◎ What are the differences between hard wood and soft wood?

Hard Wood	Soft Wood
• hard woods belong to broad leaved trees.	• Soft woods belong to conifers which have narrow leaves.
• Composition :- An average hard wood consists of about 45% cellulose, 25% hemicellulose, 23% lignin and 7% miscellaneous items.	• composition :- An average soft wood consists of about 42% cellulose, 25% hemicellulose, 30% lignin, and 3% miscellaneous items.
• The annual rings are more compact, thin and less distinct.	• soft woods are light in weight and light coloured, have distinct annual rings
• Medullary rays are more visible and in some cases are very pronounced.	• Medullary rays are not distinct, colour of heart wood and sap wood are not distinct.
• Heart woods are generally dark in colour and comparatively heavy.	• Soft woods generally bear less weight and lighter colour.
• It can resist any axial stress and transverse strain, shock and vibration quite satisfactorily because the fibres are fine grained, compact, properly bonded and often found very straight.	• The fibres are generally coarse but straight, and so capable of resisting direct axial stress but can not resist any stress developed across the fibres and timber get splitted easily.
• High density, slower growth rate and non-resinous.	• Resinous, faster growth rate and also has lower density.
• Examples :- Mahogany, teak, oak, Walnut etc.	• Examples :- pine, spruce, fir, cedar etc.

◉ Name two methods of seasoning.

The two most used and accepted methods of 'drying' or 'seasoning' are →

i) natural seasoning - also known as 'air drying'. This is a slow method but is undoubtebly the best method. This is to help dry out the interior of the timber which has been exposed by sawing.

ii) artificial seasoning - The period of seasoning process is reduced though the level of perfection is not as good as the natural process.

◉ Name three advantages of seasoning. There are various advantages of this process →

- The one major significance that the process of seasoning serves is that we obtain a more lighter timber which is both easy to handle and easy to process further. It is more resilient and is less liable to any sort of mechanical distorsion like twist, warp and split.
- The timber procured after the seasoning is also in a much better condition to retain its size and shape after being made into a piece of joinery.
- The wood not only increases in hardness and stiffness but it also becomes susceptible to external injury of any sort and helps in proper maintainance of the wood before further use or processing.

◉ Name a cutting tool and draw its diagram

A cutting tool is Rip saw

fig :- rip saw

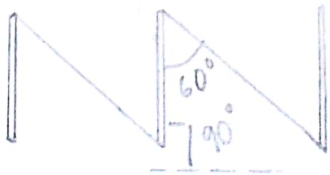


fig :- rip saw teeth.

◉ Name a planing tool and draw its diagram.

A planing tool is jack plane.

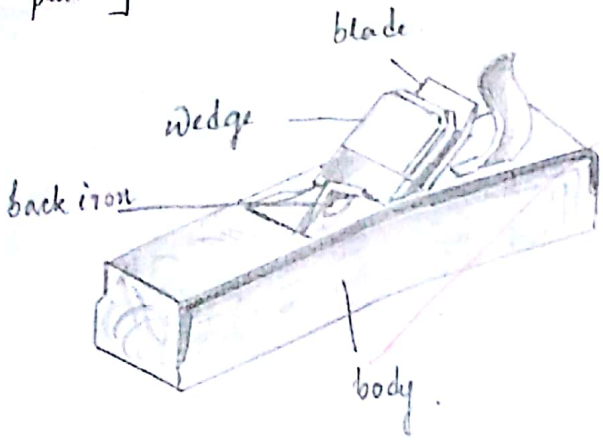


fig :- wood jack plane.

◉ Name a striking tool and draw its diagram.

A striking tool is a ball peen hammer.

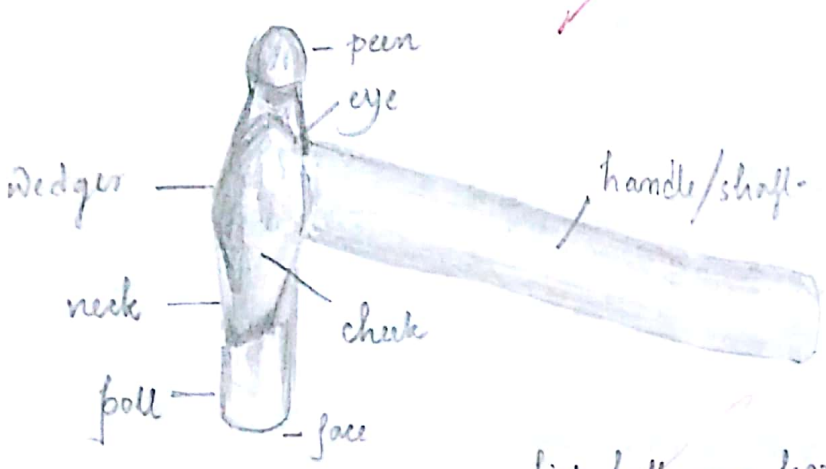


fig: ball peen hammer

◉ Name a boring tool and draw its diagram.

