

# CARPENTRY

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## Introduction

Wood is natural raw material obtained from the forest. A class of wood suitable for furniture, building and similar other applications is known as timber. Timber is non homogenous natural material drawn from the forest in form of logs, cut to marketable size at saw mills. It is treated and seasoned prior to use. Carpentry deals with handle of wood to bring it in usable form and carpenter is a person posses reasonable skill to handle timber to bring it in usable form.

## Work material

### (a) Selection of wood

Following are some of the point to select the timber:

**Work :** For superior quality work like furniture and interior common wood in use are Teak, Rose and Mahogany.

**Properties:** Like color, grain orientation, strength, workability, hardness etc.

**Finish :** Excellent finish can be obtained with Teak, Rose, Mahogany.

**Stability:** Stability in shape. Should not warp.

**Cost :** Should be low but not at the cost of quality.

### (b) Estimate of material

The cut size timber is available with timber merchants and at saw mills. Material is estimated based on drawing and quantity of items required. After deciding the size and the quantity needed for one item the volume is worked out either in cubic ft. or cubic meter. The total quantity is estimated by multiplying with number of similar items needed.

Estimate of wood for 25 tables legs using 4 batten each of size 3' length 2" width and 2" thickness will be :

Number of pieces required                     $25 \times 4 = 100$

Total volume of battens                     $100 \times 3 \times 2/12 \times 2/12 = 8'-4"-0"$

