

# 5

# Design

## KEYWORDS

aesthetics  
analysis  
brief

ergonomics  
evaluation  
process

prototype  
solutions

## WHAT IS DESIGN?

Design is a term used to describe what people do when they are trying to create something new. Designers come up with ideas and solutions to create objects that we use daily. They also redesign objects in order to improve them. They try to make them more attractive, effective and useful. Designers follow a process or procedure of design to assist them in their task.

Architects design buildings, landscape designers create designs for gardens. You will develop your own designs that you will then make in the workshop.



*Architects design buildings*



*Landscape designers create gardens*

## CHARACTERISTICS OF GOOD DESIGN

Before we look at the design process we must examine what makes a good design. There are many characteristics of good design. They are usually interconnected – one affecting the other.

### Appearance/aesthetics

**Aesthetics** is about making an object that is pleasing to look at. It is important that designs are attractive, so that they will be popular. We can tell if something is attractive, but it is more difficult to create it in an item. Your designs should have some **decorative** elements. Simple mouldings and ornamentation will make a big difference.

### Shape/form

Is the object based on rectangles or on curved shapes? Are there a lot of angled pieces in the object? The shape and form of the object greatly affect its appearance.



*Notice how the shapes and colours used in these boxes change how they look*

### Proportion

**Proportion** is the relationship of the size of various parts of an item to each other and to the overall piece.

### Style

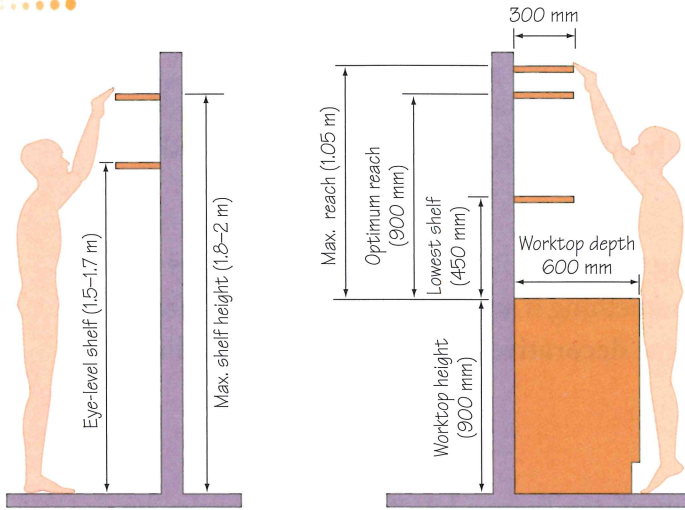
There are many different types of style, e.g. modern, antique and rustic. Styles vary with fashion.

### Colour

The colour of an item can be changed with paints and stains. Light and dark materials can be used to add colours and contrast to an item, as can be seen above.

### Structure

A piece of work should be strong and well made. The pieces should hold together well.



### Quality

The quality of the materials used and the fit will affect the design. Try to use the best materials that you can get. Do quality work and take care to pay attention to the small details for best results.

### Ease of use (ergonomics)

Ergonomics affects every aspect of design for human comfort. What is the best height for a chair? How high should a table be? It relates to how items are made with human use in mind.

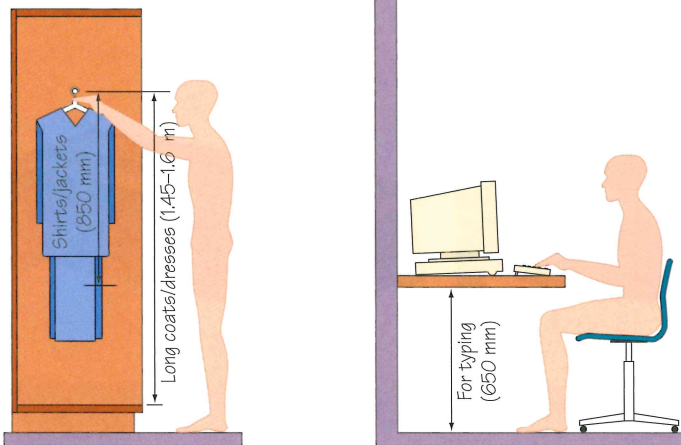
### Safety

When designing always consider how the item will be used and who will use it. The materials must be safe to use. Consider if the item is suitable for use by children, easily cleaned and so on.

