Elements and Compounds
Structure and Bonding
Quantitative Analysis
The Earth and it's Resources
Chemical Changes
The Rate and Extent of Reactions
Energy

The Core Themes in Chemistry

The **Chemistry** curriculum at Walton High School is **evidence-informed** in its design.

- Knowledge is organised into **core themes** which are **sequenced** effectively over many years. Students make explicit **links** between different concepts.
- Knowledge is **sequenced** to ensure that students have the **pre-requisite knowledge** necessary to learn new concepts. This **reduces cognitive load** and maximises retention of new learning.
- Knowledge is **revisited** over key stages, gradually increasing in complexity in a **spiral curriculum** design. This deepens knowledge and understanding of concepts.
- We have specified the key knowledge in our KS3/4 curriculum through the use of **Core Knowledge questions**.

WALTON HIGH SCHOOL – KS3 CURRICULUM OVERVIEW FOR CHEMISTRY

Year Group	Half Term 1	Half Term 2	Half Term 3	Half Term 4
7	**Elements and Compounds** • Solids Liquids and Gases • Elements • Compounds • Mixtures • Diffusion	**Elements and Compounds** • Solutions **Chemical Change** • Investigating Reactions (Dissolving) • Diffusion **Quantitative Analysis** • Chromatography • Solving a Crime	**Earth's Resources** • The structure of Earth • Weathering • Types of Rock • The Rock Cycle **Element and Compounds** • Separating rock salt	**Earth's Resources** • Atmospheric Gases • Global Warming • Reduce, Reuse, Recycle • The Carbon Cycle • The Water Cycle
	Core Knowledge **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**
8	**Elements and Compounds** • The Periodic Table • Group 1 • Group 7 • Group 0	**Energy** • Exothermic and Endothermic Reactions **Chemical Change** • Combustion • Thermal Decomposition	**Chemical Change** • Acids and Alkalis • Salts • Neutralisation • Making Salts	**Chemical Changes** • Metals and Oxygen • Reactivity Series • Metal Displacement
	Chemical Change • Chemical vs Physical Reactions • Conservation of Mass	**Earth's Resources** • Air Pollution	**Elements and Compounds** • Metals in the Periodic Table	**Earth's Resources** • Extracting Metals with Carbon • Ceramics, Composites and Polymers
	Core Knowledge **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**
9	**Elements and Compounds** • Gas tests • History of the Periodic Table • History of the Atom • Atomic Structure	**Rate and Extent** • Collision Theory • Calculating Rate • Disappearing X • Investigating Rate	**Earth's Resources** • Hydrocarbons • Fractional Distillation • Cracking • Polymers	**Chemical Change** • Complete and incomplete combustion **Earth's Resources** • Pollutants • Greenhouse Gases and Global Warming • The Evolution of the Atmosphere
	Quantitative Analysis • Ar and Mr Calculations	**Chemical Change** • Balancing Equations	**Elements and Compounds** • Separating Mixtures	
	Core Knowledge **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**

WALTON HIGH SCHOOL – KS4 CURRICULUM OVERVIEW FOR COMBINED CHEMISTRY

Year Group	HT1 (Sept-Oct)	HT2 (Nov-Dec)	HT3 (Jan-Feb)	HT4 (March-April)	HT5 (April-May)	HT6 (June-July)
10	**Structure and Bonding** • Ions • Ionic Bonding • Covalent Bonding • Metallic Bonding • Alloys	**Chemical Change** • Reactivity of Metals **Earth's Resources** • Extracting Metals • Phytomining • Finite Resources • LCAs • Reuse, Reduce, Recycle	**Elements and Compounds** • Group 1 • Group 7 • Group 0 **Structure and Bonding** • Giant Ionic Lattices • Simple Covalent • Allotropes of Carbon	**Chemical Change** • Electrolysis • Molten Salt Electrolysis • Aqueous Solution Electrolysis	**Energy** • Exothermic and Endothermic • Reaction Profiles • Investigating Temperature Changes **Full Paper Mock Exam** Provides an estimated grade for students as they progress into year 11.	**Quantitative Analysis** • Bond enthalpy • Chromatography **Earth's Resources** • Potable Water • Treating waste water • Testing the presence and purity of water
	Core Knowledge **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**
11	**Quantitative Analysis** • Moles • Masses • Balancing Equations with moles • Calculating concentrations **Chemical change** • Acids and alkalis • Salts • pH	**Chemical change** • Strong and weak acids • Making salts **Paper 1 Mock Exam** Provides an estimated grade for students.	**Rate and Extent** • Reversible Reactions • Dynamic Equilibrium • Le Chatalier's Principle • Altering Conditions	**Paper 2 Mock Exam** Combined with the December grade to provides an estimated grade for students.	**PUBLIC EXAMINATIONS**	
	Core Knowledge **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**		

