Meden School Curriculum Planning							
Subject	Chemistry	**Year Group**	12	**Sequence No.**		**Topic**	3.3.1 & 3.3.2 Intro to Organic Chemistry & Alkanes

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	**3.3.1.1 Nomenclature** Organic compounds can be represented by: • empirical formula • molecular formula • general formula • structural formula • displayed formula • skeletal formula. The characteristics of a homologous series, a series of compounds containing the same functional group. IUPAC rules for nomenclature. Students should be able to: • draw structural, displayed and skeletal formulas for given organic compounds • apply IUPAC rules for nomenclature to name organic compounds limited to chains and rings with up to six carbon atoms each	

	• apply IUPAC rules for nomenclature to draw the structure of an organic compound from the IUPAC name limited to chains and rings with up to six carbon atoms each. **3.3.1.2 Reaction Mechanisms** Reactions of organic compounds can be explained using mechanisms. Free-radical mechanisms: • the unpaired electron in a radical is represented by a dot • the use of curly arrows is not required for radical mechanisms. Students should be able to write balanced equations for the steps in a free-radical mechanism. Other mechanisms: • the formation of a covalent bond is shown by a curly arrow that starts from a lone electron pair or from another covalent bond • the breaking of a covalent bond is shown by a curly arrow starting from the bond. Students should be able to outline mechanisms by drawing the structures of the species involved and curly arrows to represent the movement of electron pairs. **3.3.1.3 Isomerism** Structural isomerism. Stereoisomerism. E–Z isomerism is a form of stereoisomerism and occurs as a result of restricted rotation about the planar carbon–carbon double bond. Cahn–Ingold–Prelog (CIP) priority rules. Students should be able to: • define the term structural isomer • draw the structures of chain, position and functional group isomers • define the term stereoisomer • draw the structural formulas of E and Z isomers • apply the CIP priority rules to E and Z isomers. Students could be given the structure of one isomer and asked to draw further isomers. Various representations could be used to give the opportunity to identify those that are isomeric.	

	Students understand the origin of E–Z isomerism. Students draw different forms of isomers. **3.3.2.1 Fractional Distillation of Crude Oil** Alkanes are saturated hydrocarbons. Petroleum is a mixture consisting mainly of alkane hydrocarbons that can be separated by fractional distillation. **3.3.2.2 Cracking** Cracking involves breaking C–C bonds in alkanes. Thermal cracking takes place at high pressure and high temperature and produces a high percentage of alkenes (mechanism not required). Catalytic cracking takes place at a slight pressure, high temperature and in the presence of a zeolite catalyst and is used mainly to produce motor fuels and aromatic hydrocarbons (mechanism not required). Students should be able to explain the economic reasons for cracking alkanes. **3.3.2.3 Combustion of Alkanes** Alkanes are used as fuels. Combustion of alkanes and other organic compounds can be complete or incomplete. The internal combustion engine produces a number of pollutants including NOx, CO, carbon and unburned hydrocarbons. These gaseous pollutants from internal combustion engines can be removed using catalytic converters. Combustion of hydrocarbons containing sulfur leads to sulfur dioxide that causes air pollution. Students should be able to explain why sulfur dioxide can be removed from flue gases using calcium oxide or calcium carbonate. **3.3.2.4 Chlorination of Alkanes** The reaction of methane with chlorine. Students should be able to explain this reaction as a free-radical substitution mechanism involving initiation, propagation and termination steps.	Global reliance of crude oil for fuels and raw materials is one of the significant problems facing the world. Countries who supply crude oil have a significant hold over the rest of the world. Large amount of inequality within nations and between nations Why oil prices matter to the global economy - an expert explains | World Economic Forum (weforum.org)