

## Chemistry Year 12

<p><b>Half term 1</b></p>	<p><b><u>Atomic Structure</u></b> Developing their knowledge and understanding of the atomic model. They are introduced to analytical techniques such as mass spectrometry. Student gain a deeper understanding of the positioning of electrons, together with their associated energies, and thus, their physical and chemical properties.</p> <p><b><u>Amount of Substance</u></b> Quantitative Chemistry. Students use practical skills in order to enhance their understanding of moles and associated calculations.</p> <p><b><u>Periodicity</u></b></p>
<p><b>Half term 2</b></p>	<p><b><u>Bonding</u></b> Students not only study the different forms of bonding in greater detail but then learn/predict the shapes of molecules, the forces that exist both within and between them, and gain an understanding as to why molecules form in the manner that they do.</p> <p><b><u>Groups 2 and 7</u></b> A return to the Periodic Table enables students to further explore patterns in behaviour. Students are able to explain any deviations from the trends and make predictions regarding unknown reactions.</p> <p><b><u>Introduction to Organic Chemistry</u></b> The name, structure and functional group of differing series of substances. They learn their corresponding IUPAC names and gain a deeper understanding as to why reactions happen the way that they do and why certain substances are formed in favour of others.</p>
<p><b>Half term 3</b></p>	<p><b><u>Alkanes and Halogenoalkanes</u></b> Students develop their knowledge and understanding from the previous unit and investigate these groups of substances. Not only will students be able to discuss in detail the how to form desired products but they will be able to map precisely the movement of specific bonds within the molecules. This is a fascinating topic and a real step-up from GCSE.</p> <p><b><u>Alkenes</u></b> Similarly, students explore the reactions of alkenes and the significance of the carbon-carbon double bond. Producing reaction mechanisms in order to model the formation of new bonds. Students then move on to examining the formation of polymers.</p> <p><b><u>Oxidation and Reduction</u></b></p>
<p><b>Half term 4</b></p>	<p><b><u>Alcohols</u></b> In this return to Organic Chemistry, students explore different reactions involving alcohols. They explore the effects of oxidising and dehydrating alcohols and the production of ethanol.</p> <p><b><u>Organic Analysis</u></b> This unit focuses on Qualitative Chemistry skills and the identification of chemical compounds. Students learn the skills to carry out different tests within the laboratory in order to identify key functional groups. Students then learn how to interpret mass and infrared spectroscopy data to in order to establish the exact structures of compounds.</p>
<p><b>Half term 5</b></p>	<p><b><u>Energetics</u></b> This unit is all about the energies associated with chemical reactions. Students are introduced to enthalpy changes and learn how to determine them both through practical work and calculations.</p> <p><b><u>Reaction Rates/Kinetics</u></b> In this short unit, students explore the speed at which chemical reactions occur. They investigate the effects of catalysts and are introduced to Maxwell-Boltzmann distributions.</p>
<p><b>Half term 6</b></p>	<p><b><u>Equilibria</u></b> In this final unit, students gain a deeper understanding of reversible reactions. They explore the effects of changing conditions and learn how to apply le Chatelier's principle in order to make predictions. Students apply their understanding to industrial processes and perform calculations to determine equilibrium constants.</p>
<p><b>Independent study expectations</b></p>	<p>During the course of the year students will be set extended and rigorous work in order to develop their knowledge, understanding and application skills. This will include questions to check foundation knowledge; exam questions to ascertain understanding; and extension material to develop application skills. In addition, students are expected to independently read around the subject.</p>
<p><b>By the time you finish key stage 5 you'll be...</b></p>	<p>.....in a position where you are able to pursue a career in Chemistry at university or in associated areas such as Forensics or Chemical Engineering. You will be confident in the planning, execution and evaluation of practical work; a skill that is transferable into many industries.</p>

## Chemistry Year 13

<b>Half term 1</b>	<p><b><u>Thermodynamics</u></b> Students now focus on the relationship between energy and the behaviour of gases, by exploring the relationship between volume, pressure and temperature and the resulting behaviour of the gas. This unit is of particular benefit to students who are also studying A-Level Physics.</p> <p><b><u>Rate Equations</u></b> Students develop learning from last year in order to quantify the rate at which reactions occur. They will consider different orders of reactions and their impact.</p> <p><b><u>Period 3</u></b> In a return to the Periodic Table enables students to further explore patterns in behaviour. Students are able to explain any deviations from the trends and make predictions regarding unknown reactions.</p>
<b>Half term 2</b>	<p><b><u>Electrode Potentials</u></b> This unit focuses on an area called electrochemistry. Students explore the potential energies associated with areas of charge.</p> <p><b><u>Acids, Bases, pH</u></b> Students enhance previous learning in order to develop their understanding of what acids and bases really are; what is meant by pH and their subsequent reactions.</p>
<b>Half term 3</b>	<p><b><u>Transition Metals</u></b> This section of metals does not always behave as we would expect. Students investigate their reactions and develop an understanding as to why they behave as they do.</p> <p><b><u>Isomerism and Carbonyl Compounds</u></b> Students build on knowledge and understanding from Year 12 with a return to Organic Chemistry. They explore in greater detail what is meant by isomerism and the effects that differing molecular arrangement has on reaction mechanisms. Students also explore in greater detail reactions involving carbonyl groups.</p>
<b>Half term 4</b>	<p><b><u>Aromatic Compounds and Amines</u></b> Students develop their knowledge and understanding from Year 12 and investigate these groups of substances. Not only will students be able to discuss in detail how to form desired products but they will be able to map precisely the movement of specific bonds within the molecules.</p> <p><b><u>Further Synthesis and Analysis</u></b> Students continue to develop their knowledge and understanding as to how products are formed. This unit builds on learning from the previous year and focuses on Qualitative Chemistry skills and the identification of chemical compounds. Students continue to learn the skills to carry out different tests within the laboratory in order to identify key functional groups. Students then develop their skills to interpret mass and infrared spectroscopy data to in order to establish the exact structures of compounds.</p>
<b>Half term 5</b>	<p><b><u>Polymers</u></b> Polymers are an important part of chemical engineering enabling Chemistry to be used to produce a range of everyday products. Students develop their understanding of the formation of polymers for industrial purposes, however, there is also an overlap into Biochemistry.</p> <p><b><u>Consolidation</u></b> The course programme has been designed whereby we are able to spend this time in consolidating learning from the past 2 years. We will use this opportunity to fully develop exam technique and to refine skills relating to practical work analysis.</p>
<b>Independent study expectations</b>	<p>During the course of the year students will be set extended and rigorous work in order to develop their knowledge, understanding and application skills. This will include questions to check foundation knowledge; exam questions to ascertain understanding; and extension material to develop application skills. In addition, students are expected to independently read around the subject.</p>
<b>By the time you finish key stage 5 you'll be...</b>	<p>.....in a position where you are able to pursue a career in Chemistry at university or in associated areas such as Forensics or Chemical Engineering. You will be confident in the planning, execution and evaluation of practical work; a skill that is transferable into many industries.</p>