

**Craft and Design**  
**Factors that Influence**  
**Design**



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HIGHER STILL

# Craft and Design

## Factors that Influence Design

Support Materials

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## **CONTENTS**

Introduction

Fitness for purpose

Choice of materials

Durability

Ease of maintenance

Efficiency

Running costs

Fashion

Safety

Obsolescence

Environmental and Social considerations

Technological opportunity

Consumer demand

Social behaviour

Economics

Commercial enterprise



## **INTRODUCTION**

This resource covers the factors that influence the design of products. Aesthetics and Ergonomics have each been covered in separate booklets as they require more detailed consideration.

When designing products the designer has to ‘juggle’ with a large number of factors and attempt to organise them in the design solution in a way that satisfies the design brief and specification.

A professional designer with many years of experience will be able to balance the factors intuitively. Students of design must take more care to consider all the relevant factors - perhaps by using a checklist.

An excellent illustration of how the designer handles these factors is given by Dick Powell in the Equinox TV programme \*‘Designing Dream Machines’\*. Here the process is described as “an explosion in reverse”.

\*The video of Designing Dream Machines is the recommended source of case-study material for this course.

### **Approaches to Teaching and Learning**

Students following this course will be required to have a good knowledge and understanding of each of the factors that are listed in the course Arrangements. The factors contained within this booklet are referred to throughout the course. Further information concerning the timing of these aspects of the course can be in forthcoming support materials.

While it might be possible to consider these factors through a series of case studies, this could prove to be cumbersome. It would be much more effective to consider each factor separately - illustrating each factor with examples and then consolidating understanding through case studies and/or through examination type questions.

## **DESIGN FACTORS (FACTORS THAT INFLUENCE DESIGN)**

### **Fitness for Purpose**

It is perhaps obvious to us all that a product should do the job it was designed to do. A can opener should open a tin and a car should be able to transport people from one place to another. But how well should a product do its job? Should a lightweight portable can opener for camping work as well as an electric opener designed for use in a restaurant/canteen? Should a small lightweight city car be as comfortable and as fast as an executive saloon?

Clearly these products are designed to carry out similar functions. However in reality what is expected from each product is quite different. In the case of the camping can opener - as long as it opens cans then it is fit for its purpose providing, in addition, that it is compact and light weight.

By contrast an industrial can opener should work very quickly and efficiently. It should be very reliable and durable. Cost will be a secondary consideration, as will size and weight.

When considering fitness for purpose the designer should begin by establishing a checklist of features that are essential and desirable. On completion the design must be able to achieve all essential features. Any desirable features the product has will be a bonus and may assist in placing the product above its competitors in the market place.

### ***Question***

*Choose a simple household product and describe in what way it is and is not suited to its purpose. A sketch of the product should accompany your answer to illustrate the points made.*

## **Choice of Materials**

When choosing the materials for a product the designer must consider a number of factors

- use of product
- quantity to be manufactured
- market niche (cost)

## **Use of the product**

The choice of material has to take into account how the product/component will be used and what environment(s) it will be used in. Take for example a plastic wing mirror body for a car. The plastic chosen will have to withstand wear and tear from stone chips etc. washing with detergents, sharp knocks from passing vehicles and at the same time tolerate temperatures from sub-zero to over 100° C. On some vehicles this component is painted to match body colour therefore material will also have to accept paint.

## **Quantity to be manufactured**

Some products could be manufactured in more than one way. Often the decision depends on the quantity to be manufactured. Metal castings for example can be made one at a time by sand casting or produced in high volume by die-casting. Although sand casting is labour intensive tooling costs are relatively low and so this process is ideal when small numbers are to be produced, say less than 100. As soon as volume increases into hundreds or thousands a more mechanised process becomes more appropriate (die-casting). Here tooling costs are very high - but as long as volume is high enough the cost of producing a single item becomes very low.

## **Market Niche**

Another factor in choice of materials can be the end cost of the product. If the product being designed is at the bottom end of the market where cost is very important then the material has to be as cheap as possible. As long as the material is able to carry out its function for a reasonable period then it will be deemed satisfactory. However with an up-market product cost becomes less of an issue. Materials chosen should perform well, should be long lasting and reflect the quality image of the product.

