YEAR 11 CURRICULUM INFORMATION – Chemistry		
	Autumn 1	Autumn 2
What will students be learning?	**C4 - Chemical calculations** Students will use calculations to work out how different chemicals can react together, establish patterns, and make predictions about chemicals in industry.	**Combined Science - C14 - The Earth's resources** Students will learn about the difference between finite and renewable resources. It is important that students understand that renewable resources are not an infinite supply, but are replaceable at a rate similar to the rate they are used up, whereas finite resources are used up faster than they can be replenished. Students understanding of finite and renewable resources should be applied to the need to reuse and recycle, and they should be able to describe and evaluate ways of reducing the use of finite resources, and carry out life cycle assessments on products. Students will then look at specific resources that we use, including water and metals (in particular copper). Students should be able to describe the different ways that water is treated, both to create potable water and to remove waste products so it is safe to release into the environment. Students have already met metal-ore extraction and electrolysis, and higher-tier students should have applied that knowledge to the extraction of copper, as well as understanding alternative biological methods used to extract copper. **Separate Science – C10 - Organic reactions** Students will learn about more organic functional groups – alkenes, alcohols, carboxylic acids, and esters. Students should be able to identify, name, and draw the structural formula of the first four alkenes, alcohols, and carboxylic acids, and should be able to identify, name, and draw the ester ethyl ethanoate. Students will also learn about the reactions of these four functional groups. They should be able to describe the reactions and conditions of alkenes (with halogens, water, and hydrogen), alcohols (combustion, oxidation, and reaction

		with sodium), and carboxylic acids (to make esters). Students should also be able to explain why carboxylic acids are called weak acids. **<u>Separate Science – C12 - Polymers</u>** Students will learn about different types of manufactured polymers, including addition polymers and condensation polymers. Students should be able to identify an addition polymer from polymer and monomer diagrams – drawing the monomer from the polymer and the polymer from the monomer. Students will be introduced explicitly to poly(ethene) but it is important that they can identify and draw other addition polymers and associated monomers. Higher-tier students should also be able to describe the basic principles of condensation polymerisation. Students will also study natural polymers, including polysaccharides, proteins, and DNA. Students should be able to identify the types of monomers that form these polymers and be able to describe the basic structure of DNA. Higher-tier students should understand in greater detail how amino acids react together to form proteins. With all polymers, students should understand the difference between the monomer and the repeating unit of the polymer.
How will students be assessed?	C4 (Chemical calculations) Checkpoint	C14 (The Earth's resources) Checkpoint Required practical – Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation C10 (Organic reactions) Checkpoint C11 (Polymers) Checkpoint
Literacy – What keywords will be taught?	Law of conservation of mass, reactant, product, relative formula mass, decomposition, uncertainty, moles, Avogadro's constant, balanced, ratio, limiting reactant, concentration, atom economy, yield, theoretical, volume, pressure	Potable, pure, sustainable, finite, renewable, ground water, fresh water, sea water, rain water, filter, sterilise, organic matter, sewage, effluent, sludge, screening, agricultural, ore, extraction, phytomining, bioleaching, life cycle assessment, reduce, reuse, recycle

		Functional group, Homologous series, Alkenes, Addition reactions, Alcohol, Carboxylic acids, Esters, Combustion, Oxidation, Strong and weak acids, Ionise, Catalyst Polymers, monomers, properties, unsaturated, hydrocarbon, addition, covalent bond, reactive, double bond, repeated, condensation, small molecule, functional group, polyester, polysaccharide, synthetic, sugar, monosaccharide, starch, cellulose, glucose, proteins, amino acids, polypeptide, DNA, double helix, strands, nucleotide
What employability skills are being developed?	Analytical, mathematical, problem solving	Analysing chemicals and their quantities Synthesis of organic compounds, analytical techniques Skills such as investigative and analytical which can lead to careers as: Materials scientist, Biologist, Research Scientist, Agriculturalist
Wider Curriculum Links?	Maths (manipulating data) Physics (conservation of mass)	Business (supply and demand) Food tech (water supplies) Design and Technology (Materials) Biology (DNA)
What useful websites are there for this topic?	 Free science lessons  Primrose Kitten  Seneca  BBC Bitesize	 Free science lessons  Primrose Kitten  Seneca  BBC Bitesize
What wider reading could be done for this topic?	Textbooks: AQA Chemistry for GCSE Combined Science: Trilogy (Oxford) Textbooks: AQA Chemistry for GCSE Separate Science (Oxford)	Textbooks: AQA Chemistry for GCSE Combined Science: Trilogy (Oxford) Textbooks: AQA Chemistry for GCSE Separate Science (Oxford)
What else can students be doing independently to develop their	Exam questions Numeracy practice – ratios, uncertainty Rearrangement of equations	Exam questions Numeracy practice Practice and use of videos to recap the required practical carried out

understanding of this topic?	Calculator skills	