

### **INTRODUCTION TO WORKSHOP SAFETY**

Safety is a major importance in any craft room. It is imperative that safe working practices are observed at all times. Failure to observe safety rules will result in that individual losing the privilege to work in the craft room. Below are some general safety precautions.

- 1 Always walk when in the workshop, running causes accidents.
- 2 If sharp tools must be carried in the workshop they must be carried facing downwards with both hands.
- 3 Always work with sharp tools, blunt tools cause accidents.
- 4 Pupils should be familiar with the position and operation of the emergency stop buttons in the workshops, only press if an emergency arises.
- 5 Eye protection must be worn if operating any machinery.
- 6 Report any damaged tools, Equipment etc. to the teacher.
- 7 Always store tools in the appropriate place when not in use.
- 8 Always keep both hands behind the cutting edge when working with a chisel.
- 9 Never strike two hammer faces together, flying metal chips could cause serious injury.
- 10 Always use a file fitted with a handle, tangs are sharp and very dangerous.
- 11 Always check machines are set correctly before using and all fitted guards in place.

### **WORKSHOP ROUTINE**

- 1 Before any work commences all jackets should be removed and hung up.
- 2 All bags placed under the workbench, any loose clothing or hair should be tucked in or tied back.
- 3 Work benches and machines must always be swept clean after use.

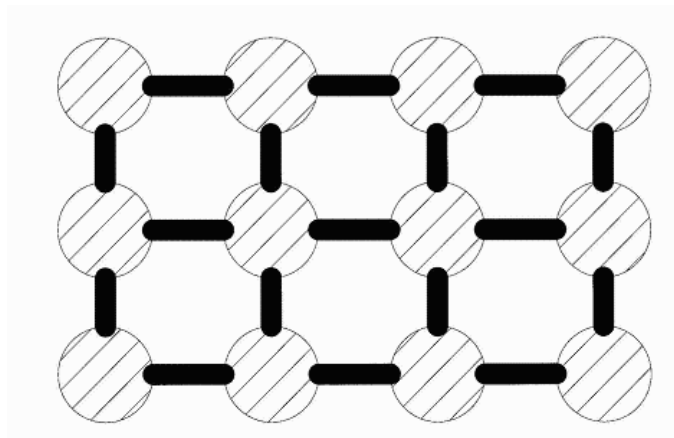
TASK: Read the above list of Safety rules and write down in the box the one rule you feel is the most important, and state why you think this.

## **MATERIALS**

The clock you may be making is constructed from various materials such as Metals, Plastics or Woods. These materials are different in many ways and these differences will be explained in the following pages.

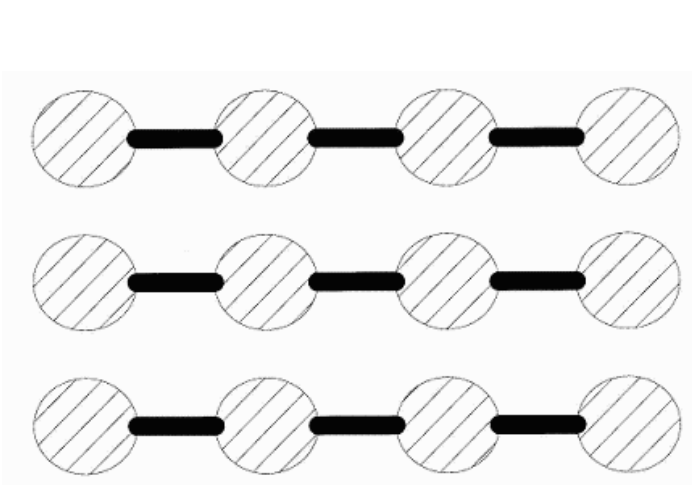
## **PLASTICS IN THE WORKSHOP**

Plastics have taken over as the most widely used materials in use today. There are two main categories of plastic Natural and Synthetic. The ones we are interested in are the synthetic types which are made from chemicals found in Oil, Coal and Gas. These come into two main categories of Thermo-Setting and Thermo-Plastic



Above is shown the structure of Thermo-setting plastic, note the cross links make it hard to reshape this type of plastic. These plastics are ideal when you want toughness and also heat resistance.

