

Consumer pull, technology push



Successful designs: Apple iPod and Dyson vacuum cleaner

Designers often produce ideas for products in response to market forces. This is called **consumer pull**. Examples of market influences include:

- a demand from consumers for new or improved products
- a competing product is launched by another manufacturer
- a manufacturer wants to increase their share of the market

Products may also be re-designed because of changes in materials or manufacturing methods. This is called **technology push**. Technological changes may allow a manufacturer to make the produce more cheaply, or more efficiently. This can reduce manufacturing costs.

Occasionally a designer will design a new or improved product simply because they feel that it is needed or because a demand will be created by the very existence of the product. Two examples of this are shown below. Designs like this may succeed or fail, depending on consumer demand, how innovative the product is, and the state of the market.

Successful product design depends on asking the right questions about the proposed product's function, purpose, shape, form, colour and texture. Product designers need to be able to analyse existing products, and be aware of new technologies and consumer demand for the new product.

The first stage in designing your own products is writing the *design specification*. Throughout the design and making process the designer should check that the product matches the specification - and that quality is maintained.

Product analysis

Product design analysis means studying how well a product does its job. When you are analysing the design of a product you need to ask these questions:

- What is the **function** and **purpose** of the product?
- What are the different parts of the product and how do they work together?
- How does the product use **shape**, **form**, **colour**, **texture** and **decoration**?

- What **materials** are used to make the product?
- What **components** are used in the product?
- Which **processes** were used to make the product?
- Who would buy this product?
- How well does the product do its job compared with other similar products?
- If two or more products are similar and do the same sort of job, what are their unique points?

The table below will help you understand the meaning of shape, form, colour, texture and decoration.

Property	Example	Description
Shape		Shape is two and three dimensional - a flat area which has lines round it.
Form		Form is three-dimensional - it is a solid object made up of shapes joined together. The object shown in this picture shows how form has been used to create an attractive design.
Colour		Colour is used to make a product more interesting and attractive. Colour may be applied to a product, eg by painting, or use can be made of the natural colour of the material, eg acrylic.
Texture		Texture is used to make an object more interesting. Surfaces are made 3-dimensional to some extent by the use of grooves, patterns and the application of other materials such as fabrics.

Property	Example	Description
Decoration		Decoration may be achieved by the use of different colours, shapes or materials. A decoration may be pasted onto a product, or be part of the material itself. The object in this picture has been decorated to make it look more interesting.

Tips for successful product design analysis

- Make sure you understand what the product actually does and how it works.
- Learn carefully how products are made in industry - especially look at what materials are used and how they are **cut, shaped, formed, joined** and **finished**.
- Apply this knowledge to the product you are asked to analyse.
- Think carefully about possible markets for different products: Who would buy the product? Why would they buy it? Where would it be used? Who would use the product?

The design specification

When designing a product, a designer has to make sure that it meets the **design specification**.

A specification is a statement that tells the designer exactly what the product has to do and what the design requirements are. A specification will always

- describe what the product has to do
- describe what the product will look like
- include details of any other requirements

In detail, a specification should include the following information about the product:

- the main function of the product
- the main overall dimensions of the product
- the main materials which are likely to be used
- an outline of the appearance of the product
- user requirements
- if needed, details of the source of power
- how **anthropometrics** and **ergonomics** effect the design
- the cost of the product
- possible production levels - one-off, batch, mass production
- legal requirements which may have to be met
- environmental considerations and requirements

Anthropometrics is the name given to the study of the sizes of people in relation to the design of products. For example, chairs used in schools need to be suitable for most of the sizes of pupils in the schools.

Ergonomics is concerned with the relationship between people and the products which they use. Anthropometric data is used to help when designing products to meet ergonomic needs. As well as sizes of people, ergonomics has to consider the force which someone can apply – for example operating a tin opener, or the pedals of a car.

Evaluating your products

In your coursework, you need to compare your finished design to see how well it meets your **specification**. You also need to look at existing products and use your findings while designing your own product.

Checking your design against the specification

It will help to evaluate your own product if you ask these questions:

- Does it meet the **design need** or situation?
- Does it meet the needs of the **intended users**?
- Does it fit the **purpose** for which it is intended?
- **Design need** - Look back at your notes to see what the need or the specification was. Check to make sure that your product meets this need. For example, if you made a rack to store CDs, can you get the CDs in and out easily?
- **User needs** - Check that the person who is going to use the product likes the final product. Does it fit into their home? Is the cost appropriate?
- **Fitness for purpose** - Does the product do what was intended? For example, if you made an adjustable lamp, is it stable? Does it direct the light where it is needed?

Quality control in your own products

You also need to check your products for **quality** - not just after they have been made, but throughout the design and making process. Here's a checklist:

- As you develop the design, keep checking the specification to make sure that it is being met.
- When you are planning the making, try out different ways of making, so that you can choose the best method.
- As you are making the product, check for quality of making. Try to do the best and most accurate work that you can.

Quality control

There are two aspects to quality control in Design and Technology:

- **quality of design** itself, or how well the product meets the needs of the user, and
- **quality of manufacture**, or how well the product has been made.

These two aspects of quality can be independent of each other. A product can be designed well but be poorly made, or a well-made product may be of a poor design which does not meet the needs of the user.

For example, a storage unit for books may be designed well, but could be poorly made with rough edges, inaccurate cutting and poorly-made joints. Alternatively it could be well made, but poorly designed so the shelves are too thin to take the weight of the books, or the shelves are badly spaced so larger books don't fit.

Checking the quality of a product

The list below shows the characteristics of a high-*quality* product:

- The product meets the needs of the user.
- Appropriate materials have been used.
- Where necessary the product should be capable of being maintained in a good condition.
- Making is planned carefully to ensure that checks for quality are made at the appropriate time.
- Making is done carefully and accurately.
- The use and disposal of the product after use have been considered.