QUESTION	ANSWER

Quiz Cards: Organic Chemistry

How to use the quiz cards to learn the key facts

1) Take 6 quiz cards at a time and read through them

2) Cover up the answer side of the page.

Question	Answer

3) Take the first quiz card and ask yourself the question. Either write the answer down or say it out loud.

4) Check your answer using the answer side of the card.

5) Do this question again until you get it right.

6) Repeat the process for the second question.

7) Before going onto the third question repeat question one and two.

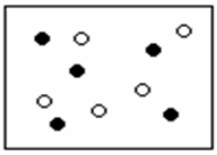
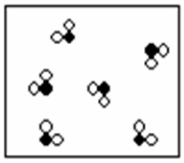
8) When you have gone through all of the questions try and do them in a random order to really test your knowledge.

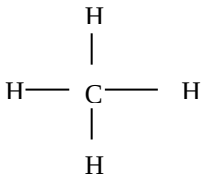
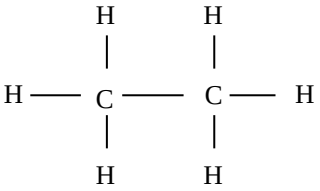
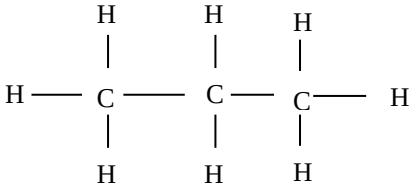
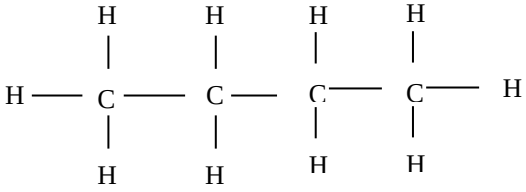
ONCE YOU HAVE LEARNT THEM ALL ….

9) Complete some exam questions to apply your knowledge.

10) Check your answer with the mark scheme and correct any errors in green pen.

11) Repeat steps 9-10 until you get the answers correct all of the time.

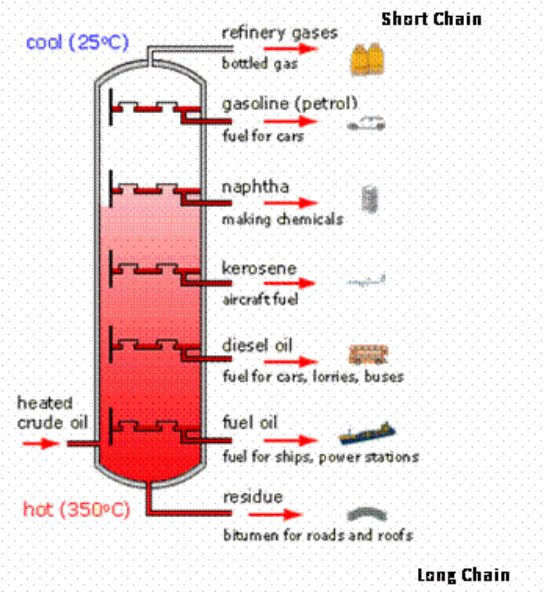
QUESTION	ANSWER
What is a crude oil?	• Crude oil is a **mixture** of a very large number of **compounds**. • These compounds are mainly hydrocarbons.
What is crude oil made from?	• Remains of an ancient biomass consisting mainly of plankton that was buried in mud.
What is a hydrocarbon?	• Compounds that are only made up of Hydrogen (H) and Carbon (C) atoms.
What is a mixture?	Two or more different types of atoms are put together but not chemically joined together.  The atoms can easily be separated by physical methods such as filtration and evaporation.
What is a compound?	Two or more different types of atom are chemically bonded together.  You need a lot of energy to break the bonds.

QUESTION	ANSWER
What is an alkane?	• Saturated hydrocarbons (contains as many hydrogen atoms as possible in each molecule) • Only contain carbon-carbon single bonds.
What is the test for alkanes?	Saturated hydrocarbon + bromine water (orange) → no reaction (stays orange)
What are the names, chemical formulae and structures of the first 4 alkanes?	Methane CH_4  Ethane C_2H_6  Propane C_3H_8  Butane C_4H_{10} 
What is the general formula for alkanes?	C_nH_{2n+2} For example if n =10 the chemical formula for our alkane is $C_{10}H_{(2 \times 10 +2)}$ which gives $C_{10}H_{22}$