Examples of this type of plastic are BAKELITE which are used for electrical fittings such as plugs and GRP (glass reinforced plastic) which can be used for car and boat bodies.



Above is the structure of Thermo-Plastic, note the lack of 90 degree cross links make it easy to reshape this type of plastic by simply reheating it. These plastics are ideal when you have a need to reshape them after they are made or during the process of making a complicated shape such as a juice bottle.

Examples of this type of plastic are PVC which is often used for shoe soles and ACRYLIC which can be used for household baths.

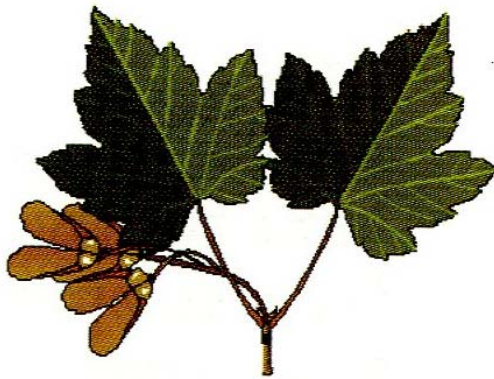
TASK: Write down two objects which are made from plastics and try and guess if there are thermo setting or thermo plastic.

Item	thermo plastic	thermo setting plastic
(1)		
(2)		

## TIMBERS

There are 3 main categories of Timber; these are Hardwoods, Softwoods and Manufactured Boards.

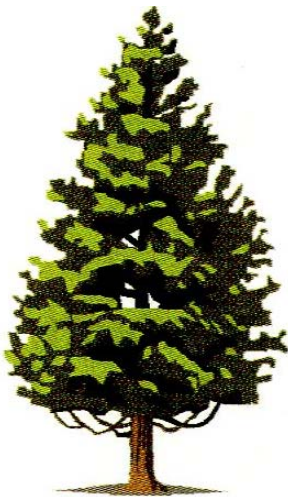
Hardwoods come from broad leaf trees. They generally grow slow and are hard In most but not all cases. Examples of these are OAK which is very strong and is mainly used for quality furniture or boats. BEECH which is light in color but tough and is ideal for toys or furniture needing to be hard wearing.



