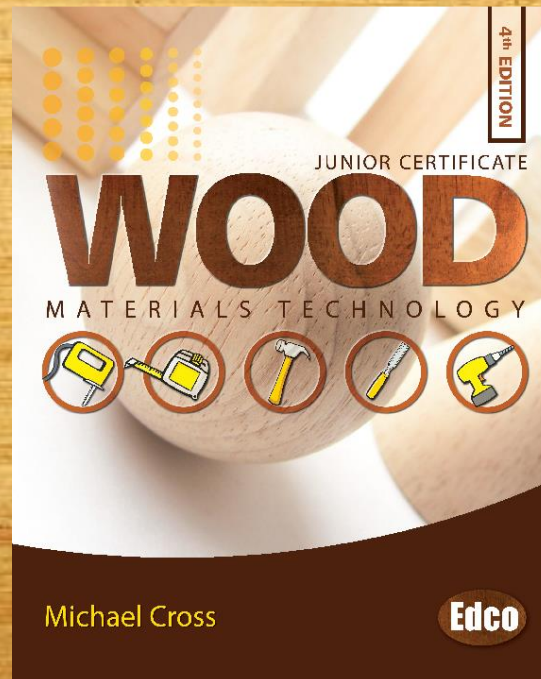


WOOD

MATERIALS TECHNOLOGY

4th Edition



Chapter 23

Joints



Wood joints

- **Advantages**

- Give strength
- Long lasting
- Decorative
- Resist forces well

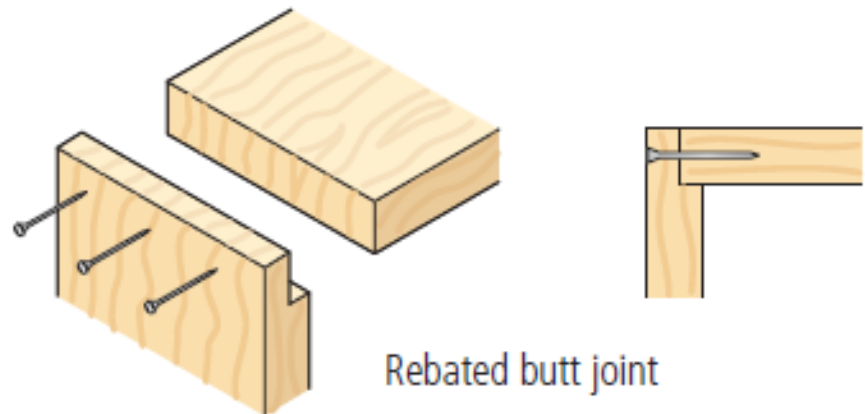
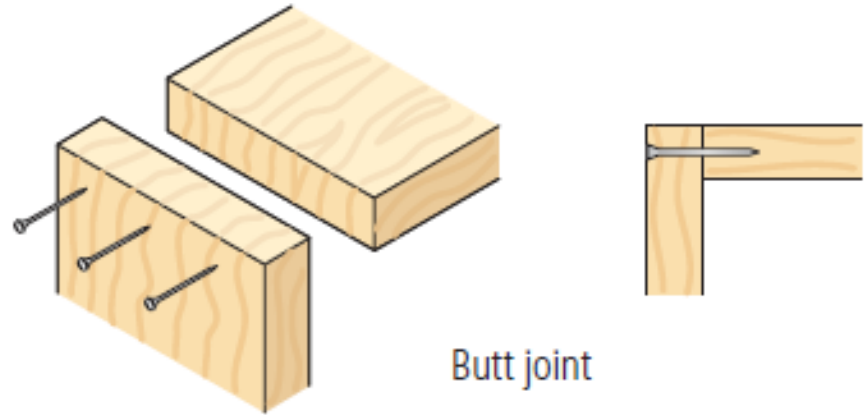
- **Disadvantages**

