



# AQA GCSE Chemistry

## Topic 10: Using resources

### Using the Earth's resources and obtaining potable water

#### Notes

(Content in bold is for Higher Tier only)



## Using the Earth's resources and sustainable development

- We use them to provide warmth, shelter, food and transport
- Natural resources, supplemented by agriculture, provide food, timber, clothing and fuels
- Finite resources from the Earth, oceans and atmosphere are processed to provide energy and materials
- Chemistry plays an important role in improving agricultural and industrial processes to provide new products and in sustainable development, which is development that meets the needs of current generations without compromising the ability of future generations to meet their own needs
- Renewable energy resources: sources of power that quickly replenish themselves and can be used again (only includes plants/wood if they continue to be re-planted)
- Finite resources: have a limited supply that will eventually run out

## Potable water

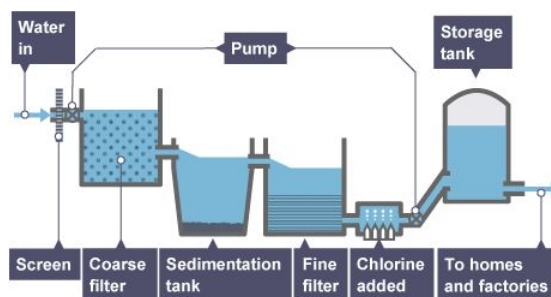
- Potable water = water that is safe to drink
- Potable water is not 'pure' because it contains dissolved substances, although to be safe it must have sufficiently low levels of dissolved salts and microbes
- The methods used to produce potable water depend on available supplies of water and local conditions. In the UK:
  - an appropriate source of fresh water is selected (rain provides water with low levels of dissolved substances and this collects in the ground/rivers/lakes)
  - the water is passed through filter beds to remove different sized insoluble solids
  - the water is then sterilised, to kill microbes (sterilising agents include: ozone, UV light or chlorine)
- If only salty/sea water is available, desalination is required:
  - can be done by distillation
  - OR can be done using processes with membranes (e.g. reverse osmosis)
  - BOTH are very expensive

## Waste water treatment

- Water of the correct quality is essential for life. It must be free of poisonous salts and harmful microbes.

### How correct quality water is produced:

1. Water is passed through a mesh screen to remove large bits e.g twigs or grit
2. Chemicals are added to make solids and microbes stick together to form sediment and sink





3. There is then anaerobic digestion of sewage sludge
  4. The water is then sterilised with chlorine to kill any microbes left.
- it is relatively cheaper and easier to obtain potable water from groundwater and wastewater than salt water, although seawater is a plentiful raw material, so is good for countries with little fresh water

### **Alternative methods of extracting metals**

- Earth's resources of metal ores are limited
- Copper ores are becoming scarce and new ways of extracting copper from low-grade ores include phytomining, and bioleaching
  - These methods avoid traditional mining methods of digging, moving and disposing of large amounts of rock
- Phytomining uses plants to absorb metal compounds.
  - Plants are harvested and then burned to produce ash that contains metal compounds
- Bioleaching uses bacteria to produce leachate solutions that contain metal compounds
- The metal compounds can be processed to obtain the metal
- For example, copper can be obtained from solutions of copper compounds by displacement using scrap iron or by electrolysis