### Normal practice to work out volume

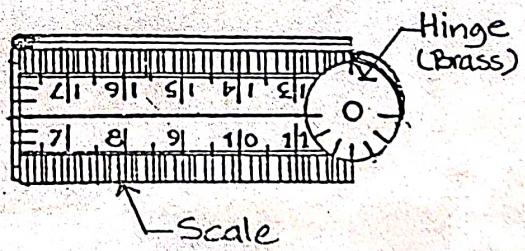
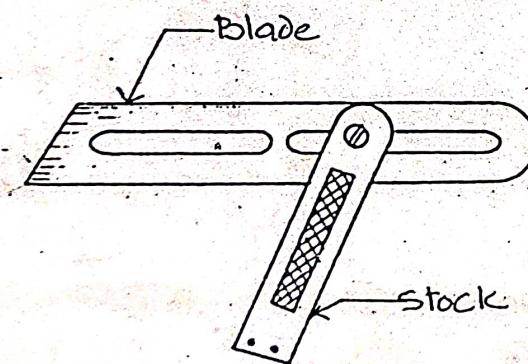
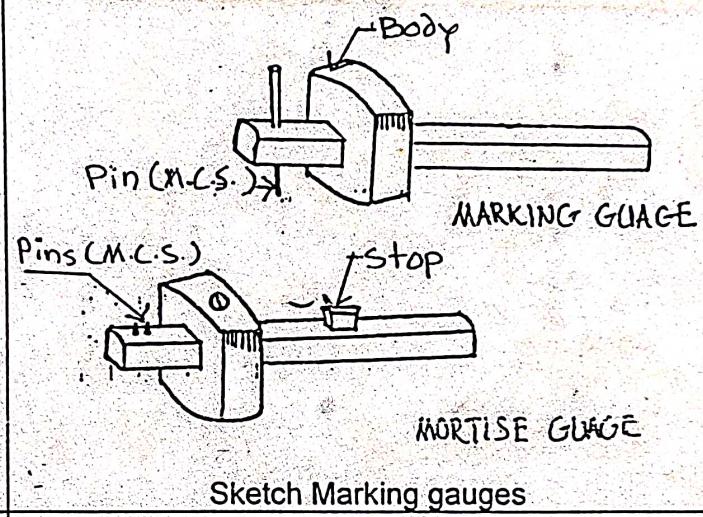
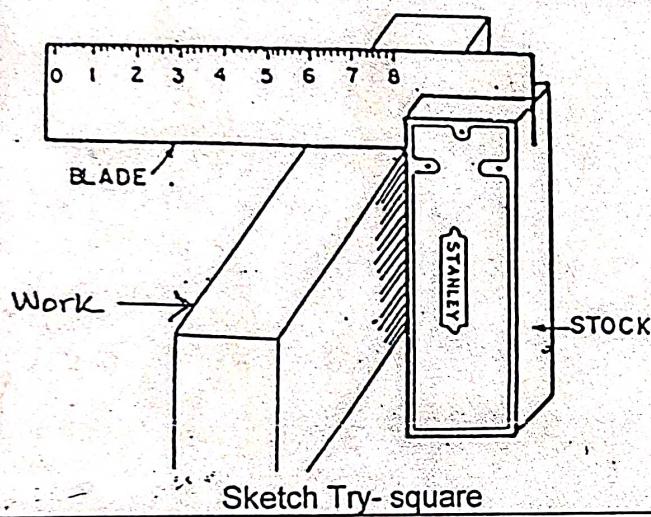
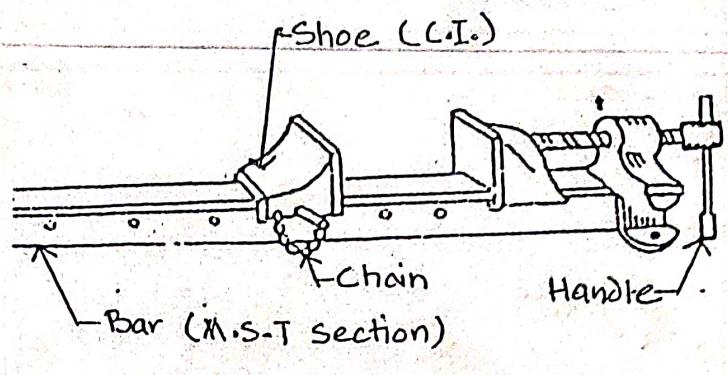
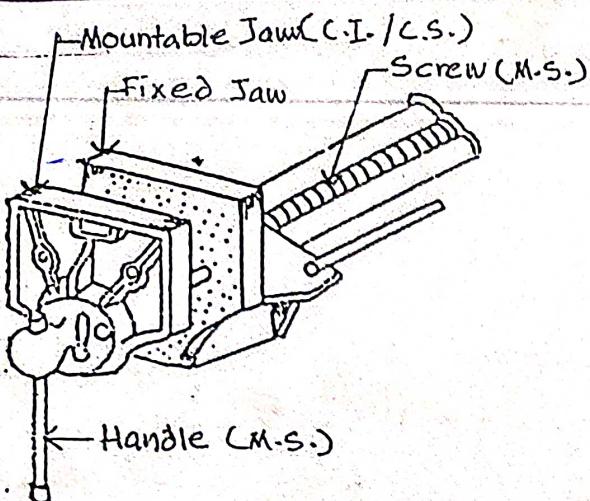
### (c) Cost of material:

For teak wood battens costing Rs.600.00 per cft.