QUESTION	ANSWER
How does the length of a hydrocarbon chain affects its boiling point?	The longer the chain the higher the boiling point. The shorter the chain the lower the boiling point
Why does the length of a hydrocarbon affect it's boiling point?	• Longer chains contain more atoms than smaller chains. • So, between two long hydrocarbon chains there are more intermolecular forces and the overall intermolecular force is stronger. • So, more energy input is needed to break the intermolecular forces. • So, the boiling point fo longer chains is higher.
How does the length of a hydrocarbon chain affects its volatility (ability to turn into a gas)?	• The longer the chain the lower the volatility (less likley it is to turn into a gas so is naturally a liquid). • The shorter the chain the higher the volatility (will easily turn into a gas).
Why does the length of a hydrocarbon affect it's volatility (ability to turn into a gas)?	• Longer chains contain more atoms than smaller chains. • So, between two long hydrocarbon chains there are more intermolecular forces and the overall intermolecular force is stronger. • So, lots of energy is needed to break the intermolecular forces. • So, the volatility for longer chains is lower.

QUESTION	ANSWER
How does the length of a hydrocarbon chain affects its viscosity (ability to flow)?	• The longer the chain the higher the viscoisty (the thicker / less runny the liquid). • The shorter the chain the lower the viscoisty (the thinner / runny the liquid).
Why does the length of a hydrocarbon affect it's viscosity (ability to flow)?	• Longer chains contain more atoms than smaller chains. • So, between two long hydrocarbon chains there are more intermolecular forces and the overall intermolecular force is stronger. • So, it is harder for the molecules to slide past each other. So, the viscosity for longer chains is higher.
How does the length of a hydrocarbon chain affects its flamability (ability to burn)?	• The longer the chain the lower the flamability (the harder it is to burn and the more smoky the flame). • The shorter the chain the higher the flamability (the easier it is to burn and the cleaner the flame).
Why does the length of a hydrocarbon affect it's flamability (ability to burn)?	• Longer chains contain more atoms than smaller chains. • So, between two long hydrocarbon chains there are more intermolecular forces and the overall intermolecular force is stronger. • So, more energy input is needed to break the intermolecular forces. • So, the flamability for longer chains is lower.

QUESTION	ANSWER
What is a fraction of crude oil?	• Different substances within crude oil that have similar boiling or condensing points.
Why can the different fractions of crude oil be seperated?	• Because each fraction has a slightly different boiling point.
Explain how the fractions of crude oil can be seperated by frac tional distillation?	• Liquid Crude Oil is heated and evaporates into gas / vapor. • The oil vapor is put into the fractionating column which is colder at the top than at the bottom. • The gas rises up the column getting colder in doing so. • When a fraction cools to a temperature similar to its boiling point it condenses and flows out through a pipe. • The different fractions have different length chains so condense at different temperatures in the column. • Fractions with low boiling points (short chains) are collected at the top whereas fractions with high boiling points (long chains) are collected at the bottom.

QUESTION	ANSWER
List the main fractions of crude oil from short chained to long chain and **state** some uses of each one.	
What is complete combustion?	The carbon and hydrogen in the fuel are completely oxidised. The fuel must be burnt in excess oxygen. Gives energy as an output. Fuel + Oxygen ⟶ Carbon Dioxide + Water e.g. propane + oxygen ⟶ Carbon Dioxide + Water $C_3H_8 + 5O_2 \longrightarrow 3CO_2 + 4H_2O$
What is incomplete combustion?	The carbon and hydrogen in the fuel are NOT completely oxidised. The fuel is burnt in a limited amount oxygen. Gives energy as an output. Fuel + Oxygen ⟶ Carbon Dioxide + Water + Carbon Monoxide e.g. propane + oxygen ⟶ Carbon + Water + Carbon Dioxide + Monoxide $C_3H_8 + 4O_2 \longrightarrow CO_2 + 4H_2O + 2CO$
How can we get smaller more useful molecules from long chain hydrocarbons?	Cracking

QUESTION	ANSWER
What happens during cracking?	Hydrocarbons are heated to **vaporise** them. The vapours then passed over a **hot catalyst** so that a **thermal decomposition** reactions happen.
What does cracking produce?	alkanes (e.g. methane), but also unsaturated hydrocarbons (double bond between C atoms =) called **alkenes**. Have the general formula $\mathbf{C_nH_{2n}}$
Why are alkenes more reactive than alkanes?	They contain a double bond
What is the test for alkenes?	**Alkenes** react with **bromine water**, turning it from **orange to colourless** (test for alkenes)
What can alkenes be used for?	Polymers
What is a polymer?	Many small molecules (**monomers**) join together to form very large molecules (**polymers**). (poly=many)

QUESTION	ANSWER
What are polymers used for?	packaging materials, waterproof coatings for fabrics, dental polymers, wound dressings, hydrogels, smart materials (including shape memory polymers).
What is the problem with most polymers?	Not **biodegradable**