

# Using Resources

## Threshold Concept

Understand how to reduce, re-use and recycle the Earth's resources.

## Resources and sustainability

Reducing doesn't just reduce the use of that specific material, but also reduces the use of any materials used to manufacture it in the first place.



## Keywords

**Reduce** - using materials/resources less

**Reuse** - using materials/resources again

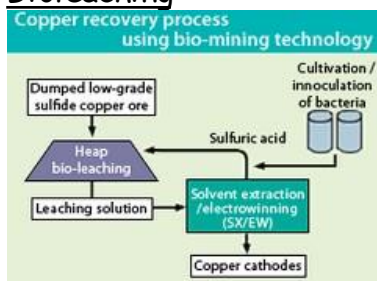
**Recycle** - converting waste into reusable material

**Renewable** - when a resource is produced at least at the same rate that it is being used

**Non-renewable** - when a resource is being used at a faster rate than it can be made

**Sustainable** - fulfilling the needs of the current generation without compromising the needs of future generations

## Biobleaching

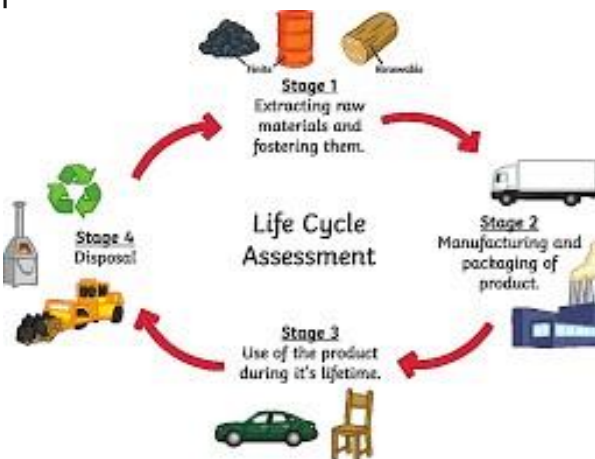


## Phytomining



## Life Cycle Assessments

A 'cradle to grave' analysis of the impact of a manufactured product on the environment.

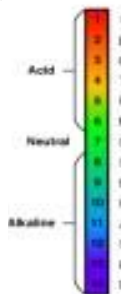


## Potable Water (inc Required Practical)

Don't forget to click on the worksheet tab to try some tasks.

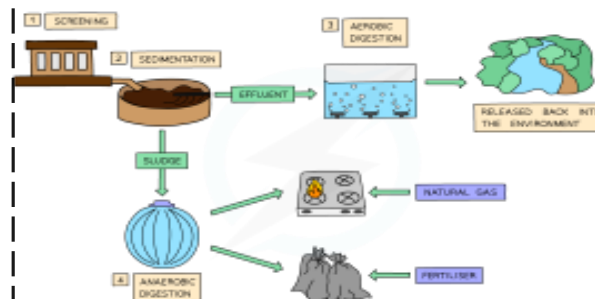
Required Practical involves:

- pH testing using a pH meter, then neutralisation using titration, if needed.
- Ion testing (flame testing)
- Distillation
- Retesting for pH and ions.



## Waste Water Treatment

Don't forget to click on the exam questions tab to try some tasks.



# Organic Chemistry

## Threshold Concept

Hydrocarbons are chains of hydrogen and carbon

## Crude oil and hydrocarbons

Crude oil is a fossil fuel. It's formed from the remains of plants and animals, mainly plankton, that died millions of years ago.

- It is a non-renewable fuel; one day it will run out.
- Crude oil is a mixture of lots of different hydrocarbons,
- Hydrocarbons are the simplest organic compounds.

There are two types of hydrocarbon:

- Alkane
- Alkene



Hydrocarbon properties changes as the chain gets longer.

The shorter the chain the:

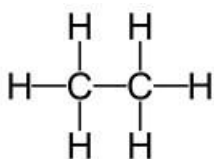
1. Less viscous the substance is (this means they are more runny)
2. More volatile the substance is (this means they have a lower boiling point)
3. More flammable the substance is (this means they are easier to ignite)

## Alkanes

Contain only single c-c bonds.

Have the general formula  $C_nH_{2n+2}$

Are 'saturated' - each carbon forms 4 single covalent bonds.



## Alkenes

- An alkene will contain at least one c=c double bond.
- Have the general formula  $C_nH_{2n}$
- Are 'unsaturated'.



Bromine water is used to test for alkenes.

## Keywords

**Hydrogen** - a non-metallic element that is the simplest and lightest of the elements

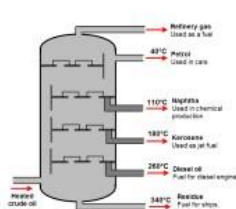
**Carbon** - a non-metallic chemical element with atomic number 6

**Formula** - a chemical formula is a way of presenting information about the chemical proportions of atoms that make up a particular chemical compound or molecule

**Equation** - A word or symbol representation of a reaction.

## Fractional distillation

Crude oil can be used to make thousands of useful things but first the different 'fractions' need to be separated out. This is done by fractional distillation.

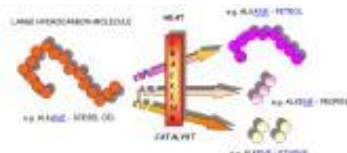


Video

Method and uses

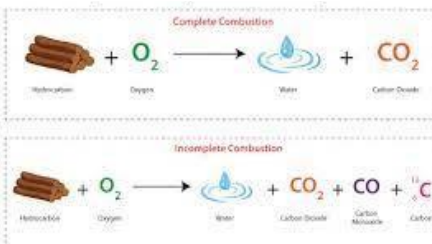


## Cracking



- This is the process of breaking long chain hydrocarbons down into shorter ones.
- Shorter chains are more flammable and therefore make better fuels.
- Cracking will produce alkanes and alkenes.

## Combustion



## Required Practical

## Equations for this topic