

CARPENTRY SHOP



SAFETY PRECAUTION

1. Don't talk with another during the working time.
2. Don't enter without shoes in shop.
3. Tools should be kept at proper place.
4. Keep hands and tools wiped, clean and free from oil and grease.
5. Don't carry hand tools in pocket.
6. Test the sharpness of the cutting edge of cutting tools.
7. Use the chisel and hammer with a properly fitted and tight handle.
8. Hold the work piece in the carpentry vice firmly.
9. Marking and measuring should be done carefully.
10. Be careful when you are using your thumb as a guide in cross cutting.

LIST OF EXPERIMENT

1. To study the different type of hand tools, and operation of carpentry shop.
2. To prepare a Cross halving lap joint by using wooden work piece as per given dimensions.
3. To prepare a Dove tail halving lap joint by using wooden work piece as per given dimensions.

EXPERIMENT NO.1

OBJECTIVE: - To study the different type of hand tools, and operation of carpentry shop.

CARPENTRY:- Carpentry is a skilled trade in which the primary work performed is the cutting, shaping and installation of building materials during the construction of buildings, ships, timber bridges, concrete formwork, etc.

COMMON TOOLS USED IN CARPENTRY

Carpentry tools are dividing into the following category.

1. Marking & Measuring Tools

STEEL RULE: - It is made of steel. Millimeter (mm) & centimeter's (cm) marking marked on one edge and inches (") marking marked on another edge. It is used for taking accurate dimensions on the job. It is getting in the market in length of 6", 12", 24", 1 meter & 2 meter. (See fig.1)

TRY-SQUARE: - Try-square is used for testing the squareness of wood and enabling lines to be marked at right angles (90°) to a given surface. (See fig.2) Its parts are

- a) Blade b) Stock c) Rivets.

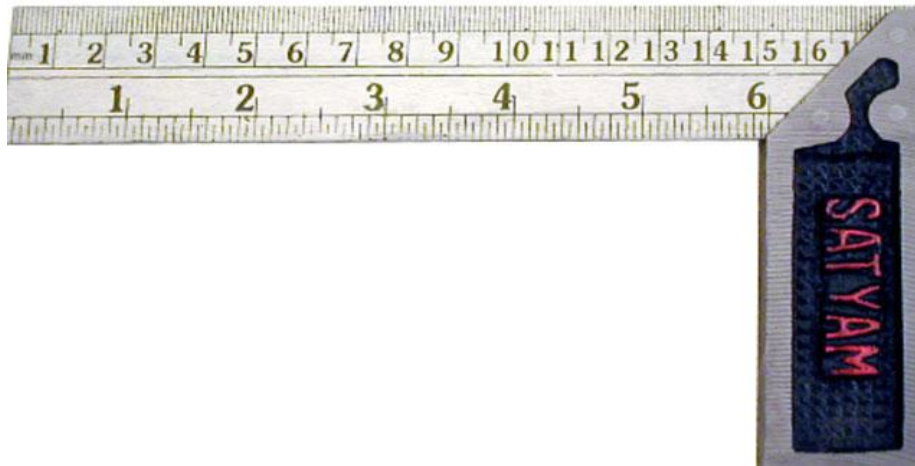


Fig.1

PENCIL: - Used on drawing lines in the setting out the shapes of parts of the job. Always used when setting out chamfers, levels or slopping edges etc. (See fig.2)



fig.2

MARKING GAUGE: - Marking Gauge is used for marking lines parallel to a face or an edge. (See fig.3)

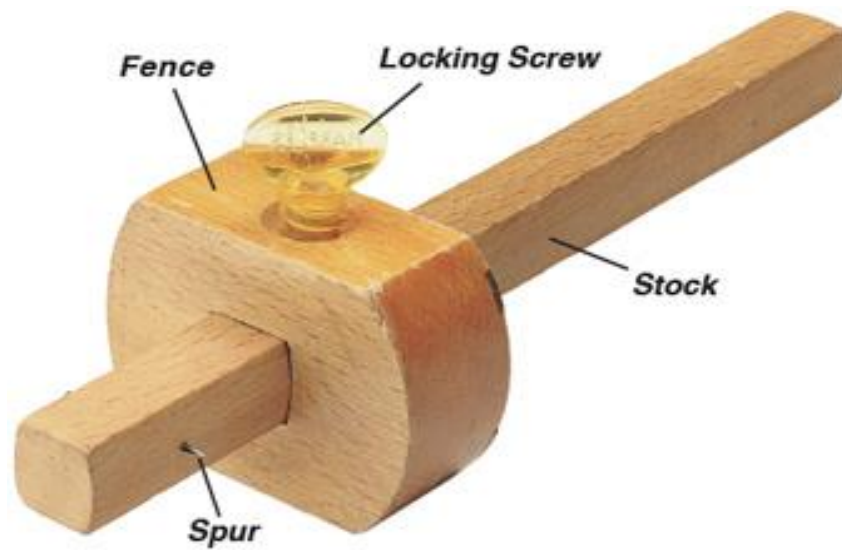


Fig.3

2. Smoothing & Planing Tools

IRON JACK PLANE: - Plane is made of wood or metal. But now days, a metal jack plane or Iron jack plane is used in carpentry. This is the quick adjustable plain. It is 14" in length. It's blade's grinding and sharpening angle of 20-25° and 25-30°. It is used for smoothing as well as removing rough surfaces quickly to bring in required size of sawn wooden piece. (See fig.4)