## ***Question***

*When choosing materials for a product the designer has to consider*

- *use of product*
- *quantity to be manufactured*
- *market niche*

*Choose one household product and discuss how these three factors will have affected the choice of materials.*

## **Finish**

The choice of finish of a product is influenced by similar factors to those affecting the choice of materials, i.e.

- use of product
- quantity to be manufactured
- market niche

## ***Question***

*A designer has designed a gardening trowel. The trowel is designed for the cheaper end of the market but is to be sold in superstores that have a reputation for selling inexpensive products that are of good quality. Discuss the factors the designer will have to consider when selecting a finish for this product.*

## **Durability**

Durability of a product or component depends on a number of factors:

- planned obsolescence
- use of product
- market niche.

The durability of a product/component depends directly on the materials chosen, the manufacturing process used and fixing methods employed (see section on selection of materials).

In a sense it is planned obsolescence which is the key factor as it is this that dictates the performance of the product/component (see section on obsolescence).

Having decided on the intended life span of the product, the designer must define the market niche and the use of the product (see materials section).

This should lead to a definition of the properties required of the product, and hence the choice of material.

### **Ease of Maintenance**

Maintenance of a product is a factor that can easily be overlooked. At the forefront of the designer's mind will be function and aesthetics. Whilst maintenance is an aspect of function, it is secondary to function in use.

Consideration of maintenance depends to a large extent on the life expectancy of the product. A cheap down-market product will often sacrifice maintenance to cost. In this instance the designer intends that the product will be thrown away when it ends its useful life.

In contrast, more expensive up-market products will generally have much longer life expectancy and therefore may require periodic maintenance to maintain optimum efficiency of the product. Building in maintenance obviously adds to the cost of the product but can be justified in higher cost products.

### ***Question***

*In the design of a family saloon car the design of the clutch can be such that replacement can be done quickly and easily but this adds cost to the vehicle. Assuming typical clutch replacement after 5 years use, discuss the factors the designer will have to consider.*

## **Efficiency**

The efficiency of a product in use depends directly on the quality of the product. One would expect that a cheap down-market product would serve its purpose, but only just. In contrast, one would expect a high quality product to fulfill its function with ease giving the user pleasure in its use (see section on fitness for purpose).

A cheap kettle will boil water. A more expensive model will boil water quickly, use less energy, be aesthetically pleasing and so on.

The designed efficiency of the product will depend upon its intended market niche.

## ***Question***

*A man buys a disposable razor. He finds the razor unpleasant to use and the quality of the shave isn't good. Discuss in terms of efficiency whether or not this product can be considered good design or not.*

## **Running Costs**

To the consumer, the running costs of a product may or may not be an issue. However the designer must consider this factor balancing it with all other factors in relation to the intended market niche.

In general, wealthy individuals buy products without considering secondary factors such as running costs. Their primary concern will be factors such as efficiency and aesthetics.

The less wealthy individual will be much more concerned about running costs. Running costs are generally made up of energy/fuel use and maintenance. To reduce running costs it is not uncommon for less wealthy individuals to carry out their own maintenance.

### ***Question***

*When buying a cycle lamp a teenager can choose between a cheaper model with disposable batteries and a more expensive version that has rechargeable cells but is more expensive.*

*Discuss the issues the teenager will have to consider in making a choice.*

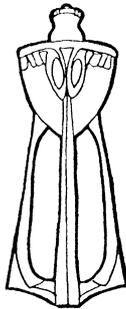
## Fashion

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

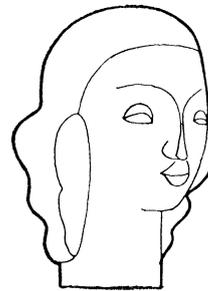
Throughout design history there have been very distinctive styles that can be linked to a period in time.

- Victorian 1830's - 1890.
- Art Nouveau 1890 - 1905.
- Art Deco 1925 -1939.
- Pop Art 1960's

Each one of these styles was fashionable during the periods indicated and has features that make each one easily recognisable, as can be seen in the examples below.