- Time-consuming
- Require skill – difficult to make
- Special tools needed



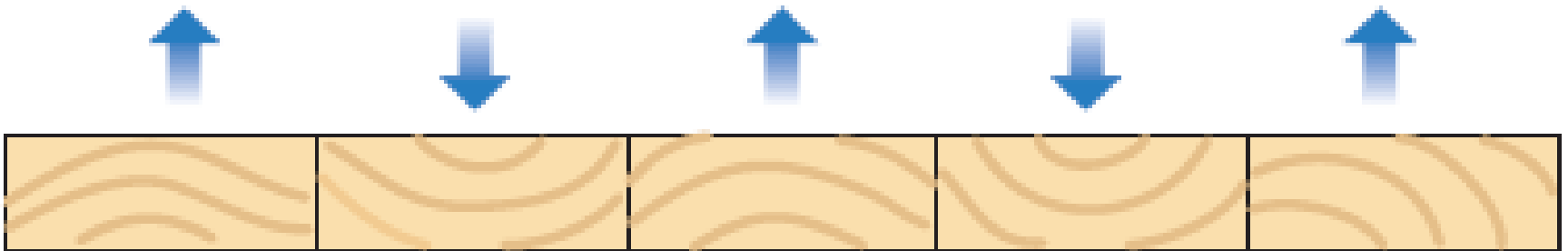
Butt joints

- Simple joints
- Need nails or screws
- Rebate will give strength
- Greater glue area



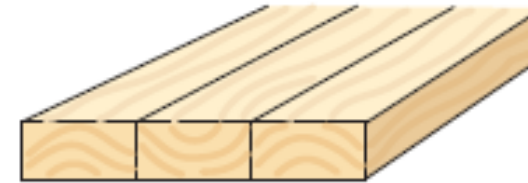
Butt joints – joining boards

- Simple edge joints used for making wide boards
- Can be strengthened using biscuit joints or tongues
- Boards arranged with alternating end grain to prevent warping

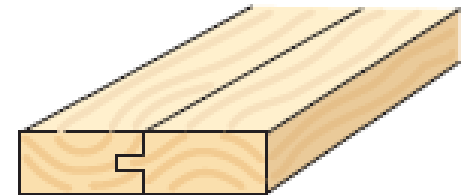


Edge joints

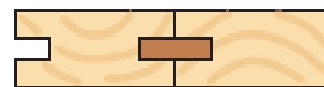
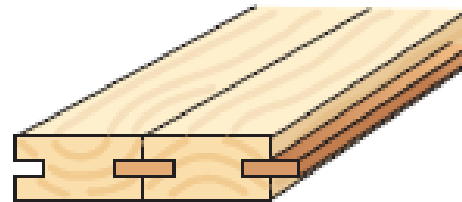
- Simple joints
- Join narrow boards together to make wider boards
- Strengthened with
 - Tongue & groove
 - Loose tongues
 - Biscuit joint



