

## MAKING USE OF OIL (MUO)

### Crude oil

Know that crude oil is formed from the remains of buried marine organisms and forms part of the global carbon cycle

Know that crude oil is a mixture of substances, mostly hydrocarbons, which can be separated by fractional distillation

Know that different products from the fractional distillation of crude oil have different properties and uses

- Understand the boiling range of fraction, flammability and viscosity in terms of the strength of forces between molecules

Know that crude oil is a major source of fuels and other chemicals

### Hydrocarbons

Know that natural gas consists mainly of methane and bottled gas is normally propane

Understand complete combustion of hydrocarbon fuels produces carbon dioxide and water

Know what products may be formed by partial combustion of hydrocarbons

Understand the meaning of the term hydrocarbons

Know that the atoms in hydrocarbons are covalently bonded

Be able to draw the structural formulae for straight-chain alkanes

Know that products from distillation of oil can be cracked to form smaller molecules

Understand that oil refinery processes are designed to match the demand for different products

Know that alkanes are hydrocarbons which are saturated (i.e. contain only single bonds) and that alkenes contain a double bond between carbon atoms

- Know how to distinguish between saturated and unsaturated compounds by a chemical test.
- Recognise displayed (structural) formulae for hydrocarbons
- Be able to explain the difference between the saturated and unsaturated compounds by use of structural formulas

### Polymers

Know that polymers are large molecules made by joining many small molecules

- Understand the relationship between a polymer and the monomer it is made from
- Be able to use block diagrams to illustrate the relationship between monomers and the polymers formed from them.
- Understand what is meant by an addition reaction

Know some uses of addition polymers (CM)

Understand the relationship between properties and structure for a thermosoftening polymer (CM)

Be able to compare the properties of cross-linked and non-cross-linked polymers (CM)

Be able to discuss the advantages and problems of recycling plastic waste (CM)

## **MUO Teacher information sheet**

The only change for this unit is that in the first lesson there is less emphasis on exploration of oil. The rest of the unit remains unchanged. I thought it may be useful when covering unsaturation to revisit addition polymerisation, thermosetting and thermosoftening polymers, since this was covered in construction materials last year.

Lesson 1. The activity in which students model the use of drill core samples to locate oil does not have to be completed but you may still wish to do so.

Lesson 2. Video available Video SC 167 Refining and products from oil

Lesson 3 Students only need to know the names and structural formulae of the first 4 alkanes

Lesson 4

Lesson 5

Lesson 6 Chance to revise polymerisation from construction materials. Revise thermosoftening and thermosetting polymers. Remind them about making Nylon and that it was addition polymerisation.