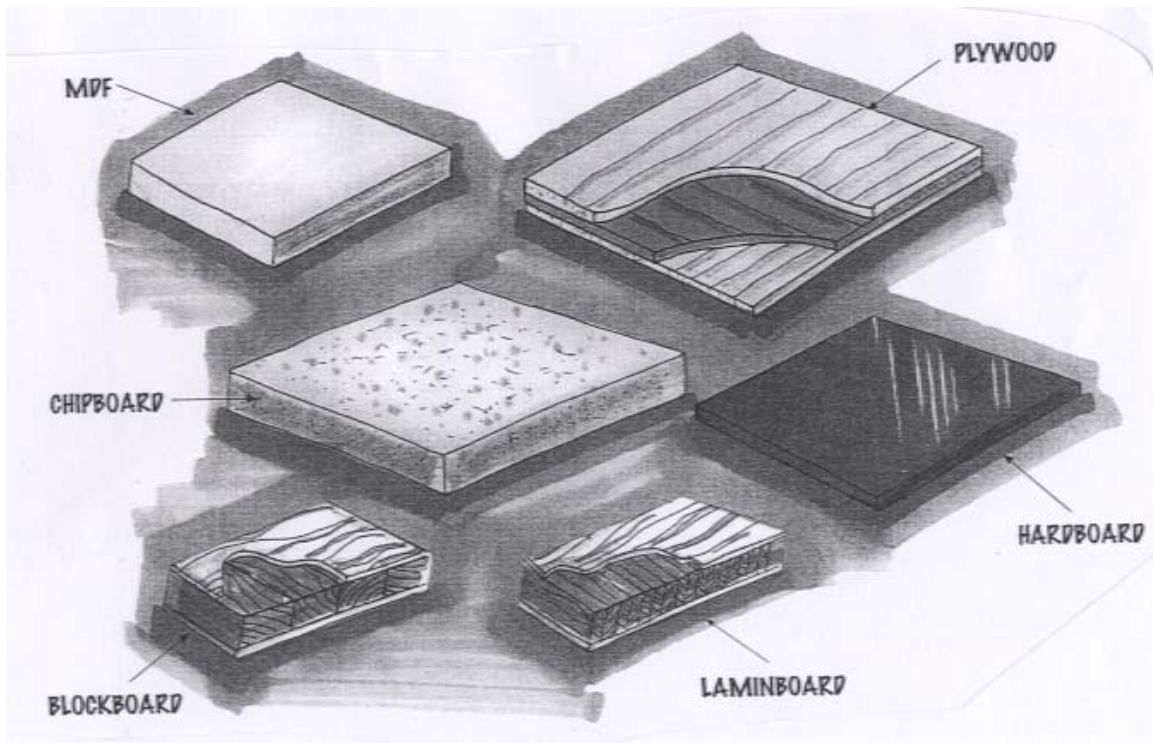
Softwoods come from trees with needles Rather than leaves. These trees tend to Grow faster than hardwoods but are Softer to use.

Examples of these are SPRUCE which is soft but easily shaped for indoor furniture.

SCOTS PINE is fairly strong and is mainly used for building houses.



Manufactured Boards are made by using layers or particles of wood ,combining them with glue and heat or pressure to create a variety of large boards for varying uses in industry, DIY and schools. They tend to be cheap with little waste.



TASK: Using the information on pages 3 and 4 write-down the answers to the following, what type of wood would be suited to the following uses; A- front door, B- coffee table top, C- Toy box.

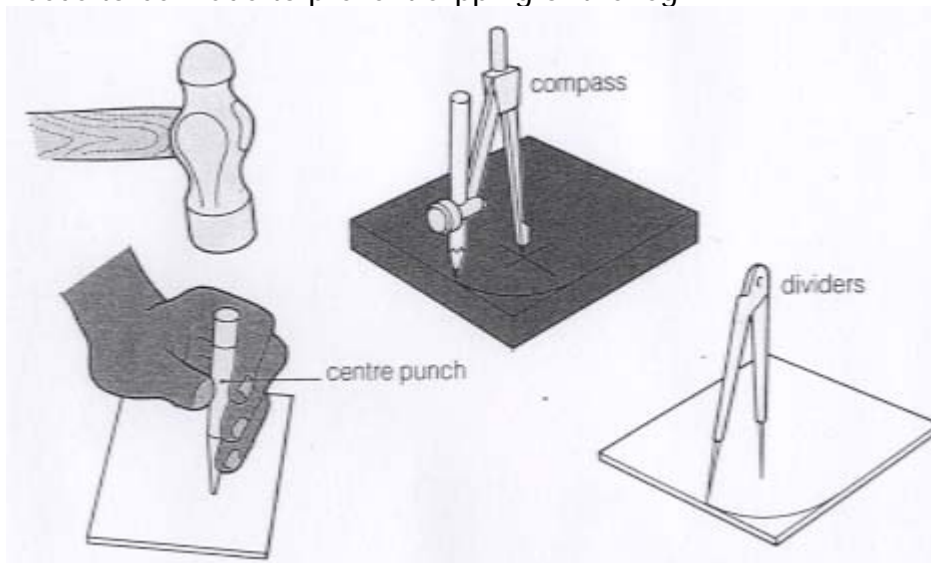
- (a) Front door
- (b) Coffee table
- (c) Toy box

