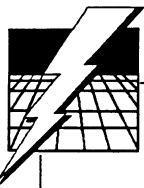


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# Introduction

Modelling is an activity which affects all of our lives. Without models, many things we use every day would be unsafe and unpredictable. Chairs or bridges might collapse, our homes and schools would be badly constructed and a lot of time and money would be wasted on products that might not work properly.

Before a new design is put into production, no matter how small or large it is, models need to be made to test whether or not the design will work. You do not need any special skills to make a model and many of the materials used are cheap and readily available. As you read through this book, you will learn the basic techniques for making different kinds of models, including models which work. Tips are also given for how the models can quickly and easily be made to appear realistic.

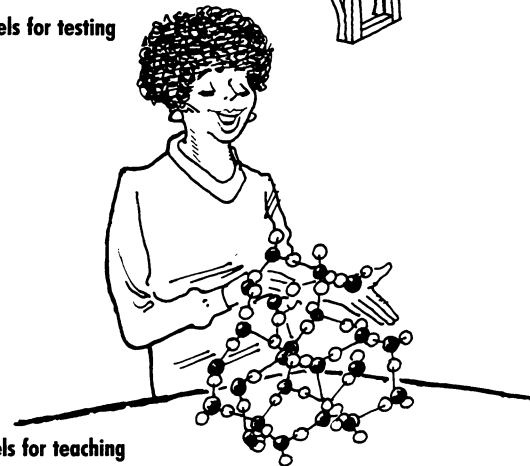
A section has been included which explains how computers can be used for making models since they have become more and more important in design and manufacture over recent years. The words which are printed in **bold** throughout this book might be new to you and are listed in a mini-dictionary at the back. Model making can be very exciting and satisfying and this book attempts to show you how to do it. Read on. . . .

## Fact File

People have been building models for thousands of years. Ancient Egyptian models of shops and boats made in 2000 BC have survived inside tombs.



Models for testing



Models for teaching



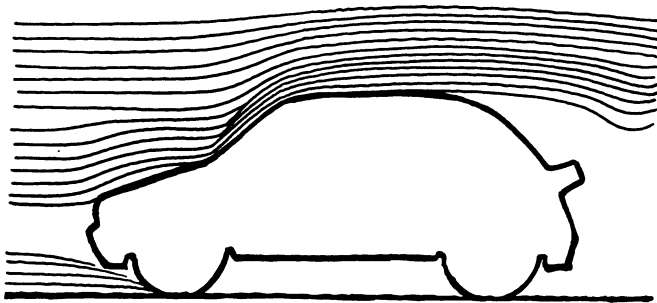
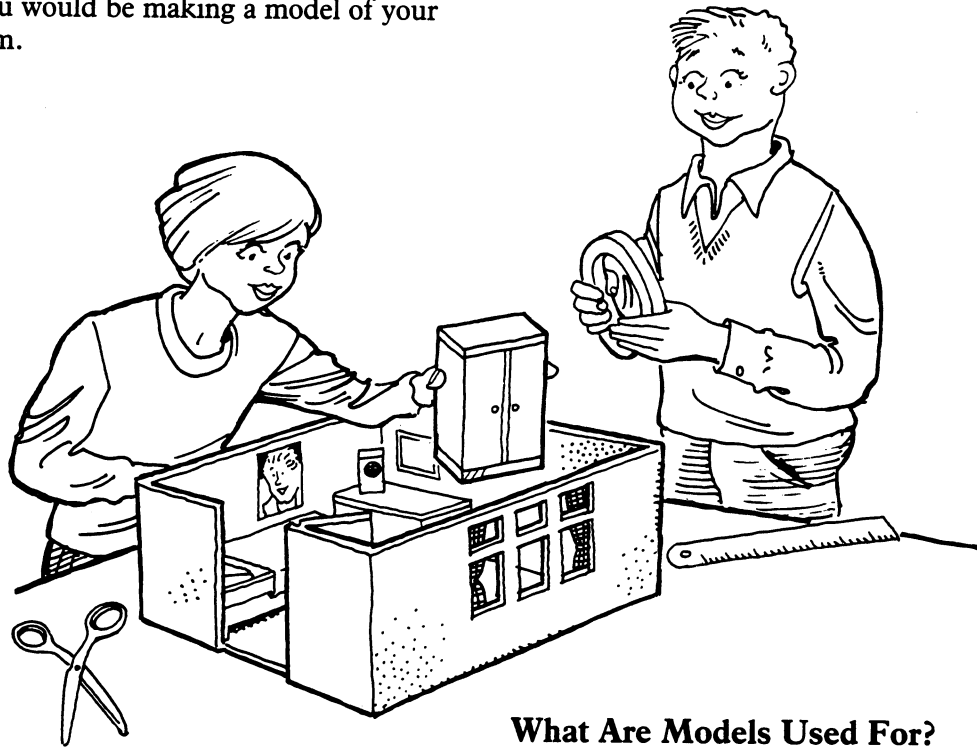
Models for having fun