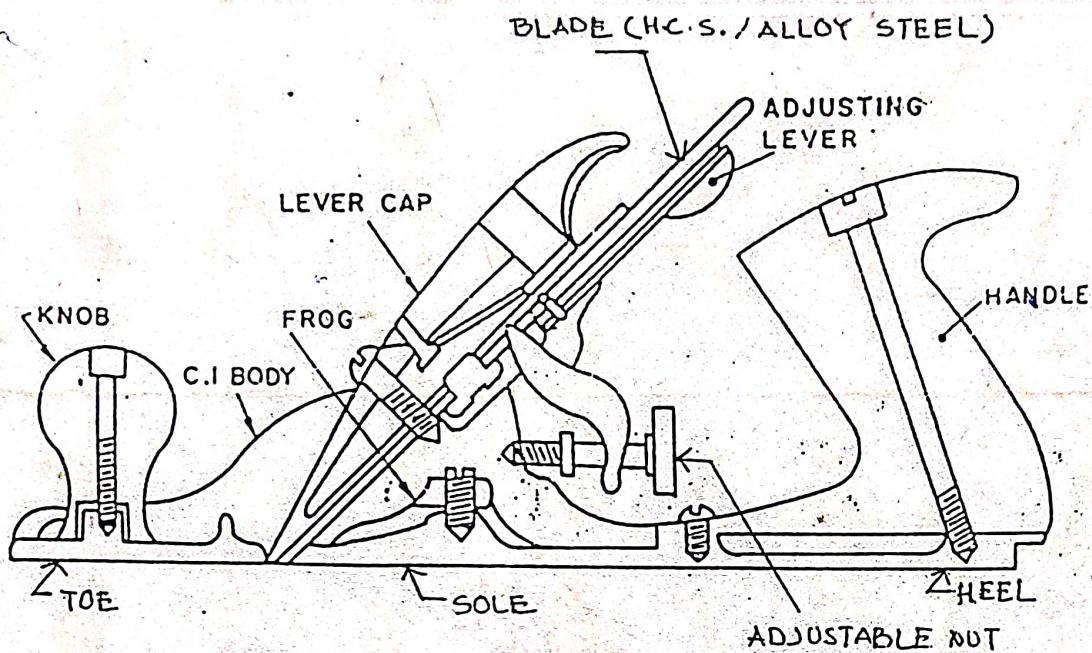
Cost will be:

$$\begin{aligned} 8' &= 8 \times 600 &= 4800.00 \\ 4" &= 4 \times 600/12 &= 200.00 \\ 0" &= 0 \times 600/12 \times 12 &= 0.00 \end{aligned}$$

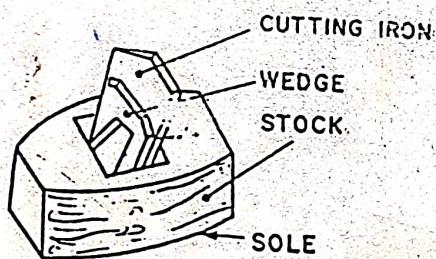
Total    Rs.5000.00



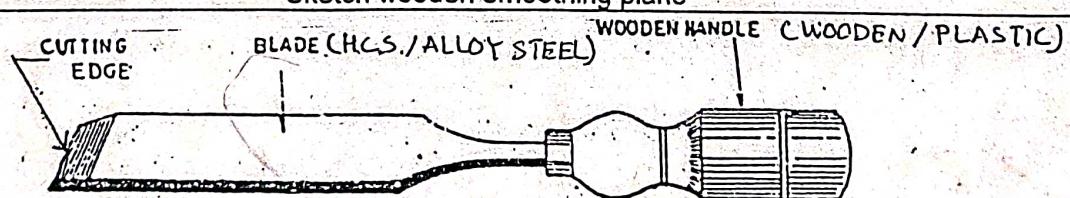
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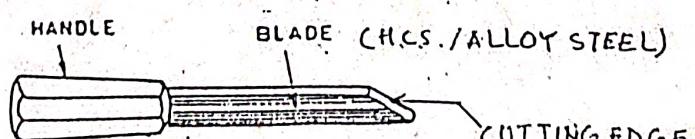
Sketch Iron Jack Plane



