

Critical Evaluation : a process that identifies positives and negatives in a design, process or material.

Design decisions are affected by emerging technologies.

Designers must critically evaluate their designs when using new and emerging technologies.

https://www.youtube.com/watch?v=vb79-_hGLkc

Planned obsolescence

Most products have a limited lifespan. Some products like cars have a lifespan of 10+ yrs. A teabag is used once. This is planned obsolescence. This helps keep a manufacturer in business, but can be bad for the environment. They have to balance profit with ethics.

Manufacturing capabilities



Timescale



Budget Constraints



<https://www.youtube.com/watch?v=Q3XxfeoTpel>

- Medical advances, eg robotic surgeons, prosthetics, eg. 3D printed jaw
- Environmental impact
- Fossil fuels

- Travel. Quicker methods have a Larger carbon footprint.
- **Planned obsolescence**

- Cost of transportation
- Materials
- Manufacturing processes, and systems

Things to consider when **critically evaluating** new & emerging technologies that inform design decisions

Materials



- Environment, Strength, Suitability, Cost, Lifespan, planned obsolescence.
- Health and safety eg adverse reaction,
- New/smart materials

Ethical Issues



- Worker/supplier exploitation, to cut costs.
- Use of overseas cheaper labour.
- New technologies
- Illegal disposal of waste
- Cheaper, substandard materials to cut costs

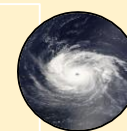
Transportation

- Carbon footprint
- Fossil fuels

<https://www.youtube.com/watch?v=QQwnT1jqxw8>

Possible Future Scenarios

- Natural disasters eg hurricanes, floods.
- **Global warming**

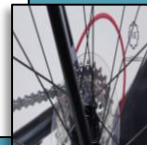


<https://www.youtube.com/watch?v=7mYJ9GJMgaw>

End Users

- Quality of life

Design for Maintenance: Some products are designed for maintenance. If part of a product is broken, that component can be repaired. (eg. a puncture in a bicycle) So design for disassembly needs to be considered. In this case, the wheel needs to be able to be taken off to repair or replace the inner tube.

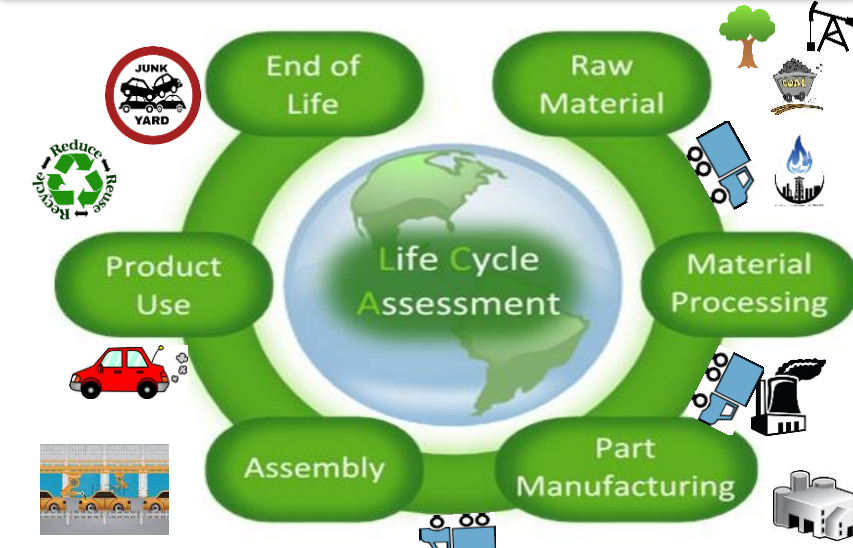


Carbon Footprint: the amount of CO2 emissions that can be directly or indirectly attributed to an individual's or organisation's activities. The bigger the environmental impact, the bigger the carbon footprint.

- To minimise their carbon footprint, companies should
- Maximise efficiency in energy usage
 - Look at their supply chain and see how things could be done better
 - Get involved in recycling
 - Use renewable energies



Life Cycle Assessment: a systematic list of environmental impacts at every stage of a product's life.

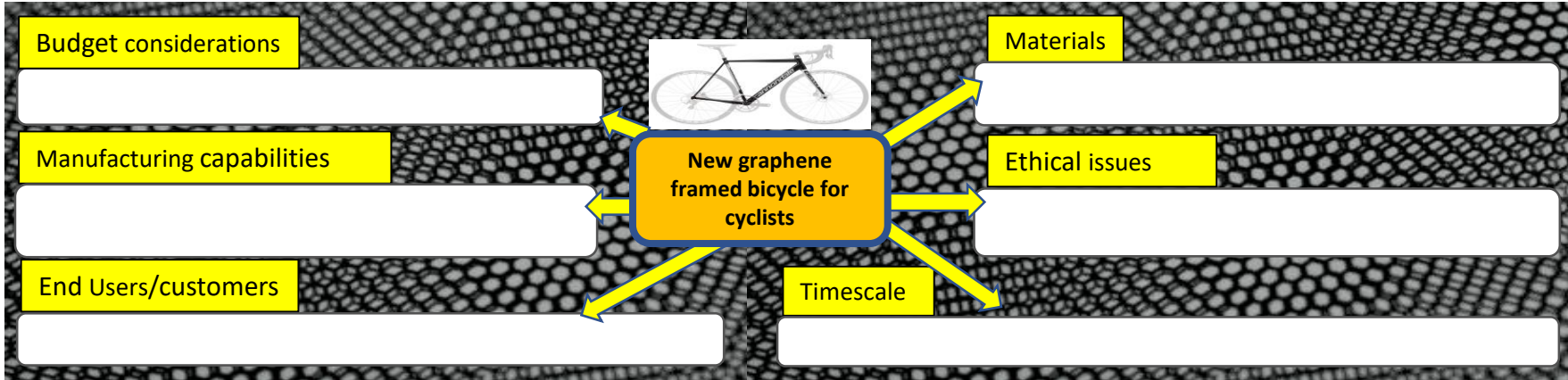


Core 1.2 : Evaluating New & Emerging Technologies to Inform Design Decisions

1. What is “critical evaluation”? _____

(1 mark)

2. Evaluate the considerations for using new and emerging technologies in the development of a new graphene framed bicycle for competitive cyclists. Write your answers as relevant questions. Useful video: <https://www.youtube.com/watch?v=FaKl3OymFy4>



(6 Marks)

3. What solutions might there be to **global warming** (climate change)? _____

(3 marks)

4. Discuss the **life cycle analysis** of a mobile phone, which has been designed in the UK but manufactured in China.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

(6 marks)

5. What is meant by the term “**carbon footprint**”? _____

(1 mark)

6. a) Designers will create products with a limited lifespan. This practice is called **P**_____ **O**_____.
- b) Why are single-use coffee pods bad for the environment? _____

(2 marks)