WALTON HIGH SCHOOL – KS4 CURRICULUM OVERVIEW FOR CHEMISTRY TRIPLE

Year Group	HT1 (Sept-Oct)	HT2 (Nov-Dec)	HT3 (Jan-Feb)	HT4 (March-April)	HT5 (April-May)	HT6 (June-July)
10	**Structure and Bonding** • Ions **Quantitative Analysis** • Testing for Anions • Testing for Cations • Instrumental Analysis **Structure and Bonding** • Ionic Bonding • Covalent Bonding • Metallic Bonding	**Elements and Compounds** • Transition Metals **Chemical Changes** • Rusting **Structure and Bonding** • Alloys **Earth's Resources** • Extracting Metals • Phytomining and Bioleaching **Chemical Change** • Ionic Equations	**Elements and Compounds** • Group 1 • Group 7 • Group 0 **Structure and Bonding** • Giant Ionic Lattices • Simple Covalent Molecules • Allotropes of Carbon • Nanoscience	**Chemical Change** • Electrodes • Molten Salt Electrolysis • Solution Electrolysis • Batteries • Fuel cells	**Energy** • Exothermic and Exothermic • Reaction Profiles • Investigating Temperature **Paper 1 Mock Exam** Provides an estimated grade for students as they progress into year 11.	**Quantitative Analysis** • Bond enthalpy • Chromatography **Earth's Resources** • Potable Water • Treating water from waste water • Testing the presence and purity of water
	Core Knowledge **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**
11	**Quantitative Analysis** • Moles • Masses • Reacting Masses • Atom Economy • Percentage Yield **Chemical change** • Acids, Alkalis and Salts • pH • Strong and Weak Acids	**Chemical change** • Making Salts **Quantitative Analysis** • Titrations • Titrations Calculations **Paper 1 Mock Exam** Provides an estimated grade for students.	**Rate and Extent** • Reversible Reactions • Dynamic Equilibrium • Le Chatalier's Principle • Altering Conditions • The Haber Process	**Chemical change** • Reactions of Alkenes **Structure and Bonding** • Alcohols and Esters • Natural Polymers • Condensation Polymers **Paper 2 Mock Exam** Combined with the December grade to provides an estimated grade for students.	**PUBLIC EXAMINATIONS**	
	Core Knowledge **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**		

WALTON HIGH SCHOOL – KS5 CURRICULUM OVERVIEW FOR CHEMISTRY

Year Group	HT1 (Sept-Oct)	HT2 (Nov-Dec)	HT3 (Jan-Feb)	HT4 (March-April)	HT5 (April-May)	HT6 (June-July)
12	**Quantitative Analysis** • RAM, RMM, Moles • Empirical and Molecular Formula • Atom Economy • Percentage Yield • Ideal Gas Equation **Elements and Compounds** • Fundamental Particles • Mass Number, Atomic Number, Isotopes • Electron arrangements **Structure and Bonding** • Ionic Bonding • Covalent Bonding • Metallic Bonding **Elements and Compounds** • Hydrocarbons • Nomenclature • Structural Isomers	**Quantitative Analysis** • Moles in Solutions • Titrations **Energy** • Exothermic and Endothermic Reactions • Calorimetry **Structure and Bonding** • Electronegativity • Intermolecular forces • Properties of Substances **Elements and Compounds** • Shapes of Molecules • Bond angles **Earth's Resources** • Fractional Distillation • Alkanes, Crude Oil • Cracking • Combustion • Atmospheric Pollutants	**Energy** • Bond Enthalpy • Hess's Law **Elements and Compounds** • Orbitals • Ionisation Energy **Quantitative Analysis** • Mass Spectroscopy • TOF Spectroscopy **Elements and Compounds** • Halogenoalkanes **Chemical Changes** • Radical Substitution • Nucleophilic Substitution • Elimination	**Rate and Extent** • Collision Theory • Maxwell-Boltzmann Distribution • Catalysts • Dynamic Equilibrium • Le Chatalier's Principle **Elements and Compounds** • The Periodic Table • Trends in Period 3 • Trends in Group 2 • Halogens • Alkenes • Stereoisomers • Alcohols **Chemical changes** • Electrophilic addition • Reactions of alcohols **Earth's Resources** • Producing Ethanol	**Rate and Extent** • Kc • Factors Affecting Kc **Chemical Changes** • Oxidation States • REDOX • Reactions of Halogens • Halide Ions • Alcohol oxidation **Quantitative Analysis** • Test tube reactions • Mass Spectroscopy of Compounds • IR Spectroscopy • Spectroscopic Analysis	**Required Practical Skills** Required Practical 1-6 Completed for AQA A-Level Practical Endorsement **Preparation and Feedback on Mock Examination**
13	**Energy** • Enthalpy Changes • Born-Haber Cycles • Entropy • Gibbs free Energy **Chemical Changes** • Reactions of Period 3 • Nucleophilic addition **Elements and Compounds** • Period 3 Oxides • Transition Metal Properties • Coloured Ions • Aldehydes and Ketones • Carboxylic Acids and Esters • Stereoisomers (optical)	**Rate and Extent** • Rate expression • Orders of Reactions • Initial Rate methods • Arrhenius equation • Rate determining steps **Structure and Bonding** • Complex Ions • Benzene **Elements and Compounds** • Oxidation states of transition elements • Amines **Chemical changes** • Electrophilic substitution • Nucleophilic Addition-Elimination • Catalysis	**Structure and Bonding** • Polyesters • Polyamides • Amino acids • Proteins • Enzymes **Chemical changes** • Acid, bases, pH • pH equation • Buffers • Titration curves • REDOX titrations **Elements and Compounds** • Amines • Reactions of Amines	**Chemical changes** • Electrode potentials • Electrochemical cells • REDOX and chemical cells • Ligand Substitution Reactions **Structure and Bonding** • DNA Structure • Anti-cancer drugs **Quantitative Analysis** • NMR Spectroscopy • Chromatography (TLC) • Transition metal test tube reactions	**PUBLIC EXAMINATIONS**