Boards butt jointed with glue



Tongue and groove joint



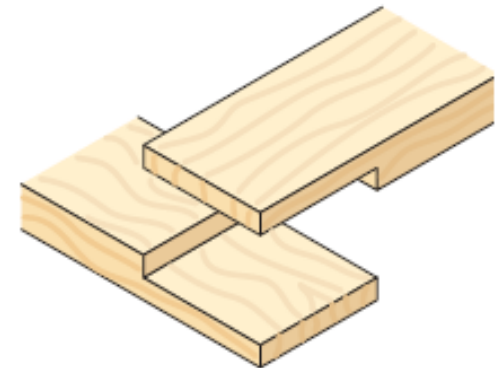
Loose tongue or spline

Halving joints

- The two halves of the joint make up the full thickness

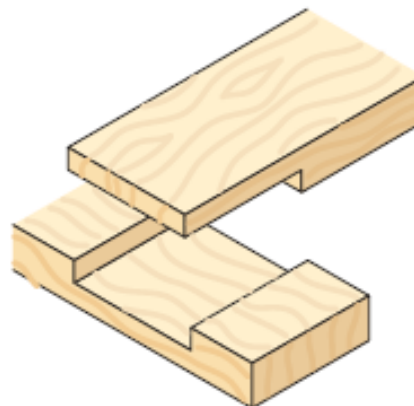


Cross halving joint

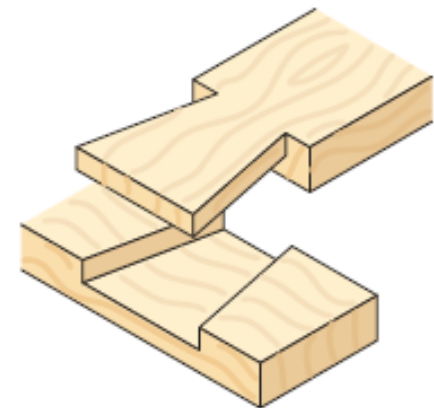


Corner halving

- Uses
 - Frames
 - Rails

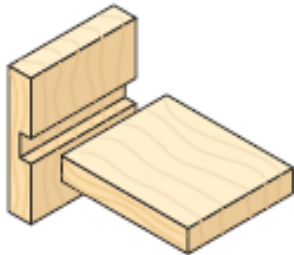


Tee halving

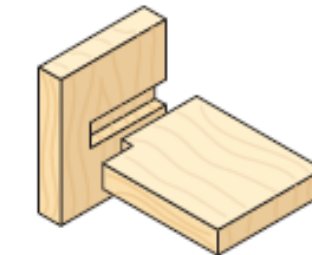
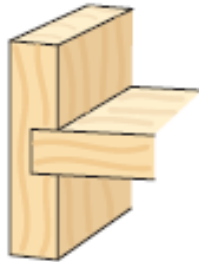


Dovetail halving

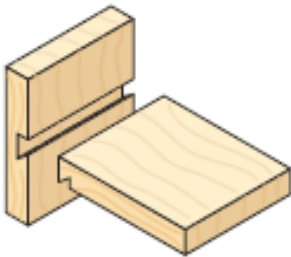
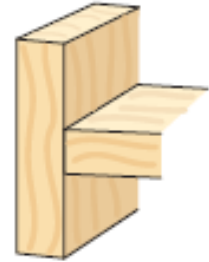
Housing joints



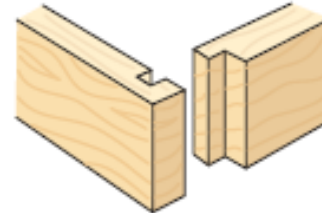
Housing joint



Stopped housing joint



Dovetail housing joint



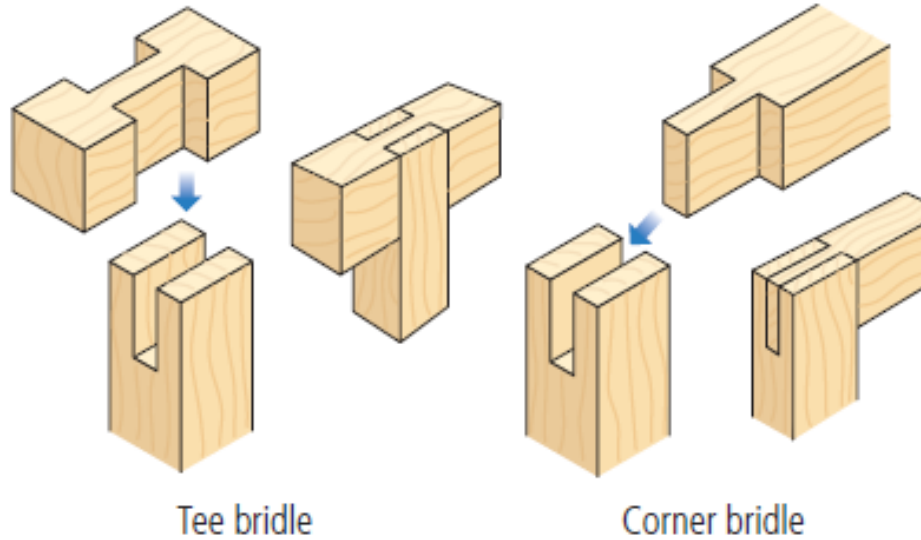
Tongued and grooved joint



Corners of drawers

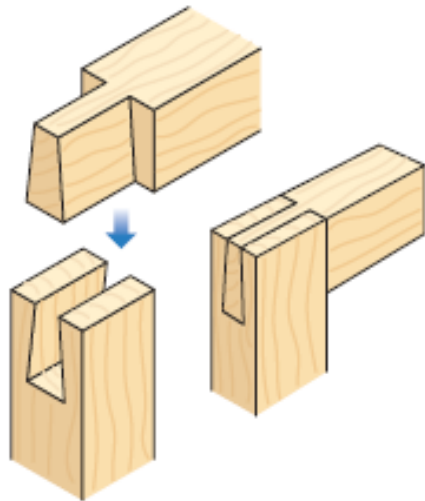
- Uses
 - Shelved units
 - Dividers for boxes