A boring tool was a carpenter's brace.

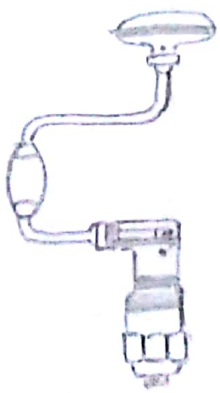


fig :- carpenter's brace.

◉ Name a holding tool and draw its diagram.

A holding tool is c-clamp.

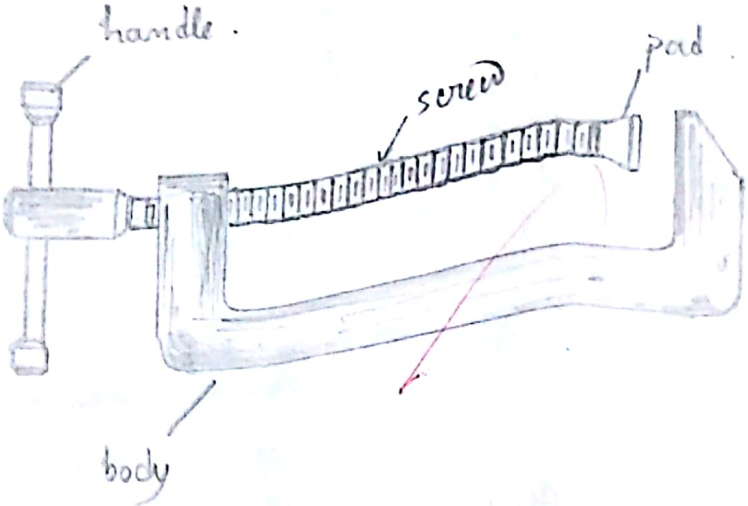


fig :- C-clamp.

◉ Name a marking tool and draw its diagram.

A marking tool is marking gauge.

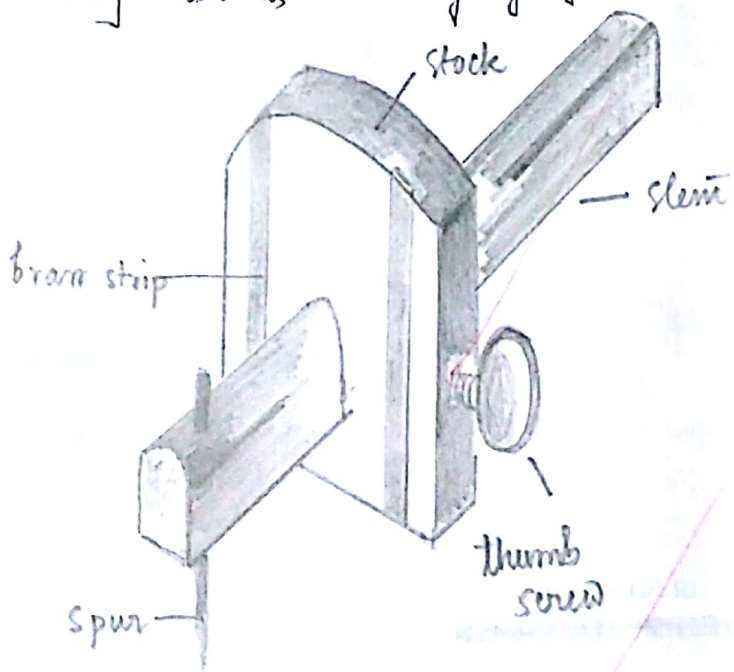
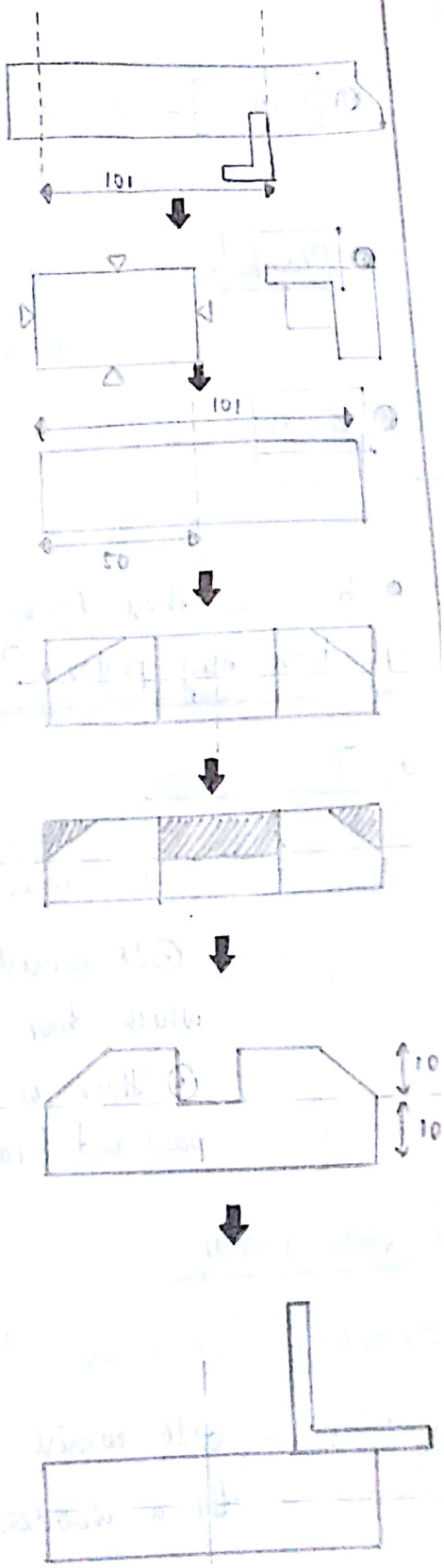