# Introduction

## What Is a Model?

If you were asked to explain to a friend what your bedroom looks like, how would you do it? Would you describe the furniture, colour of the walls, size and so on? Perhaps you would draw a picture of it. Another idea would be to build a copy of your room using cardboard or small pieces of wood. If you did this, you would be making a model of your bedroom.

Models are useful because they can give us a much clearer idea of what something looks like. We can look at the models from different angles and see how individual parts relate to each other.



A wind-tunnel simulation

## What Are Models Used For?

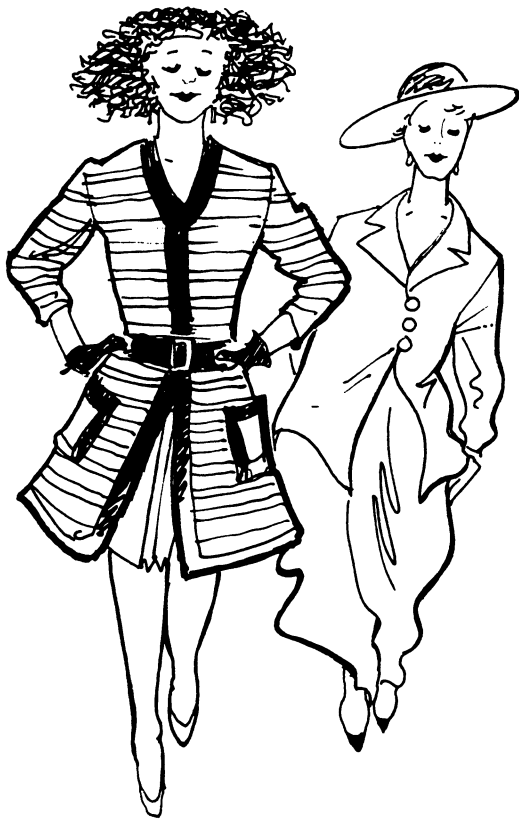
Before a new product is put into production, models are built and tested to make sure that the final product will work as it is supposed to. The product might be anything from a hairdryer to a hovercraft. There are many different types of model.

Before a new building is built, the architect will have a model made to work out where gas pipes or electric wires should be placed, for example. A model of a building is called an **architectural model**.

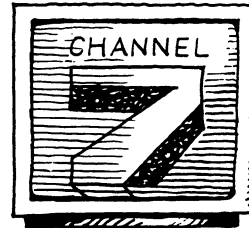
# What Different Types of Model Are There?

Models of smaller household items are known as **product models**. This form of modelling is often concerned with products which would be injection-moulded. Models which have working parts are often required either to demonstrate a principle, such as how a mechanism works, or to test an idea. These are known as **working models**. **Static models** have no working parts and are used to convey ideas about appearance, weight, feel and so on.

