



Chemistry – Year 11 Combined Science

Curriculum Intent

Chemistry is the science of the composition, structure, properties and reactions of matter, understood in terms of atoms, atomic particles and the way they are arranged and link together. It is concerned with the synthesis, formulation, analysis and characteristic properties of substances and materials of all kinds. The GCSE Chemistry course provides interesting and challenging experiences to link key chemical ideas and understand how they relate to each other.

The course aims for all students to:

- develop essential knowledge, understanding and application of different areas of Chemistry and how they relate to each other
- understand how society makes decisions about scientific issues and how Chemistry contributes to the success of the economy and society
- develop competence and confidence in a variety of practical, mathematical and problem solving skills
- develop and demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods
- promote students' interest in and enthusiasm for the subject, including an interest in further study and careers associated with the subject.

Autumn Term | Electrolysis & Energy changes

Students will learn:-

Electrolysis
Energy changes

What does excellence look like?

Carrying out practical processes logically, precisely and accurately.

Linking ideas together to answer questions logically and sequenced.

Linking big ideas to answer Chemistry problems.

For example:

- Explain the electrolysis of brine using half equations, classifying reactions at the electrode as oxidation or reduction.
- Calculate an unknown bond energy from the energy change of a reaction
- Plan, carry out and evaluate the errors in a calorimetry investigation.
- Justify the procedure and equipment used in an investigation

How will we assess impact?

- Peer and self-assessment
- Previous lesson recap quiz
- Land mark tasks
- End of topic test

How is homework used to enhance learning?

BBC Bitesize

<https://www.bbc.co.uk/bitesize/examspecs/z8r997h>

Doc Brown's Chemistry <http://www.docbrown.info/Physicsandmathstutor>

<https://www.physicsandmathstutor.com/chemistry-revision/gcse-aqa/>

Example homework tasks

- Learn definitions of key terms.
- Group and independent research projects
- Past examination questions practice
- Practical activity preparation, simulations and follow-up.

Knowledge, understanding & Skills

Electrolysis of molten ionic compounds, extraction of reactive metals, electrolysis of aqueous solutions, representation of redox reactions at electrodes as half equations.

Exothermic and endothermic reactions: energy transfer, reaction profiles, calculation of energy change using bond energies.



Students will learn:-

Rate and extent of chemical change
Organic Chemistry: Crude oil and fuels

Knowledge, understanding & Skills

Rate of reaction: measuring rate of reactions, calculating rate of reactions, factors affecting rate, collision theory and activation energy, catalysts.

Reversible reactions and dynamic equilibrium: reversible reactions, energy changes, equilibrium.

The effect of changing conditions on equilibrium: temperature, equilibrium, pressure.

Carbon compounds as fuels and feedstock: crude oil, hydrocarbons, alkanes; fractional distillation; properties of hydrocarbons; cracking.



What does excellence look like?

Carrying out practical processes logically, precisely and accurately.

Linking ideas together to answer questions logically and sequenced.

Linking big ideas to answer real life Chemistry problems. For example:

- Justify quantitative predictions and evaluate in detail their investigation into the effect of concentration on rate of reaction.
- Justify the use of catalysts in industry and in household products.
- Predict the effect on the rate of forward and reverse reactions by applying the Le Chatelier's Principle when conditions of a dynamic equilibrium are changed then equilibrium is re-established.

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International Opportunities

Within the curriculum

The GCSE Combined Science Chemistry curriculum is designed to deepen understanding and appreciation of how the International scientific society collaborates and makes decisions about world scientific issues.

Students are encouraged to research each theme beyond lessons, exploring topical international scientific examples. Classwork and homework is designed to ensure that they can draw upon a worldwide knowledge of skills, techniques and theoretical understanding required for their examinations and the potential further study of Chemistry at an International level at global universities.