

AQA GCSE Chemistry

Topic 10: Using resources

Life cycle assessment and recycling

Notes

(Content in bold is for Higher Tier only)



Life cycle assessment

- These are carried out to assess the environmental impact of products in each of these stages:
 - Extracting and processing raw materials
 - Manufacturing and packaging
 - Use and operation during its lifetime
 - Disposal at the end of its useful life, including transport and distribution at each stage
- Use of water, resources, energy sources and production of some wastes can be fairly easily quantified
- Allocating numerical values to pollutant effects is less straightforward and requires value judgements, so LCA (life cycle assessment) is not a purely objective process
- Selective or abbreviated LCAs can be devised to evaluate a product but these can be misused e.g. in support of claims for advertising purposes

Ways of reducing the use of resources

- Reduction in use, reuse and recycling of materials by end users reduces the use of limited resources, use of energy sources, waste and environmental impacts
- Metals, glass, building materials, clay ceramics and most plastics are produced from limited raw materials.
 - Much of the energy for the processes comes from limited resources
 - Obtaining raw materials from the Earth by quarrying and mining causes environmental impacts
- Some products, such as glass bottles, can be reused
 - Glass bottles can be crushed and melted to make different glass products
 - Other products cannot be reused and so are recycled for a different use
- Metals can be recycled by melting and recasting or reforming into different products
 - Amount of separation required for recycling depends on the material and the properties required of the final product
 - E.g. some scrap steel can be added to iron from a blast furnace to reduce the amount of iron that needs to be extracted from iron ore