## MARKING OUT

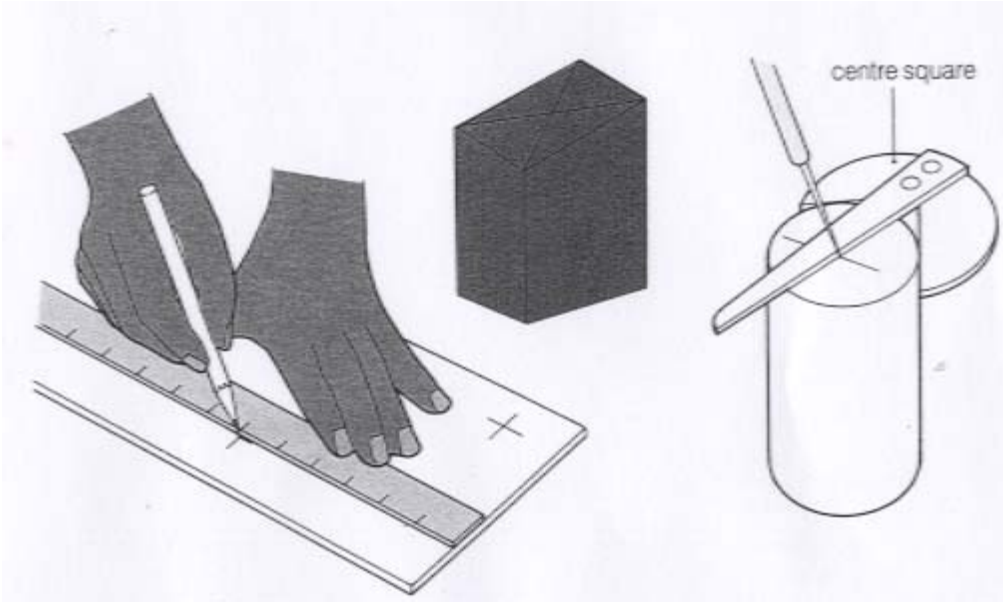
When it comes to making your clock you will be given a piece of plastic or wood which will be square or rectangular in shape. You will have to draw or mark onto the surface of this material the shape of your clock or the parts which will join up to create your clock, this is called marking out.

Depending on the material and the shape you want to make there are a variety of tools and equipment you may use. Your teacher will guide you to select the correct ones and instruct you in their correct use. Below shows various marking out tool and their uses.

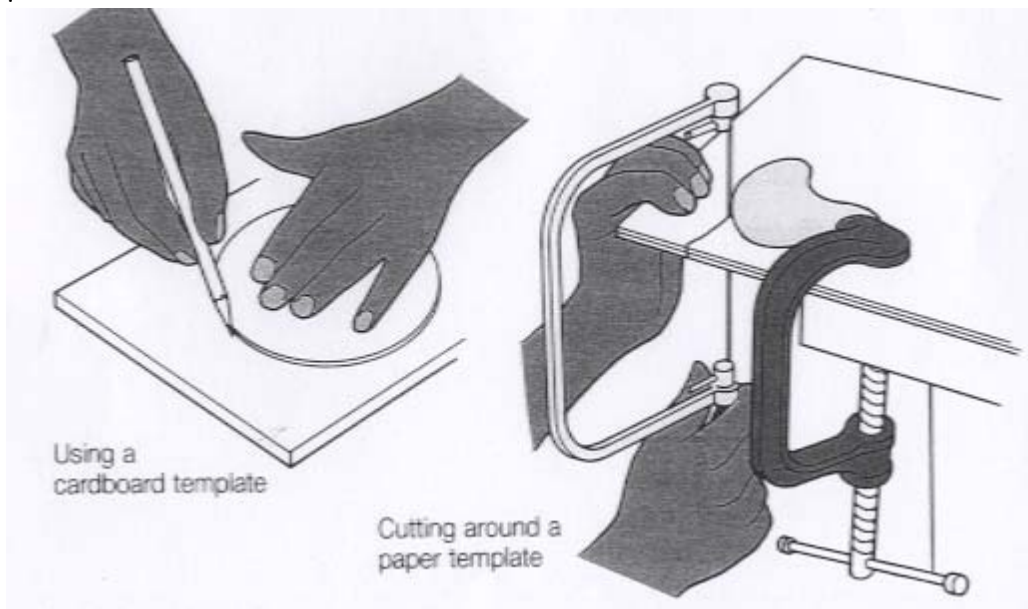
Circles or part circles can be marked onto the surface of various materials using either a compass or dividers. On some materials such as metals a small dent needs to be made to prevent slipping of the leg.