Art Nouveau Lamp 1901



Art Deco Bronze

As a consequence of pop music and fashion becoming an important part of modern western culture good design has become more readily available to everyone. Although products designed by leading designers are still quite expensive, mass produced products tend to follow the style set by these designers and are available at a much more accessible price. This has been the case for clothing since the 1960's but more recently furniture and household goods have followed the same pattern. Furniture stores such as IKEA sell designer 'style' products which are inexpensive.



Today products are available in many different styles. Designers are able to emulate styles of the past and manufacturers produce these products using modern materials and manufacturing processes e.g. Retro Car (only available in Japan) produced by Nissan which is in the style of a 1950's model. This approach to design actually produces a new style which could be considered the style of the 1990's. In addition designers are also able to utilise modern technology to produce totally new styles that would not have been possible in the past.

The trend in the 1990's then seems to be to mix styles, often to render these styles in new materials in a functional manner. Colour and decoration tend to be subdued with combinations of High Tech and Traditional materials being used together e.g. Pastel coloured injection moulded plastic with galvanised steel or brushed aluminium creating a very subtle contrast as used in the Dr Globb chair designed by Philippe Stark.

An increased concern over the environment has also influenced today's products. Many new products are designed to be easily recycled e.g. Mk. III Volkswagen Golf. Often products are made from recycled materials. This has in itself become fashionable.

Designers can take advantages of fashion trends to design products that fit into a particular market 'niche' which has been identified by market research. Also since trends tend to change quite rapidly it is possible for designers/manufacturers to cash in on these changes by updating products in keeping with the latest fashion. Motor car manufacturers do this by producing limited edition models in special colours and styling details. Clothing manufacturers use the changing seasons (spring, summer, autumn and winter) to encourage people to buy new clothes. Each new season creates the opportunity for designers to introduce a new style or colour. Designers also use trends set by pop groups or cult figures to create new fashions.

For further reading see Design Source Book ISBN 0-356-12005-8.

## Questions

### *Question 1*

*During the past 20 years many domestic products were designed with a particular look or style in mind e.g. the 'high tech look' or the 'country cottage look'.*

- (a) Explain what each of these particular 'looks' were with particular reference to two products which embodied each look.*
- (b) Name one other 'look' of the last twenty years.*

*(1992 SEB Paper 1 question 1.)*

### *Question 2*

- (a) Distinguish between fashion and style.*
- (b) Describe one example of each.*

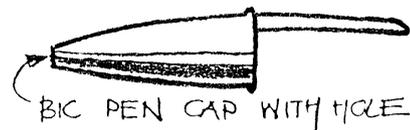
*(1993 SEB Paper 1 question 2.)*

## Safety

Many products have to be designed to comply with regulations laid down by law or by recommendations made by organisations such as BSI (British Standards Institution) and ISO (International Standards Organisation). Often ISO, BSI and the Government work together to set standards. The government will for example state that car seat belts must be fitted to all cars and that the belt design should be to BSI/ISO standards. When a product is manufactured to these standards it will be clearly indicated that this is the case somewhere on the product with a number and the BSI/ISO logo.

The designer of a product is responsible for ensuring that products are safe to use. There are a number of well documented cases where designers have been sued for negligence, i.e. designing a product which proves to be unsafe and causes injury to the user. The driver was badly burnt, sued the designer and won. As a consequence of such cases designers must make every effort to design products that will be safe in use by carrying out stringent functional tests.

Occasionally products are found to be unsafe after they have been put on the market and have to be redesigned, e.g. plastic pen tops such as those manufactured by BIC caused a number of deaths in young children when accidentally swallowed. The pen top was modified so that it is open at both ends so that if swallowed the airway does not become blocked.



For further reading see Advanced Design and Technology pp. 113-117.

## Questions

### *Question 1*

*In the evaluation of any product, 'safety' is an important general criterion.*

- (a) List four general criteria.*
- (b) List four specific aspects of safety which should be considered in the evaluation of a portable, electric hair dryer.*

*(1994 SEB Paper 1 question 8.)*

## **Obsolescence**

When designers consider the materials and the method of construction of a product they obviously have to take into account the following.

- How long the product should last for.
- How, and under what conditions, will the product be used, i.e. function, durability and safety.

Like all factors that influence design these considerations have to be taken along with all others.