Bridle joints

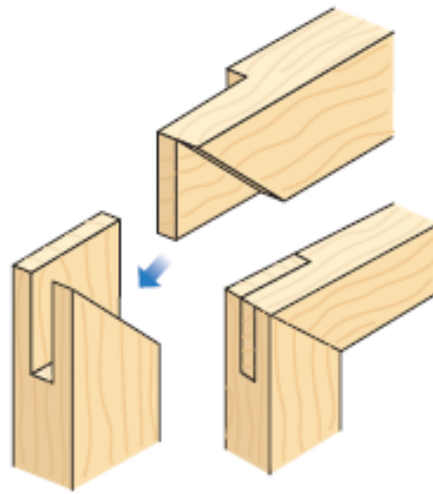


- Uses
 - Frames
 - Doors
 - Making tables
 - Making chairs

More bridle joints



Dovetail bridle

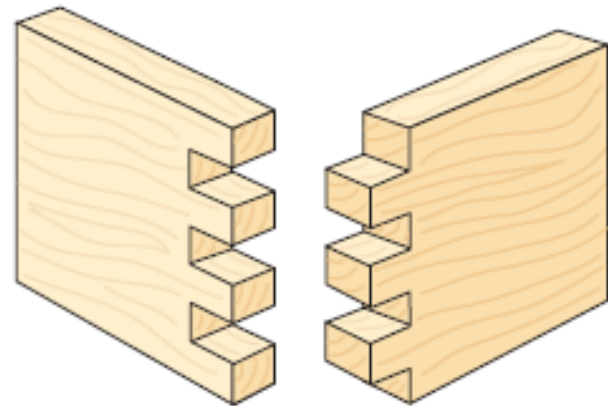
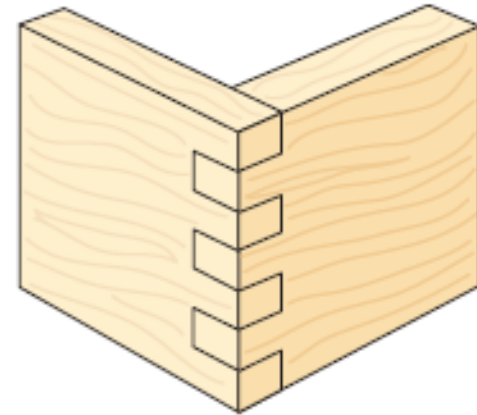


Mitre bridle

- Uses
 - Frames
 - Doors
 - Making tables
 - Making chairs

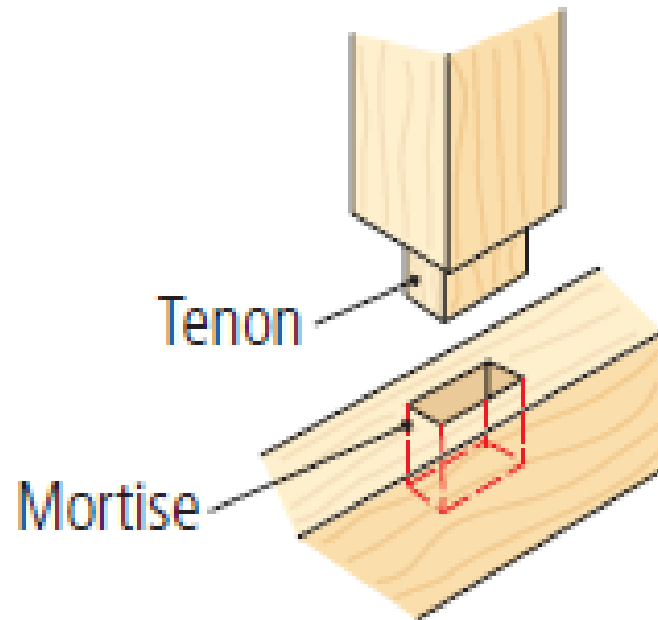
Finger joint

- Large glue area
- Common joint
- Odd number of fingers
- Uses
 - Joining corners of frames and boxes
 - Cabinet construction



