Design Strategies are used to solve **Design Fixation**, and help develop creative design ideas.

Iterative Design

- A Proposal is made
- It is then planned and developed to meet the brief
- It is analysed and refined
- It is then tested and modelled
- Then evaluated against the brief – many versions fail but that then informs development to make the idea better
- The cycle then repeats and if the product is successful it is then made and sold on the market

Iterative Design	
Advantages	**Disadvantages**
• Consistent testing helps solve problems earlier • Constant feedback • Easy evidence of progress	• Designers can loose sight of "the big picture" • Time consuming

User-Centred Design

- This is when designs are based on fulfilling the needs and wants of the Users/ Clients at every stage of the design process
- Questioning and testing is ongoing and is often found through interviews, questionnaires, surveys, etc

User-Centred	
Advantages	**Disadvantages**
• User feels listened to • Makes sure the product meets their needs	• Requires extra time to get customer feedback • If focused on just one person it can limit appeal to others

Systems Approach

- Usually used for electronic products
- Often uses diagrams to show systems in a visual way
- Planning the layout for the correct sequences e.g. inputs, outputs, timings, etc
- Electronics and mechanical systems need an ordered and logical approach

Systems Approach	
Advantages	**Disadvantages**
• Does not need specialist knowledge • Easy to communicate stages • Easy to find errors	• Sometimes over-simplifies stages • Can lead to unnecessary stages

Collaborative Approach

- Working with others to share data and solving problems and coming up with design proposals can help with creativity
- Numerous companies work in teams, and has been shown to improve the range and quality of ideas produced

Collaborative Approach	
Advantages	**Disadvantages**
• Gets multiple opinions and a range of views • Working in groups can produce more ideas	• Can be difficult to design ideas with opposing views • Can be difficult to find time to communicate with multiple people

Key words: Iterative design/systems approach/user-centred design/collaborative design/sustainability/ethical/social/moral/environmental/product life cycle

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Designers need to understand the challenges of using raw materials and the processes available to limit the amount of waste when manufacturing a product.

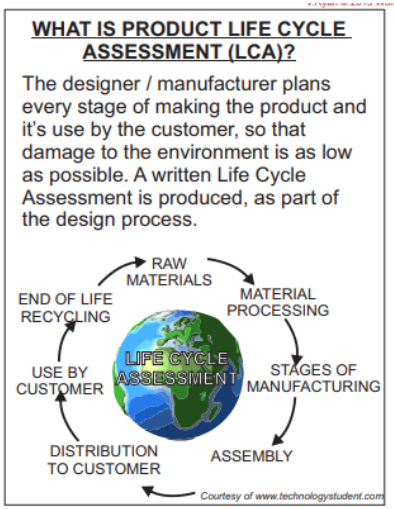
Deforestation - A lack of tree roots leads to soil erosion, causing rivers to silt up. It is possible to manage deforestation through responsible management of the forests. If more trees are planted than are cut, it is possible to minimise the impact. Designing to ensure less wastage will cost less and be better for the environment.

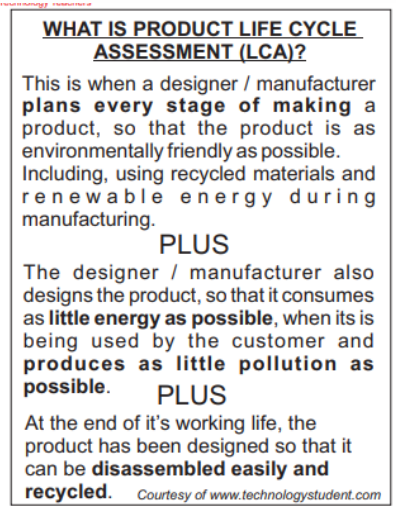
Mining and drilling - The environmental impact of mining and drilling is primarily to the area around the sites. Loss of habitat for wildlife is caused by the clearance of land above the sites as well as the noise and light pollution in the area. Water run-off can also create ponds of concentrated chemicals, which can harm the human and wildlife population. Designing products that use a more renewable set of materials will help solve this problem.

Carbon footprint - Mining, moving and processing raw materials, then moving them onto the consumer causes pollution of its own. CO_2 (carbon dioxide) emissions from factories, power stations and vehicles need to be reduced to stop further damage to the environment. Everything has a carbon footprint, from creating the raw material to delivering the product in a vehicle. The best way of combating CO_2 emissions is by using the 6 Rs.

An **environmental footprint** compares the resources people consume with the land and water area needed to replace them.
If products or raw materials have travelled a long way, they have a larger carbon footprint. Carbon emissions from vehicles produce CO_2 in the atmosphere. Some companies try to help manage this in several ways:
planting trees to absorb the CO_2
buying products locally to avoid CO_2 emissions
powering their facilities using renewable energy to reduce their carbon footprint

Another issue is waste and packaging - this has led countries to sign agreements to cut waste and use more responsible sources and recyclable raw materials to try to help tackle landfill and ocean pollution.





https://www.bbc.co.uk/bitesize/guides/zbn6pbk/revision/4

Ethical issues are becoming more important to designers. It is becoming more likely that consumers will ask whether the products they're buying are harming the environment or treating people unfairly. Fair trade is a principle where everyone in the chain of manufacturing is offered fair wages and good working conditions:

a minimum standard for the pay and conditions of workers is set:
workers are paid a fair wage
their conditions are monitored and kept safe
the use of safety equipment like goggles and guards is encouraged
toxic chemicals that could harm staff are changed
the use of sweatshops and child labour is banned