

Exam Question 2 - Sustainability & Legislative Issues
(This question is worth 10 marks in the exam)

Sustainability in Design & Technology

The 6R's

The '6R's' (Rethink, Reuse, Recycle, Repair, Reduce, Refuse) provide a framework you can use to check that you are considering appropriate environmental, social and economic issues when you are designing and making products.

Rethink

Designers need to think about how to improve the products performance at doing its function and also making it more environmentally friendly, more socially and morally acceptable as well as more economically viable for the company and the consumer. They also need to think about how to utilise the materials and parts of another product for the product they are designing after they have become waste and without a use.



Reuse

This is when a product is re-used again for the same or alternative purpose. A designer can make a product re-usable for alternative uses for example a bag for life can be used for shopping and then after that you can use it as a bag for whatever you like and even just the shopping. Re-using is also when you are finished with something and even though you may not use it again someone else may (eg. Charity shops)



REMEMBER: Re-using something is the same as primary recycling.

Recycle

You can recycle most things which are made from plastic, paper, glass and metal.



This symbol is used to show that an object, product or packaging is capable of being recycled but it doesn't mean that it has been recycled

There are three types of recycling:

- ❑ **Primary Recycling:** is the same as re-using a product as explained previously.
- ❑ **Secondary Recycling:** is when you cut pieces of material from the product or use components of it without altering its chemical properties and then you use it for a new use.
- ❑ **Tertiary Recycling:** is when you alter the chemical properties of a product or a part of a product in order to re-use it in another product.



This sign indicates that the product or the packaging is made out of aluminium and is therefore recyclable



This sign indicates that the product or the packaging is made out of recyclable steel



This sign encourages consumers to recycle glass such as bottles and jars in bottle banks, etc.

Repair

Sometimes it is easier to replace something rather than to repair it and sometimes it is not.

1. A hair drier is expensive to repair and it is about the same price or cheaper to replace it, so it may as well be replaced
2. Furniture may be easier and cheaper to repair as it is more expensive to buy a whole new set and more difficult to find just one individual replacement piece that will match the design of the others



Reduce

This is when the designer tries to reduce any unnecessary packaging, energy and waste during the manufacturing stage and also tries to reduce the products ecological footprint and carbon footprint during the whole of the product's lifecycle.



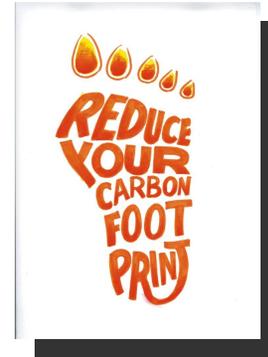
This symbol is known as the green dot symbol and it means that the manufacturers have made the packaging more environmentally friendly and easier to recycle or have made it out of sustainable or recycled materials. It also shows that the manufacturers have successfully minimised the amount of packaging and materials used.

This stage also involves the designer thinking about the product's built in obsolescence. (This is when a product gradually becomes non-functional by design so that the product will be repurchased again by the customer) and how to try and avoid the use of it as all the old products which are non-functional become useless and are dumped in landfills etc.

Refuse

Products:

- With unnecessarily over-packaged cases
- That are toxic or have toxic chemicals in them
- Have been transported along way
- Have a large carbon footprint
- Aren't environmentally friendly throughout their product life style
- Aren't morally or socially acceptable
- Aren't economically viable



may all be refused by customers.



1. This is polyester and it is a popular and inexpensive packaging material.
2. This is high density polythene and it is strong and stiff and it is used for some packaging
3. This stands for poly vinyl chloride and it is strong but easy to bend and so it is used for packaging where strong chemicals are involved
4. This is low density polythene and it is tough but flexible and it is use for bags and it is good as it can be recycled
5. This is Low density polyethylene and is mainly used for plastic bags
6. This is polystyrene and it is a good insulator so it is used for plates and cups and it is also easily shaped
7. The properties of materials in the 7 category vary because they have a mixture of the properties shown in 1,2,3, 4 and 6. Used for packaging in general.

Social Issues

Products should be as universal as possible but if there are a smaller group of people that the product is being designed for the product must then be adapted to meet their specific needs. For example baby's high chairs. These are the social issues.



Moral Issues

Moral Issues are concerned with the way in which products are manufactured and the comfort, pay and well-being of the workers who make them as well as their safety and treatment.