Fig. 4

RASP: - A rasp is a tool used for shaping wood or other materials, rasps are used for rapidly removing wood from curved surfaces. It consists of a point or the tip; it is a long steel bar, a heel or bottom. The tang is joined to a handle, usually made of plastic or wood. The bar has sharp teeth. Rasps generally cut more coarsely than files (See fig.5).



Fig.5

3. Cutting Tools

SAWS: - There are two types of saws used in carpentry shop.

Taper blade saw:- Hand saw or Rip Saw It is 15" to 18" in length, and the ratio of its blade slop is 1:2, and 5 to 7 teeth per inch of blade length, the teeth of rip saw are 45 degree inclined, It is used for cut the wood in along to the grain (parallel to the grain). (See fig.6).



Fig.6



Fig.7

Parallel blade saw:-Tenon saw— it is used for fine and accurate cutting in joinery. It is 8”to 12” in length with 8 to 12 teeth per inch with closed handle. The ratio of its blade slop is 1:1, and tenon saw teeth are inclined at 60 degree and make an equilateral triangle, it is used for cut the wood in across to the grain (perpendicular to the grain) (See fig.7).

CHISELS: - Mostly **Firmer chisel** and **Mortise chisel** are used in carpentry. Its size depends on the width of blade, range in 3, 6, 9, 12, 18, 21, 25 mm, up to 50mm. Both chisel consist of two main parts

a) Blade

b) wooden handle.

Its angle of grinding and sharpening is 15 to 20° and 20 to 25°. **Firmer chisel** is used for finish laps, mortise socket, pins, etc. And **Mortise chisel** is used for deep cutting or making rectangular holes in wood called mortise. (See fig.8).

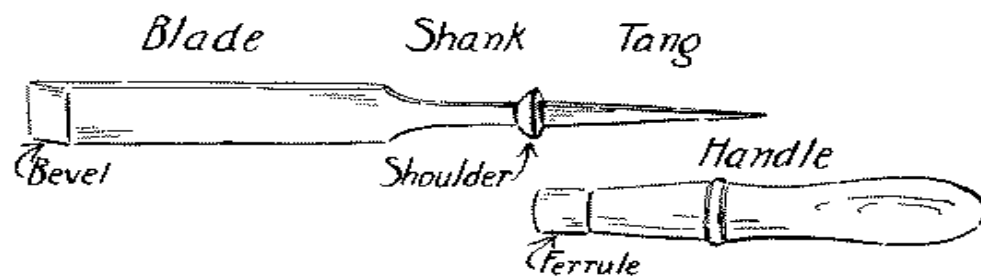


Fig.8

4. Holding and Supporting Tools

BENCH VICE: - It is used to hold the job while performing various operations like planing, sawing, trenching, chiseling, screwing, gluing etc (See fig.9).

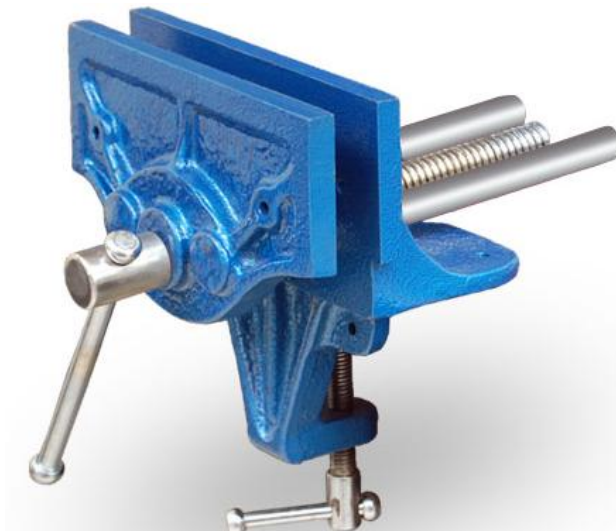


Fig.9

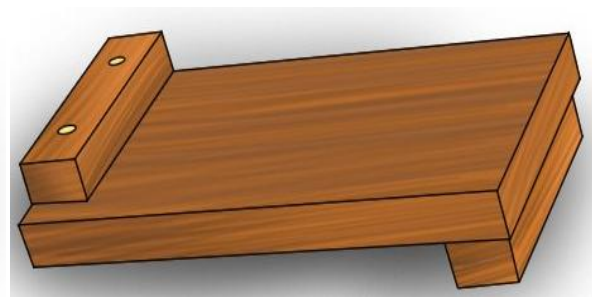


Fig.10

THE WORK BENCH: - It is used for give support to the job while operations like cutting, chiseling, planing etc. It is 6ft in length, 3ft wide and 33inch in height. It's top's lower portion is called as “Well” to accommodate tools

