Chemistry Crib Sheet: Topic 10

FINITE AND RENEWABLE RESOURCES

Natural resources form without human impact.
Renewable resources reform at a similar rate to or faster then we use them . E.g. timber, food.
Non renewable resources (finite) aren't formed quick enough to be considered replaceable. E.g. fossil fuels and nuclear fuels.

EXAMPLE: The table below shows information for two resources, coal and timber. Identify which resource is which.

	Energy Density (MJ/m^3)	Time it takes to form
Resource 1	7600-11400	10 years
Resource 2	23000-26000	10^6 years

The time it takes for Resource 1 to reform is 10^5 times shorter than Resource 2 suggesting it is a renewable resource. Resource 1 is also a far less energetic fuel than Resource 2, so is more likely to be timber than coal.

Resource 1 is timber and Resource 2 is coal.

10^6 is a shorthand way of showing 1000000. This is because $10^6 = 10 \times 10 \times 10 \times 10 \times 10 \times 10 = 1000000$.

Reuse and Recycling

The resources on the Earth are limited.
Once resources run out it is better to recycle instead of using new finite resources which will eventually run out.

We can recycle many resources including:
- **Glass** – Reduces the amount of energy needed to make new glass products.
- **Metal** – Uses less energy to mine and extract a new meal
- **Copper** – Extracting copper from low grade ores.

2 methods.1) Bioleaching (bacteria) 2) Phytomining (plants)

Life cycle assessments

Looks at every stage of a products life to asses the impact it would have on the environment.
STAGES:
1) Getting raw materials
2) Manufacturing and packaging
3) Using the product
4) Product disposal

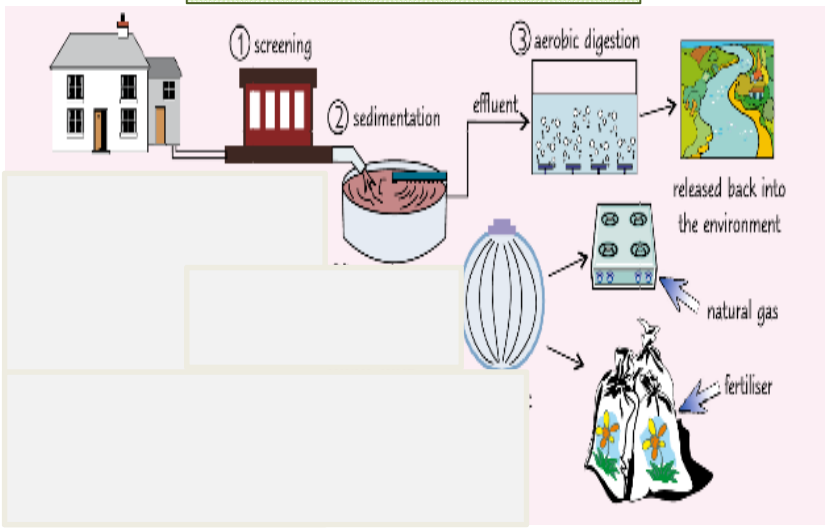
Life cycle assessment comparison – Plastic bag vs Paper bag

Life Cycle Assessment Stage	Plastic Bag	Paper Bag
Raw Materials	Crude oil	Timber
Manufacturing and Packaging	The compounds needed to make the plastic are extracted from crude oil by fractional distillation, followed by cracking and then polymerisation. Waste is reduced as the other fractions of crude oil have other uses.	Pulped timber is processed using lots of energy. Lots of waste is made.
Using the Product	Can be reused. Can be used for other things as well as shopping, for example bin liners.	Usually only used once.
Product Disposal	Recyclable but not biodegradable and will take up space in landfill and pollute land.	Biodegradable, non-toxic and can be recycled.

Waste water treatment

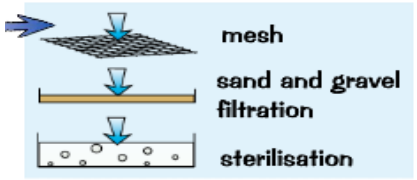
Waste water comes from lots of different sources e.g. – Having a bath, using the toilet, agricultural systems, industrial processes.

Sewage Treatment process



Potable water

Potable water is water you can drink.
Has being treated and is safe for humans to drink.



Stages of treatment:
1) Filtration – Filters out solid bits
2) Sterilisation – To kill harmful bacteria and microbes.

Practical : Testing and purifying water in a lab – **Distillation**