



Turnbull High School

Technical Department

Craft & Design

Information Sheet Level F - Wood

In this unit you will be designing and manufacturing a CD Rack which will be used to store CD's. During the manufacturing process (i.e. making the CD rack) you will develop further knowledge and understanding and skills in the following:-

1. Safety in the workshop.
2. The use and naming of various tools.
3. How to transfer your own ideas from paper to the wood.
4. About the re-cycling of materials and deforestation.

Some facts about the tools/materials used in the manufacture of the CD rack.

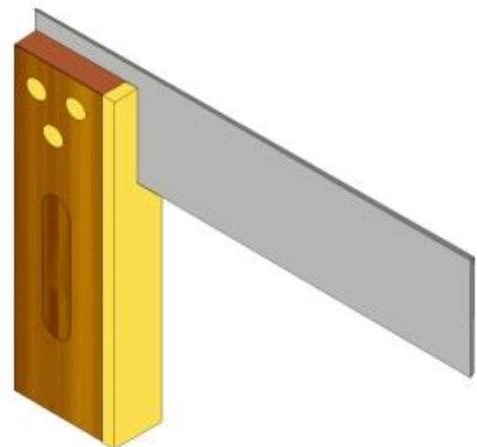
Safety

When in the school workshop the following safety rules must always be observed:-

- Never carry on with others.
- Always wear goggles when using machinery.
- Always listen to what the teacher has to say.
- Always tuck in loose clothing such as ties, shirt tails, etc.

Try Square

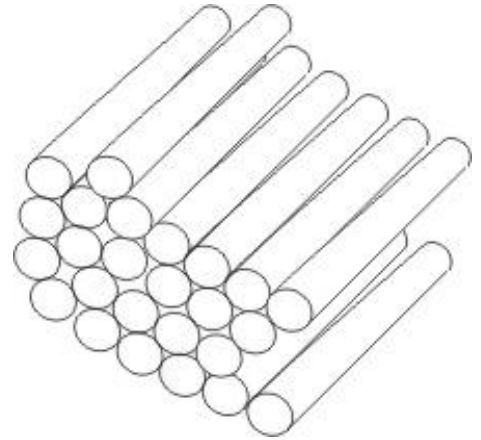
The try square is used to test the squareness of material and mark out lines at right angles to a given surface on wood or plastic. The stock is made from rosewood with a tool steel blade.



Grain

When we talk about the *GRAIN* of the wood, this refers to the fibres of wood which are all squeezed very tightly together. Try to imagine if we took a really strong magnifying glass to look at the fibres they would look like drinking straws all stacked on top of each other. When planing end grain it is important that the wood does not split.

