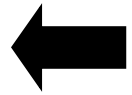


Higher Product Design

Design Issues, the Design Team and Intellectual Property Rights





Teachers Guide

Dear colleague, I put this presentation together to aid with the teaching of some of the theory elements of the new Higher Product Design course. It can be used directly in the class by projecting it and it can also be saved onto the school server to be accessed by students at their leisure (if you wish to do this I recommend you produce a second copy without the 'Suggested answers' slides).

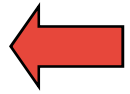
As it is a PowerPoint presentation you can make any changes and personalise it as you wish.

I hope that this is of use to you and perhaps saves you some time. If you have any feedback (positive or negative) or suggestions on how it could be improved please feel free to contact me using the following e-mail address:

enquiries@LTScotland.org.uk

P.S. please delete this slide if you decide to place it on your server. Thank you.



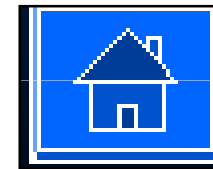


Instructions

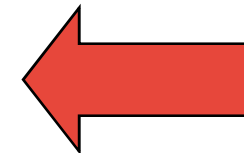
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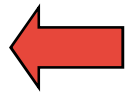


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Click on the red arrow to go back one page or to a sub-menu



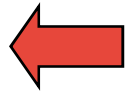


Product design

Product design is all around us. We live with it every day and it has become such a necessary part of our existence that we would struggle to survive without it. However, the way in which we design products has changed over the years. The impact of new technologies and manufacturing systems has altered the way we approach designing. No longer is the appearance of a product dictated by the way it works. The aesthetics of many products are no longer determined by their mechanics thanks to new computer chip technology and miniaturisation.

In this new century, the possibilities offered by product design promise a lot of pleasant surprises. However, product designers must take more responsibility for the products they design and the impact these will have on our lives. Unfortunately designers don't always get it right: aerosols, fridges and the motor car engine can all be cited as having a detrimental effect on the environment in some way or another. It may well be argued however that the benefits of these products outweigh any damage caused. We need designers who have social consciences and consider the way their designs will integrate and interact with everyone and everything that they come into contact with.





Product design

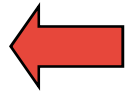
Products have the ability to enhance or hinder our existence. Ultimately, they should be easy and enjoyable to use. They should provide benefits to everyone who comes into contact with them and they should be well designed.

Some of the benefits product design can offer

A product can:

- *Improve the quality of life for a user*
- *Give an improved performance over previous models*
- *Provide the user with status*
- *Minimise manufacturing costs*
- *Create a new market or expand an existing market*
- *Increase company profits*
- *Use existing resources more economically*
- *Create a new or better aesthetic*





Main menu

Design issues



The 'design team'

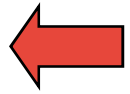


Intellectual property



Click on the appropriate star



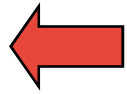


Design issues

- Function 
- Performance 
- Market 
- Aesthetics 
- Ergonomics 
- Economics 
- Environment 

Click on the appropriate star





Function

All products have a primary function and some also have secondary functions, i.e. they do something else or can be used for something else other than their primary function. This may or may not be related to the design, *i.e. using a litter bin as a door stop.*

A product must do the job it was designed to do; if it fails to do this, the user may become frustrated with it. For example,

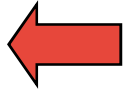
A tin opener should be able to open a tin, but should a lightweight portable camping tin opener work as well as an electric tin opener for use in a restaurant or canteen ?

There are other issues that need to be considered in this scenario, such as the market the product is aimed at or its durability. So a designer should establish a checklist of features that are essential and desirable at the start of the design process.

Essential - *musts*

Desirable - *wants*





Task 1

- o A mobile phone's primary function is as a telephone. List as many other possible secondary functions of a mobile phone as you can think of.
- o List the essential and desirable features of the mobile phone.
- o Select a product of your choice and repeat the previous 2 exercises.



← Task 1 - Suggested answers

Secondary functions of a mobile phone:

Text messaging

Camera

Video recorder

WAP (internet access)

Play games

Personal organiser

Voice recorder

PDA (Personal Digital Assistant)

Essential features:

Make calls

Send texts

Be hand held

Be rechargeable

Desirable features:

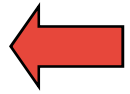
Camera/ Video recorder

Games, etc...

Ergonomic design

Available in range of styles





Performance

All of the design issues discussed in this presentation interlink with one another when considering the design of a product. So when looking at the *Performance* of a product it is important that we consider the following issues:

Durability

Value for money

Ease of maintenance

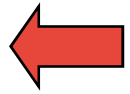
Running costs

Materials and manufacturing processes



Click on the appropriate star

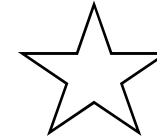




Durability

Durability is the the life expectancy of a product, or how long it is expected to last. For each product its life expectancy depends on the following issues:

Use of product



Market niche

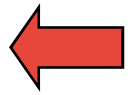


Planned obsolescence



Click on the appropriate star





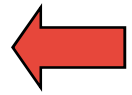
Use of the product

When designing or analysing a product we must consider how, and in what conditions, the product will be used. Linking back to *Function*, if a product is used for something it was not intended for, it may not last very long.

The way the product will be used will influence the choice of materials. For example:

A plastic wing mirror for a car will have to withstand stone chips, washing with detergents, sharp knocks, a range of temperatures, fading in bright sunlight. Sometimes the material will have to accept a painted finish.





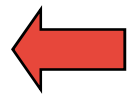
Market niche

Where in the market are you aiming to sell your product?

Bottom end - Cheap but functional for a reasonable lifespan.

Top end - Expensive, best of everything, long lasting.





Planned obsolescence

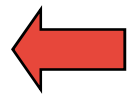
In many instances it is possible to design a product that will last a lifetime. But is this necessary or indeed desirable?

If a manufacturer of washing machines produces a machine that will last forever, what impact will this have on the manufacturer's business?

1. *The manufacturer will not sell as many machines.*
2. *The machines will be very expensive.*
3. *The buyer will end up with a product that still works well, but is old fashioned in style and uses older technology.*

Think of computers - who wants last year's model?





Planned obsolescence

Designers and manufacturers have to find a balance between profit, value for money, durability and satisfying the buyers' desire to own the latest, most fashionable products.

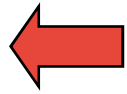
So they build in obsolescence and this allows the manufacturer to constantly sell new models, bringing in more business by continuing to satisfy the buyer's desire to have the latest, most fashionable model.

In reality, most products have a built-in life expectancy.

Light bulbs are expected to last no more than six months in normal use.

Washing machines are designed to be replaced after about six years.





Task 2

Mass produced cars have built-in obsolescence.

1. *Explain the implications of this for the consumer and the manufacturer.*
2. *List two other products which you consider to have built-in obsolescence.*
3. *Often similar products are available with different life expectancies. Consider and compare the following for different ends of the market:*
 - *Cars*
 - *Razors/shavers*
 - *Pens*



← Task 2 - Suggested answers

Question 1

Consumer: Parts of the car will fail after a certain amount of operations and the consumer will have to pay to replace and maintain them. This can be expensive. The more the consumer pays initially for the car the less they would expect to have to pay for maintenance and repairs, i.e. although an old banger may be cheap to buy it may cost more than it's worth to keep it up and running. On the other hand, if the car lasted for ever the consumers would not have an excuse to update their car and keep up with the latest fashion and technology.

Manufacturer: This can work for and against the manufacturer. If they do not build in obsolescence their customers will have no need for warranties and the company may not make as much money through parts and maintenance. However, if they build in too much obsolescence they may require a bad reputation in the market and the consumer will look elsewhere for a more reliable product.



← Task 2 - Suggested answers

Question 2

Products with obsolescence built in:

- o *Electrical goods (irons, fridges, microwaves, etc.)*
- o *Cameras*
- o *Mobile phones*
- o *Electric drills*
- o *Any other suitable products.*



← Task 2 - Suggested answers

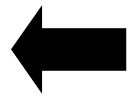
Question 3

Cars: Often, cars at the lower end of the market cost less but are more likely to break down sooner and require parts to be bought and maintenance to be carried out. Whereas cars at the higher end of the market may cost more initially - but they should last longer and have less need for replacement parts.