fig :- marking gauge.

◉ Name the different procedures that are involved in a typical carpentry job and tools used for those operations.

Operations.	tools used.
1. Marking and parting off required length, with necessary cutting allowance	scale, try square, scribber, rip saw.
2. Planning all four surfaces for parallelism and squareness.	jack plane, try square.
3. Making centerline and parting off.	try square, marking gauge, scriber, scale.
4. Marking centerlines and other construction lines, as required.	try square, marking gauge, scriber, scale.
5. Sawing the side walls up to required length.	Rip saw.
6. Chisel out the excess material for making the rough groove	firmer chisel, ball pein hammer.
7. finishing the grooves for proper relationship between mating parts.	firmer chisel, ball pein hammer.
8. Assembling and checking	try square.



- **Explain the terms log, batten, plank and beam**

- **Log** – Log is a part of the trunk or a large branch of a tree that has fallen off or being cut off.

- **Batten** – Batten is a long flat strip of squared timber used to hold something in place or as an fastening against wall. (width 135 mm to over 150 mm wide)

- **Plank** – It is a long, narrow, flat piece of wood which is more used for making floors. (275 to 450 mm wide, 75 to 150 mm thick)

- **Beam** – Beam is a long, sturdy piece of squared timber used to support the roof or floor of a building.

- **How are these tools specified? How are they classified in relation to the operation they perform?**

a) **Try square.**

operation :- Try squares are used for marking and testing angles of 90°

specification :- ⊙ It consists of a steel blade, riveted into a hard wood stock which has a protective brass plate on the working surface.
⊙ There is a clear 90° demarkation visible between the wood stock part and brass plate part.

b) **Jack plane.**

Operation :- It is used for planning purpose.

specification :- ⊙ It consists of a block of wood into which the blade is fixed by a wooden wedge.
⊙ The blade is set at an angle of 45° to the sole.
⊙ On the cutting blade another blade is fixed called cap iron
⊙ They are from 350 to 125 mm length and 50 to 75 mm wide.

c) Vice

operation :- It is a holding tool, used for holding larger wooden pieces to make the operation thereafter easy and handsfree.

specification :-
- It consists of two specified jaws.
- Its one jaw is fixed to the side of the table.
- The other jaw is kept movable by means of screw and a handle.
- The whole system of the vice is kept attached at the side of the table for easier operation

d) Marking gauge.

Operation :- It is solely used for marking reasons to specify the particular line along which the cut or shape is required.

Specification :-
- It consists of two marking points.
- One marking point is fixed near to the end of the stem.
- The other marking point is attached to the brass sliding bar.
- These two teeth cut two parallel line, called mortise lines.

e) Marking gauge

Operation :- This is used for marking purpose.

Specification :-
- It has one marking point
- It gives an accurate cut line parallel to a true edge, usually with the grain.
- The panel gauge, is longer than marking gauge.

8) Rip saw

operation :- It is used solely for cutting the demarkated portions in a wooden block

specification :-
- The blade is of high grade tool steel, and may be either straight or skew backed.
- It is fitted in a wooden handle made of hard wood by means of rivets or screws.
- Rip saws are about 700 mm long with 3 to 5 points or teeth per 25 mm.

9) Bench vice.

Operation :- It is used for holding the wood log.

Specification :-
- It has two operating jaws.
- One is movable jaw and can be controlled by handle.
- The other jaw is fixed to the end of the table.
- The bench vice is kept at the edge of the table for easy holding.