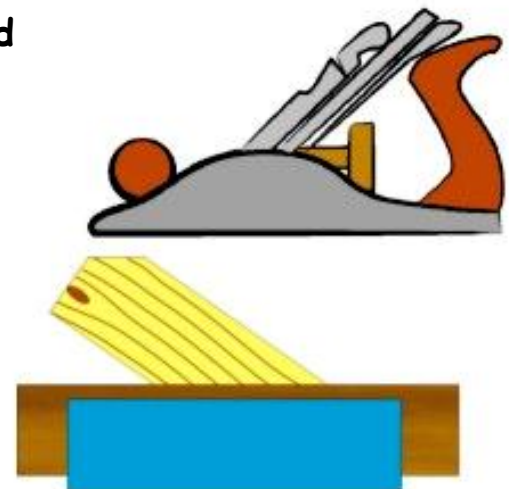
Fibres



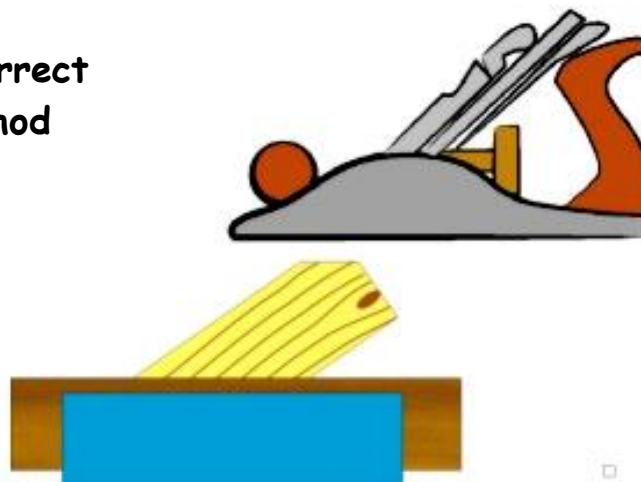
Planing End Grain

When planing end grain it is important that the wood does not split. There are numerous ways to overcome this splitting, e.g. If you look at the two examples shown opposite, in the correct method of planing end grain the plane is planing in the same direction of the grain. In the incorrect method it can be seen the plane is planing against the grain. Your teacher will explain this in greater detail.

Correct Method



Incorrect Method



Wood

Wood comes from trees, therefore depending on the type of tree the wood was taken from will determine the colour, strength, durability etc. of the wood. Trees are general classified as either a Softwood or a Hardwood.

Hardwoods

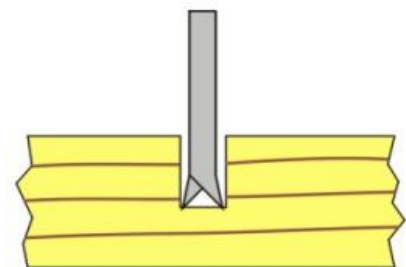
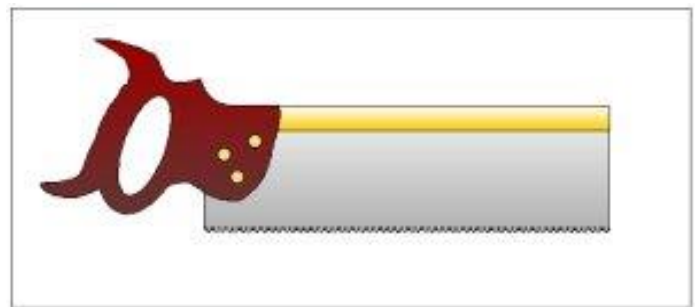
This group of trees generally have broad flat leaves and their seeds are enclosed in a fruit. Examples are beech, oak, mahogany,

Softwoods

This group of trees generally have long needle-like leaves and their seeds are held in cones. Examples are red pine, white pine, douglas fir and cedar.

Tenon Saw

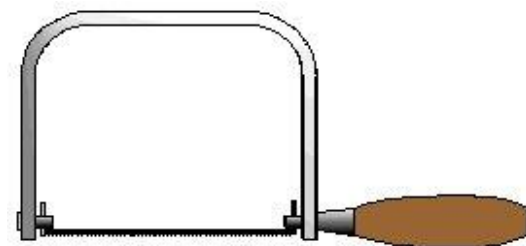
The Tenon Saw is used for general sawing in wood. The fine teeth, 12 - 14 per 25mm ensure a fine saw cut or KERF. To help prevent the saw blade jamming when sawing, the teeth are SET, i.e. the first tooth is bent to the right and the second to the left and then right and so on. The purpose of this is to make a bigger gap than the thickness of the blade, this will allow the blade to cut without jamming. Your teacher will demonstrate what this means. The Tenon Saw has a brass or steel Stiffening Rib to strengthen the back of the blade and prevents it from being too flexible.



Kerf

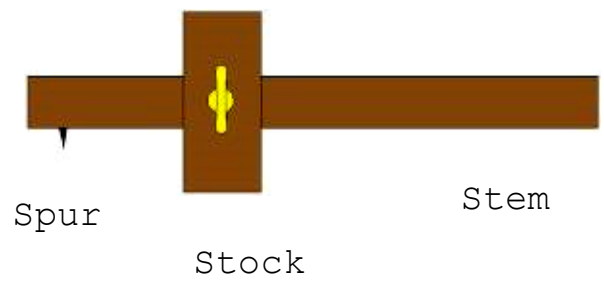
Coping Saw

The coping saw as the name implies is used because it is very good at coping with awkward cuts in wood. It is also unique as it is the only saw which has it's teeth facing backwards. In normal sawing the cut is made in the forward stroke but with the coping saw the cut is made on the backward stroke.



