Chemistry Curriculum Overview - Year 9 - Combined Higher

	Unit	Details
Sept - Oct	**Atomic Structure**	Pupils will develop their understanding of atoms as fundamental chemical building blocks. They will see how to interpret chemical formulae and extend their KS3 knowledge of the law of the conservation of mass, leading to balancing chemical equations. It is important that pupils understand that when balancing an equation, the formula of the substance must not change. Pupils will also develop their understanding of the differences between compounds and mixtures, and how mixtures can be separated using techniques such as filtration, crystallisation, distillation, and chromatography. Finally, they will learn about the development of the atomic model, providing ample opportunity to foster their working scientific skills.
Oct - Jan	**The Periodic Table**	Pupils will learn about the development of the periodic table, including the work of Dalton, Newlands, and Mendeleev, they will also develop their understanding of electronic structures from Atomic structure, and apply this to the arrangement of the periodic table and the chemical properties of Group 0, Group 1, and Group 7 elements. They should also be able to identify trends in properties and reactivity, explaining these in terms of the electronic structure of the elements.
Jan - May	**Structure and Bonding**	Pupils have developed their understanding of the states of matter from KS3. They have built upon their understanding of the particle model, using this to explain the energy transfers involved when substances change state. Pupils have also learnt about the different types of bonding in substances. They will learn about ionic, covalent and metallic bonds and how the bonding of a substance affects its bulk properties. They should be able to describe the difference in bonding and properties of giant ionic structures, simple covalent molecules, and giant covalent structures. Finally, pupils should have learnt about nanoparticles, their properties, and be able to explain how the surface area to volume ratio of nanoparticles is different to bulk material, and how this affects their uses.
May - July	**Chemical Changes**	Pupils will revise and develop their understanding of the reactivity series from KS3. They will study the reactions of the metals with water and acids and should be able to recall and describe these reactions. They will apply their understanding of the reactivity series to displacement reactions and the extraction of metals, considering the concepts of oxidation and reduction as the loss and gain of electrons respectively. Pupils will also learn about salts and how they are prepared. Pupils should be able to prepare a pure, dry sample of a salt from an insoluble metal oxide or carbonate as part of the required practical. Finally they will learn about the pH scale and should be able to explain how pH relates to H+(aq) ion concentration and the difference between strong and weak acids.