genetics and Evolution**: inherited/environmental variation, DNA/genes, evolution, and fossil evidence.	
KNOWING WHAT…	**Radioactivity**: the history of atomic structure, explores types of radioactive emissions, contamination, and irradiation. **Immunity**: Covers four major pathogens, the body's first line defences, how microbes make us ill and viruses damage cells, the role of white blood cells, how vaccines prevent disease, the importance of antibiotics and the impact of resistance, and the main steps in developing and testing a new drug. **Quantitative Chemistry**: the law of conservation of mass, the concepts of the mole and concentration. **Electricity**: electric charge, circuits, power, circuit symbols, current/voltage properties, resistance, resistor effects, and the details of the UK mains plug. **Energy Changes**: exothermic/endothermic reactions, their uses, activation energy, reaction profiles, and energy calculations.		**Rates of Reactions**: the term rate of reaction, collision theory, factors affecting rate, and reaction rate units. **Electromagnets**: magnetic interactions, electromagnetic field induction in a solenoid, and how an electric motor works. **Forces**: explores contact/non-contact forces, Newton's Laws of Motion, and factors affecting a car's stopping distance. **Plants**: photosynthesis, plant transport, structure, leaf anatomy, transpiration, translocation, and plant diseases. This unit includes one required practical activity: investigating photosynthesis.		**Hydrocarbons**: examples of alkanes, separating mixtures using fractional distillation, and the process of cracking to make more useful materials. **Homeostasis and the Nervous System**: neuron structure and function in reflexes, the endocrine system and hormones, maintaining water, glucose, and temperature balance in the body, negative feedback in different contexts, and comparing and contrasting hormonal and nervous responses. **Chemical Analysis**: pure substances and formulations, tests for common gases, and chromatography. **Genetics and Evolution**: genetic and environmental variation, how evolution occurs through natural selection, the process and/or impacts of selective breeding, the benefits and risks of genetic engineering, evidence for evolution, factors leading to extinction, and the current issue of antibiotic resistance.	
KNOWING HOW…	**Radioactivity**: Master nuclear equations and half-life calculations. **Immunity:** Sharpen diagram labelling skills, practice unit conversions, and interpret data graphs. **Quantitative Chemistry:** Balance equations, calculate formula mass and concentrations, use moles in reactions, and find yields. **Electricity**: Build and analyse series/parallel circuits. Calculate and explain energy transfers via formulae. Conduct a full investigation into resistance factors. **Energy Changes:** Differentiate exothermic/endothermic reactions. Draw reaction profiles and calculate energy transfers using bond energies. Investigate temperature changes in reacting solutions.		**Rates of Reactions:** Explain rate changes via collision theory with concentration, temperature, surface area, and catalysts. Draw and interpret reaction profile graphs, calculate rates. Investigate temperature's effect on reaction rate. **Electromagnets:** Master right-hand and left-hand grip rules. **Forces:** Analyse motion graphs and calculate motion with formulae. Investigate force effects on acceleration and spring stretching. Use Hooke's Law and calculate spring constant. **Plants:** Measure and calculate photosynthesis rate. Extract and interpret graphs, write methods for light intensity investigations.		**Hydrocarbons:** Recognise alkenes and label fractional distillation diagrams. Apply melting point and boiling point data. **Homeostasis and the Nervous System:** Plan an investigation into reaction time factors. Identify scientific variables, especially controls. **Chemical Analysis:** Investigate paper chromatography for separating coloured substances. **Genetics and Evolution:** Evaluate benefits/risks and ethics of selective breeding. Analyse information from evolutionary trees and classify organisms. Understand scientific methods and theory development.	
ASSESSMENT	**Half-term 1** Atomic structure, Properties of radioactive emission. Half-life calculations. UK plugs, circuit diagrams, resistance RP. Exo/endothermic, data analysis task, energy profiles.	**Half-term 2** Formula mass. Calculating percentage by mass, moles (H). Defence against pathogens, antibiotic resistance, drug trials.	**Half-term 1** Collision theory, factors affecting rate, concentration RP. Drawing the field around a magnetic material, changing the strength of an electromagnet,	**Half-term 2** Hooke's Law, free body diagrams, force calculations, motion graphs, Newton's Laws. Photosunthesis RP, leaf structure and function, data analysis	**Half-term 1** Fractional distillation, alkanes, complete/incomplete combustion. Reactions RP, neurone structure and reflex reactions, hormonal responses.	**Half-term 2** Pure/impure chemicals, gas tests, chromatography RP and calculating Rf values. Linnaean classification, GM crops, genetic cross diagrams. Mitosis/meiosis.

Updated: December 2023