Sketch wooden smoothing plane



Firmer Chisel



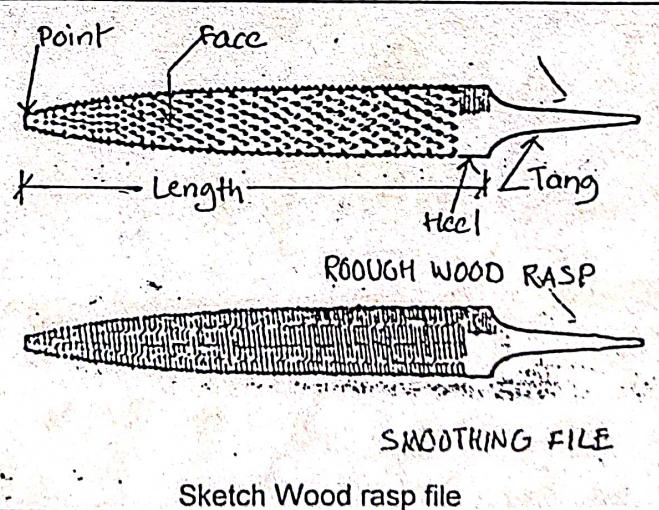
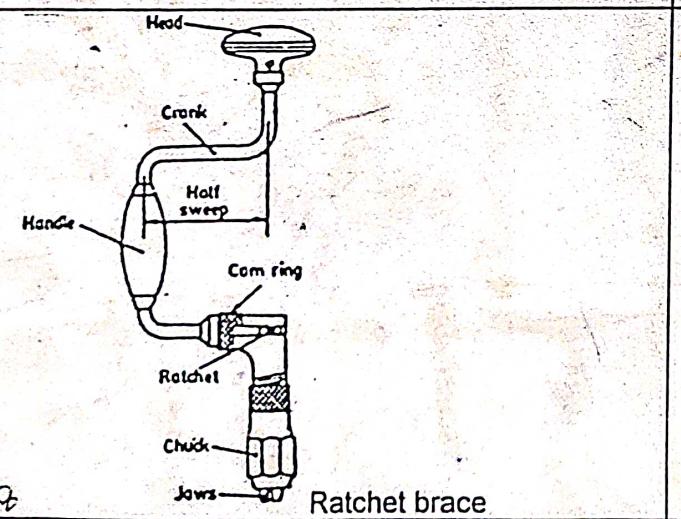
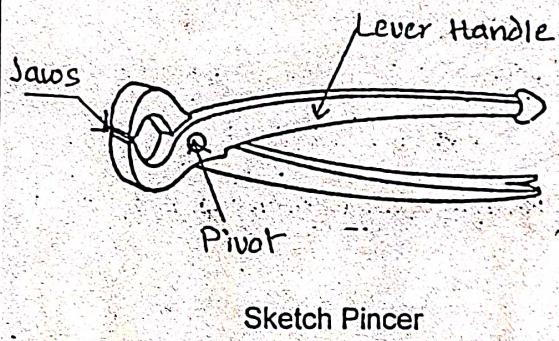
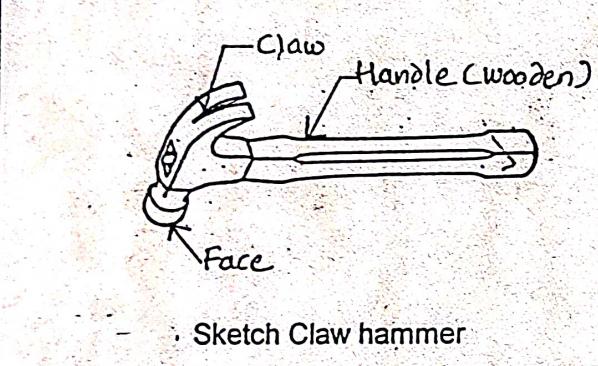
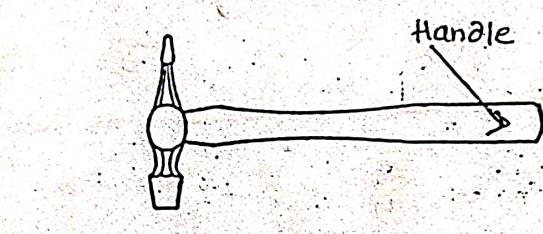
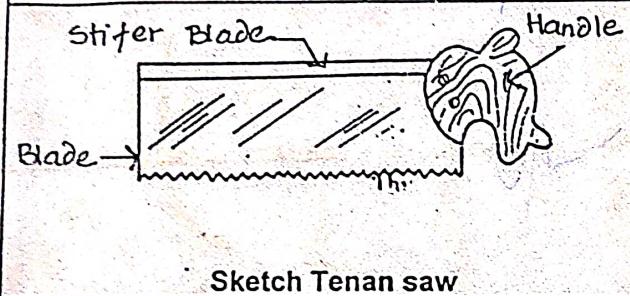
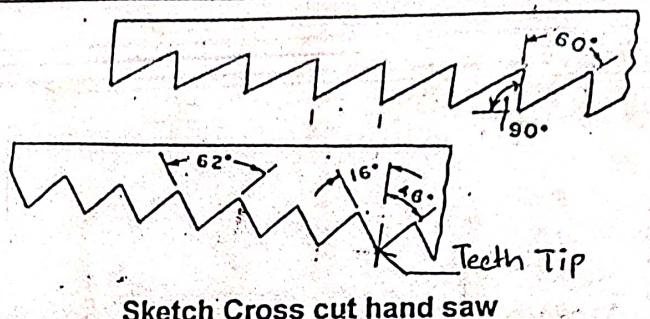
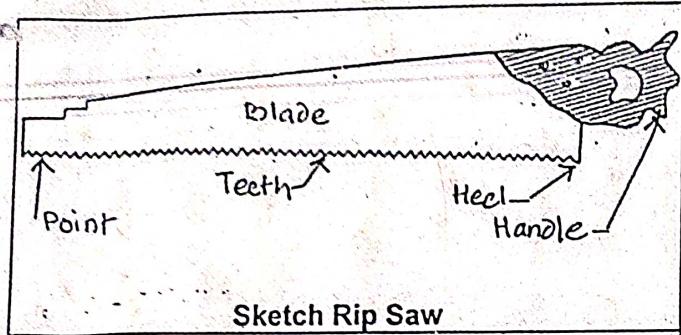
Mortise Chisel