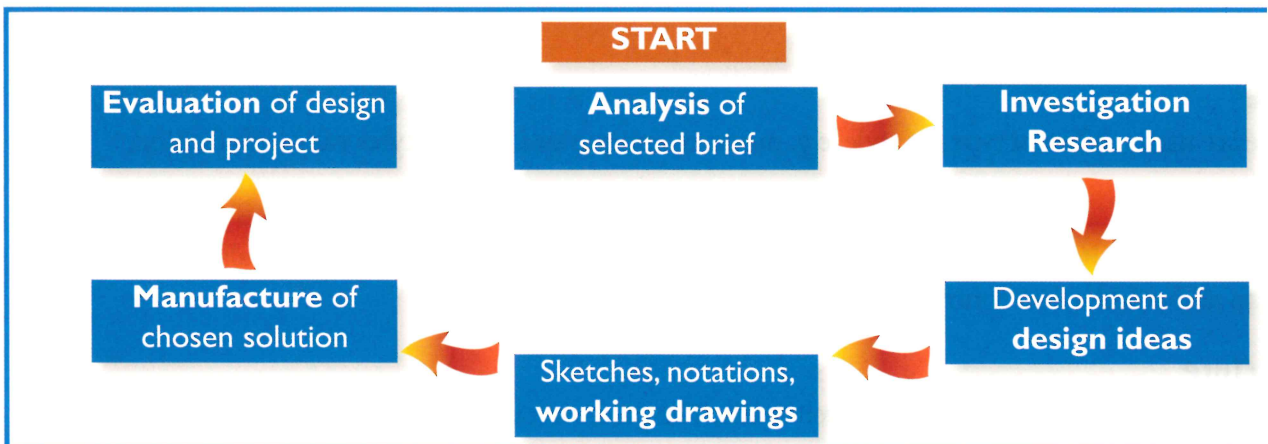
### A DESIGN PROCESS

A simple model of a design process is shown below. It is the recommended model for the project element of the exam. You should follow this model for all your design work.

This process will help you to design. It may be that some headings overlap, but thinking of it as stages in a journey will help.



Ergonomics – design sizes for human comfort



## The brief

The **brief** is a statement of what is to be made. It outlines the problem to be solved and is the starting point of the design. The brief may include some conditions, for example a brief might ask you to design and make a box to hold not more than ten DVDs. If the finished box held twelve DVDs it would not fully meet the challenge of the brief.

### Brief (2006)

Design and make a decorative book holder, which should rest on a desk top and hold a maximum of ten books.

The object should be elegant in appearance and incorporate a nature theme.