In many instances it is possible to design product that will last a lifetime. Is this necessary or even desirable? If a manufacturer designs a product which lasts forever, say a washing machine, what impact would this have on the manufacturer? They would not sell so many machines. The machines would probably have to cost a lot more than current models. The buyer would end up with products which are old fashioned but still functioning well. The user would not be in a position to take advantages in advances in technology by purchasing the latest most economic/environmentally friendly design.

Designers and manufacturers have therefore to find a balance between profit, value for money, durability and at the same time satisfying the customers desire to own the latest most fashionable products. This is called building in obsolescence. i.e. the product is designed to last for a set period of time. This allows the manufacturer to be able to be constantly selling new products in the market place which is good for business and at the same time satisfies the markets desire for the latest new products.

In general washing machines are designed to be replaced after about six years. Ordinary light bulbs are designed to last for a maximum of six months of normal use. Most products then have a built in life expectancy. Often similar products are available with different lengths of planned obsolescence, for example up-market cars are designed to last for as long as 10 years without the need for major repairs (which is one of the reasons why they are so expensive) against a cheaper models designed to last for only 5 years.

## **Questions**

### *Question 1*

*Mass produced cars have built- in obsolescence.*

- (a) Explain the implications of this for the consumer and the manufacturer.*  
*(b) List two other products which you consider to have built-in obsolescence.*

*Question 2*

*What do you understand by the concept 'designed obsolescence'?*

*Give two examples of products which illustrate this concept.*

*(a) What effect does designed obsolescence have on:*

- i. the environment;*
- ii. the consumer;*
- iii. the national economy?*

*(1993 SEB Paper 1 question 8.)*

## **Environmental and Social Considerations**

The designer has a major role in shaping the environment in which we live. Designers therefore have a moral responsibility to ensure that the products they design contribute towards our environment in a positive way.

All products have an impact, to a lesser or greater extent on society. This impact will influence the following areas.

- Environment - aesthetic. As a consequence of the visual impact of the product in association with its surroundings;
- Environment - pollution. Created by the manufacture, use and/or disposal of the product at the end of its life;
- Social - physical and social impact of the product on the user and society in general.

### **Environment - aesthetics.**

The designer has the ability to create products in any style. It is possible to design products that merge well with their environment or alternatively those which stand out in stark contrast to their surroundings. Products which harmonise with their environment are pleasing to the eye but can be considered to be boring and not stimulating.

For example a designer may choose to design a bus shelter in the Georgian style to match the surrounding architecture. This approach would blend in well and probably would be acceptable to the majority of people. However this 'safe' approach to design can create an environment which is monotonous. Alternatively the designer may choose to design the bus shelter to contrast with the Georgian buildings by producing a design with modern materials such as steel and plastic with simple geometric forms and shapes perhaps integrating bold lighting so that the shelter stands out day and night. This approach was taken when designing the metro and subterranean gallery entrance at Le Louvre in Paris which is a glass pyramid and is in stark contrast to the decorative Renaissance sandstone architecture surrounding it. 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 offensive to others. The designer then has to make a decision concerning the impact that the design will have in order to ascertain whether or not it will be acceptable to society.

### **Environment - pollution.**

When designing products the designer must consider the effect on pollution levels that their design will have. The product and its manufacture may also be influenced by legislation which controls pollution outputs. This is further complicated by the fact that pollution controls vary from country to country. There has also been a major shift in public interest in environmental issues and many people will take this into account when purchasing a product.

At all stages in the development, manufacture and disposal of a product environmental issues have to be considered. This also applies to the product when in use. This will clearly have considerable effect on the final price of the product. Let us take the example of the MK III Volkswagen Golf which is advertised as being environmentally friendly.

For this to be the case the following conditions would have to true.

- The use of finite resources should be avoided whenever possible.
- Most materials used should be recyclable, say 90% or more.
- The processes used to manufacture these materials should not pollute the environment beyond legally acceptable limits.
- The processes used to form the materials into car components should not pollute the environment beyond legally acceptable limits.
- The processes used to assemble the components should not pollute the environment beyond legally acceptable limits.
- Finishing processes such as painting should not pollute the environment beyond legally acceptable limits.
- The waste products from manufacturing processes should not pollute the environment. Within the EEC it is the responsibility of the manufacturer to dispose of all waste safely.
- The operation and maintenance of the vehicle should not pollute the environment beyond legally acceptable limits.
- The disposal of the product at the end of its life should not pollute the environment beyond legally acceptable limits.

