Chemistry Year 11 Triple

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 | Organic Chemistry & Analysis

Students will learn:-

Organic chemistry (Part 2): Alkenes, oxygen-containing compounds and biochemistry

Analytical chemistry

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:

- Predict the word and balanced symbol equations to describe reactions between alkenes and hydrogen, water (steam), or a halogen.
- Explain, using ionic equations, why carboxylic acids are weak acids.
- Compare and contrast in detail, giving appropriate examples, the two methods of polymerisation.
- Write balanced ionic equations, including state symbols, for simple laboratory tests for carbonate, halide, or sulfate ions.
- Explain how metal ions emit light when in a flame.

How is homework used to enhance learning?

BBC Bitesize https://www.bbc.co.uk/bitesize/examspecs/z8xtmnb

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

How will we assess impact?

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

Knowledge, Understanding & Skills

Alkenes: functional groups, homologous series, structure, reactions; addition polymerisation

Alcohols: production from alkenes and by fermentation, uses, solubility trend with water, reaction with sodium, combustion, with an oxidising agent.

Carboxylic acids: solubility in water, reactions with carbonates and with alcohols to form esters

Condensation polymerisation : polyesters and polyamides; amino acids and polypeptides; DNA, proteins, starch, cellulose.

Purity, formulations and chromatography. Identification of common gases. Identification of ions by spectroscopic and chemical means. Instrumental methods of analysis.

Spring Term | Using Materials & Haber Process

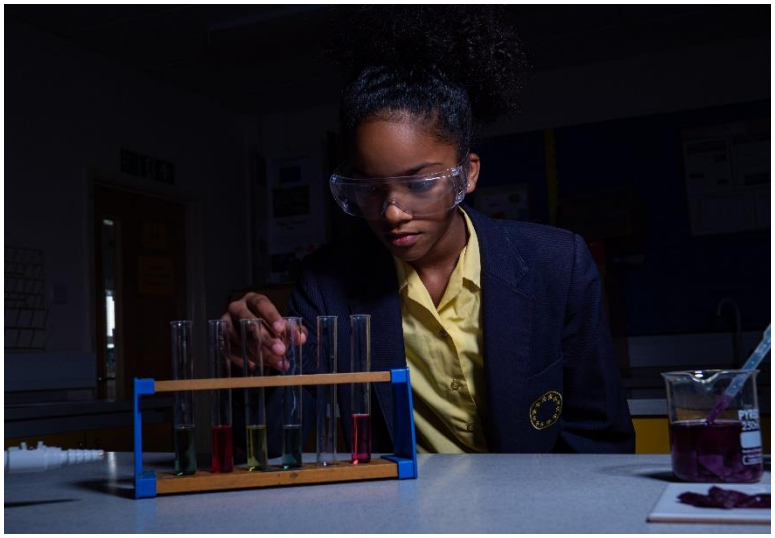
Students will learn:-
Using materials
The Haber process and fertilisers

How will we assess impact?

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

Knowledge, Understanding & Skills

Corrosion and its prevention, alloys. Ceramics, polymers and composites.
Synoptic: Rate of chemical change: Investigating factors affecting rate;
Synoptic: Dynamic equilibrium: effect of changing conditions on equilibrium: temperature, equilibrium, pressure.
The Haber process; production and uses of NPK fertilisers.



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Example homework tasks

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Linking ideas together to answer questions logically and sequenced.
Linking big ideas to answer real life Chemistry problems.
For example:
- Explain the properties of ceramics and composites in terms of structure and bonding.
- Justify quantitative predictions and evaluate in detail their investigation into the effect of concentration on rate of reaction.
- 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.
- Justify why the conditions used in the Haber process are a compromise.
- Evaluate different processes to make NPK fertilisers.

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.