BENCH HOOK: - A **bench hook** is a workbench accessory used in woodworking. The purpose of the bench hook is to provide a stop which a piece of wood being worked can be placed against to hold it steady whilst cutting, planing, or chiseling that piece of wood. Bench hooks make your hand sawing safer and more accurate.

The bench hook is simply a short wooden board with a batten fixed top (the stop) and bottom (the hook) at opposite ends (see diagram to the right). Usually, the stop is shorter than the width of the bench hook's base and offset from one edge (See fig.10).

5. Striking Tools

MALLET: - It is used for driving chisel handle as well as assisting in assembling jobs. It is also called as wooden hammer. They are rectangular or round in shape (See fig.11 & 12).

CLAW HAMMER: - It is used for where heavy hammering is necessary to drive large nails. Useful size being 0.45 to 0.57kg. It is also has claws for extracting nails. (See fig.13).

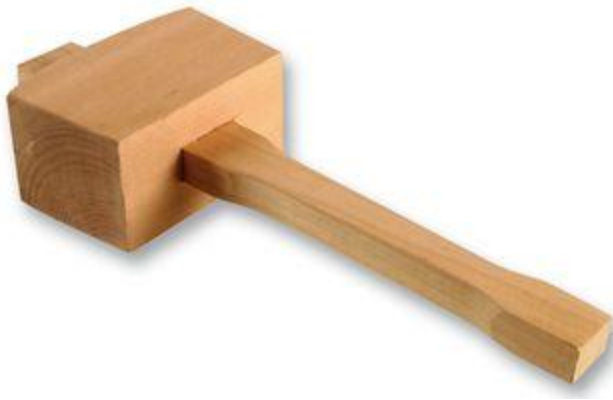


Fig.11



Fig.12

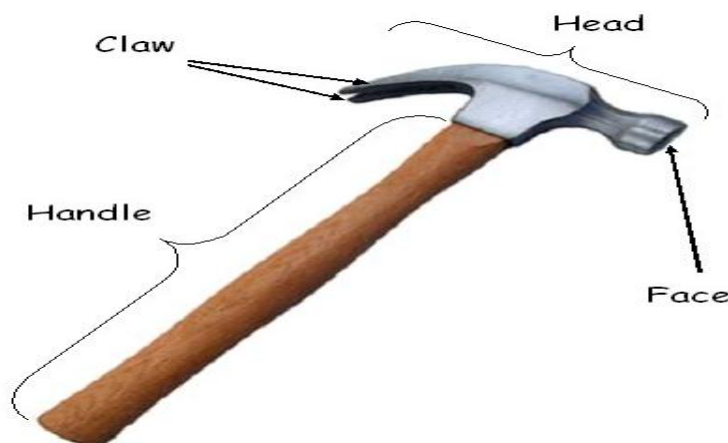


Fig.13

6. Miscellaneous Tools

SCREW DRIVER: - It has an alloy blade or bar (flat, round, or square) and wooden handle. Common screw drivers used in carpentry is London pattern and Cabinet making screw drivers for loosening or tightening the screws (See fig.14).

PINCER:- It is used for pull out the nails from wood. It is also called as a nail puller. It is used in upholstery work to take out the nails(See fig.15).

HAND DRILL MACHINE: - It is used for making holes up to 12mm in wood (See fig.16)

OIL STONE: - It is used for sharpening the tools like chisels and planer blade (See fig.17).



Fig. 14



Fig.15



Fig. 16



Fig.17

EXPERIMENT NO.2

Objective: To prepare a Cross halving lap joint by using wooden work piece as per given dimensions.

Material Required: Soft wood (kail) of size: (300 x 50 x 22) mm, Quantity: 1No.

Drawing: See fig. 18

Tools to be used: Steel Scale, HB Pencil, Marking Gauge, Try-Square, Iron Jack Plane, Tenon saw, Rip saw Hammer, & bench vice.