Razors/shavers: At the lower end of the market, disposable razors are cheap to buy but are intended only for a single use. At the higher end, electric shavers are expensive initially but should last a long time (but there are still maintenance costs - like buying new shaver heads and cleaning equipment, service charges, etc.).

Pens: Disposable ballpoint pens are an example of a pen at the lower end of the market. Once it is finished you throw it away. At the higher end there are refillable pens that cost more to buy but are usually nicely styled. They may suit the user better, especially a person who does a lot of writing and finds a particular pen comfortable to use.



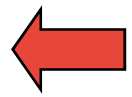


Value for money

To determine whether a product is good value for money you must consider several things:

- Is it worth the price it is sold at?
- Consider its quality, how well it performs its intended purpose as well as other design factors such as its aesthetic and ergonomic qualities.
- Compare the price with like or similar products.





Ease of maintenance

The maintenance requirements of a product depend a great deal on its life expectancy.

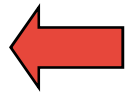
A cheaper product is probably intended to be thrown away after use and will need no maintenance.

A more expensive product is likely to last much longer and will require periodic maintenance to keep it in good order.

Making allowances for maintenance in the design of a product (*i.e. bolting on the panels of a washing machine to allow access to repair or replace parts*) inevitably results in a more expensive product.

In the higher-cost market niche, this may be justified, but at the lower end of the market the increased price may result in a product pricing itself out of its market niche.





Running costs

The consumer may or may not see this as an issue, but in general the less wealthy user of a product will be more likely to be concerned about its running costs.

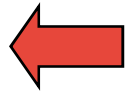
The more affluent will be more concerned about things like the product's aesthetics and efficiency.

For the designer, the product's running costs have to be considered in terms of its market niche.

Running costs tend to be made up of:

- Fuel/energy consumption
- Maintenance costs
- Depreciation.





Task 3

When buying a cycle lamp a teenager can choose between a cheaper model with disposable batteries or a more expensive version with rechargeable batteries.

In terms of running costs, discuss the issues this youngster should consider before making the choice.



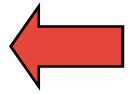
← Task 3 - Suggested answer

Cost is obviously the main issue here as teenagers do not usually have much money.

When deciding which lamp to buy the teenager must consider how often he/she will be using the bike after dark. For example, if the teenager has a paper round and will be using it every morning or if they have an evening job and cycle home each night it may be worth while spending that extra bit of money on the purchase of the rechargeable lamp.

However, if they only used the bike at night or early morning on the odd occasion, it would probably make sense to purchase the cheaper alternative and replace the batteries every once in a while.





Materials and manufacturing processes

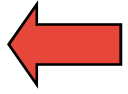
Materials

When coming up with a design for a product we must consider how many are to be produced, who the target market is, what the product is going to be used for, how and where it is to be used. When we have established all of this it becomes easier to decide which materials would be most suitable for the job.

In order to decide which materials to use we must have an idea of what *properties* we wish them to have.

For instance, a car wing-mirror must be waterproof, resistant to sunlight, impact resistant, chemically resistant and corrosion resistant. On top of this, the shape of the wing mirror must be able to be formed easily as it is a 'mass produced' product.





Task 4

Select a product of your choice, analyse it and justify the materials used considering the following points:

- how many would be produced (*production method*)
- who the target market is (*cost*)
- what the product is used for (*properties*)
- how it is used (*properties*)
- where it is used (*properties, environment*).



← Task 4 - Suggested answer

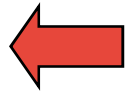
Suitable analysis of any product considering as many of the points stated as possible.

The justifications should be backed up with factual information from textbooks, the internet or elsewhere, e.g. when justifying the properties of the materials.

Suggested method of answering:

- *Selected product, and materials used stated clearly at the top of the page*
- *Each bullet point written out and underneath each one a short written answer*
- *A short conclusion.*





Materials and manufacturing processes

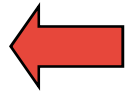
Manufacturing processes

As we select an appropriate material from which to manufacture the product (or parts of the product) we must also consider the best way to manufacture it.

When selecting the best method of manufacture we should consider the following:

- The materials to be used
- The number of products to be produced (one-off, batch, mass)
- The location of the manufacturing facilities (locally would be ideal)
- The cost of tooling, materials, labour, etc.





Materials and manufacturing processes

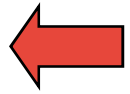
Most products can be made in more than one way, e.g. metal castings can be made one at a time by sand casting or many at once by die casting.

Sand casting is a relatively cheap process and is ideal when numbers are low (<100)

Die casting uses expensive moulds but many items can be produced at once.

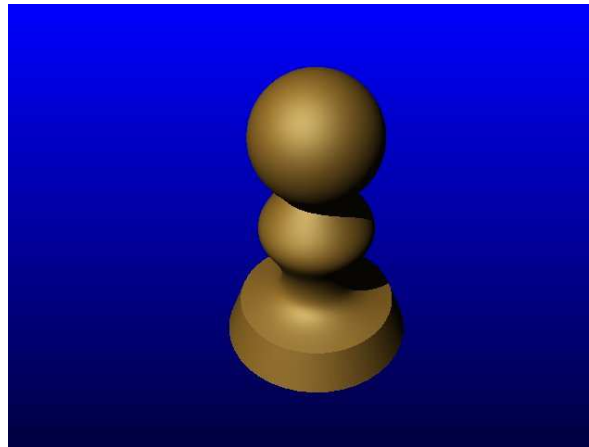
So the most appropriate method must be selected to suit the product to be manufactured.





Task 5

Consider this chess pawn and consider two different methods of manufacturing it. One method for a product aimed at the top end of the market and another for the bottom end of the market. Justify your choices.



← Task 5 - Suggested answer

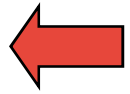
Top end of the market

It could be made of solid brass and would be turned on a centre-turning lathe and polished. This would be a time-consuming process and therefore more expensive but the product would be substantial and would give the feel of being higher quality. Or turned ebony wood (black) and boxwood (white) could be used.

Bottom end of the market

It could be cast using a cheaper metal and then given a coating to make it appear more expensive. This process would be much cheaper and suitable for producing batches, and it would also give a lighter product. It would have lines down the side of it where it had been removed from the mould. Or injection-moulded plastic could be used.





Market

Marketing is a subject in its own right; but a designer must be aware to a certain extent of what marketing entails in order to design a successful product. Here we shall look at the following:

Identifying the market

Commercial enterprise

Market research

Market pull/technology push

Fashion/style/fads



Click on the appropriate star



← Identifying the market

To design a product that will appeal to everybody is pretty much impossible. So designers tend to break people up into groups and target them specifically. This is called *niche marketing*.

The four major groups that people are broken up into are:

- **Geographic** - *such as countries, regions, cities*
- **Demographic** - *such as age, sex, income, education*
- **Psychographic** - *such as personality, lifestyle, social class*
- **Behaviouristic** - *such as purchase frequency, usage, benefits sought, brand loyalty*



← Identifying the market

Each of the four market segments can be narrowed down even more by designers by splitting them into age ranges.

- 5-10 yrs - this age group could be classified as **fun** years
- 11-17yrs - these are often **fashion**-driven years
- 18-25 yrs - most people become **independent**
- 26-35 yrs - many people are motivated by their **careers**
- 36-55 yrs - often **family** becomes the major priority
- 56+ yrs - this is a time when more **choice** is available



Commercial enterprise

Probably the single most important factor the designer has to consider is cost. This obviously affects the volume of sales and therefore the profit for the company.

The designer should take advantage of any factor which is likely to create a market niche. This will give the product a head start in the marketplace as it ensures reduced competition.

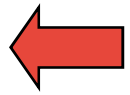
Creating a market niche can be achieved in many ways...



Commercial enterprise

1. Using new technology to make new and better products than before
2. Use of new materials and processes to save costs
3. Creating a new use or image for an existing product to give it a new lease of life
4. Use of clever marketing, e.g. linking products to fashion trends, books, films, etc.