It is clear then that these limits will have major implications for the design.

### **Sociological considerations**

The environment in which we live, work and play has a considerable effect on our state of mind and general well being.

Studies show that, for example, to simply alter the lighting levels from day to day in a factory will improve the output of the work force. It is not the quality of light that creates the improvement but the fact that there has been a change. A changing environment is more stimulating and therefore more motivating.

This example shows that even very subtle changes to the environment can have dramatic effects on people. Clearly then, designers have to be very careful when designing the products which shape our environment. The impact that a major new

building has on those who live and work in and around is obvious. 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 and even anger when a product we are using doesn't function in the way expected are common place. This contributes to the stress of modern day living. Well-designed products should be pleasing to use; they should be reliable and do the job they were designed to do. As well as functioning well their aesthetic will also effect us.

Why is it that we have feelings of refreshment or contentment when standing on top of a hill on a glorious day with a spectacular view before us? It is due in part to the fresh air but also the colours and shapes of the view i.e. the aesthetics of the view makes us feel good. Therefore it is clear that if we are surrounded by products which are attractive (in an aesthetically pleasing environment) then we will inevitably feel better within ourselves. To create this designers have to create a fine balance between pleasant harmonising products (which in extreme cases can be boring) and bold contrasting designs (which can be irritating).

In catering for the needs of the individual the designer must consider age, culture and physical ability/disability. Each of these aspects will effect the user's reaction to a particular product.

Often modern 'High Tech' products can be threatening to older people making them feel insecure. A designer must, in such situations, try to make new technology as 'user friendly' as possible. Care needs to be taken to ensure that products do not cause offence to a particular race or culture. Even something as simple as the name of a new model of car needs to be carefully selected to ensure that in a world market the name which may be perfectly acceptable in Europe is not totally unacceptable in another continent.

Many available products do not take into account the problems of the disabled, old or very young. In particular handles and switches are often too small or too difficult to operate. With a little bit of thought many of these problems could be avoided. Good design should take into account as many users as possible.

For further reading see Advanced Design and Technology pp. 7-15.

## **Questions**

### *Question 1*

*The designers of today are accepting a growing responsibility for the conservation of some of the world's dwindling resources. Recycling is one of the main ways in which this is being tackled and recycling is having a marked effect upon much of industrial design. This can be seen clearly in the way components for domestic washing machines are designed to be removed and then recycled when the machine has served its useful life.*

*Briefly describe how recycling has effected the following design situations.*

*(a) Soft drinks packaging.*

*(b) The family car.*

*(1992 SEB Paper 1 question 7.)*

*Question 2*

*Energy is often wasted in the home. Many products have been designed to reduce this loss.*

*Suggest four such products.*

*(1994 SEB Paper 1 question 1.)*

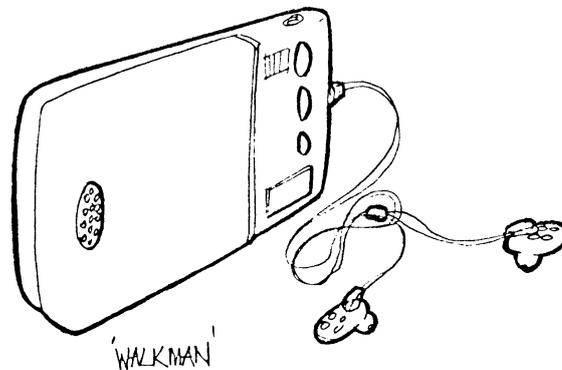
## Technological Opportunity

Products which appear on the market sometimes do so as the result of technological innovation. This is often referred to as technological 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 obvious application and sometimes not. Sometimes technology is transferred from one application to another.

In other words advances in technology create new products and therefore new markets. Sometimes the products are simply better versions of existing products but occasionally products that have not existed before are produced creating a completely new market niche.