Procedure:-

1. Take a flat rectangular wooden work piece and holding it about 10mm above into the wooden vice such as the surface of work piece is parallel to the jaws of vice and start planning & smoothing operation with the help of Iron Jack Plane.
2. After smoothing then check flatness of the surface of work piece with the help of try-square, if not done correctly then repeating step1.
3. After smoothing one surface then smoothing the adjacent side of the work piece with the help of Iron Jack Plane and check the right angle between two smoothing sides with the help of try-square.
4. After smoothing two adjacent surfaces, mark a parallel line both side the work piece 42mm apart from the smoothing edge with the help of marking gauge and smoothing the work piece to the marking line.
5. Again mark a parallel line on both side of the work piece 22mm apart from the smoothing face and then smoothing the last face to the marking.
6. Doing marking on work piece according to given drawing with the help of HB pencil, steel scale, try-square, and then cutting operation perform according to the marking.
7. Doing cutting and chiseling according to the drawing.
8. Assembly both part in cross shape with the help of hammer, and obtained the required joint.

Precautions:

1. Work piece should be hold properly in the vice.
2. Smooth the surface carefully and check the angle using a try square regularly at proper time interval.
3. Iron jack plane should be driving slowly to both hands.
4. Marking should be doing carefully.
5. Use saw in a proper direction for better cutting.
6. Paring with firmer chisel half way through from both edges.
7. While chiseling hold the piece with the help of 'G' clamp.
8. Don't saw or chisel without holding.
9. Always use proper sharpened tools.

Outcomes: - On successful completion of this experiment, the students will be able to prepare itself any type of lap joint.

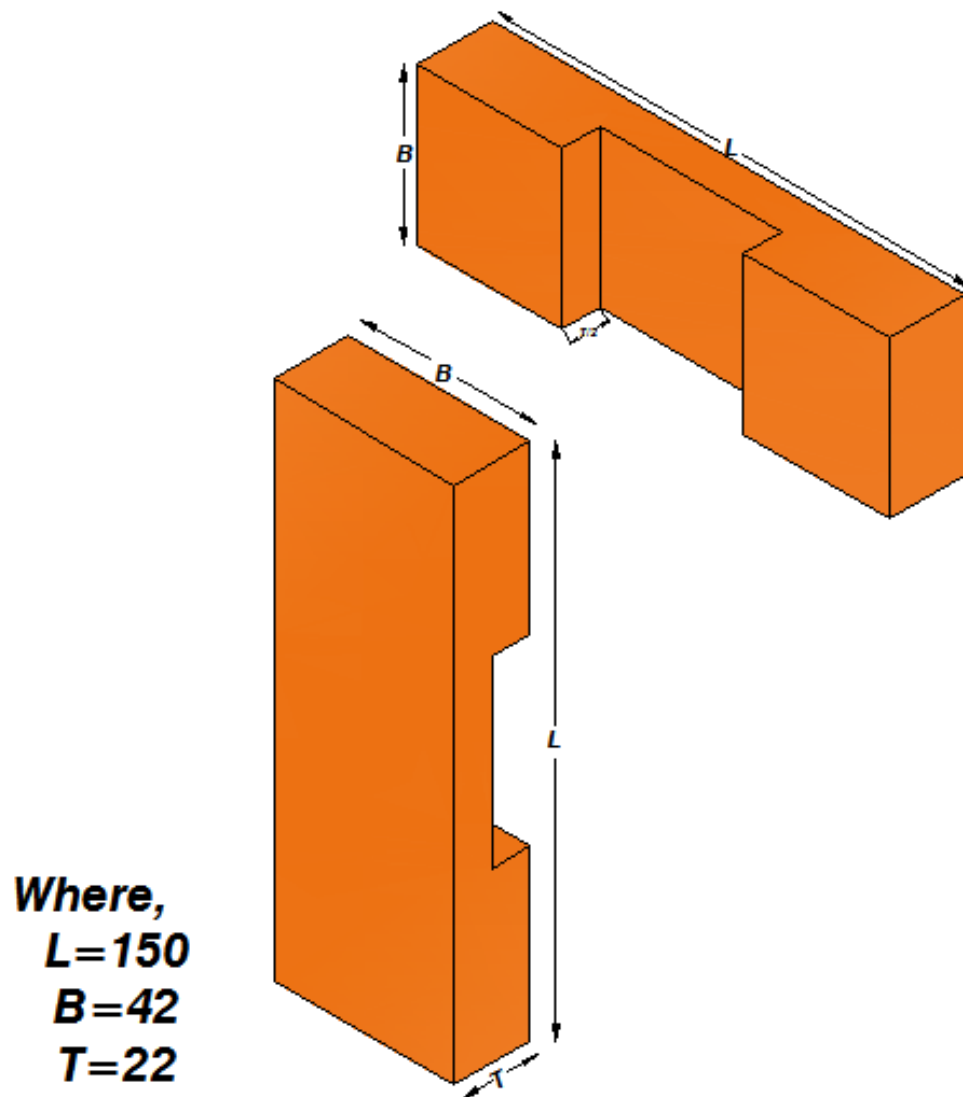


Fig.18

**Where,
 $L=150$
 $B=42$
 $T=22$**

NOTE: All dimensions are in mm