Market research

At some stage the designer will have to carry out market research (this could be before or after the target market has been defined) in order to gather information about how well the product will sell, what the public want and what the competition is like.

The two basic types of research techniques are **desk** research and **field** research.

Desk research

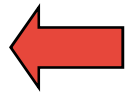
➤ External sources

Reports, newspapers, journals, media reports, government audits

➤ Internal sources

Accounts, sales records





Market research

Field research

➤ Experiments

Such as demonstrating a new product in a store after its launch

➤ Audits

Carrying out a check of product stock in shops and stores

➤ Observing

Like noting how many people use a public telephone over a set period

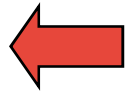
➤ Recording

Counting how often consumers use a specific product over a set time

➤ Surveys

Interaction with a specific market group through questionnaires, individual interviews and group interviews





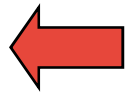
Market pull/ technology push

Products can be developed through "market pull" (consumer demand) or "technology push". Market pull is when the market recognises a need for a particular product. Technology push occurs when technology produces a new/improved product for which demand has to be created: thus, it is being 'pushed' onto the market.



A "Pushme-Pullyou"



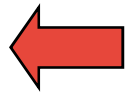


Consumer demand

Consumer demand, also known as market pull, produces products that derive from the demands of the market. In most cases this demand is identified through market research. Designers and manufacturers are always looking for new markets in which to sell their products, or markets for which they can design new products (market niche).

Specialist market research companies are constantly gathering data on the requirements of the market-place. Often this is done by questionnaire. A market researcher complete with clipboard is now a common sight on our High Streets. Sometimes the data collected will be offered for sale by the research company.





Consumer demand

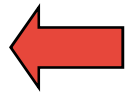
Any designer or manufacturer who does not carry out thorough market research is taking a very great risk indeed.

A classic example of this is the Sinclair C5 which was developed by Sir Clive Sinclair.

After a huge success with his computer innovations, Sinclair decided to design a small electric three-wheeled vehicle intended to be a powered alternative to the bicycle.

Although it was an innovative product and a technological success story, lack of market research doomed it before it even started.





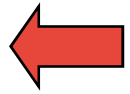
Consumer demand

Market research has led to a number of success stories however.

VW introduced the *Golf*, which was the first real hatchback car, in direct response to the results of market research. This design satisfied an identified need for a small economical utility vehicle which fitted in with the lifestyle of the modern European.

Other successes in this area have been products that satisfy a need to provide for a healthy, environmentally sound lifestyle. Examples of these are organic foods, biodegradable detergents and sports equipment such as home exercise machines.





Task 6

Designers recognise the market force of people wanting to buy products which they feel will boost their personal image.

1. Give two examples of products which you feel may be bought for this purpose.
2. Give one reason for each of your choices.



← Task 6 - Suggested answer

Mobile phones

They are seen as accessories nowadays and it is uncommon not to own one. Due to the fashion status attached to having a mobile phone people feel they need to keep up to date with the latest technology to boost their personal image and social status.

Cars

These are also often bought to boost one's personal image, more so within the younger car-buying generations. The latest model that can be added to and personalised is often desirable.

Other image-linked products include computers, games consoles, clothes, jewellery, electrical gadgets, etc...



← Technological opportunity

Products which appear on the market sometimes do so as a result of technological innovation. As we saw, this is often referred to as technology push. Scientists, engineers and designers are always looking for new ways of doing things and always striving for the ultimate solution to a given problem.

Often new technology is stumbled upon in this search. Sometimes the new technology has an immediately obvious application and sometimes not. Sometimes technology is transferred from one application to another.

In other words sometimes new technologies create new products and therefore a completely new market niche appears. (This is one of the four ways to create a market niche mentioned in the 'Commercial Enterprise' section).



← Technological opportunity

Examples of products from new technology:

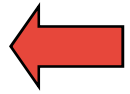
Microwave oven - from research into wave energy

Ceramic knives - from space-shuttle research. The shuttle nose is covered in ceramic tiles

Sony Walkman - through advances in microelectronics

CD player - through advances in laser technology.





Task 7

Select a product that was initially a 'technology push' but once introduced to the market became a 'market pull'.

Explain your answer in detail.

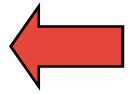


Task 7 - Suggested answer

The mobile phone was initially a 'technology push' and came about due to advancements in microelectronics and communications technology. In their initial stages mobiles were very expensive and only the rich could afford to have them. As they developed, although they were not expected to catch on, some people bought them as an emergency device to be kept in the car.

As the costs came down due to the development of the technologies and competing manufacturers, people started to become more interested and now through clever marketing (using celebrities to endorse them) people are demanding better phones with more functions and more choice.





Fashion/style

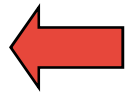
Product design, like all areas of creativity, follows patterns or trends in style. These trends are closely linked to fashion.

Throughout design history there have been very distinctive styles that can be linked to specific periods in time, such as:

- Victorian (1830s to 1890)
- Art Nouveau (1890 to 1905)
- Art Deco (1925 to 1939)
- Pop art (1960s)

Each one of these styles was fashionable during the periods indicated and has features that make each particularly recognisable.





Fashion/style/fad

The difference between fashion and style can be confusing.
Think of them as:

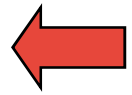
Fashion - a trend that tends to change over a period of time

Style - something that lasts forever, even if it is associated
with a period of time

There is also something else called a 'fad'. Fads are seen as short-term gimmicks that are very popular for a brief period of time and then the hype dies down and they are dropped.
Examples of fads are:

- Yo-yos
- Electronic pets
- Mini scooters





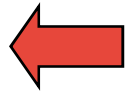
Fashion/style/fad

In order to keep up with the market, designers must use market research to find out what the current trends are and respond to them with the style of their products.

Although products designed by the leading designers are very expensive, it is still possible to purchase 'style' products that have been mass produced at relatively low cost. IKEA, for example, sell stylish furniture at very low cost.

Designers also have to take advantage of fashion changes in order to cash in; think of how fashion designers produce clothes by the season and come up with new ideas to keep us spending.





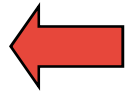
Fashion

Increased awareness of the problems facing the environment has also influenced design.

Many new products are designed to be recycled, e.g. the MK3 Volkswagen Golf

Products are often made from recycled materials. This has become fashionable.





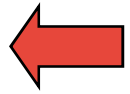
Aesthetics

This is concerned with the 'appearance' of a product. This is a very important factor with regards to selling a product because it is literally the first thing the consumer sees. If a product catches your eye and interests you enough to investigate it further it is said to have the 'X-factor'.

Every product has aesthetic qualities that can be examined in depth. Consideration must be given to the following:

- Shape
- Form
- Line
- Colour
- Proportion
- Contrast
- Harmony
- Balance
- Light
- Pattern
- Texture
- Rhythm





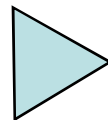
Aesthetics

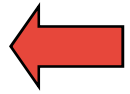
We shall now look at some of these aesthetic qualities in a bit more detail.

Shape

Shapes are 2D (i.e. squares, circles, ellipses, etc.) and certain ones can affect us in certain ways, particularly those based on the human body as they relate to our most primitive feelings.

In the analysis of a product look for the different shapes used within them, e.g. on a mobile phone look at the overall shape of the handset, the shape of the screen, the shape of the buttons, etc. and decide how well they go together. Many products combine different shapes for contrast; some use shapes to help identify a function; for example, think of a DVD player's remote control.





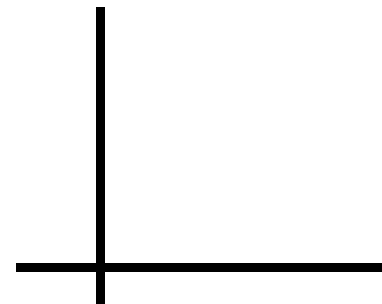
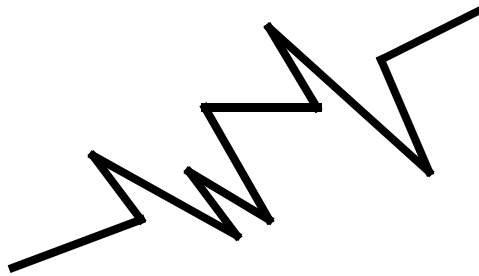
Aesthetics

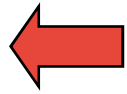
Form

Form is shape with the third dimension added. For example, the square becomes a cuboid, the circle a sphere or cylinder, etc. The form of a product gives us a perception of its bulk; it can help a product to appear large and heavy or small and light.