Sketch firmer and mortise chisel

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Tenon saw	Length of blade 250 to 400 mm thin blade with fine teeth	Fine straight finish and accurate cuts across the grain	1. Locate the position leaving mark 2. Support toe to start cut 3. Move straight observing marking line
Warrington hammer	Numbers & weight No 00, 200 gm to No 6 550 gm.	Light jobs & bench work for striking in carpentry work	1. Hold at right place 2. Ensure tight ness of handle
Claw hammer	Numbers & weight No 1 to 4 weight 375, 450, 550 and 675	Light jobs & bench work for striking, preferred by carpenter	1. Hold at right place 2. Ensure tight ness of handle
Mallet	Round or rectangular face	Light blow of cutting with chisels	1. Hold at right place 2. Ensure tight ness of handle
Pincer	Length of arm 6, 7, & 8 inch	Pulling out nails & levering out small tacks	1. Balance to avoid slip 2. Hold properly so as take advantage of lever
Ratchet brace	Max. size of drill bit $\frac{1}{4}$ , $\frac{1}{2}$ , & $\frac{3}{4}$ , Inch	Making round holes	1. Make small impression & ensure correct position of hole. 2. Tight the work with adequate pressure
Hand Drill	Max. size of drill bit $\frac{1}{4}$ , $\frac{1}{2}$ , & $\frac{3}{4}$ , Inch	Making round holes	1. Make small impression & ensure correct position of hole. 2. Tight the work with adequate pressure

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## Carpentry Processes

### Marking:

Fixing dimensions on work is known as marking. The work is carried out first sizing the material and then fixing the dimension as per drawing. In sizing material out of six work surfaces one best face and one side is planed to make them flat and smooth maintaining square ness, to achieve the pre conditions for marking. Gig jack Lines are marked with pencil for easy identification as reference surfaces. Using marking gauge lines are marked on both faces and sides for required width and thickness respectively. The remaining face and side is then planned to make them flat and smooth maintaining the square ness with each other.

