



Chemistry

Year 11 Combined (for exams 2021)

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 | Analysis, Chemistry of the Atmosphere and Earth's Resources

Students will learn:-

- Analytical chemistry
- Chemistry of the Atmosphere
- Using the Earth's resources

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:
 - Link ideas about global warming with energy transfer pathways in Physics.
 - Explain the limits of the theory for the development of the Earth's atmosphere and why it has changed.
 - Justify the choice of potable water supply in a given scenario.
 - Write balanced symbol equations to explain metal extraction techniques

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?

- Kerboodle <https://www.kerboodle.com/app>
- BBC Bitesize <https://www.bbc.co.uk/bitesize/topics/z88jity>
- Doc Brown's Chemistry <http://www.docbrown.info/>
- Physicsandmathstutor <https://www.physicsandmathstutor.com/chemistry-revision/gcse-aqa/>

Suggested 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

- Purity, formulations and chromatography. Identification of common gases.
- The composition and evolution of the Earth's atmosphere.
- Carbon dioxide and methane as greenhouse gases.
- Common atmospheric pollutants and their sources.
- Using the Earth's resources and sustainable development.
- Alternative methods of extracting metals. Life cycles assessment and recycling.
- Potable water and waste water treatment.
- Alternative methods of extracting metals.
- Life cycle assessments (LCAs) and recycling.



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 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.