In **Sweat-Shops** (a place of work where their wages are low and the conditions are poor or even illegal) the workers aren't treated right and this creates a moral issue if a product is manufactured in a sweat-shop and so the people may refuse to purchase this product



The **ETI** (ethical trading initiative) is an alliance of **NGOs** (Non Governmental Organisations) and companies which promotes improvement in the implementation of codes of practice so that there are more morally acceptable products. **Fair trade** is an example of an ETI.

Another moral issue is the safety of manufacturers and users of products. The COSHH (Control Of Substances Hazardous to Health) regulations requires the employers to control substances that can harm workers health because of using or being exposed to toxic chemicals or other hazardous substances that could harm the workers health and put their lives at risk.



Also the kite mark symbol is awarded to products which are safe to use (on products where safety is important e.g. fire extinguishers) and it is awarded by the British Standards Institute (BSI)

The CE Mark is awarded by the Committee for European Standardisation (CEN) and certifies that the product meets the European Consumer safety, health or environmental requirements



Environmental Issues



Sustainable materials are usually ones which are biodegradable (can degrade naturally and organically), not finite resources and are environmentally friendly in their use. CFCs are a group of synthetic substances containing chlorine and bromine which were developed in the 1930s when they were thought to be safe and non-flammable and then they were discovered in the 1980s to be the main source of harm to the ozone layer and then their use stopped.

The eco-logical footprint is the measure of the impact of human activities on the environment and it shows how many Earths would be needed for sustainable use if everyone had the same lifestyle. The carbon footprint is the measure of human impact on the environment in terms of carbon dioxide or other green house gasses released into the atmosphere.



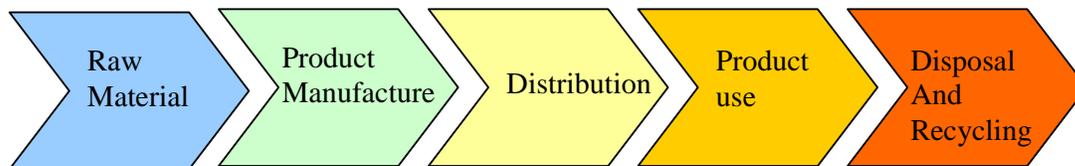
Carbon Offsetting is when people and companies try to reduce the negative impact they have on the environment by using more ecological and sustainable resources and using renewable sources of energy generation. Reforestation is a carbon offsetting scheme where you replant trees to soak up some of the negative effects of carbon dioxide and trying to pay off your carbon debt. Another way you can pay off your carbon debt is using a renewable energy resource carbon offsetting scheme:

- Hydropower**
- Wind**
- Solar**
- Geothermal**
- Tidal/Wave**

In order to tackle the disposal of products and their redundant packaging, there are also labels and symbols and awards to guide the consumer on buying and disposing their packaging in a particular way which is safe and environmentally friendly.

Life Cycle Analysis

Life Cycle Analysis (LCA) is a method used to measure and evaluate the impact of a product across a wide range of environmental issues. It involves collecting and analysing complex data relating to the inputs and outputs of material, energy and all forms of waste. This is carried out over the full life cycle of the product - from raw material manufacturing, right through to the final end-of-life disposal of the product. Also known as a 'cradle-to-grave' study.



In studying the LCA of a particular product, it is possible to see which stage in the product's life cycle causes most damage to the environment

Other Legislative in Design & Technology

ISO

The International Standards Organisation (ISO) is an international standard-setting body that is recognized world wide.

Packaging (Essential) Regulations (P(ER)R) 2003

The UK Packaging (Essential) Regulations 2003 requires that packaging is manufactured so that its volume and weight are limited to the minimum adequate amount to maintain the necessary level of safety, hygiene and acceptance for the packed product and for the customer. These regulations are enforced by trading standards officers across Great Britain.

PP8888-1:2007 (Drawing Practice) & PP7321:2004 (Compendium of British Standards for Teachers of D & T in Schools and Colleges)

These are reference guides for teachers and students in secondary schools and colleges of further education. They cover the main standards for all drawing practices relevant to Design & Technology.



Remember:

Sustainable design is a way of thinking that supports responsible designing and making a product which does not deplete or obstruct its function but at the same time does not have a negative impact on the environment, society, consumer, designer and the economy.