Year 11 Chemistry

In Year 11, students build on the foundations developed in Year 10 to deepen their understanding of chemical reactions, organic chemistry and industrial processes. Students learn how chemists investigate reaction rates, analyse substances, manufacture useful products and apply chemistry to solve real-world challenges. The course develops practical, mathematical and analytical skills in preparation for GCSE examinations and further study.

Advent 1: Rates of Reaction

Students investigate the factors that affect how quickly chemical reactions occur and learn how collision theory can be used to explain reaction rates.

Key areas of study:

- Measuring the rate of reaction
- Collision theory
- Factors affecting reaction rates
- Temperature and reaction rate
- Concentration and pressure
- Surface area and particle size
- Catalysts and their applications

Advent 2: Organic Chemistry and Further Organic Chemistry

Students explore the chemistry of carbon compounds and the substances that form the basis of fuels, plastics, pharmaceuticals and many everyday products.

Key areas of study:

- Crude oil and fractional distillation
- Hydrocarbons and fuels
- Alkanes and alkenes
- Cracking and fuel production
- Alcohols
- Carboxylic acids
- Polymers and polymerisation
- Natural and synthetic polymers

Lent 1: Chemical Analysis, Electrolysis and Fuel Cells

Students learn how chemists identify substances and investigate the technologies used to generate electricity from chemical reactions.

Key areas of study:

- Pure substances and formulations
- Chromatography
- Tests for gases
- Tests for ions
- Electrolysis of aqueous solutions
- Industrial applications of electrolysis
- Hydrogen fuel cells
- Comparing fuel cells with batteries

Lent 2: Equilibrium, Haber Process and Fertilisers

Students study reversible reactions and how chemists use equilibrium principles to maximise the production of important industrial chemicals.

Key areas of study:

- Reversible reactions
- Dynamic equilibrium
- Le Chatelier's Principle
- The Haber Process
- Production of ammonia
- NPK fertilisers
- Industrial and environmental considerations

Trinity 1: Further Quantitative Chemistry

Students revisit and extend their quantitative chemistry knowledge, developing confidence with the mathematical skills required for GCSE Chemistry and future scientific study.

Key areas of study:

- Percentage yield
- Atom economy
- Calculating concentrations
- Titration calculations
- Gas volumes
- Required practical calculations
- Applying mathematics to chemical processes