Line

Different types of line can create different effects. A horizontal line is associated with passive or stable feelings, whereas a zig-zag suggests excitement and even chaos. A vertical line on a horizontal line can dominate the horizontal by stopping our horizontal eye movement.





Aesthetics

Colour

Colour affects us in the same way as shapes. Red and orange will make us feel hot, while blue and green make us feel cool.

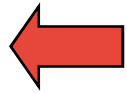
It has been proven by experimentation that a red room will tend to raise the blood pressure of the people in it while a green room will lower it.

Red can also suggest danger, whereas blue evokes passive feelings. Black and yellow are used together to suggest danger and are often used in warning signs. In nature they are used by bees and wasps to warn others to stay away.



We also associate colours with commands and functions, i.e. green for **GO** and red for **STOP**.





Aesthetics

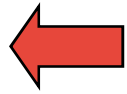
Colour cont...

Colours relate to each other in different ways. For example, colours that are next to each other on the *colour wheel* are said to be in harmony, while colours that are opposite each other are contrasting or *complimentary*.

Our response to any sensation can usually be increased by using contrast, for example, a sweet taste can be made sweeter by contrasting it with a sour one, and a loud noise seems louder if it comes after a period of silence.

If a product has an equal colouring of red and green (two colours opposite each other on the colour wheel) it may appear garish and unsettling, but if the product is mostly red and uses small amounts of green, it can help to enhance the red without creating a garish colour scheme.





Aesthetics

Proportion

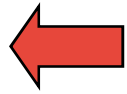
Proportion concerns the relationship of one size or area to another. Proportion can be used to balance, contrast or highlight different areas of a design.

In an asymmetric composition, like the one shown below, the large difference between the sizes of the two surfaces creates a contrasting effect where one area is contrasted against another. This can create a dynamic look.



The balanced or symmetrical composition, shown below, gives an impression of stability and order.





Aesthetics

Proportion cont...

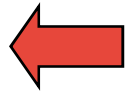
There is something in design called the "Golden ratio", or the "Golden section", or the "Golden number", or "Phi". Basically, this "Golden ratio" is 1:1.618 and was defined by Euclid over 2000 years ago. It is said to have been used in many works of art and architecture over the years and it also appears in mollusc shells, sunflower florets and the shape of the galaxy to name a few.

From a practical point of view, if you can incorporate this "Golden ratio" in your designs they should look just right.



For example, this bed was designed considering the "Golden ratio". The length and width were designed considering the size of the mattress that was to fit it, but the headboard is 1.618 x the size of the tailboard and it appears to look just right.



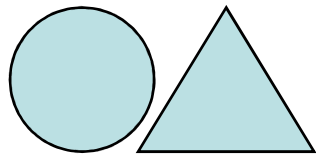


Aesthetics

Contrast and harmony

As mentioned before, to increase our response to any sensation we can use contrast.

This is the most dynamic of visual techniques, where different parts of a design can be compared or differences made clear. Contrast can be made using shape, colour, texture, pattern, etc.

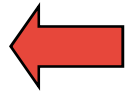


On the other hand, the above elements (shape, colour, etc.) can be combined to give design a harmonious look.



The almost oval shape of the wing mirrors combined with the overall flowing shape of the car gives the Audi TT roadster a harmonious look.





Task 8

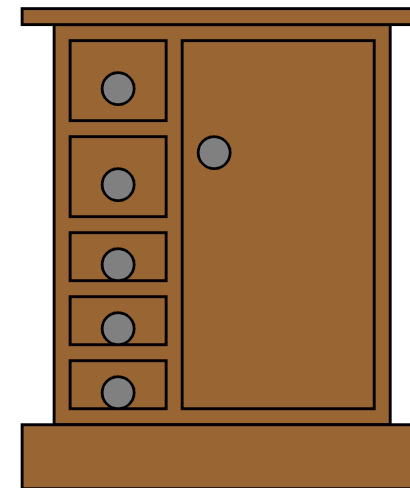
1. Two kettles are shown below.
 - a) Write a comparison of both in terms of aesthetics.
 - b) Decide which one appeals to you more and explain why.

Kettle A



Kettle B

2. A design for a drawer unit is shown on the right. Suggest how the proportions could be altered in order to make it more pleasing to the eye. Use notes and sketches to explain your answer



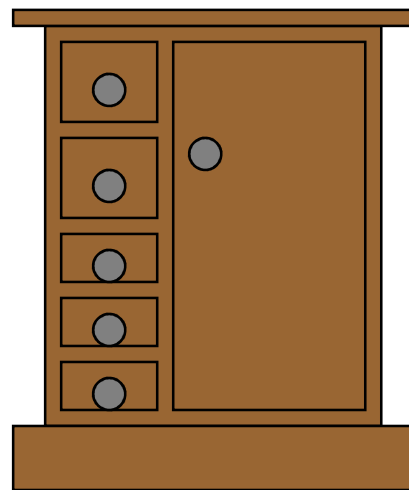
← Task 8 - Suggested answers

- 1.A) Kettle 'A' is a *dynamic* and *streamlined* kettle. It has a large base which looks *stable* and it tapers up to a point at the top. The kettle does look *balanced* but it also looks like it might be quite heavy to pick up when full. The shapes used for the main body are mostly *round, soft* shapes and combined with the *sharp* spout shape and the almost *straight* handle, this creates a *contrast* that accentuates the soft body shape. The colours used look very *stylish*, silver with elements of black, and it looks *modern* and '*clean*'.
- B) Kettle 'B' is very simple and could be described as *boring* in design. It looks quite *boxy* in shape with a very *straight* handle and body. The base is not wider than the top but it does still look relatively *balanced* and *stable*. It does not look as if it would be too heavy to lift up when full, but it does look like it may be awkward to pour if full. Its colour is quite *bland*, with the only *contrast* being the red switch. So it would *blend in* with the other 'white goods' in a kitchen and could be seen to be a 'safe design' in this respect.
2. A decision should be backed up with appropriate reasoning.

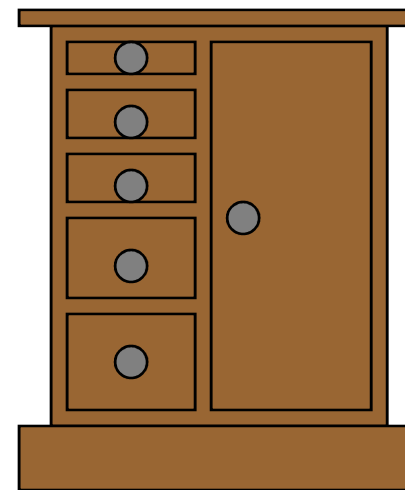


← Task 8 - Suggested answers

Drawer unit 'A' is quite disproportioned, but by making only a few minor changes it can be transformed into a unit that is more pleasing on the eye. The main door on drawer unit 'B' has been made half the width of the front unit giving it a more balanced look. The door handle has also been moved to the halfway point as well to help it look more symmetrical. The drawers have been altered so that there are 2 large drawers at the bottom which not only help it to look more stable, but would encourage people to place larger and heavier items in them. The drawers become smaller the higher they are positioned.

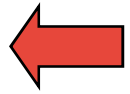


Drawer unit A



Drawer unit B





Ergonomics

Ergonomics is the study of how humans interact with their environment and the products they use.

It can be sub-divided into three main areas:

➤ Anthropometrics



➤ Physiology

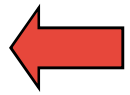


➤ Psychology



Click on the appropriate star





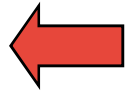
Ergonomics

Anthropometrics concerns the measurements of the human body. A survey is made of around 1 million people between the ages of about 19 - 65 with every relevant part of the body being recorded.

This information is then compiled to make charts called 'Anthropometric data tables' which show us what the smallest, largest and average sizes are. This information is very important when designing for people.