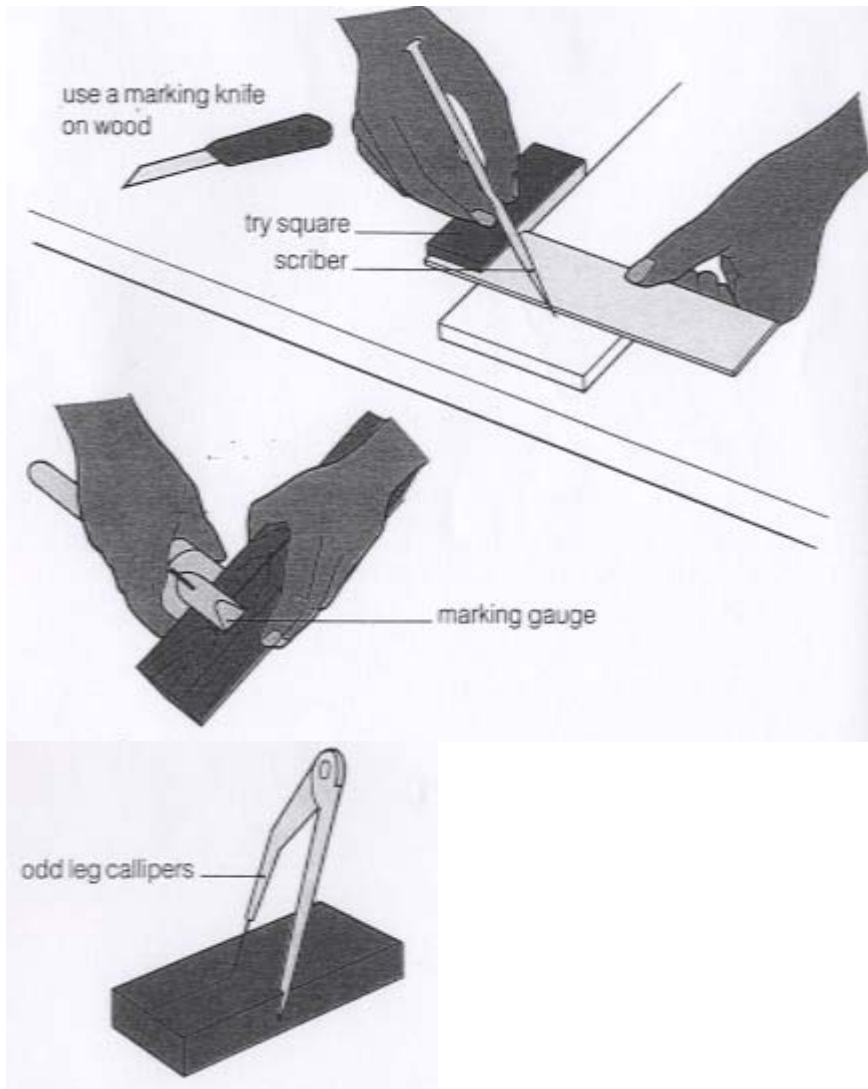


Centre's can be marked by using either a centre finder or ruler and pencil.



