

1. Key Words

Finite resource	A resource that will eventually run out
Renewable resources	Resources that reform at a similar, or faster, rate that we use them
Life Cycle Assessment (LCA)	An assessment of the environmental impact of a product over each stage of its life
Sustainable development	Meeting the needs of the present society whilst not damaging the lives of future generations

2. Life Cycle Assessments

These are often used to determine the most environmentally viable option in production of a product.

LCA Stage	Plastic bag	Paper bag
Raw Materials	Crude oil	Timber
Manufacturing and packaging	Key components extracted by fractional distillation. Waste has other uses	Takes lots of energy to pulp timber and creates lots of waste
Using the product	Reusable	Single-use
Product disposal	Recyclable, not biodegradable	Biodegradable and recyclable

3. Extracting Copper

Copper is a finite resource that is becoming scarce
Sustainability can be improved by extracting copper from low grade ores

Phytomining	Plants are grown in copper rich soils The plants absorb the copper and levels build up in the leaves Crops are harvested and burned to leave ash containing copper compounds Copper is extracted using a displacement reaction with scrap iron.
Bioleaching	Bacteria are used to convert the copper compounds in the ore into soluble copper compounds The copper is then extracted using electrolysis

4. Recycling

Recycling helps to save on the large amounts of energy required to extract and process natural resources.

Material	Process	Extra Info
Recycling metals	Waste metals are melted down and recast into new products	Amount of separation required for the recyclable metal depends on the metal and the final product
Recycling glass	Waste glass is separated in to colours, crushed and melted This is then reshaped in to new products	Glass bottles can also be washed and sterilised and used again instead of recycling them

5. Treating Water

Key Word	Definition
Potable water	Water that is safe to drink
Pure water	Water that contains only water molecules
Ground water	Water from underground rocks and rain

Treating ground water to produce potable water:

1	Passed through a mesh that removes larger debris such as twigs and stones
2	Passed through a filter to remove any smaller solid bits
3	Water is sterilised to kill off any harmful microbes using chlorine, ozone or UV light

There are two methods of treating salt water to produce potable water:

Distillation	Reverse osmosis
Water is boiled and the condensed to remove the salt	The water is passed through a membrane that only allows water molecules through

6. Wastewater Treatment

1	Screening	Large waste products are removed such as paper
2	Sedimentation	Tiny particles settle to the bottom of a still tank that then splits in to two sections effluent and sludge
3	Aerobic digestion of organic matter	The effluent is treated with aerobic bacterial to reduce the volume of solid waste
4	Anaerobic digestion of organic matter	The sludge is digested anaerobically by specific bacteria
5	Released back into the environment	The treated effluent is returned to rivers and water ways
6	Natural gas	Methane gas is produced from the anaerobic digestion of sludge and can be used as a fuel
7	Fertiliser	The remaining sludge is rich in minerals and can be used as a natural fertiliser

