



Chemistry Year 7 – Year 13 Curriculum Experience

Cohort: Year 7 2022- 2023

Subject Intent Statement:

Through our Chemistry curriculum students are challenged to become competent chemists highly skilled in practical investigations who demonstrate fluidity of thought and are able to apply their knowledge and understanding holistically to unfamiliar situations and contexts.

	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12		Year 13	
						Teacher 1	Teacher 2	Teacher 1	Teacher 2
Term 1	Biology 1 – Interdependence Chemistry 1 - Matter and Separation Techniques <ul style="list-style-type: none"> Safety and risk assessments in Science Solids, liquids and gases Changes of state (linked to energy changes – simple!) Diffusion and dissolving Simple Dalton atomic model Elements / compounds / atoms / molecules Introduction to the Periodic Table Mixtures and separation techniques Pure substances and their identification Distillation Chromatography 	Biology 3 – Biochemistry Chemistry 3 – Chemical Reactions 2 <ul style="list-style-type: none"> Arrangement of the Periodic Table Properties of metals and non-metals Reactivity Series Metals + Acids Displacement reaction Thermal decomposition Exothermic and endothermic reactions Patterns of reactivity Combustion 	Chemical Reactions (GCSE Introduction) <ul style="list-style-type: none"> Chemical testing Combustion, oxidation and thermal decomposition reactions Conservation of mass Changes of State Endothermic and Exothermic reactions (qualitative) Balancing Equations 	Topic 2 – Bonding, Structure and the Properties of Matter <ul style="list-style-type: none"> Ionic bonding and the properties of ionic compounds Simple covalent molecules and their properties Giant covalent structures and their properties 	Topic 6 – Rate and Extent of Chemical Change <ul style="list-style-type: none"> Reversible reactions and equilibrium Factors affecting equilibrium Topic 10 – Using Resources Equilibrium, the Haber process and fertilisers	Module 2.1 Atoms and Reactions (2.1.1 – 2.1.3) <ul style="list-style-type: none"> Atomic structure and isotopes Amount of substance – moles, formulae, reacting masses, concentrations percentage yield atom economy 	Module 4.1 Basic Concepts and Hydrocarbons (4.1.1 – 4.1.3) <ul style="list-style-type: none"> Hydrocarbons Isomerism Functional Groups Alkanes and their reactions Alkenes and their reactions 	Module 5.3 Transition Elements (5.3.1 – 5.3.2) <ul style="list-style-type: none"> Transition elements Ligand substitution and precipitation reactions Qualitative analysis 	Module 6.1 Aromatic Compounds, Carbonyls and Acids (6.1.2 – 6.1.3) <ul style="list-style-type: none"> Carbonyl Compounds Carboxylic acids Esters
Term 2	Physics 1 – Forces and Motion	Physics 3 - Energy Resources	Topic 1 – Atomic Structure and the Periodic Table <ul style="list-style-type: none"> Elements, compounds and mixtures Separation techniques recap Atoms and their structure Development of the atomic model History of the atom* 	Topic 2 – Bonding, Structure and the Properties of Matter <ul style="list-style-type: none"> Metallic bonding and their properties Nanoscience Topic 10 – Using Resources <ul style="list-style-type: none"> Extraction of metals, alloys and corrosion Topic 3 – Amount of Substance <ul style="list-style-type: none"> Moles Limiting reactants Percentage yield and atom economy 	Topic 7 – Organic Chemistry <ul style="list-style-type: none"> Crude, oil hydrocarbon and fuels Fractional distillation Properties of hydrocarbons Cracking and alkenes Reactions of alkenes Alcohols Carboxylic acids Condensation and addition polymerisation Ceramic, polymers, composites 	Module 2.1 Atoms and Reactions (2.1.4 – 2.1.5) <ul style="list-style-type: none"> Acids Redox Module 2.2 Electrons, Bonding and Structure (2.2.1 – 2.2.2) <ul style="list-style-type: none"> Bonding and structure 	Module 4.1 Basic Concepts and Hydrocarbons (4.1.3) <ul style="list-style-type: none"> Stereoisomerism Addition polymerisation and associated environmental impacts Module 4.2 Alcohols, Haloalkanes and Analysis (4.2.1 – 4.2.2) <ul style="list-style-type: none"> Alcohols and their reactions Haloalkanes and their reactions 	Module 5.2 Energy (5.2.1 – 5.2.2) <ul style="list-style-type: none"> Lattice enthalpy and Born Haber cycles Entropy and Free Energy 	Module 6.1 Aromatic Compounds, Carbonyls and Acids (6.1.1, 6.2.4 – 6.2.5, 6.3.1, 6.3.2) <ul style="list-style-type: none"> Aromatic Compounds Benzene and Phenols Qualitative analysis NMR spectroscopy Carbon-carbon bond formation Organic synthesis
Term 3			Topic 1 – Atomic Structure and the Periodic Table <ul style="list-style-type: none"> Structure of the Periodic Table Development of the Periodic Table* Trends in reactivity of Group 1 and Group 7 Transition Metals compared to Group 1 	Topic 3 – Amount of Substance <ul style="list-style-type: none"> Gas volumes Concentrations of solutions Titrations Required practical - titrations Topic 4 – Chemical Changes <ul style="list-style-type: none"> Metal extraction Electrolysis of molten compounds and solutions 		Module 2.2 Electrons, Bonding and Structure (2.2.2) <ul style="list-style-type: none"> Shapes of Molecules and Ions Intermolecular forces and electronegativity Module 3.1 The Periodic Table (3.1.1) <ul style="list-style-type: none"> Periodicity 	Module 4.2 Alcohols, Haloalkanes and Analysis (4.2.3 – 4.2.4) <ul style="list-style-type: none"> Organic synthesis Analytical techniques – infrared spectroscopy and mass spectrometry 	Module 5.2 Energy (5.2.3) <ul style="list-style-type: none"> Redox and titrations Electrode potentials 	Module 6.2 Nitrogen Compounds, Polymers and Synthesis (6.2.1 – 6.2.3) <ul style="list-style-type: none"> Amines Amino Acids, Amides and Chirality* Polyesters and Polymerisation of amines and amides Amino acids

