Year 12 LONG-TERM SEQUENCE for Chemistry

Bishop Milner CATHOLIC COLLEGE

Year 12 LONG-TERM SEQUENCE for Chemistry

The curriculum for this stage of students' education has been designed to ensure students understand that Chemistry is about everything. It is the central science that explains how the world around us works. It enables us to see patterns in the myriads of chemical reactions that occur in nature. The curriculum for this stage of students' education has been designed to inspire students, nurture their passion for the subject and lay the foundations for further study and the workplace. Building on work done in KS4, the course will bring to life the real-world contexts and applications of the modules being studied, with emphasis on the application of knowledge and the usefulness of laboratory research. Students will see how the laws of chemistry and the skills of today's chemists have been used to control chemical reactions and the importance of chemistry in manufacturing processes.

HALF TERM 1: AMOUNT OF SUBSTANCE/ATOMIC STRUCTURE

STUDENTS MUST KNOW:

Amount of substance EGU

Avogadro's number and Moles, Significant figures and Standard form, gas volumes, RFM and Percentage of an element in a compound, Empirical formula, ideal gas equation, standard solutions and molarity. Titration Calculations and errors, predicting masses, atom economy, Predicting and writing ionic formula.

Atomic structure KCH

Atomic Structure, The TOF Mass Spectrometer, Electron Configuration, Ionization Energies and Trends.

RP1: Making a standard solution and performing titrations

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

HALF TERM 2: INORGANIC CHEMISTRY/BONDING

STUDENTS MUST KNOW:

Inorganic Chemistry EGU

The periodic table, periodicity, Group 2 and group 7 and tests for ions.

Bonding KCH

Ionic bonding, Covalent bonding, charge clouds, shapes of molecules, polarisation, intermolecular forces, metallic bonding and properties of metals.

RP4: Testing for cations and anions including halides

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

HALF TERM 3: ENERGETICS/INTRO TO ORGANIC

STUDENTS MUST KNOW:

Energetics EGU

Enthalpy, bond enthalpies, measuring enthalpy changes, Hess's Law

Organic Chemistry KCH

Introduction to Organic Chemistry, Naming and drawing Organic Compounds, Isomers, Alkanes, Complete and incomplete Combustion, Cracking. Haloalkanes, Alkenes, Alcohols, Organic analysis, Analytical Techniques.

RP2: Measuring enthalpy change

RP5: How to distil a product from a reaction

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

HALF TERM 4: KINETICS/ALKANES AND HALOGENOALKANES

STUDENTS MUST KNOW:

Kinetics EGU

Reaction Rates, Catalysts, Measuring reaction rates

Organic Chemistry KCH

Alkanes and petroleum, alkanes as fuels, synthesis of chloroalkanes, halogenoalkanes, nucleophilic substitution and elimination reactions.

RP3: Measuring the rate of reaction with changes in temperature.

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

HALF TERM 5: ORGANIC CHEMISTRY, EQUILIBRIA AND REDOX

STUDENTS MUST KNOW:

Equilbria and Redox EGU

Reversible reactions, industrial processes, equilibrium constant and factors affecting it. Redox reactions and equations.

Organic Chemistry KCH

Alkene reactions and addition polymerisation, alcohols, dehydration of alcohols, ethanol production and oxidation of alcohols.

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

HALF TERM 6: STRUCTURAL DETERMINATION

STUDENTS MUST KNOW:

Equilbria and Redox EGU

Reversible reactions, industrial processes, equilibrium constant and factors affecting it. Redox reactions and equations.

Organic Analysis and Structural Determination KCH

Tests for functional groups, mass spectroscopy and infrared spectroscopy.

RP6: Tests for functional groups

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

Embedding this knowledge can be supported at home by completion of homework, reviewing information and practicing past papers (www.chemguide.co.uk , www.physicsandmathstutor.com), watching videos placed on Sharepoint and reading scientific articles in newspapers, magazines, scientific journals and

periodicals. Also inspire your further studies with trips to science fairs, The Big Bang Show, Science Live or visit Universities where famous scientists made discoveries; for example the Rutherford Building at The University of Manchester. Also visit Science museums and exhibits.