Examples of products that result from technological opportunity are:

- The microwave oven - developed as a consequence of research done by physicists into wave energy.
- Ceramic knives (the edge will last a lifetime) and ceramic engine components developed from research carried out by engineers working on the space shuttle at NASA. The shuttle nose cone is covered with ceramic tiles. The only material that would withstand the impact of reentry into the Earth's atmosphere.
- The Sony Walkman - this product was only possible through advances in microelectronics making it possible for a cassette tape player to be manufactured in a size that will fit in the pocket.



For further reading see Advanced Design and Technology pp. 113-117.

## Questions

### *Question 1*

*Products can reach the market place because of 'market pull' or 'technology push'. Market pull is when a need is recognised in the market for a particular product. Technology push occurs when technology produces a new or improved product for which a demand has to be created.*

*For each of the above categories name one product and explain how each was identified and developed.*

*(1990 SEB Paper 1 question 4.)*

### *Question 2*

*For each of the following give two examples of how products have been developed:*

*(a) from technological opportunity as a result of scientific discovery;*

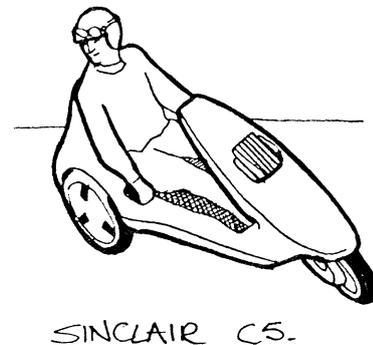
*(b) from market research.*

*(1992 SEB Paper 1 question 6.)*

## Consumer Demand

Consumer demand, sometimes referred to as market pull, produces products that derive from the demands of the market. In general this demand is identified through market research. Manufacturers and designers 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 consultancies are constantly gathering data on the requirements of the market place. This data is often gathered through the use of questionnaires. It is quite commonplace to see market researchers with their clipboards on our high streets particularly on a Saturday. Sometimes the market research will involve gathering together general information which will be offered 'for sale' by the market research company. Alternatively the market researchers may be given a specific area to research for a client. Any designer/manufacturer that does not carry out thorough market research is taking a great risk. To invest large sums of money in design, setting up a manufacturing facility and producing the product without checking out whether or not that it is what the public wants is very foolish.

A classic example of this is the Sinclair C5 which was developed by Sir Clive Sinclair. The C5 was developed on the back of enormous success with personal computers by Sinclair Industries. The C5 was a small electric three wheeled vehicle intended to be an alternative to the bicycle. It is true to say that the C5 was extremely innovative and technologically a success. However, detailed market research was not done to establish whether or not people would use such a vehicle. The C5 did not sell. This error led to the failure of Sinclair Industries.



In contrast to this many products have been introduced or redesigned following detailed investigation of the market and have been a great success. For example Volkswagen introduced the VW Golf which was the first real hatchback car. This design satisfied the need for a small economical utility vehicle fitting in perfectly with the lifestyle of the modern European. The Golf was a major success and has had a major impact on the design of cars today and has resulted in the enormous expansion of the VW/Audi Group. Prior to the Golf, VW only manufactured the Beetle and the VW Variant. In other words VW identified what the market wanted and then designed it.

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

For further reading see Advanced Design and Technology pp. 20-24.

## **Questions**

### *Question 1*

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

*(a) Give two examples of products which you feel may be bought for this purpose.*

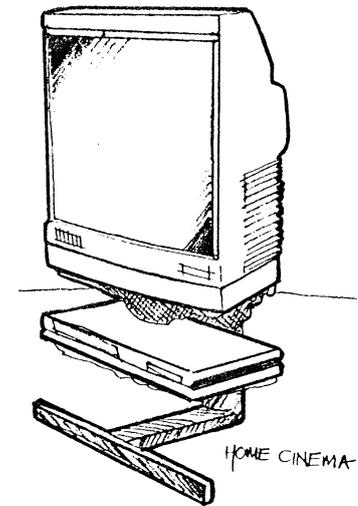
*(b) Give one reason for each of your choices.*

*(1994 SEB Paper 1 question 2.)*

*See also the questions in the following section on Technological Opportunity*

## Social Behaviour

Changes in patterns of social behaviour must be considered by the designer when working on new products. Factors that would have been considered important in the design of products 50 years ago would not be seen as important today. Today lifestyles are such that leisure time is very important. Generally both adults in the family unit work. Therefore tasks such as cooking and cleaning need to be made much quicker and easier to do. Hence the increase in the use of products that permit this, such as food processors and fully automatic washing machines with combined tumble dryers. The increase in the use of precooked foods, freezers and microwave ovens have also contributed to increased efficiency in carrying out domestic chores.