Models are often used in advertising and promotion. Cardboard developments may be built for shop window displays. Fashion models are used to try out new styles of clothing.



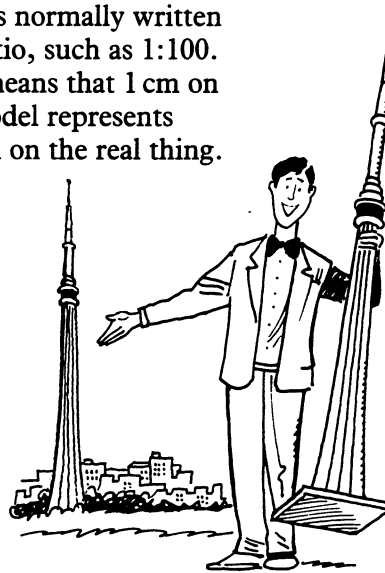
Models may be created using a computer and displayed on a screen. The opening titles for many television programmes are made in this way. These models are not real but exist only inside the computer as a series of numbers.



## Scale

If the model is smaller than the real thing, then the model is said to be 'scaled down'. Architectural models are usually scaled down. Models which are larger than the real thing are said to be 'scaled up'. This kind of model is often used in science, to show what a molecule looks like, for example. Product models are usually the same size as the real thing and are said to be 'actual size'.

Scale is normally written as a ratio, such as 1:100. This means that 1 cm on the model represents 100 cm on the real thing.



# Introduction

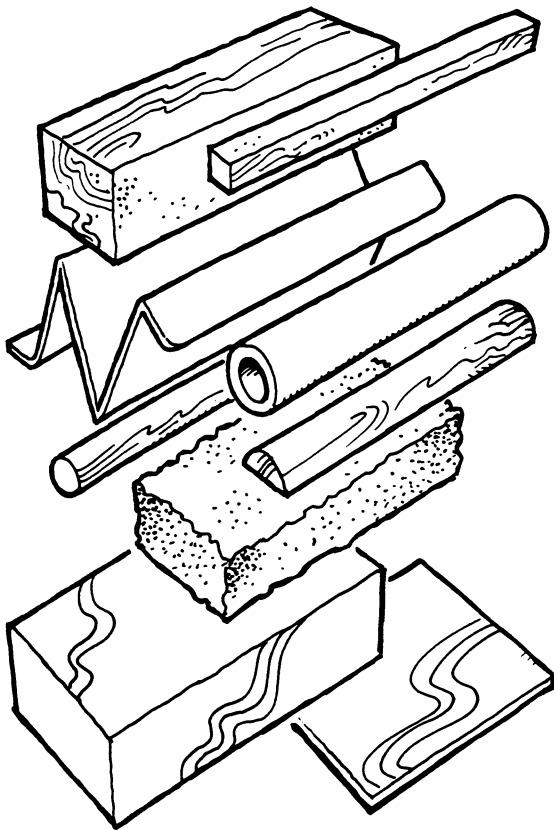
## Equipment

### Materials

Simple models can be made very cheaply using some basic tools and **materials**. The type of material you use for a model will depend upon what sort of model you are making and how large the model is.

Paper and card are easy to obtain and are not too expensive. They are available in various colours and thicknesses and may have textured or mirrored surfaces. Card is often used for development work by bending or folding it.

**Balsa wood** and **jelutong** are the best woods to use because they are quite easy to shape. They are available in thin sheets, blocks and lengths of varying cross-section.



Plastics such as **polystyrene**, **ABS** and **acrylic** are particularly useful for **prototype** models. **EMA** plastic tubing and connectors may be used to model such things as buildings, furniture or containers.

**Aluminium** is probably the most useful metal to use for modelling. In sheet form it can be folded in a similar way to card to create developments. In block form it can be machined to create a **block model**.

Many other materials can be used for modelling such as matchsticks, clay and scrap materials. Decide what effects you want to create before deciding which material you will use.