Marking Gauge

The marking gauge is used for marking lines parallel to an edge on timber (cut wood). The stock and stem are made from beech because beech is a very hard wearing wood, whilst the spur is made from steel sharpened to a point. The thumbscrew is made from plastic or box wood and then threaded into the stock.



Manufactured Boards

Very wide boards of timber (cut wood), especially hardwood, are in short supply because many of the world's rain forests are disappearing due to the over cutting of trees. One way which has overcome this problem is the development of manmade boards. These boards are generally very strong although some are stronger than others, depending on how they have been made. There are many different types of manmade board available and among the more common are PLYWOOD, BLOCK BOARD, CHIPBOARD and HARDBOARD.

PLYWOOD



CHIPBOARD



Recycling

Everyday new designs are being created which in turn leads to new products being made such as the new Playstation II. To make these new products, materials such as plastics, metals and woods are required. Well, have you ever asked yourself where does all of this material come from, it comes from our surroundings. Whether it comes from the highlands in Scotland or the deepest forests in South America, we (humans) are cutting trees down faster than we can grow new trees, e.g. a hardwood tree takes at least one hundred years to grow to a size which will allow a decent sized plank to be cut. A softwood tree only takes about thirty years to do the same.

This removal of trees leads to many environmental problems including soil erosion, to the animals that live in them losing their homes. Trees turn Carbon Dioxide (a waste material given off by us in our breath, car exhausts and factories, etc) into oxygen, so therefore if we lose our trees where are we going to get our oxygen from? We will all suffocate.

One method which could overcome this problem is to stop cutting down the trees and make manmade boards instead. Two examples of a manmade board were shown earlier in the booklet.



Soil Erosion caused by cutting down all the surrounding trees

Plastics are another natural resource and one which is becoming more and more commonly used in the manufacture of our everyday products, virtually everything nowadays is made from some kind of plastic. Plastics are produced from coal and oil, another natural resource which is also diminishing very quickly, therefore more and more emphasis is being placed on re-cycling material such as these. Turning old wood into manmade boards and taking old plastics and re-cycling them into new products such as toys, bottles, etc. This practice is a must if we do not want to damage our planet any more than we have to date. The re-cycling of paper for uses such as toilet paper is another initiative which saves on the amount of trees being cut down.

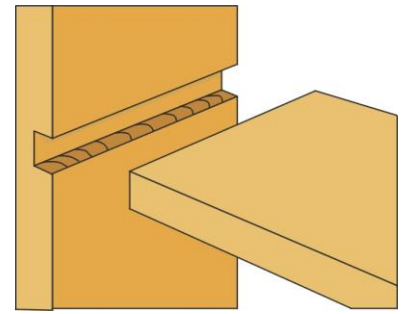
Smoking Stacks causing huge amounts of damage to our surroundings



Metals are produced from ore which is mined from the ground. This is both expensive to mine and damaging to the surrounding environment, because the mining causes erosion of soil which can lead to flooding. Again one way of stopping this, is the ever increasing practice of re-cycling old cars, vans, scrap metal etc.

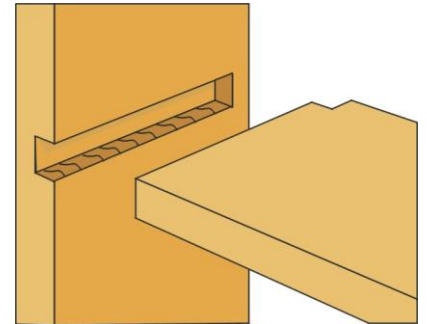
Through Housing

These joints are simple to make and are suitable where the two parts being joined together are the same width.



Stopped Housing

These are harder to make, but are neater because the joint does not show on the front edge.