From the tables, designers only use information from the 5th to the 95th percentile. This is because they want to be able to cater for as many people as possible and the people from the 0 - 5 percentile and those from the 96th - 100th percentile are seen as being too extreme, i.e. too small and too big.





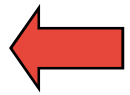
Ergonomics

Physiology is concerned with the study of the systems within the human body, their responses, limitations and capabilities. Designers may have to consider strength, fatigue, muscle control, colour perception, hearing capabilities and other features when designing for people.

For example, when designing the braking system for a car it must be able to be operated effectively by all drivers. Anthropometric information must therefore be gathered about the strength of people's legs, as well as on lever and hydraulic systems designed to suit the forces required.

The legs are used for the repetitive tasks in driving such as applying the brakes and the clutch because they are much stronger than arms and hands, which are more nimble and better suited to finer controls like using the steering wheel or adjusting the volume on the radio.





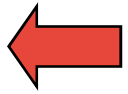
Ergonomics

Psychology is concerned with the human mind and the way it works. Human senses (sight, hearing, smell, touch, taste) are continually being stimulated and send messages to the brain where they are processed. Some signals are ignored while others provoke a rapid response, some are interpreted accurately whereas others may be misunderstood.

Understanding some of these processes involved in the interpretation activity proves to be vital in the development of a good design.

An example of psychology being taken into consideration at the design stage is mobile-phone buttons. When you press the button, you 'know' that you have pressed it because it makes a 'click' sound or it lights up or makes a noise. The phone does not need to do this to operate, but these features are included because it makes it easier for us to use.





Task 9

1. Measure the heights of all the people in your class and make up a table of all the sizes to show who is the smallest, average and tallest.

Now that you have this information, how might you be able to use it from a design point of view?

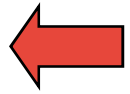
2. Why is an adjustable chair a better option for someone who works at a desk all day?
3. What other issues affect the fact that most school chairs are non-adjustable?
4. What physiological issues need to be considered in the design of a laptop computer?
5. What areas of a kettle suggest that psychological issues have been considered to make it a more 'user friendly' product?



← Task 9 - Suggested answers

1. *This information could be used to aid the design of a bed or a doorway or anything else that involves a person's height.*
2. *It can be adjusted to suit that particular person's posture. If they do repetitive tasks all day, comfort is important to minimise repetitive strain injury (RSI).*
3. *Cost affects the choice of chair in the classroom. Although adjustable chairs are a more comfortable choice, they are more expensive and to furnish every classroom with them for a lesson that will last no more than an hour and a half does not balance up.*
4. *As it is portable, the weight is an issue. If it is too heavy people will tire after carrying it around for a while. The screen must open up easily without causing strain. The buttons must be easy to push; if they are too stiff they could cause RSI.*
5. *The on/off switch makes a 'click' sound when the kettle is switched on; a light usually comes on to indicate that it is boiling; the on/off switch 'clicks' off when the water has boiled; there is a water gauge to indicate how much water is in it; this is often by the cup as opposed to litres.*



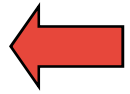


Economics

Most products are much cheaper to buy today than in the past. This is mainly due to the economies of mass production. The more a process produces, the cheaper each item becomes. The use of modern materials, e.g. plastics, means that complex items can be produced by a single process like injection moulding.

Savings can be made by careful selection of the most suitable materials and processes. Designers also make use of standard components to reduce costs, for example with bulbs, switches, simple fixings to alternators and even whole engines. Manufacturers will often use facilities in other countries where labour costs are lower than at home. Many products are manufactured in countries such as China or Korea where labour costs are very low and efficiency is high compared to Europe.



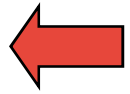


Economics

The price of a product depends on creating a balance between:

- Manufacturing costs
- Advertising and distribution costs
- Design and development costs
- Profits, overheads and reinvestment
- Prices set by other manufacturers





Environment

Three key considerations of the environment should be kept in mind:

Pollution



Aesthetics



Sociology



Click on the appropriate star



← Environment and pollution

Pollution is created by the manufacturer - during the making of the product, its use and/or its disposal at the end of its life.

Designers have a large responsibility to the environment and must try to keep pollution to a minimum in their designs.

Some products are advertised as being 'environmentally friendly', like the Volkswagon Golf MK3.



VW Golf MK3

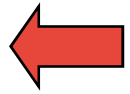


Environment and pollution

For this to be true these conditions must apply:

- The use of finite resources must be avoided
- Most materials should be recyclable (>90%)
- The processes used in manufacture should not pollute the environment
- The waste products produced during manufacture should not cause pollution
- The operation and maintenance of the product should not pollute the environment
- The disposal of the product at the end of its useful life should not pollute the environment





Task 10

Designers today are accepting a growing responsibility for the conservation of some of the world's dwindling resources. Recycling is one way in which this is being tackled.

Briefly describe how the need for recycling has affected:

1. Soft-drinks packaging.
2. The family car.



Task 10 - Suggested answer

- 1. Soft-drinks packaging has been influenced by recycling in that cans are now made of aluminium which can be recycled and used again. Cardboard juice cartons can also be manufactured using recycled material, as can plastic (PET) containers.*
- 2. The family car is now made up of a lot more plastic parts, which can be recycled, and some of the metals used are now much thinner in section and can have lower melting points allowing them to be recycled more easily. Because designers are always looking for materials that are strong, light and easy to recycle, this has had an effect on material development. Lots of car parts are standardised, making them more 're-usable'; for example if you needed a part for your car, you could find the part at a scrap yard instead of ordering a brand new one.*



← Environment and aesthetics

The designer has the ability to create products in any style he/she chooses. It is possible to design products that merge well with their environment or alternatively those that contrast with their surroundings. Products which harmonise well with their surroundings are pleasing to the eye but might be considered boring by some.

A bus shelter may be designed in mock Georgian style to blend in with the surrounding architecture. However, this "safe" approach can create an environment which could be described by some as monotonous.



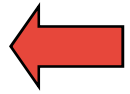
← Environment and aesthetics

Alternatively the designer might choose a modern design to contrast with the existing buildings. S/he might use modern materials such as steel and plastic and incorporate features such as integrated lighting so that the shelter stands out day and night. This concept can be seen in the glass pyramid metro entrance at the Louvre in Paris.

This bold approach to design can be shocking and often attracts controversy, particularly in relation to architecture.

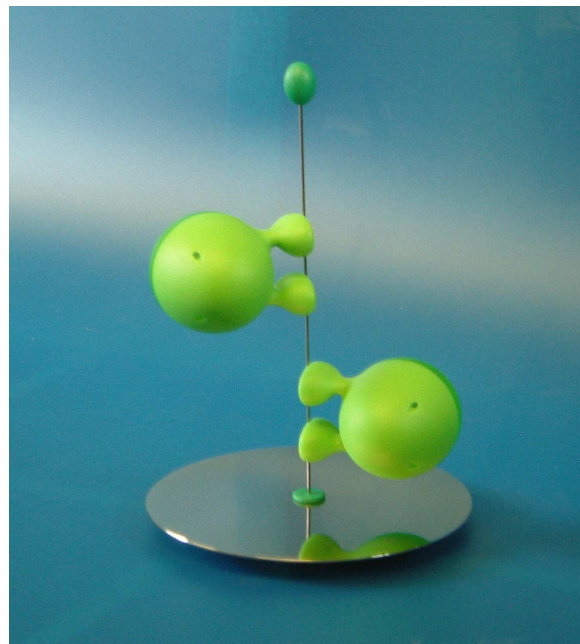
Such an approach can be interesting and exciting to some people and yet offensive to others. The designer then has to come to a decision regarding the impact the design will have and then decide if it is acceptable.





Task 11

What approach has the designer of the salt and pepper pots below taken in their design with regard to their environment?



"Lilliput" salt and pepper set by Alessi 1993



← Task 11 - Suggested answer

The salt and pepper pots are to be used in a kitchen/dining room environment where traditional shapes and colour schemes are usually adopted. These stand out because they are very colourful and of an interesting shape (almost egg-like, which does in fact tie in with the kitchen theme), that may or may not 'blend in' with a typical kitchen or dining room environment. The designer has been very bold with this product because it is not obvious that the product is a salt and pepper set.