This has in turn led to a situation where people have more spare time which has increased demand for home entertainment such as stereo systems, video and more recently home cinema. Linked to this desire for good use of leisure time has also seen an increase in the use of sports/leisure equipment such as exercise bikes and sun beds.

## Economics

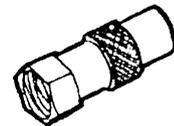
The motor industry is a good example of an increase in the importance of this factor. At one time the price of petrol was such that the fuel consumption of a vehicle was not important. In the late 1970's the price of oil increased sharply making large gas guzzling vehicles impractical. This brought about the development of lean burn engines and an increase in the use of diesel engines which are more economical (diesel fuel is also less expensive). The aerodynamics of cars has also been significantly improved. Today it is not uncommon for vehicles to be able to do 50 mpg compared to 20 mpg or less which was the norm before the fuel crisis.

Generally products today are cheaper to buy than in the past. This is largely due to the economies of scale. Most products nowadays are produced in large quantities using manufacturing processes that are expensive to set up but which, once established, can produce products quickly and very cheaply. The more products that are produced the cheaper the price of a single product.

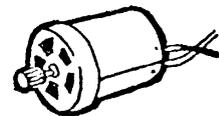
The development of modern materials such as plastics and composites means that highly complex components, that may have been constructed from a number of components in the past, can now be made as a single item by processes such as injection moulding.

Designers also make use of standard components to reduce costs. Whether the product is something as simple as a torch or as complex as a motor car, standard components are available from such things as simple fixings (special screws, bolts etc.) to bulbs, switches, alternators and even whole engines. The current Vauxhall Omega Turbo Diesel is in fact fitted with a BMW turbo diesel engine. This practice is effective because the standard component manufacturer is able to produce the parts in large quantities making them cheaper.

Savings can also be made by carefully selecting the best material and manufacturing process for the item being designed. Because most markets are so competitive the price can not afford to be unnecessarily high as this could prevent the product from selling. Often manufacturers will set up factories in countries where costs are low. Many products today are manufactured in countries like China where labour costs are very low, compared to Europe, and efficiency is high.



ADAPTOR



SMALL DC MOTOR



GLOBE LAMP



POINTER KNOB

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

- Manufacturing costs (materials and processes);
- Advertising and distribution costs;
- Design and development costs;
- Profit, overheads and reinvestment;
- Prices set by other manufacturers.

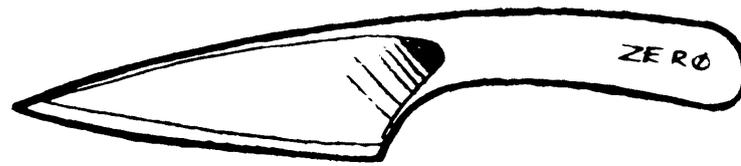
For further reading see Advanced Design and Technology pp. 16.

## Commercial Enterprise

Probably the single most important factor the designer must consider is cost. This obviously effects the volume of sales and consequently the profit for the shareholders.

When designing products the designer should seek to take advantage of any factor which creates a market niche. This will give the product an advantage in the market place as it ensures reduced competition. Creating a market niche can be achieved in a number of ways:

- utilising new technology making it possible to produce a new and better product than before. Ceramic edge to kitchen knives stays sharp for a lifetime.
- innovative cost savings through the use of new materials, manufacturing processes etc. Use of injection moulded panels in car body manufacture.
- creating a new use or image for a product giving it a new lease of life. Storing text and film images on CD's which were originally created for the music industry.
- use of innovative marketing, advertising and sales techniques to encourage the customer to buy. Linking products to fashion trends, blockbuster films etc. such as books and toys that use the characters from the latest film.



Ceramic Knife by Seymour-Powell