				<ul style="list-style-type: none"> Required practical – electrolysis 						
Term 4	<p>Biology 2 -</p> <p>Chemistry 2 – Introduction to Chemical Reactions</p> <ul style="list-style-type: none"> Atoms, elements and compounds Molecules and Lattices Chemical and Physical reactions Conservation of Mass Word equations Chemical reactions as the rearrangement of particles <p>Physics 2 – Space</p>	<p>Biology 4</p> <p>Chemistry 4 - Acids and Alkalis</p> <ul style="list-style-type: none"> Safety and risk assessments in Science Acids and alkalis Indicators and the pH scale Strong and weak acids Acid rain Neutralisation reactions 	<p>Topic 5 – Energy Changes</p> <ul style="list-style-type: none"> Endothermic and exothermic reactions (quantitative) Required practical – investigating temperature changes Energy profile diagrams Bond energy calculations 	<p>Topic 4 – Chemical Changes</p> <ul style="list-style-type: none"> The Reactivity Series Neutralisation and pH scale Required practical – making salts Strong and weak acids <p>Topic 5 – Energy Changes</p> <ul style="list-style-type: none"> Cells, batteries and fuel cells 	<p>Topic 8 – Chemical Analysis</p> <ul style="list-style-type: none"> Chemical testing Analytical techniques Required practical - chromatography Required practical – identifying ions Pure substances and their identification Formulations 	<p>Module 3.1 The Periodic Table (3.1.2 – 3.1.4)</p> <ul style="list-style-type: none"> Group 2 The Halogens Qualitative Analysis 	<p>Module 3.2 Physical Chemistry (3.2.1)</p> <ul style="list-style-type: none"> Enthalpy changes and Hess’ law Bond enthalpies 	<p>Module 5.1 Rates, Equilibrium and pH (5.1.2)</p> <ul style="list-style-type: none"> Equilibrium constants 	<p>Module 6.3 Analysis (6.3.1)</p> <ul style="list-style-type: none"> Chromatography 	
Term 5			<p>Chemistry 5 – The Earth and its Atmosphere</p> <ul style="list-style-type: none"> Composition and structure of Earth The rock cycle The carbon cycle Composition of the Atmosphere Carbon dioxide and human impact on climate change Impact of climate change in different areas across the world 	<p>Topic 9 – Chemistry of the Atmosphere</p> <ul style="list-style-type: none"> Evolution of the atmosphere Combustion of fuels Environmental impact of pollution – climate change and greenhouse gases Atmospheric pollutants Resources, sustainability and life cycle assessments 	<p>Topic 6 – Rate and Extent of Chemical Change</p> <ul style="list-style-type: none"> Rates of reaction – collision theory, activation energy and catalysts Required practical – rates of reaction 		<p>Module 3.2 Physical Chemistry (3.2.2)</p> <ul style="list-style-type: none"> Reaction rates Boltzmann distribution 	<p>Module 3.2 Physical Chemistry (3.2.3)</p> <ul style="list-style-type: none"> Chemical equilibrium Equilibrium constants 		
Term 6			<p>Physics 4 – Light and Sound</p>	<p>Topic 10 – Using Resources</p> <ul style="list-style-type: none"> Water and waste water treatment Required practical – analysis and purification of water 			<p>Module 5.1 Rates, Equilibrium and pH (5.1.1)</p> <ul style="list-style-type: none"> Rate equations and rate constants Orders of reaction Reaction mechanisms 	<p>Module 5.1 Rates, Equilibrium and pH (5.1.3)</p> <ul style="list-style-type: none"> Acids and bases Buffers pH and neutralisation 		