Environment and sociology

The physical and social impact of the product on the user and society in general need to be considered.

Studies show that if we simply alter the lighting from day to day in a factory, it will improve the output of the workforce. It is not the quality of the light but rather that there has been a change that causes this. A changing environment is more stimulating and therefore more motivating than a static one.

Products such as computers or even hair dryers all have a bearing on our general state of mind, particularly in a society where people lead very busy lives. The feelings of frustration we feel when a product fails to function are commonplace. Well designed products should be pleasing to use, reliable and do the job they were designed to do.



← Environment and sociology

In catering for the needs of the individual the designer must consider age, culture and physical ability/disability. They all have an effect on a user's reaction to the product.

A designer must try to make new technology as user friendly as possible; for example 'high tech' products can be threatening to older people because they do not understand how they work, which makes them feel insecure.

Care must be taken that a design does not cause offence to a particular race or culture.

Many products do not take into account the problems of the elderly, disabled or very young. In particular handles and switches are often too small or difficult to operate. With some thought many of these problems could have been avoided. Good design will take account of as many users as possible.



← Environment and sociology

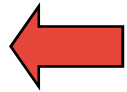
People's lifestyles have changed over the years and these sociological factors have an effect on Product Design.

Today leisure time is seen to be very important. Factors that would have been important even thirty years ago are seen as unimportant today.

Tasks such as cooking and cleaning have to be quicker and easier to do, hence the increase in the use of things like precooked foods, microwave ovens and dishwashers.

People therefore now have more leisure time and this has increased demand for items like stereo systems, video and more recently home cinema. Linked to this has been the increase in the use of sports / leisure equipment such as exercise bikes, jogging machines and sun beds.

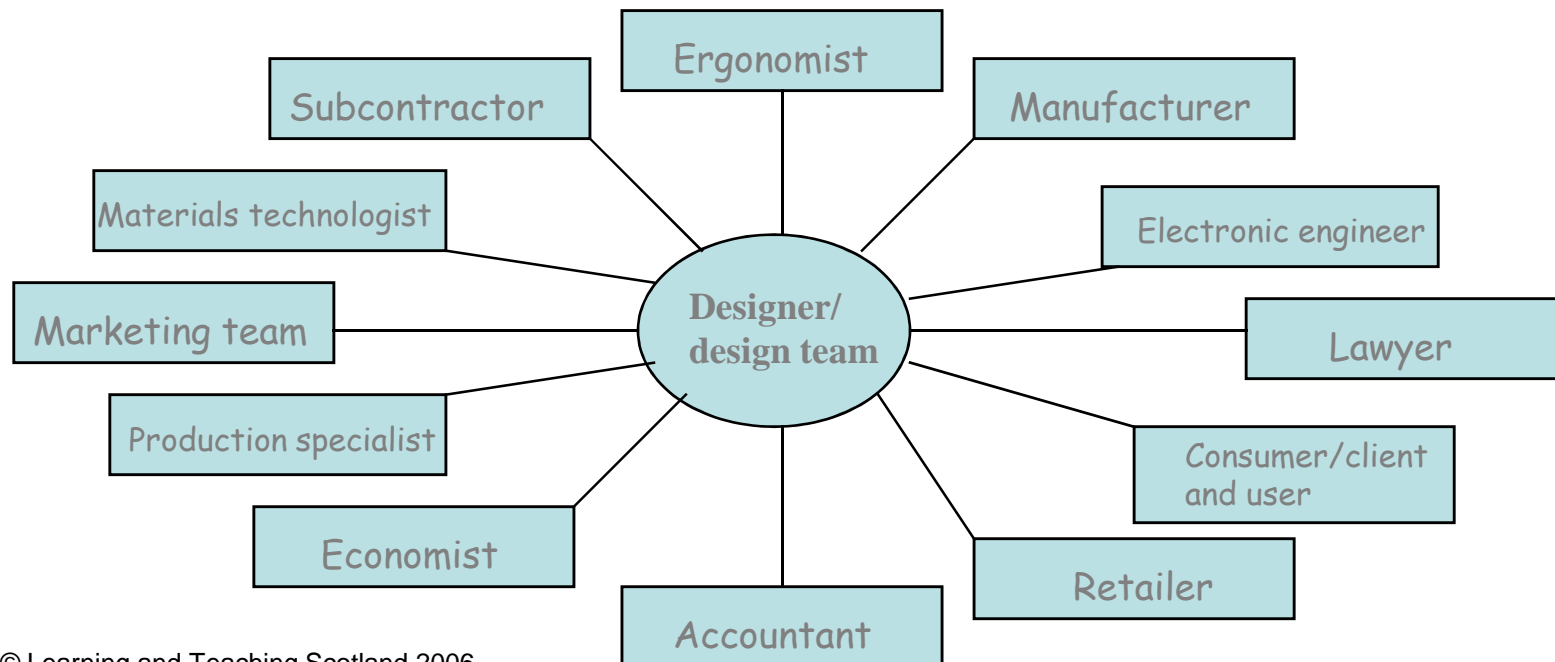


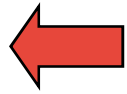


The design team

Products today have to compete in very wide market places and most commercially-produced items are mass produced. They are usually the result of quite extensive developments in materials, systems technologies and production methods. The more complex nature of modern products has made it impossible for any single designer to work on his or her own. Most designers now work as part of bigger teams, liaising with other experts from time to time.

The diagram below gives an indication of the type of experts who may be asked to contribute to a design team.





The design team

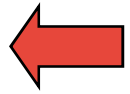
Ergonomist: Works with all aspects of ergonomics specific to the product being developed. Will give suggestions to the designer as well as facts relating to the human body and human behaviour.

Manufacturer: Manufactures the components of the product and assembles the final product. Uses the plans and specifications given by the designer.

Electronic engineer: Has knowledge and experience of electronics. Can advise the designer about this area with regard to what is possible for the product.

Lawyer: Advises the designer on all legal aspects including *intellectual property* and ensures that the product being designed does not breach copyrights in the other products by rival companies or vice versa.





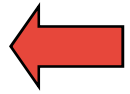
The design team

Consumer/client and user: Person who will buy/use the the product. Can aid the designer by offering opinions and feedback on the product at various stages of the design process. Consumer demand: the consumers have either a **need** or a **want** to which the designer will try to respond.

Retailer: Sells the product to the consumer. Can aid the designer by telling him/her what the public want and when they want it. Retailers can identify trends in sales and target markets, i.e. who is buying what and when. Retailers are the first people to know what is selling well and what is not.

Accountant: Budgets the project. Offers advice to the designer on the costing of the project, restrictions, etc.





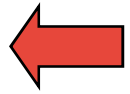
The design team

Economist: Has knowledge of local, nationwide and worldwide economies and can offer advice on whether or not people are likely to buy the product. Taxes, house prices, petrol costs, etc., have a direct effect on people's lives and can control their standard of living.

Production specialist: Has strong knowledge of available processes and offers this to the designer during certain stages of the design process. Will try to find the most suitable method of production for a product by taking into consideration economics, environmental concerns, materials, availability, etc.

Marketing team: Carries out research on what the consumers' wants/needs are. Compiles findings and presents to the designer. Also is involved in the advertising and aids with sales of the product.





The design team

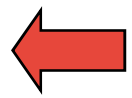
Materials technologist: Has knowledge of materials and their properties. Offers advice to the designer about the materials which would be best suited to the job, taking into consideration their properties, working characteristics, cost, availability, etc.

Sub-contractor: Carries out work on certain areas of production. Could be used to manufacture components that the main manufacturer could not produce (i.e. electronic circuitry, specifically engineered components); or could be used to save time. Advantages of sub-contractors are:

- They will already have the specialist skills required
- They will already have the facilities available for manufacture.

Sub-contracting saves the company investing in new machinery/facilities and training the work-force how to use the machinery. If a company sub-contracted successfully it might consider expanding its market, i.e. by investing in electronics fabrication tooling, it might decide to further develop products of this type.





Intellectual property

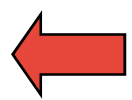
What is intellectual property?

