

GCSE Design & Technology: Graphic Products

Sustainability & Legislative Issues

Revision Booklet

Sustainability

Sustainability is a very important word, particularly in Design & Technology. It refers to anything and everything to do with reducing the damage we are causing the environment. This includes how we design things, how we make things, the materials we use, how much material we use and how we dispose of our waste.

There are 6 main considerations when discussing Sustainability. They are known as 'The 6 R's of Sustainability'.

The 6 R's of Sustainability



Reduce:-

- Use less material to make things
- Use less 'non-renewable' energy resources
- Use less packaging on products
- Throw less things away (Recycle more)



Re-use:-

- Use an old product elsewhere for a different purpose
- Avoid throwing it away if it can be used for something else



Recycle:-

- Recycle your waste instead of throwing it away so that the materials can be broken down and used to make new products
- Use your recycling bins from the Council - Paper, Glass, Plastic, Food



Re-think:-

- Can we change the way we live? E.g. Turn power off at the mains
- Can we use different sources of power to manufacture? E.g. Solar Panels or Hydro Power
- Use waste land rather than destroying natural habitats



Refuse:-

- If you don't need it, refuse to buy it
- Don't buy something if it has too much packaging
- Don't throw plastic away, recycle it
- Don't drive there if you can walk there



Repair:-

- If something is broken, don't throw it away, try to fix it

Responsible Design and Manufacture

All over the World, companies and governments are being told to behave in a more responsible way in order to provide the best quality of life for us and future generations.

Designers and Manufacturers must consider how a product is used/maintained and then disposed of. This is referred to as a 'Product's Life Cycle'.

Product's Life Cycle	
	<p><u>Extraction of Raw Materials:-</u></p> <ul style="list-style-type: none"> • How the materials E.g. Oil is taken from the ground • Is the method used the most environmentally friendly?
	<p><u>Manufacturing:-</u></p> <ul style="list-style-type: none"> • What methods of production are being used? • How much pollution does this cause?
	<p><u>Packaging and Distribution:-</u></p> <ul style="list-style-type: none"> • How many layers of packaging are used? Are they all necessary? • How will the goods be transported? Lorry, Train, Aeroplane, Ship?
	<p><u>Product Use:-</u></p> <ul style="list-style-type: none"> • Are there moving parts which could break? Can they be fixed? • How long is the intended use of the product? Days? Years?
	<p><u>Final Disposal:-</u></p> <ul style="list-style-type: none"> • Can it be recycled? Does it need to be taken apart first? • What effect will this have on the environment? Is it bio-degradable?

There are 3 main areas of responsibility, which we need to focus on and be aware of. These areas combined are known as 'The Triple Bottom Line'.

The Triple Bottom Line	
	<p><u>Social Responsibility:-</u></p> <ul style="list-style-type: none"> • Employing local people • Paying them fairly • So that they can look after themselves
	<p><u>Economic Responsibility:-</u></p> <ul style="list-style-type: none"> • Paying fairly (the market rate) for goods means that people can then afford to buy food, clothes, and medicine • Those regions then become more important in the World Market
	<p><u>Environmental Responsibility:-</u></p> <ul style="list-style-type: none"> • Laws tell companies how much pollution they are allowed to produce • Targets are set to reduce pollution in companies and countries in order to reduce our Carbon Footprint

An example of Responsible Design and Manufacture

Look at the example below. It shows how a company 'Yeo Valley' has considered the 6 R's of Sustainability and the Triple Bottom Line in the way it approaches the production of its yoghurts.



Organic Farming	
<ul style="list-style-type: none"> • Only organic food products are used • No artificial fertilisers or pesticides are used, which keeps the soil healthy, so it can be used year after year • Less land is needed as there are no rotations • Natural habitats are kept safe 	
Materials Used	
<p>Card Sleeve:-</p> <ul style="list-style-type: none"> • Tear-away strip makes it easy to remove • Made of 98% recycled card • Easy to Mass Produce - cheaper 	<p>Polypropylene Pot:-</p> <ul style="list-style-type: none"> • The thinnest grade of polypropylene possible for this use • Takes less time to break down than other plastics

The Triple Bottom Line (Responsibilities)

<u>Social:-</u>	<u>Economic:-</u>	<u>Environmental:-</u>
<p>By employing lots of people, Yeo Valley reduces unemployment in the local area.</p> <p>These people then go out and spend their money, therefore improving trade in other businesses such as pubs, restaurants, shops.</p> <p>The above helps to reduce sickness and poverty.</p>	<p>Yeo Valley employs many people to do different types of jobs:-</p> <ul style="list-style-type: none"> • Farmer • Producer of the food • Producers of the pots • Employees who put the food into the pots • Designers of sleeves • Delivery drivers 	<ul style="list-style-type: none"> • Only land that is needed is used • No land-rotation systems • Wildlife thrives due to habitats being left alone • Packaging used is minimal and is easy to manufacture and recycle

