

1 – Hydrocarbons		
Hydrocarbon	Molecules that only contain hydrogen and carbon atoms.	
Homologous series	A group of organic compounds that react in a similar way.	
Properties	-The longer the hydrocarbon, the more viscous it is. -The longer the hydrocarbon, the less volatile it is. -The longer the hydrocarbon, the less flammable it is.	
Alkanes	Simplest type of hydrocarbon. They are saturated compounds. They have general formula C_nH_{2n+2} The first four alkanes are: methane (CH_4), ethane (C_2H_6), propane (C_3H_8) and butane (C_4H_{10}).	
2 – Crude oil and fractional distillation		
Crude oil	A fossil fuel formed over millions of years. It is a non-renewable fuel. It is an important source of fuels such as petrol , diesel , kerosene , heavy fuel oil and liquified petroleum gas . It is also used for feedstock in the petrochemical industry.	
Fractional distillation	1. Oil is heated to a gas and enters fractionating column . 2. There is a temperature gradient in the column, long hydrocarbons (with high boiling points) condense early on near the bottom of the coloum. 3. Shorter hydrocarbons (lower boiling points) points condense much later on near the top of the column. 4. The crude oil is separated into different fractions, each one containing a mixture of hydrcarbons of similar length.	
Fractions	Carbon chain length	Name
	~3	Liquified petroleum gas
	~8	Petrol
	~15	Kerosene
	~20	Diesel
	~40	Heavy fuel oil
	40+	Bitumen

3 – Combustion	
Complete	Happens when there is a good supply of oxygen . hydrocarbon + oxygen → carbon dioxide + water
Incomplete	Happens when there is not a good supply of oxygen . Carbon monoxide or carbon particulates produced instead of carbon dioxide.
Balancing combustion equations	<u>1. Balance number of carbons by adding a number in front of CO_2.</u> E.g. $C_5H_{12} + O_2 \rightarrow 5 CO_2 + 6 H_2O$ <u>2. Balance the number of hydrogens by adding a number in front of H_2O.</u> E.g. $C_5H_{12} + O_2 \rightarrow 5 CO_2 + 6 H_2O$ <u>3. Add up the number of oxygen atoms on the right hand side and balance by putting a number in front of O_2.</u> E.g. $C_5H_{12} + 8 O_2 \rightarrow 5 CO_2 + 6 H_2O$

4 – Alkenes and cracking	
Alkenes	Alkenes are hydrocarbons with a double carbon-carbon bond. They are unsaturated . They have the general formula C_nH_{2n} .
Cracking	Cracking is a thermal decomposition reaction. Hydrocarbons are cracked to produce smaller , more useful molecules.
Catalytic cracking	Hydrocarbons are vapourised at around 550°C . The vapour is passed over a hot aluminium oxide catalyst .
Steam cracking	Hydrocarbons are vaporised at a very high temperature . They are then mixed with steam .
Testing for alkenes	Bromine water will become colourless (bromine added across double bond to form colourless di-bromo compound) in an alkene and remain bright orange in an alkane .

GCSE Science

Chemistry C7 – Organic Chemistry