Creative processes generate new ideas, whether in the field of product design, music, art or elsewhere. These ideas, which may have commercial value, are the intellectual property (IP) of the creator, whether they are an individual or a company organisation.

IP can have enormous commercial value, and can be traded as a commodity. However, commercially valuable ideas can be at risk if not carefully protected, and others may gain commercial advantage as a result. Over the last three hundred years five different types of IP protection have been developed on top of the first type ever used: *Confidentiality*.

These five types of protection are: *Copyright, Trademark, Design right, Registered design, and Patent*.





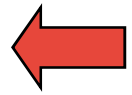
Intellectual property

Why is intellectual property important?

IP is important because it brings benefits to those who know how to take advantage of it. The two main ways to do this are:

- 1. Ideas can be protected from exploitation by other parties*
- 2. Much research work becomes public and is thus a valuable resource*





Intellectual property

Confidentiality



Copyright



Trademark



Design right



Registered design

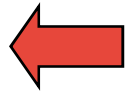


Patent



Click on the appropriate star





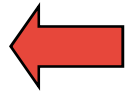
Confidentiality

Background

This the big name for secrets. Secrets have been around for a long time, and they are cheap to keep as long as the people keeping them can be trusted. In general, the fewer people who know a secret, the safer it is. Some companies use confidentiality rather than patents because applying for patents results in the application becoming public. Not much use if you are designing a top-secret product!

But secrets are not much use for some people. For example, protecting a new tune with a confidentiality agreement would mean that the composer would never earn any money, as no one would be able to hear it.





Confidentiality

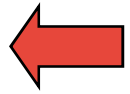
Example

Only three people in the world know the exact recipe for Barr's Irn Bru. Until recently they were all members of the Barr family, but now one of the company employees has the 'know how'. The reason that the recipe is kept secret is that competitors have to guess how to copy it, whereas if it was patented they could visit the patent library, find out exactly how it is made and alter their own brew slightly, and not to infringe the Barr patent. Some agreements prohibit those 'in the know' from travelling together in the case the secret is lost due to an accident.

Process

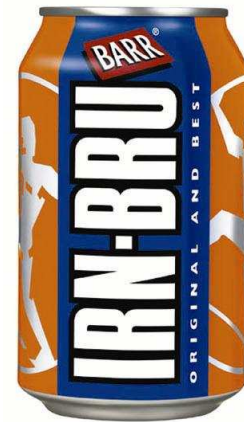
A confidentiality agreement is usually drawn up by a solicitor and is signed by those 'in the know'. This is then legally binding and any breach could result in legal action.





Task 12

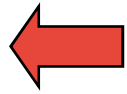
1. Try to find some other examples of well known 'secret recipes'.
2. Explain why Barr's Irn Bru is kept secret and not patented.



Task 12 - Suggested answers

- 1. Drambuie, Heather Ale, Campbells soup, Kelloggs Frosties, Mars Bars, etc.*
- 2. The recipe for Irn Bru is kept secret because, as a commercially successful product, its makers need to prevent competitors from copying the recipe.*



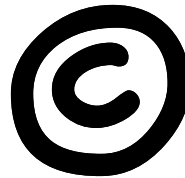


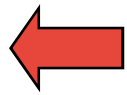
Copyright

Background

Copyright is used mainly to protect written, printed or broadcast materials, and is relatively simple to use. It actually exists on any written piece, the copyright usually belonging to the author automatically, although it can belong to the company employing the author if that has been agreed. Look at the bottom of this page to see who owns the copyright in this PowerPoint presentation.

The copyright can be bought and sold in the same way as any other commodity.





Copyright

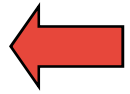
Example

The most obvious examples of copyright are books and other printed materials, where the copyright usually belongs to the author, or the publisher. Films, TV programmes, songs and music are nearly all protected by copyright. Pop groups often copy other groups' songs; this is called making a cover version. The second band to record the song have to pay royalties to the writer of the song and therefore do not make as much money.

Process

The simplest method to ensure that the copyright is known to belong to the author is to mark the item with the © mark, and then proving it was produced on or before that date. This proof can be easily provided by the author posting a copy of the item to themselves and not opening it on its return. The postmark on the stamp is proof of the date of posting. This can be used as evidence if someone else is found to be infringing the idea. A more formal method is to send a copy to a lawyer or bank for safekeeping. A copyright registry exists for music, and this charges a fee.





Task 13

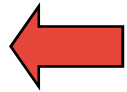
1. Make a list of five items that you can find with the copyright mark © on them.
2. Design a logo which uses your own surname, and copyright it using the postal method stated on the previous slide. Remember that copyright only protects the appearance of your design and not the actual word.



Task 13 - Suggested answers

- 1. Five suitable examples of copyright work might be books, sheet music, CDs, photographs, maps, etc.*
- 2. Suitable standard of design work for the student concerned.*





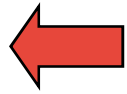
Trademark

Background

Trademarks are all around us nowadays; indeed you may be displaying some on your clothing as you read this. Most logos that you see on anything from adverts to clothing are Trademarks. They identify the product with a company, and the company hopes that its image will help to sell the product. Trademarks have been registered since 1876, at the Patent Office.

Trademarks are usually words, although it is becoming more common for other items to be protected in this way too, for example tunes (T-mobile) and aromas (perfumes, etc.). Companies protect their names to prevent other competitors from copying or 'passing off' their products. It is common practice not to trademark the company's own name, but only the 'brands' that they produce. Some companies may wish to protect their company logo and in some cases this can be done, for example Nike.





Trademark

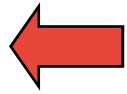
Example

There are thousands of different trademarks in existence at present, and many more whose protection has expired. Trademarks have become a fashion accessory, particularly in the clothing industry, where clothing manufacturers use their trademarks to create very strong brand images, which the public find desirable and stylish.

Trademarks are applied in groups, each group representing a different range of products. For example, the name Mazda is trademarked by three different companies: the car manufacturer, the light-bulb manufacturer and the cooking-oil manufacturer. The reason this can be done is that each company operates in a different sector and thus will not be competing in the others' markets.

There are different trademark sectors, and as it costs money to register for each sector, most companies only register in the sector that directly affects their business.





Trademark

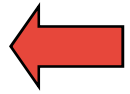
Process

Companies do not have to trademark their names, but it can be very worthwhile to do so. Even if a name is not registered, after some time it will begin to be associated with the product and rights will be established: these names have TM beside them. However, registering the trademark is much more clear cut and has distinct advantages. Trademarks are best applied for early in a product's life to prevent problems. When a company applies to the Patent Office for a trademark a search is carried out to find whether other companies are using the same or similar names. Companies can have the same name however if the other company falls into a different sector.

If a trademark is granted it can last forever, or as long as the company keeps paying the renewal fees every 7 years, and the letters RTM or the symbol ® can be used beside the name.

The first ever trademark registered was by Bass, the brewers, and it is still registered.





Task 14

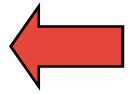
1. Make up a trademark for an imaginary product you have invented.
2. If internet access to the Patent Office website (www.patent.gov.uk) is possible, conduct a search in the Trademark Register for your invented name to see if anyone else is already using it and if so, what for?
3. What is the difference between the meaning of the two symbols, ® and ™?
4. Sketch from memory three trademarks and then compare them to the originals. Observe how recognisable the best designs are, and try to explain what it is about the designs that makes them so effective.



← Task 14 - Suggested answers

- 1. A suitable new word is created.*
- 2. Search conducted and any 'hits' recorded.*
- 3. ® means that the symbol is legally registered, whereas ™ means that it is not formally registered.*
- 4. The recognition activity shows how recognisable most trademarks are.*



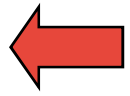


Design Right

Background

Design Right is a new form of IP that was introduced in the UK in 1988 and which is very similar to Copyright, although there are some important differences. Design Right's main similarity to Copyright is that it exists automatically, i.e. there is no application process involved. However this in turn means that it offers less protection, and is really only suitable for protecting items that fall outwith the other forms of IP protection. Due to its simple nature it is also a cheap form of protection.