Dimensions are then fixed as per drawing and type of joint.

### Cutting:

It's a process of parting wood by sawing. The work is carried out by selecting the appropriate saw for cutting. The cut is initiated with teeth at point moving slowly to a small distance in support with left index finger and maintaining angle for starting cut. Observing mark, maintaining normal sawing angle and posture further sawing is done.

**Reaping:** Reaping is process of cutting wood along the grain. Rip saw and hand saw are used in this operation. The selection of saw is done depending length of cut and thickness of work piece.

**Cross cutting:** It is a process of cutting across the grains. In cross cutting hand saw, cross cut saw and tennon saw are used

**Cutting thick pieces:** For cross cutting pieces having cross section more than 75mmx75mm back saw is used

### Planing:

Planing is operation making surfaces flat and smooth. To perform planing the blade is first sharpened maintaining 25 to 35 degree angle. It is then assembled with cap iron and placed in the body of plane adjusting the cut. For planing, the plane is moved forward horizontally with pressure and balancing it using both hands. More downward pressure is put on knob with one hand. As plane moves forward the downward pressure on knob is reduced increasing downward pressure on handle. Proper balance is maintained for pressure required to move the plane and downward pressure on knob and handle.

### Planing faces and sides:

For planing face and side jack plane is used for roughing and smoothing and trying plane are used for finishing cut for small and long length work respectively.

### Planing ends:

The ends are planned preventing splitting by using stops, shooting boards, working from edge to middle and beveling edge.

### Chiseling:

Chiseling is a operation for localized cutting and finishing of work such as making grove, making square & rectangular holes, beveling etc. with the help of chisels.

- (a) Grooving: Cutting channel with firmer chisel.
- (b) Mortising: Making square & rectangular holes to form joint.
- (c) Beveling: It's a operation to finish the leveled edge by chiseling.

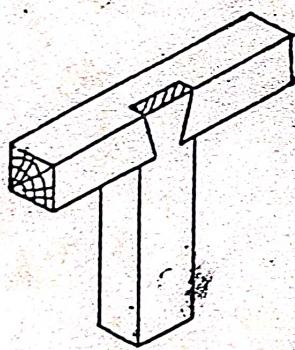
### Boring

Boring is operation of making holes with hand drills, ratchet brace or barmi kamani. Looking to the size, the bit is selected and hole is made by using any of the tool, keeping it vertical rotating bit and putting vertical pressure.

For making bigger diameter holes Gimlets are used.

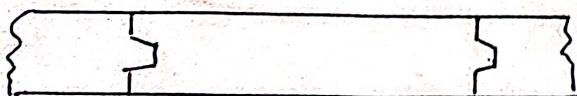
## Carpentry joints

### Dovetail joint



The joint is made by inclined cut in the shape of dove tail as shown in the figure. This joint is used in quality work for strong joints in boxes and drawer.

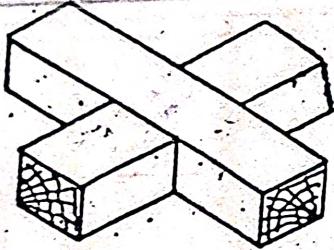
### Tongue and groove joint



To meet out requirement of large surface area as in the case of drawing boards, table topes, door panel etc. to keep the planks in position with out gap.

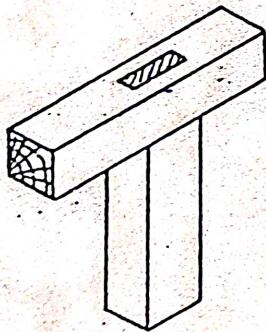
### Cross lap joint

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Simple frame work as in carom board,  
back side of wooden Elmira and  
cabinet.

### Mortise and Tenon joint



This is popular joint for door & window  
frames and all quality office and  
domestic furniture.