

## Informing Design Decisions

### What you need to know:

- Be able to evaluate the advantages and disadvantages of planned obsolescence from different perspectives
- Understand how products can be designed to be repaired and recycled
- Be aware of ethical and environmental concerns when designing with new technologies

### Evaluating the use of new technologies...

When designers first come up with new ideas for a product they also need to carry out a lot of market research. Market research allows the designer and manufacturer to fully understand the task and have detailed knowledge of the marketplace. Through market research, designers will find out about the latest technologies and materials available to them, they will evaluate the use of these technologies and materials against a number of criteria, including;

- Cost
- Reliability
- Longevity
- Sustainability
- Recyclability

Even with detailed research, some potential long term issues may still not be known, which is one of the main risks in using new and emerging technologies.

### Ethics and the Environment

Finding out whether a new technology will have a negative effect on the environment is usually discovered through research and the conducting of a Life Cycle Assessment (LCA). It is becoming more important, and expected, that companies show they are environmentally and socially responsible. Consumers are also more aware through social media and global news access of the issues surrounding pollution of land, air, and sea—making consumers more demanding on companies to closely monitor their social and ecological footprint.



### End of working-life disposal

Considering how a product is to be disposed of at the end of its useful life needs careful consideration. How recyclable or reusable a product is will depend on the materials chosen and how they are joined together—decisions made early in the design process. If a product can be separated into its separate component materials easily it will be easy to recycle and take less time and energy to do so. If the product is also made from fully recyclable materials it potentially means none will end up in landfill or cause contamination to the environment.

Some products are designed to be reused, such as glass milk bottles. Other products can be given new life due to inventive people choosing to reuse them in innovative ways. For example old car tyres can be reused in the building of houses, as swings in playgrounds, or to produce high quality oil. When a product is reused instead of recycled it uses less energy and does not degrade in quality from the recycling process.

Responsible end of life design should include; as few materials as possible, recycled or recyclable materials, easy to separate materials and built in re-usability wherever possible.

### Key Questions:

- What effect would planned obsolescence have on the use of materials during manufacture?
- Explain the advantages of planned obsolescence for the manufacturer.
- Explain the advantages and disadvantages of planned obsolescence for the customer.
- Why is the manufacture of electronic devices more likely to be affected by planned obsolescence?
- Find out what a service contract is. What are the advantages and disadvantages of using a service contract for the consumer, and the manufacturer?
- What benefits to the environment could a 'repair before replace' approach have?
- How could the following commonly thrown away items be re-used? (Carrier bags, Plastic drinks bottles, Tin Cans)
- Debate—Should coffee shops ban disposable cups? Present an argument for and against based on environmental and ethical concerns.
- Research how products can be reused in creative ways—use Pinterest.com to produce a visual mood-board.

### Design for Maintenance

Less and less products are now designed to be repaired. Ones that are repairable often require specialist tools and home repair is discouraged and harder to achieve. A reason for this is that many products—especially electronic and mechanical devices have become very complex and therefore are beyond the ability of most people to repair them, without specialist training or tools. For most companies—they also want customers to buy a new product as soon as possible so that they can make money. If a product breaks after the guarantee has expired they may even offer a discount on a new version to keep the customer's loyalty and their business.

Companies will have service contracts with repair firms and can make a profit from organising the repairs for their customers—another reason specialists tools are required, they don't want just anybody to be able to offer the repair service because they will lose out on money!

Key words: (Find out what these mean!)

Planned obsolescence	Social Footprint
Market Research	Ecological Footprint
Trend	Life Cycle Assessment
Maintenance	
Social responsibility	

### Planned Obsolescence

When buying products we expect some to last a long time, and others we expect to throw away after just one use. For example a sofa would be expected to last many years, a pair of headphones a year or two, and a ball point pen until it runs out of ink (it is not designed to be refilled and reused). Built-in or planned obsolescence is ensuring that a product will only perform its function for a certain length of time. Designers and manufacturers need to consider this for a number of reasons.

#### 1. Appropriately engineered quality.

If a product only needs to last a short amount of time it would be a waste of materials and energy to make it robust enough to last a long time. A disposable razor has a plastic handle because the non-replaceable blade will become blunt quickly, a cheap polymer like polystyrene is the best material due to it being cheaper to produce.

#### 2. Upgrading and function.



Some products are designed to receive updates or be upgraded. Manufacturers need to decide how upgradeable a product needs to be. If a product can be continuously upgraded the chances of new sales will be reduced as customers will wait for a significant upgrade to become available before purchasing a new model. If the product does not have enough potential for an upgrade, again money and sales could be lost as it isn't seen as good value for money. The smart phone is a great example of this as it can usually be upgraded a few times, but after a while will stop being able to receive updates or certain features will stop working.

#### 3. New technologies (Technology push)

Changes in materials, manufacturing techniques, technologies and customer desires are guaranteed. Most manufacturers will avoid producing goods that will last a long time because as technology moves on, customers will want newer versions.

#### 4. Fashion and Trends



Many goods are sold as novelty items which are often led by trends in the market, seasons or fashion. The quality of goods will vary depending on how long they need to last for as well as the price point they are manufactured to. Most Halloween or Christmas items are not designed to last more than the current season so getting a couple of years use out of them is considered a bonus!