### Brief (2008)

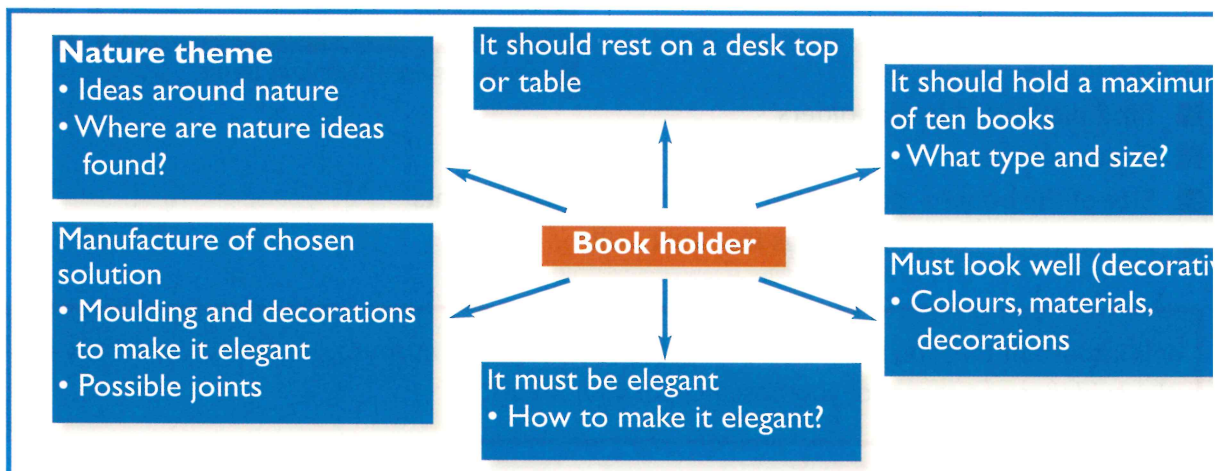
Design and make a small decorative object to display household notices and remind of the recycling theme. The object should include a facility to hold the necessary writing materials and also reflect a recycling theme.

Examples of design briefs

It is important to read the design brief carefully and be guided by it. As you read through the brief underline the important phrases.

## Analysis

In the **analysis** examine fully what the brief is asking you to do and what is to be made. A good and effective analysis is the key to a successful design. Identify and list all the items in the brief. Examine each carefully and make sketches to help you. Look up keywords and list the possibilities and the difficulties you might meet.



Analyse the brief. Using spider diagrams and graphics can help



## Investigation/research

After doing an analysis you need to gather information about the things highlighted in the analysis. Research is done to find ideas for solutions to the design, to gather measurements, to find images and graphics. Research can also be done to find out how similar problems were solved. This information can be used to develop your own design ideas.

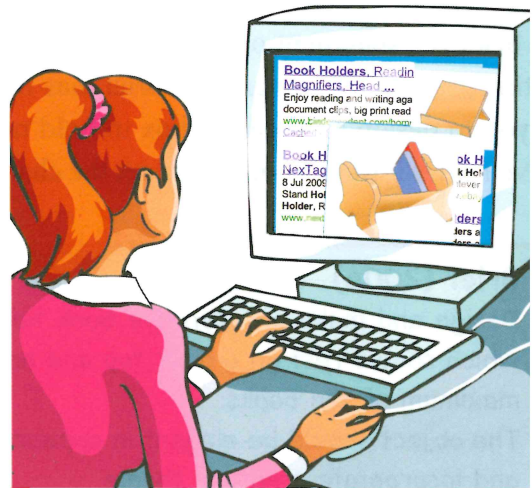
- Examine the sizes of items relating to the design brief, e.g. sizes of books
- Find out about suitable materials
- Decide on overall sizes
- Safety considerations
- How will it be used?

## Information sources

- Magazines
- Shop catalogues
- Library
- Newspapers
- The Internet
- Local furniture and gift shops
- Hardware shops

## Book holder

- Find pictures of book holders
- Types of books
- Size of the books – do a sketch and include measurements
- Decorations – examine things that look well



*Searching on the Internet. Record evidence of your investigation*



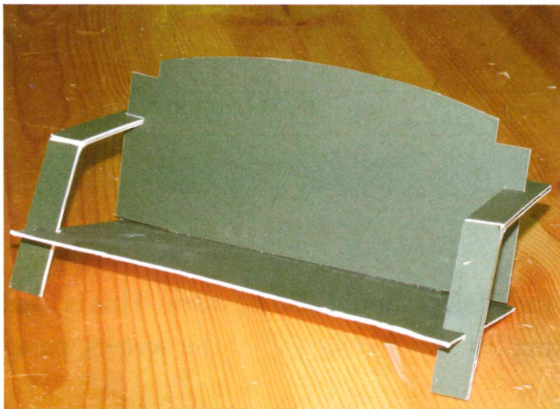
*Measure sizes of relevant items*

It is important that you show evidence of your investigation in your work. You should show the evidence as a record of your research for your report.

