Meden School Curriculum Planning							
Subject	Chemistry	**Year Group**	12	**Sequence No.**		**Topic**	3.3.5 & 3.3.6 Alcohols and Organic Analysis

Retrieval	Core Knowledge	Student Thinking
What do teachers need to **retrieve** from students before they start teaching **new content**?	What **specific ambitious knowledge** do teachers need to teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to **development of our students thinking, encouraging them to see the inequalities around them** and 'do something about them!'
GCSE C7 Organic Chemistry A Level Bonding, polar bonds and electronegative elements. A Level 3.3.1-3.3.2 Sections on nomenclature and isomers and products of cracking	**3.3.5.1 Alcohol Production** Alcohols are produced industrially by hydration of alkenes in the presence of an acid catalyst. Ethanol is produced industrially by fermentation of glucose. The conditions for this process. Ethanol produced industrially by fermentation is separated by fractional distillation and can then be used as a biofuel. Students should be able to: • explain the meaning of the term biofuel • justify the conditions used in the production of ethanol by fermentation of glucose • write equations to support the statement that ethanol produced by fermentation is a carbon-neutral fuel and give reasons why this statement is not valid • outline the mechanism for the formation of an alcohol by the reaction of an alkene with steam in the presence of an acid catalyst • discuss the environmental (including ethical) issues linked to decision making about biofuel use. Students could produce ethanol by fermentation, followed by purification by fractional distillation.	Global demand for fuels includes the production of bio alcohol. Environmental Impacts of Biofuels - The Crop Site

	3.3.5.2 Oxidation of Alcohols Alcohols are classified as primary, secondary and tertiary. Primary alcohols can be oxidised to aldehydes which can be further oxidised to carboxylic acids. Secondary alcohols can be oxidised to ketones. Tertiary alcohols are not easily oxidised. Acidified potassium dichromate(VI) is a suitable oxidising agent. Students should be able to: • write equations for these oxidation reactions (equations showing [O] as oxidant are acceptable) • explain how the method used to oxidise a primary alcohol determines whether an aldehyde or carboxylic acid is obtained • use chemical tests to distinguish between aldehydes and ketones including Fehling's solution and Tollens' reagent. Students could carry out the preparation of an aldehyde by the oxidation of a primary alcohol. Students could carry out the preparation of a carboxylic acid by the oxidation of a primary alcohol. **3.3.5.3 Elimination** Alkenes can be formed from alcohols by acid-catalysed elimination reactions. Alkenes produced by this method can be used to produce addition polymers without using monomers derived from crude oil. Students should be able to outline the mechanism for the elimination of water from alcohols. Students could carry out the preparation of cyclohexene from cyclohexanol, including purification using a separating funnel and by distillation. **Required practical 5** Distillation of a product from a reaction. **3.3.6.1 Identification of Functional Groups by test-tube reactions** The reactions of functional groups listed in the specification. Students should be able to identify the functional groups using reactions in the specification. Students could carry out test-tube reactions in the specification to distinguish alcohols, aldehydes, alkenes and carboxylic acids. **Required practical 6**	

	Tests for alcohol, aldehyde, alkene and carboxylic acid. **3.3.6.2 Mass Spectrometry** Mass spectrometry can be used to determine the molecular formula of a compound. Students should be able to use precise atomic masses and the precise molecular mass to determine the molecular formula of a compound. **3.3.6.3 Infrared Spectroscopy** Bonds in a molecule absorb infrared radiation at characteristic wavenumbers. 'Fingerprinting' allows identification of a molecule by comparison of spectra. Students should be able to: • use infrared spectra and the Chemistry Data Sheet or Booklet to identify particular bonds, and therefore functional groups, and also to identify impurities. The link between absorption of infrared radiation by bonds in CO2, methane and water vapour and global warming.	