Test Yourself

- (1) What are the 6 R's of Sustainability?
- (2) Give an example of what you could do for each of the 6 R's.
- (3) What effect does recycling have on land-fill sites?
- (4) How many stages are there in a Product's Life Cycle?
- (5) Explain why it is important to consider how a product can be disposed of before it is made.
- (6) What are the 3 main considerations in the Triple Bottom Line?
- (7) Fairtrade is an organisation which strongly considers the Triple Bottom Line. True or False?
- (8) Briefly describe the work of such organisations as Fairtrade. How do they help those in developing countries?

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

The Essential Packaging Regulations is a set of rules that was put in place to reduce the amount of waste material from packaging.

They state that if you are designing or manufacturing packaging, you must do everything you can to minimise the weight and volume of packaging produced.

Designers can reduce waste by designing packaging which contains minimum levels of hazardous substances and by choosing materials which are mostly recyclable.

Manufacturers can reduce waste by only providing the necessary protective layers of packaging and by not including the excess, unnecessary, wasteful 'frilly bits' to draw attention.

Recovery Methods

The regulations also state that packaging should be recovered where possible to reduce harm to the environment.

The table below shows the 4 main methods of recovery and how the recovery should take place. You will need to be familiar with these and understand their importance.

Recovery Methods	
	<p><u>Material Recycling:-</u></p> <ul style="list-style-type: none"> • A certain % of the material used must be recyclable • E.g. Yeo Valley Yoghurt Pots
	<p><u>Energy Recovery:-</u></p> <ul style="list-style-type: none"> • If burned (incinerated) the amount of energy produced must be greater than the amount of energy used to burn it
	<p><u>Composting:-</u></p> <ul style="list-style-type: none"> • The material used must be bio-degradable • E.g. Tea Bags
	<p><u>Re-using Packaging:-</u></p> <ul style="list-style-type: none"> • The material used must be capable of being used several times • E.g. Plastic Water Bottles

Standards

There are 3 main organisations which you need to be fully aware of. These organisations create standards which products are then tested against. There are a number of reasons why it is important to have standards but mainly, standards exist to keep us healthy and safe.

The table below shows how standards are created and by whom.

How Standards are Created

- A range of people from different backgrounds in industry are gathered to discuss a particular product and what requirements should be met
- They will draw up a draft version of the standard and use it against the product
- The same group will then review the success of the draft and make any necessary changes
- The final draft is then written and it is given a unique number/code

In the UK, standards are created by an organisation called the British Standards Institution (BSI).

British Standards Institution - BSI

Symbol Used:-



The Kitemark

Information:-

- If a Kitemark is seen on a product it shows that certain quality, safety and hygiene rules have been met
- Companies pay the BSI to have a copy of the standard sent to them so that they can test their products against the standard
- The BSI is a non-profit organisation. All money received goes back into the company to create further standards and continue to carry out checks
- All British Standards begin with the letters BS
E.g. BS 8888, 2006

European standards are also created for countries within Europe. These standards are created by an organisation called the Committee of European Standards (CEN).

Committee of European Standards - CEN

Symbol Used:-



The CE logo

Information:-

- Standards are created for use throughout Europe
- Encourages trade between European countries
- Adds strength to European power in the Global Market
- All European standards begin with the letters EN
E.g. BS EN 1998-4:2006

Standards

There is also an organisation which creates standards on a global scale. This organisation is called the International Standards Organisation (ISO).

International Standards Organisation - ISO

Symbol Used:-



An example

Information:-

- Monitors and facilitates trade between different countries, to make the trading fair
- Good practice in Manufacturing or Systems for working are shared between countries to make the global environment and economy healthier
- ISO Standards can cover things from transport, tools and reducing pollution
- All ISO standards begin with the letters ISO
E.g. ISO 9001

Test Yourself

- (1) How many methods are there for recovering packaging?
- (2) If you are planning to recover packaging through composting, the materials used must be bio-degradable. True or False?
- (3) How do standards play a part in our everyday lives?
- (4) A Kitemark can be added to any product. True or False?
- (5) How does the BSI check that companies showing the Kitemark are meeting the standards?
- (6) What does BSI stand for?
- (7) How are standards created?
- (8) What is the name of the symbol used to show that British Standards have been met?
- (9) What two letters are used in British Standards?
- (10) What does CEN stand for?
- (11) Give two advantages of having European Standards.
- (12) What symbol is used on products to show that European Standards have been met?
- (13) What does ISO stand for?
- (14) How does the ISO benefit countries when trading together?