Chemistry at A Level

Chemistry is an extremely diverse subject to study. It provides learners with many transferrable skills and this is why it is a highly sought after A Level for many careers such as Medicine through to Engineering. Chemistry at a further level requires not only a strong ability to recall facts, theories and laws but also how to apply those to unfamiliar situations. At A Level the main themes of study are the same as at GCSE but we look at them in more detail and in more complex settings.

Physical chemistry is the branch of **chemistry** that deals with the **physical** structure of **chemical** compounds, the way they react with other matter and the bonds that hold their atoms together.

Inorganic

Inorganic chemistry deals with the synthesis and behaviour of inorganic compounds. **Inorganic chemistry** is used to study and develop catalysts, coatings, fuels, surfactants, materials, superconductors and drugs

Organic chemistry is **important** because it is the study of life and all of the **chemical** reactions related to life.

Key themes from GCSE are studied further and ideas are developed to look at more complex examples. A more detailed look at atomic structure means students learn about orbitals and the arrangement of electrons within these. They also learn about how information about elements can be gleaned from using various spectrometers. As an extension of the types of bonding previously studied, students now start to think about the various structural shapes that can be made when elements bond with each other. They look at the impact that non- bonding electrons can have on this shape and they look at the intermolecular forces that can be generated between different molecules. Students use their maths skills to complete more complex calculations that explore the amount of substance, rates of reactions and the energetics of reactions. Students can use data and apply the laws of thermodynamics to explain why reactions will happen and comment on their feasibility and stability. Students look at how formulas and calculations can enable you to predict changes in acidity within reactions. They also study how chemical reactions can be used to generate a voltage which can be used for electricity- they analyse electrode potential data to identify what if oxidised and what is reduced within a chemical cell.

Through the study of further inorganic chemistry we look at the trends in chemical and physical properties of lots of groups of compounds such as groups 7, group 2, period 3 elements and their oxides and the transition metals.

Our study of transition metals looks into in details the key features we have identified of these elements lower down the school such as why they are good catalysts, why they form coloured compounds and why they can often be used within chemical testing.

<u>How we learn and how we are assessed</u>

Students study Chemistry further using a range of theory based lessons, practical lessons and lessons where they get practise of applying the theory. To further enthuse and enhance the student's learning they are given opportunities to take part in nationally recognised competitions and attend lectures at nearby institutions as well as having experts come into school. Throughout all of this we prepare our student's with internal assessments that replicate the external exams they will take. We focus on lots of transferrable skills that will set up our student's to study further in their chosen field.

A basic insight to organic chemistry previously looked at in KS4 is given more detail and we extend the number of organic homologous series studied. As part of this we look at more complicated nomenclature and use IUPAC rules to systematically name and draw compounds. We look at the concept of isomerism and how molecules with the same formulas can look different. We look at how this can be of importance when creating compounds, especially within pharmaceuticals.

Organic chemistry enables us to identify the group a compound belongs to and allows us to explain how organic synthesis could be used to generate this compound. By outlining the reactants and reagents a reaction mechanism can be generated which tells us how the reaction is taking place. We discuss how analysis can be used to identify or confirm the identity of a substance through a range of chemical testing but also spectroscopy techniques.