Irregular shapes can be transferred onto materials by using a paper or card Template. This is a piece of paper which is cut to the desired shape then drawn or cut around.





Parallel lines can be marked onto materials by use of the methods shown above.

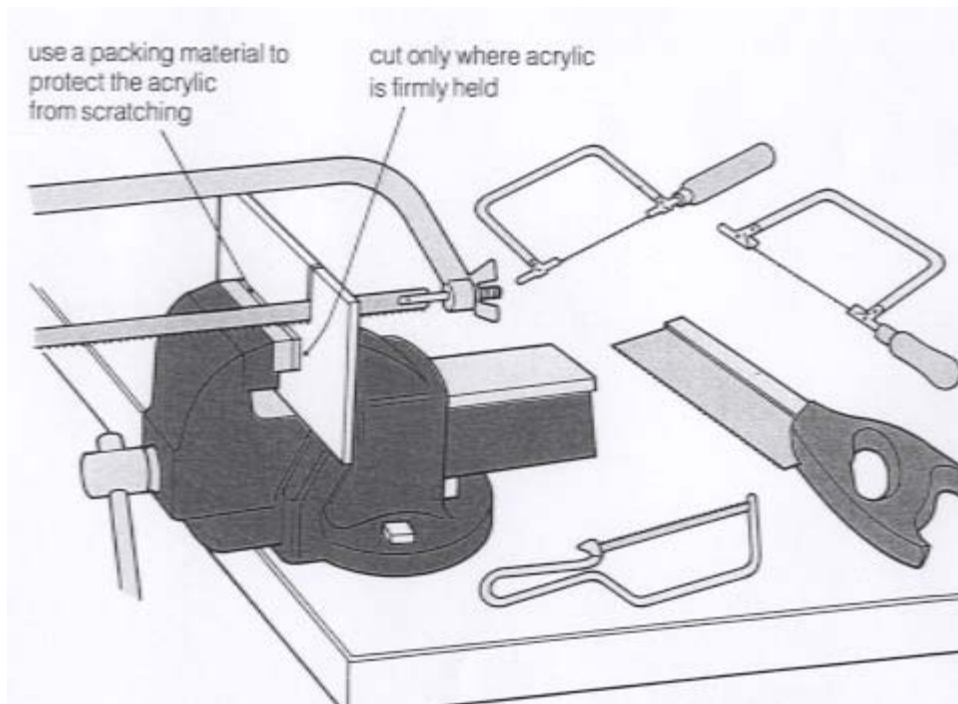
TASK: Ensure all model marking out is now completed