Design Right

Examples

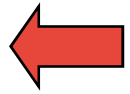
Design Right is particularly useful for protecting the way things look; shape, form and appearances of products that are different from before but sufficiently so to allow for patenting. For example, the appearance of a new toaster may be protected by Design Right because underneath the stylish case are the same mechanisms as the previous model's.

Process

As there is no formal registration system for Design Right, all that needs to be done is to mark the work 'Design Right' and date it. However, it is a good idea to keep the idea secret until this has been done and an original has been kept somewhere secure with proof of the date when it was done. Design Right only protects the idea in that specific form, and it is easy for competitors to copy with minor changes so as to avoid infringement of the Design Right.

DR has a short lifespan of only 10 years from the first sales, and during the last 5 of these anyone is entitled to copy the design provided they pay a licence fee to the owner of the IP.





Task 15

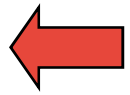
1. If you have made any project material, mark it with 'Design Right', your name and date.
2. Design a symbol to represent design right, in the same way that © represents copyright.
3. IP is not suitable for protecting the symbol you have just designed. Explain why the symbol should not be protected.



← Task 15 - Suggested answers

- 1. Design work marked appropriately.*
- 2. A suitable symbol is designed.*
- 3. No protection is required because people should feel free to use the symbol wherever necessary.*



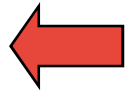


Registered design

Background

Registered Design is a form of IP protection that was first used in 1787, in response to the demands of the textile manufacturers who were concerned about competitors using their patterns. It is still much used by industry today as this form of protection covers the appearance of a product, but not how it works. If the way it works is new then a Patent may be applied for, in addition to using Registered Design to protect its appearance. It is important to understand that one product may involve several or even all of the forms of IP protection.





Registered design

Examples

Car body shapes are good examples of Registered Designs. Manufacturers want to stop other companies copying successfully styled cars, even if the technology inside the car is too similar to the previous models to be able to patent them. Distinctive features such as radiator grills can be protected as well as the overall body shape.

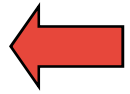


VW
Beetle

Process

The process for registering a design is similar to that for obtaining a patent and is also controlled by the Patent Office. The design has to be kept confidential before the application is filed, and then a search is carried out to see if there is any previous work that is similar. If the search does not show up any possible conflicts, the design is granted its Registration. Once granted, the registration can be kept for 25 years, as long as renewal fees are paid. If the company does not feel it is worth spending the money as the product's life cycle nears its end, they may allow its registration to lapse. This enables competitors to begin copying the design legally.





Task 16

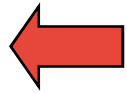
1. Find one example of a product that is protected by Registered Design, and write down its registration number.
2. Why does 'Registered Design' offer more protection than 'Design Right'?
3. Design a symbol to signify that a product is protected by Registered Design, in the same way that ® means that a name is protected by Trademark law.



← Task 16 - Suggested answers

- 1. One suitable example with a registration number.*
- 2. Because it is formally registered with the Patent Office.*
- 3. A suitable symbol designed.*





Patent

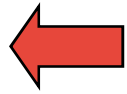
Background

The first patent was granted in 1449, to John Utynam, who wanted to protect his method for making stained glass. He was granted a monopoly on the process for 20 years by the King, in the form of an open letter. This was the method before the Patent Office was opened in London in 1852. Nowadays, over 30,000 patents are applied for each year.

If you own the patent on a product you will have exclusive design rights on it for up to 20 years. However, as part of the process the patent is made available to the public for any interested parties, including competitors, to see. This has two results: firstly, competitors can keep an eye on what the opposition are working on and see which way the market may be going; and secondly, 65% of research and development (R&D) has been done before and is available for viewing in the Patents Library. This can save vast sums of money in R&D budgets.

The main aim of this process is to encourage innovation.





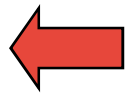
Patent

Examples

Tracks: Tanks and diggers are fitted with tracks which enable them to travel over soft ground without them sinking and becoming stuck. The first use of tanks was at the Battle of Cambrai in 1916, during WW1, and most people think that this was the first time that tracks had been used. In fact the first patent for such devices was issued in 1770!

A famous example of a successful patent is the Anglepoise lamp. This was developed in the 1930s, and is still used worldwide today.

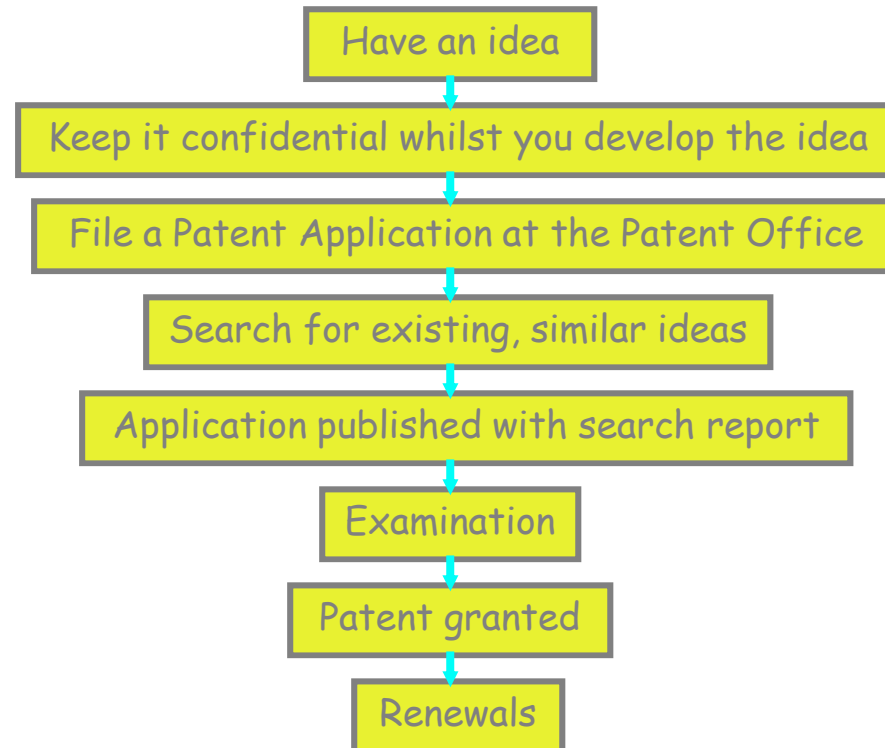




Patent

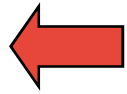
Process

The flowchart below shows the main stages in obtaining a patent.



Patents do not have to be maintained for 20 years. They can be allowed to lapse by not paying renewal fees which arise annually after the 4th year. If the patent lapses your competitors may start using your idea.

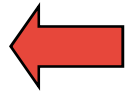




Task 17

1. Find one product in your kitchen that is patented.
2. What do new products have marked on them if sold before a patent is finally granted?
3. Find one of the above.
4. Try to find the approximate cost of a patent being awarded for 20 years.
5. a) Conduct an internet search to find Espacenet ([www.espacenet](http://www.espacenet.com)), and then search for patents on products that interest you, or relate to current project work.
b) Could you improve any of the products that you have found during your search? If so, how?





Task 17 continued

6. Some examples of famous inventions that have been patented are shown below in the table. Try to fill in the gaps:

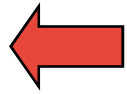
Product	Inventor	Year
Cats-eye road stud		
Workmate folding bench		
Electric light bulb		
Anglepoise lamp		
Pneumatic tyre		



← Task 17 - Suggested answers

1. *One suitable example*
2. *Patent pending or Patent applied for*
3. *One suitable example*
4. *In the region of £20,000*
- 5.a) *search conducted*
b) *suitable suggestions made*





Task 17 - Suggested answers continued

6.

Product	Inventor	Year
Cats-eye road stud	<i>Percy Shaw</i>	1933
Workmate folding bench	<i>Ronald Hickman</i>	1961
Electric light bulb	<i>Joseph Swan (UK)</i>	1878
	<i>or</i> <i>Thomas Edison (US)</i>	1879
Anglepoise lamp	<i>George Cowardine</i>	1934
Pneumatic tyre	<i>John Dunlop</i>	Oct 1888
	<i>or</i> <i>Robert Thompson</i>	Dec 1945