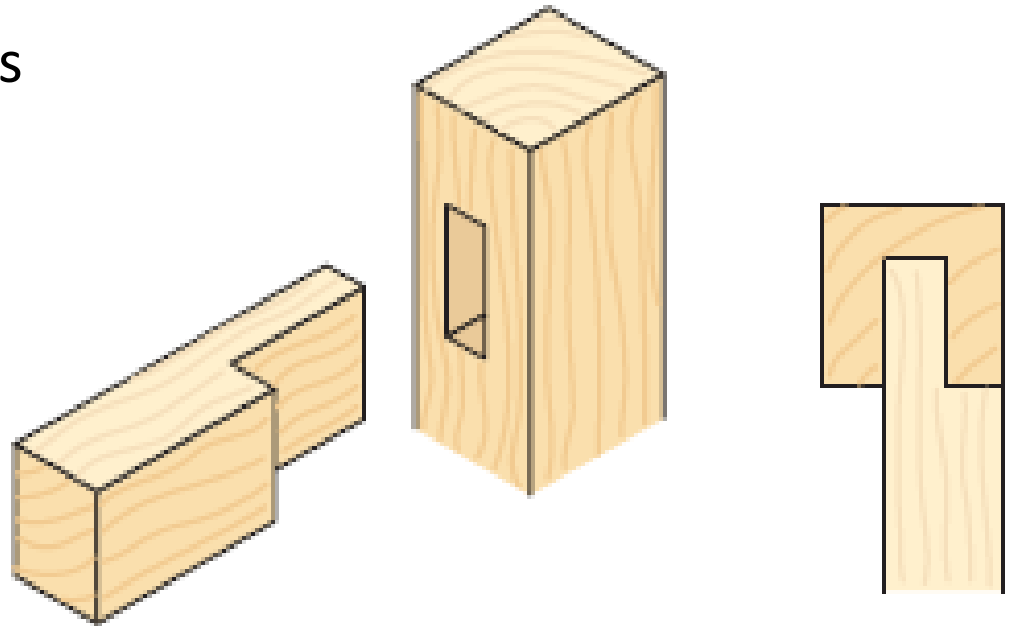
Mortise and tenon joints

- Widely used
- Large glue area gives strength
- A number of different types
- Uses
 - Frames
 - Doors
 - Tables & chairs

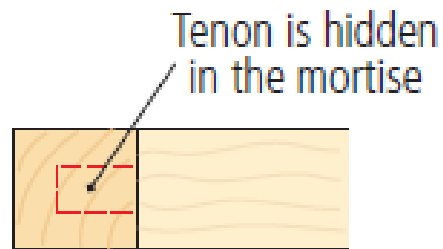
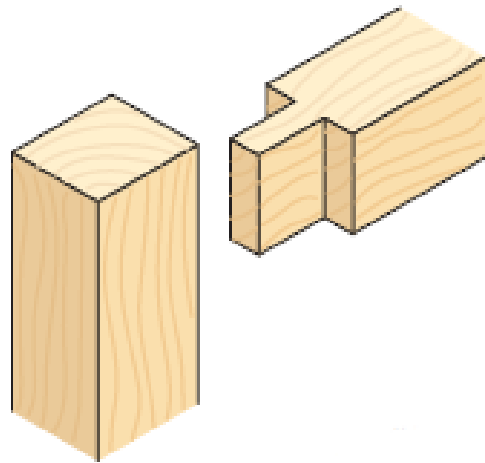


