KS5 Long Term Curriculum Plan: A LEVEL CHEMISTRY Year 13 2021-2022

Curriculum Aim: A level Chemistry attempts to answer the big question 'what is the world made of' and its search for this answer that makes this subject so fascinating. From Investigating how one substance can be changed drastically into another, to researching a new wonder drug to save millions of lives, the opportunities that chemistry provides are endless. Throughout the course students will be learning the 3 main areas of chemistry: Physical Chemistry, Inorganic Chemistry and Organic Chemistry. The course prepares students for further study.
Link to prior learning: The subject builds on key knowledge and skills from Year 1 A Level Chemistry and GCSE, by diving deeper into key topics
Rationale of sequencing: We begin the course by focusing on essential knowledge from Year 1 of the A level course and developing on the basics from GCSE, when learning about equilibria and polymers. This essential knowledge underpins key concepts in later topics. Throughout all topics we practice essential practical skills. Topics link from one to another, we use continuous recall starters to embed content.

	Focus / Topic	Knowledge & Skills (from NC/Programmes of Study)	Assessment
Autumn 1 Autumn 2	Equilibria Carbonyl Compounds Aromatic Chemistry Thermodynamics Amines Polymerisation	Students will gain an understanding of: ● How to apply equilibrium constant to gases to work out partial pressure. ● The chemistry of aldehydes, ketones, carboxylic acids and esters, all of which contain a carbonyl group, C=O. ● The Compounds containing a benzene ring, which has unexpected properties due to a system of electrons delocalised over hexagonal ring of carbon atoms. ● Feasible using the Gibbs free energy change. ● Ammonia and other organic compounds ● The reactivity and uses as nucleophiles. ● 2 types of long chain molecules based on smaller repeating units – condensation and addition polymers. Students will develop key skills such as defining the term enthalpy of hydration and perform calculations of an enthalpy change using these cycles. They will learn to rearrange the equation $\Delta G = \Delta H - T\Delta S$ to find an unknown.	Students will be assessed approximately every 4 weeks using End of Unit exams on each topic.
Spring 1	Acids, bases and buffers Amino acids, proteins and DNA Organic synthesis and determination	Students will gain knowledge on: ● Bronsted-Lowry acid and calculating the pH of a solution using logarithms. ● The biologically important groups of polymers which are vital for life. ● How to show how a series of reactions can be linked together to make a target molecule from a given starting material.	1 x Year 1 Paper and 1 x Year 2 paper (on Year 2 content so far) **Mock week (w/b 5th Jan 2022)**

Spring 2	Structural determination and chromatography Transition metals Reactions of inorganic compounds in aqueous solutions	Students will gain knowledge of: ● The techniques of NMR and shows how these techniques can be used to help deduce structures of organic compounds and how chromatography can separate mixtures of organic compounds. ● How metals have unique chemical structures which give compounds characteristic and useful properties. ● Reactions of some metal ions in solution. Students will develop key skills such as calculating R_f values from a chromatogram and the ability to identify unknown substances using reagents. Students carry out test-tube reactions of complexes with monodentate, bidentate and multidentate ligands to compare ease of substitution. Students carry out test-tube reactions of solutions of metal aqua ions with ammonia or concentrated hydrochloric acid whilst embedding skills such as planning investigations and carrying out detailed risk assessments.	Students will be assessed approximately every 4 weeks using End of Unit exams on each topic.
Summer 1	Periodicity Electrode potentials and electrochemical cells	Students will gain knowledge of: ● Trends between periods of the Periodic Table. ● The idea of half cells which can be joined to generate an electrical potential difference. ● Predicting redox reactions and the description of how a number of types of batteries work. Students will develop key skills such as the ability to use $E^{\ominus}$ values to predict the direction of simple redox reactions. Calculate the EMF of a cell. Write and apply the conventional representation of a cell.	End of year in class mock examinations for all three papers.

Further Information

The Course Specification https://filestore.aqa.org.uk/resources/chemistry/specifications/AQA-7404-7405-SP-2015.PDF

All topics will be assessed with an end of module exam (every 3-4 weeks). Practical skills will be assessed throughout the course during required practicals. Students are expected to complete 5 hours of additional study per week for this course.