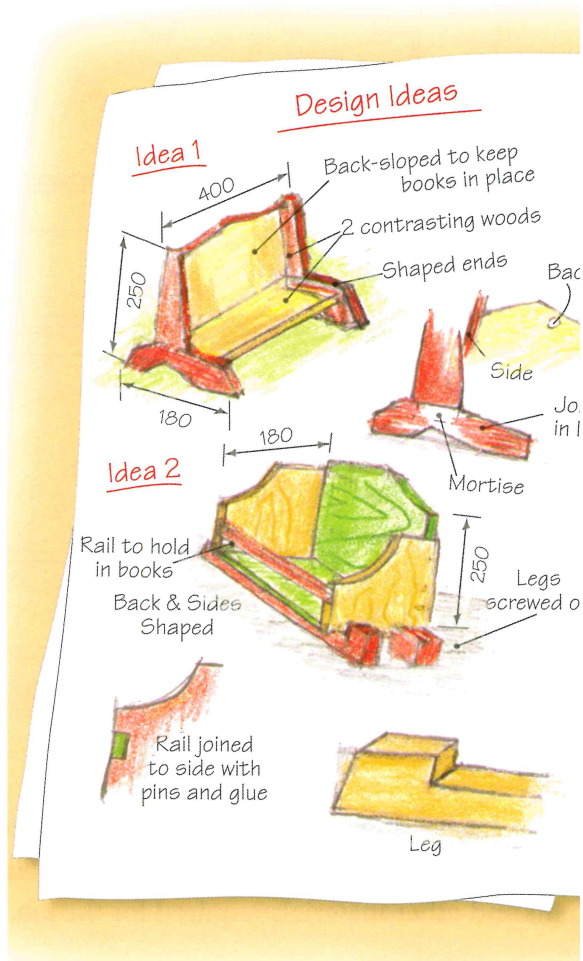
## Design ideas and solutions

Ideas will be formed from your investigations. You may record your ideas in the form of sketches with labels to explain the detail. The sketches should also include basic overall measurements, as well as listing the materials to be used. Discuss the good and bad points of each idea. Several ideas should be set down. From this material you can develop a final idea that brings together all of the good points.

You can make a basic **prototype** or mock-up of your final idea to get a good sense of it. The model need not be very detailed to be effective.



*Model of a book holder; models or prototypes are useful in designing*



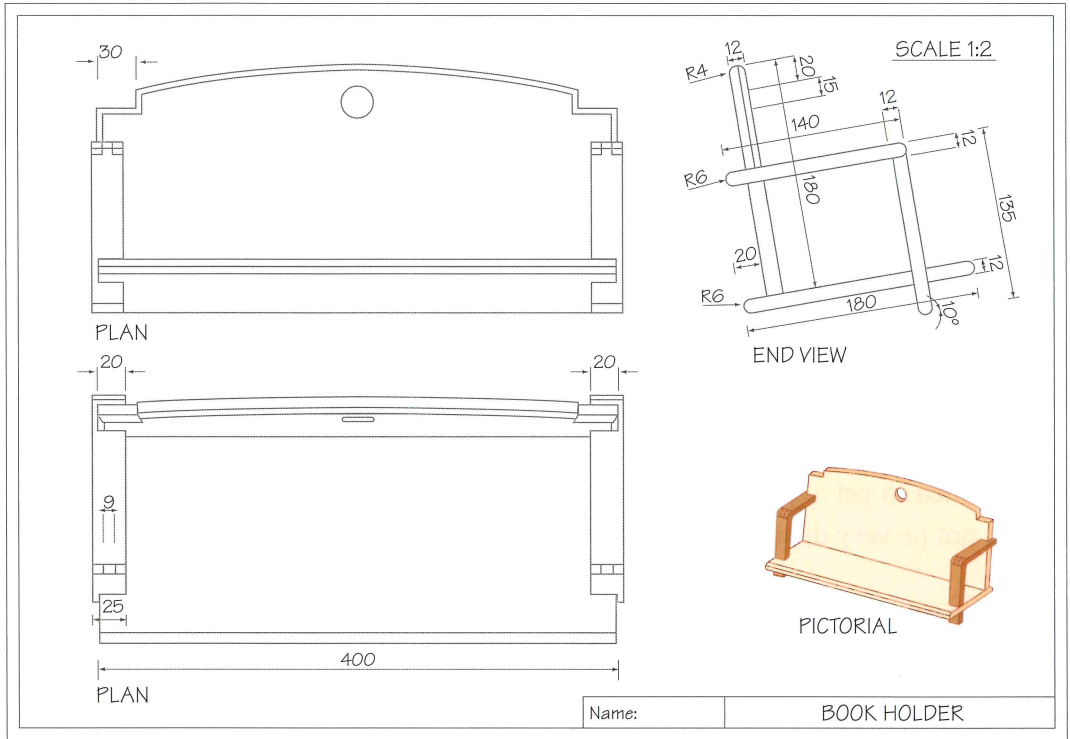
*Design ideas with comments and main sizes*