Mortise and tenon joints

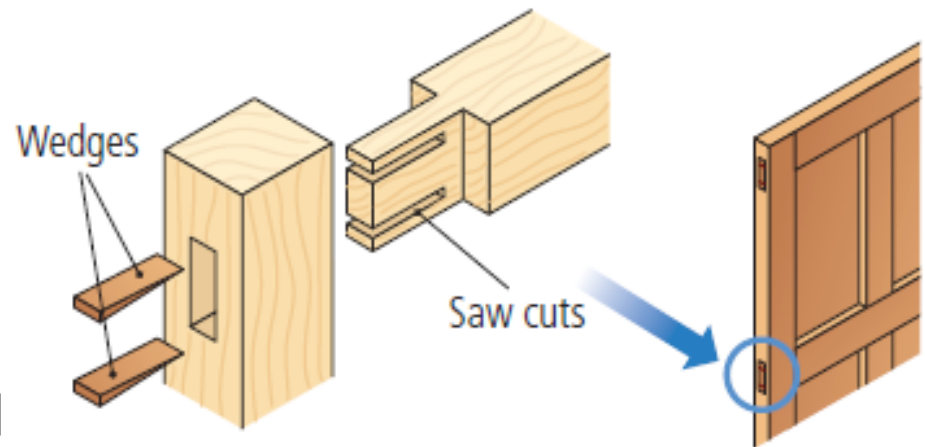
- **Barefaced mortise and tenon joint**
 - Barefaced tenon has only one shoulder



