Meden School Curriculum Planning							
Subject	Chemistry	**Year Group**	13	**Sequence No.**		**Topic**	3.3.7 & 3.3.8 Optical Isomers, Aldehydes and Ketones

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!'
A Level Bonding, polar bonds and electronegative elements. A Level 3.3.1-3.3.2 Sections on nomenclature and isomers	**3.3.7 Optical Isomers** Optical isomerism is a form of stereoisomerism and occurs as a result of chirality in molecules, limited to molecules with a single chiral centre. An asymmetric carbon atom is chiral and gives rise to optical isomers (enantiomers), which exist as non super-imposable mirror images and differ in their effect on plane polarised light. A mixture of equal amounts of enantiomers is called a racemic mixture (racemate). Students should be able to: • draw the structural formulas and displayed formulas of enantiomers • understand how racemic mixtures (racemates) are formed and why they are optically inactive. Students could be asked to recognise the presence of a chiral centre in a given structure in 2D or 3D forms. They could also be asked to draw the 3D representation of chiral centres in various species. Students understand the origin of optical isomerism. Passing polarised light through a solution of sucrose.	In the medical world, the importance of optical isomers in drug production is critical as one isomer maybe medically active but the other isomer could be toxic. This all relates to the specificity of enzymes Optically Active Pharmaceutical Compounds Biology Essay (ukessays.com)

	3.3.8 Aldehydes and Ketones Aldehydes are readily oxidised to carboxylic acids. Chemical tests to distinguish between aldehydes and ketones including Fehling's solution and Tollens' reagent. Aldehydes can be reduced to primary alcohols, and ketones to secondary alcohols, using NaBH4 in aqueous solution. These reduction reactions are examples of nucleophilic addition. The nucleophilic addition reactions of carbonyl compounds with KCN, followed by dilute acid, to produce hydroxynitriles. Aldehydes and unsymmetrical ketones form mixtures of enantiomers when they react with KCN followed by dilute acid. The hazards of using KCN. Students should be able to: • write overall equations for reduction reactions using [H] as the reductant • outline the nucleophilic addition mechanism for reduction reactions with NaBH4 (the nucleophile should be shown as H–) • write overall equations for the formation of hydroxynitriles using HCN • outline the nucleophilic addition mechanism for the reaction with KCN followed by dilute acid • explain why nucleophilic addition reactions of KCN, followed by dilute acid, can produce a mixture of enantiomers. Students could carry out test-tube reactions of Tollens' reagent and Fehling's solution to distinguish aldehydes and ketones.	Aldehydes have been used in medicines for centuries. It had been found that Cinnamaldehyde prevents above 50% of the bacterial growth in the oral cavity. It is especially effective for preventing the growth of bacteria and other pathogens in the tongue. It is regularly added to chewing gum. A review of cinnamaldehyde and its derivatives as antibacterial agents - ScienceDirect