A model can also be made using CAD (computer aided design) software. Changes can be made and it can be used to produce a basic working drawing.

Even when you arrive at a final solution you can make refinements. As well as assisting the design, a model may gain you marks.

## Working drawings

Working drawings are produced of your final solution. An orthographic view is generally used. The drawings are used to make the item and so must have all the measurements and details. It is a good idea to include sketches or drawings of joints and other important parts of the solution. These can be done on a larger scale and give greater detail.



Working drawing

### Cutting list

A cutting list showing the sizes of all of the pieces in the project should also be made. This is usually prepared by your teacher to prepare the materials. The cutting list should also detail the screws, pins and other materials required for the job.

Item	Quantity	Length	Width	Thickness	Materials
Back	1	400	180	12	Beech
Base	1	400	180	12	Beech
Leg	2	135	25	12	Mahogany
Rail	2	140	25	12	Mahogany
Screws	3	3 x 25 mm countersunk			

Table of a cutting list

## Making

Using the working drawings or sketches, you begin making the item. You should record the main points of the process in your folder.

- First mark out the pieces
- Then work and process the joints
- Finally, mark and process the decorations on the pieces
- Assemble and finish the final piece

Recording the important processes of the work will be of benefit to you in reviewing and evaluating your work at the end.

## Evaluation

At the end of all projects the designer (you) will stand back and review the work done. You must look critically at your work and the design to examine all the good points as well as the bad ones. All the best craftspeople evaluate their work to try to improve it. Evaluation is a critical way to assist in making better, more useful items.

It is best to divide up the **evaluation** into three parts. This method of working is the same as suggested in the project exam design brief.

### 1 The design

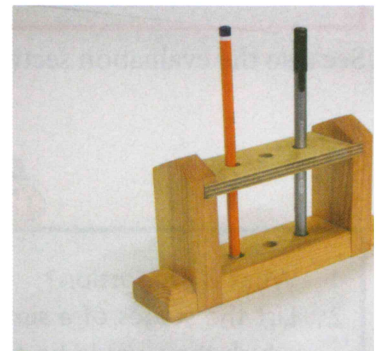
Reviewing the final design and its positive points.

### 2 The making

Describe what you learned from doing the work. Describe the problems you encountered and how they were solved. Discuss how you learned from your mistakes.

### 3 The finished item

How does the finished item compare with what you were asked to make in the brief? What were your impressions of the final piece? Describe some of the changes or improvements that you would make. Always include sketches to help your description.