## CUTTING AND FINISHING

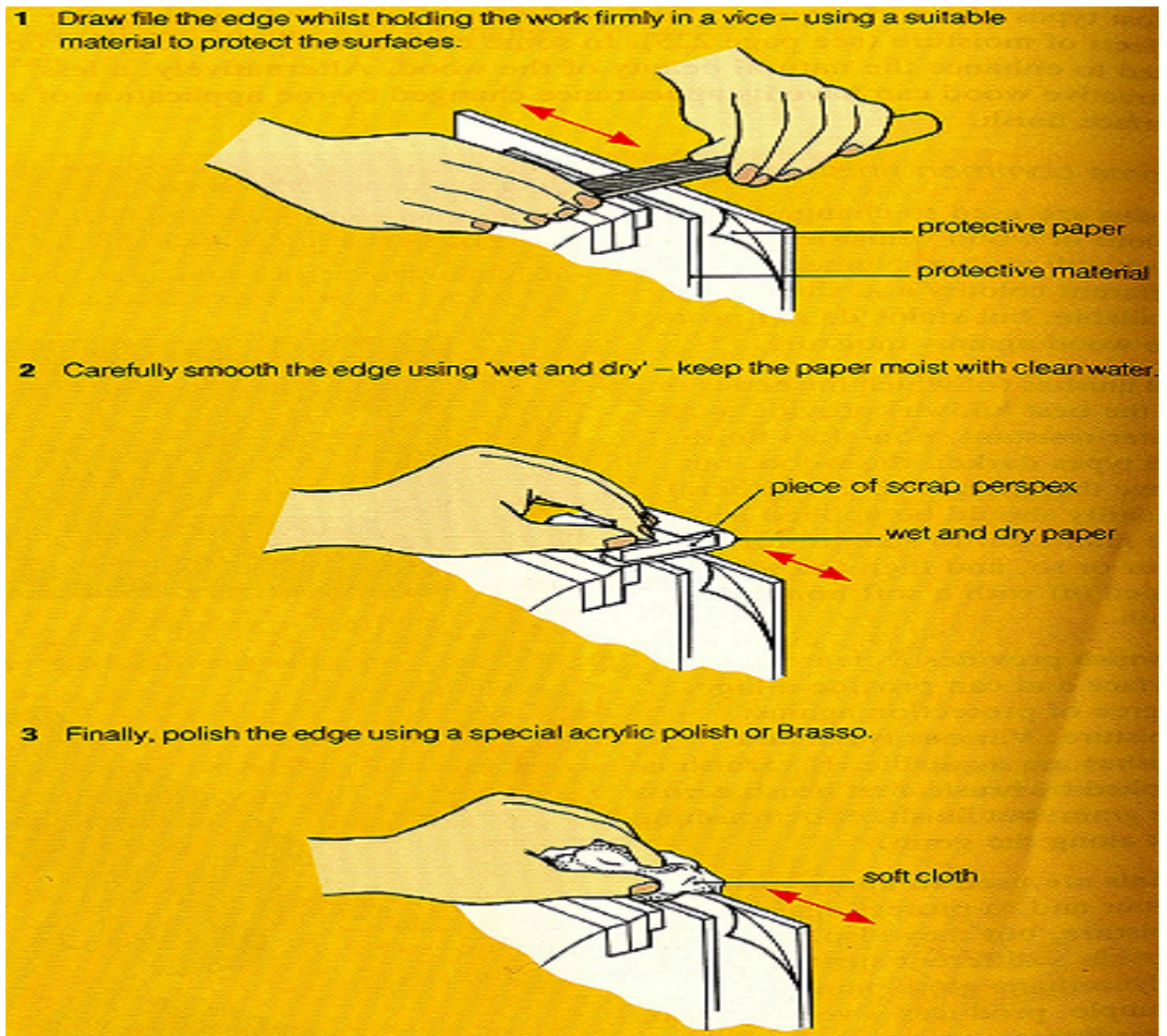
When you have finished marking out you will use a variety of tool such as Saws Drills etc to cut out the shape, you will then need to finish it by smoothing the edges and surface of wooden parts and edges of plastic parts.

Below is shown the methods employed..



The Plastic we use being a Thermo plastic can be reshaped by using a strip heater which will allow you to fold the material along a straight line and set it at a desired angle by cooling it.

## Plastic finishing



TASK: Ensure all cutting and finishing is now completed.

## WEEK 17

### **ASSEMBLY**

When all the parts are complete they will need to be assembled into the finished object.

This may involve using fixings such as brackets and hinges or various joints or nails and screws or glues of varying types.

When the assembly is complete the object should be tested to see if all the parts work correctly, any malfunctions should be fixed at this stage.

### **FABRICATION**

This is the “putting together” of materials and components to make structures or products.

There are basically 3 different types of joint used for “fixing” things together.

These are permanent, temporary and moveable joints.

## WEEK 18 and 19

The final stage would be to apply any finish such as paint, varnish or polish which is part of your model. Once this is done your model is complete.

## WEEK 20

### **COMPLETION OF MODEL**

TASK: ensure final completion of model and testing of all parts is now completed.