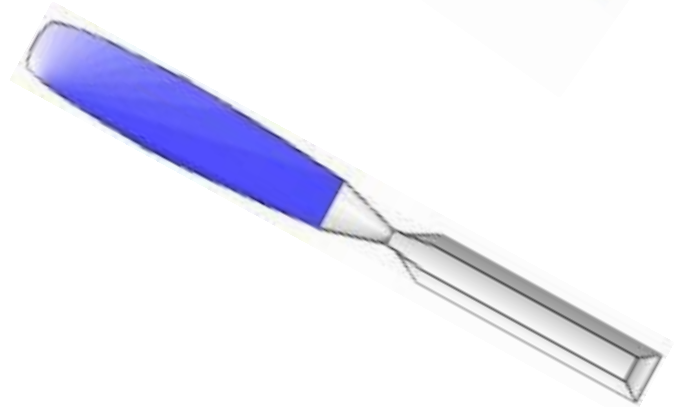
Carpenters Mallet

The carpenters mallet is used in woodwork for hitting chisels or for assembling parts of wood together. The carpenters mallet is made from a hardwood called beech as this wood is very hard wearing.



Bevel Edged Chisel

The bevel edged chisel is used for paring and general chiseling of wood. Two edges of the blade are beveled along their length and this makes it suitable for accurate joint work. The size of the chisel is indicated by the width of the blade (3mm - 50mm)



Safety Note

When working with the bevel edge chisel or any type of wood chisel **ALWAYS** keep both hands behind the cutting edge.

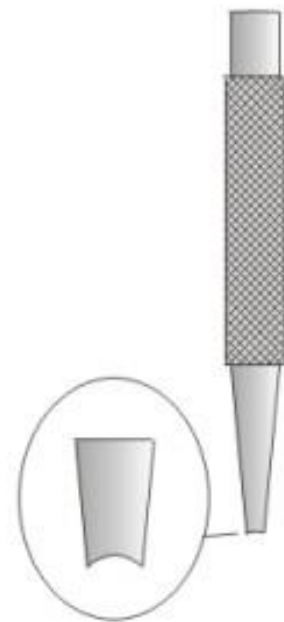
PVA Glue

Polyvinyl acetate (PVA) is probably the most common type of wood glue used in the school workshop. It is a white water based liquid adhesive (i.e. it is mainly made of water). It is supplied to schools in plastic containers. It is easy to apply, non-staining (although excess glue should be wiped off with a damp paper towel) strong and attains its maximum strength usually after twelve hours.



Nail Punch

There are different sizes of pin punch to suit different sizes of nail. They are used to drive headless nails and panel pins below the surface, so that the hole can be filled with a suitable wood filler.



Cross Pein Hammer

This is a very light weight hammer with a cross pein at one end. This hammer is used for light work with the cross pein part being used to start driving short nails and panel pins into the wood. The shaft of the hammer is made from a special wood called Hickory. The reason for using hickory is because it is a very hard wood and therefore less likely to break when being used.



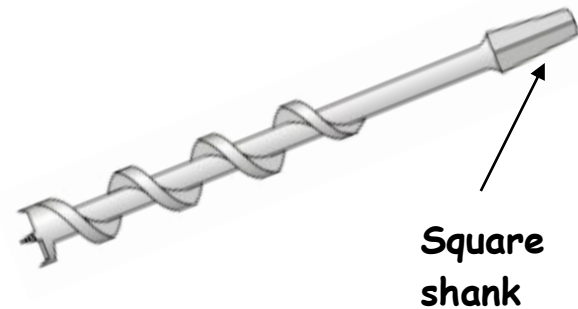
Ratchet Brace

The ratchet brace is used to hold and turn various boring bits when cutting circular holes in timber. The head of the brace rotates on a ball bearing washer to reduce friction. The other end of the crank has a chuck containing "alligator" jaws which hold the bit. The chuck is attached to the brace by means of a threaded core at the end of the crank. The ratchet enables the brace to be used in a confined space where it would be impossible to make a complete revolution of the crank. The sweep of the crank is usually about 250mm.



Augre Bit

The augre bit is used for drilling deep holes in wood. It is unsuitable for boring end grain due to its tendency to drift. Sizes vary from 6mm to 50mm. The bit has a square shank at the end which allows it to be gripped by the jaws of the Carpenters brace.



Claw Hammer

This hammer is used for heavy nailing (i.e. used for hammering big nails). The claw part of the hammer is used to remove nails that have already been driven into the wood.



Marking Knife

As the name implies it is used to mark wood at right angles to the grain prior to cutting.