- *It turned out well*
- *The thin trench for the plywood was difficult to remove*
- *The wood split as I was chiselling it out*



- *I like the colour and it went together easily*
- *It was difficult to get the legs attached to the seat piece*
- *A small piece broke off the backrest because it was very small*





### Evaluation prompt questions

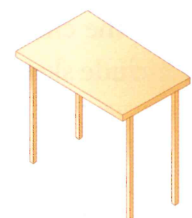
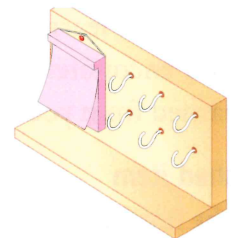
- How does your item meet the requirements of the brief?
- How does it address the points in the analysis?
- Are there things that may have been left out?
- Were the materials used suitable and appropriate?
- Discuss the problems you overcame
- Discuss the work quality: how could it be improved?
- Discuss the joints used: how did they work out?
- How did you make the piece attractive? Was it successful?
- How could the finish quality have been improved?

See also the evaluation section in the projects, pages 300–319.



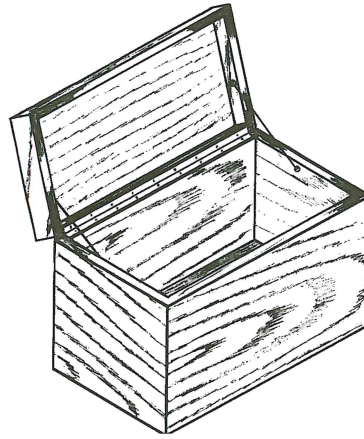
### Exercises

- 1 What is proportion?
- 2 List the stages of a simple design process in the order in which they would be approached.
- 3 Sketch two suitable shapes that might be used for a cheese cutting board.
- 4 Describe why a prototype would be useful in the design process.
- 5 Describe some of the things that you should research when designing a small safe candle stand for at least four night-lights, see opposite.
- 6 Write a brief analysis of the following project titles:
  - (a) Money box
  - (b) Desk tidy with a clock
  - (c) Desk lamp
  - (d) Tool box for small tools
- 7 Using notes and neat sketches show how you would make the key holder/notice board opposite more attractive.
- 8 Design a nameplate for your bedroom. Draw your ideas on grid paper.
- 9 The table shown opposite lacks strength. Describe using neat labelled sketches how you would improve the design to make it stronger.

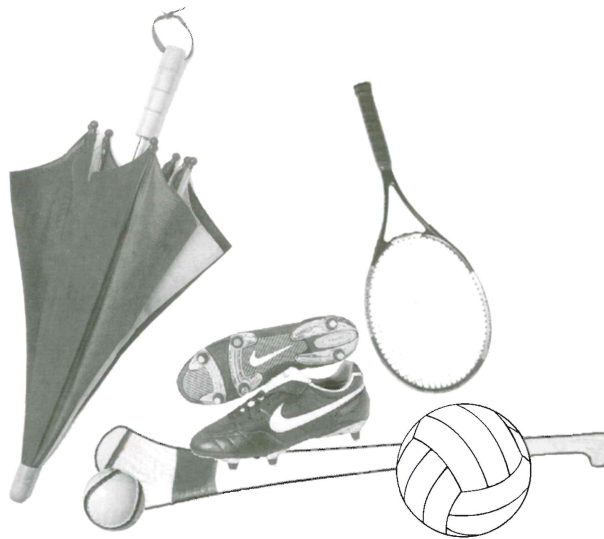


### Exam Questions

- 1 Using notes and sketches show two ways that you could decorate this box to improve its appearance.  
(JC, OL, 2005)



- 2 (a) Two stages in a typical design process are sketches/working drawings and evaluation. Explain these two stages.  
(b) The diagram shows a collection of items which are often found in a home. Using notes and freehand sketches to communicate your ideas, design a unit to store these items.  
(c) State two specific requirements that must be considered in your design.  
(d) Suggest a suitable material for the manufacture of the unit and give two reasons for your choices.



(JC, HL, 2008)