Mortise and tenon joints



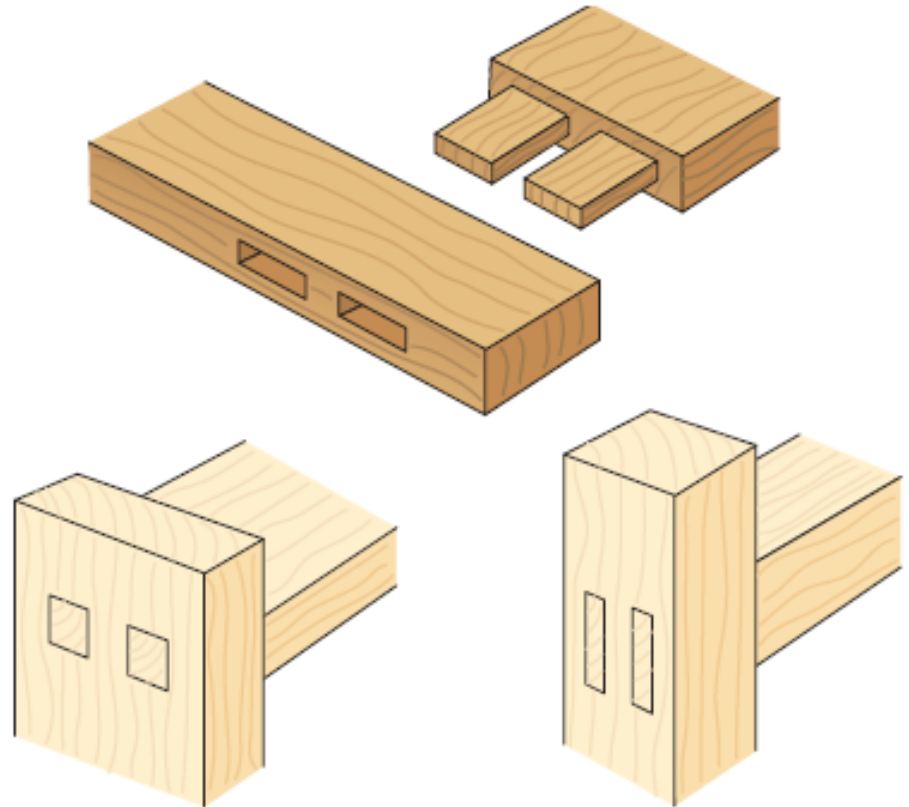
- **Stopped mortise and tenon joint**



- **Wedged mortise and tenon joint**

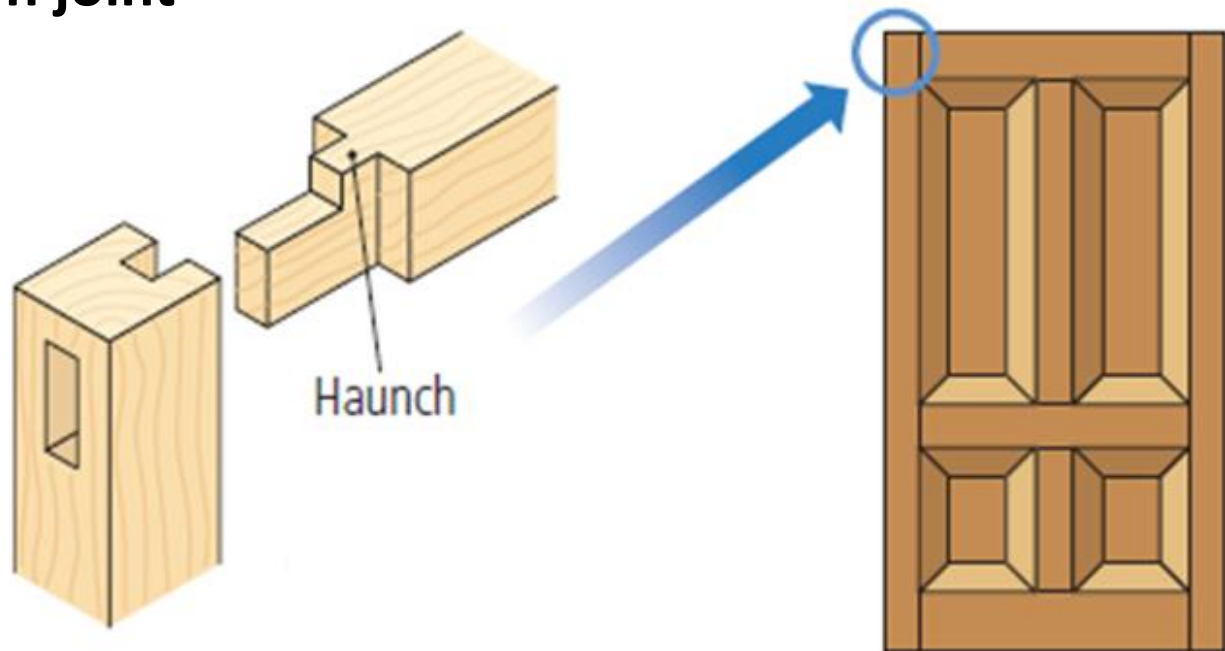
Mortise and tenon joints

- **Twin mortise and tenon joint**
 - Greater glue area and a stronger joint
 - Used when a wide tenon could become loose with shrinkage



Mortise and tenon joints

- **Haunched mortise and tenon joint**



Dovetail joints



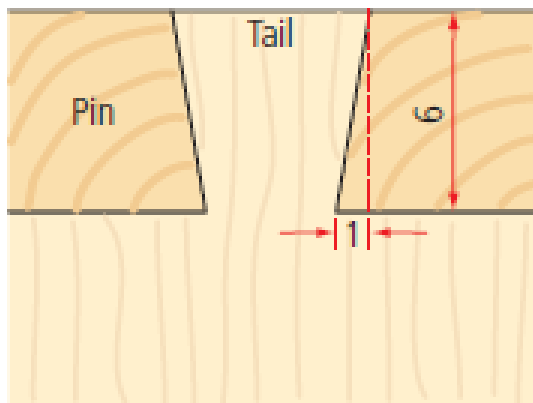
- Strong joint
- Attractive
- Dovetail tightens when a pulling force is applied
- Use
 - Drawers

Slope of the dovetail

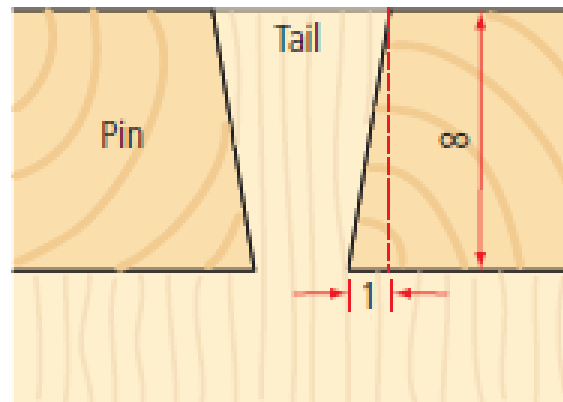
Softwood	Hardwood
1 : 6	1 : 8

Slope of dovetail joints

Slope of the dovetail	
Softwood	Hardwood
1 : 6	1 : 8



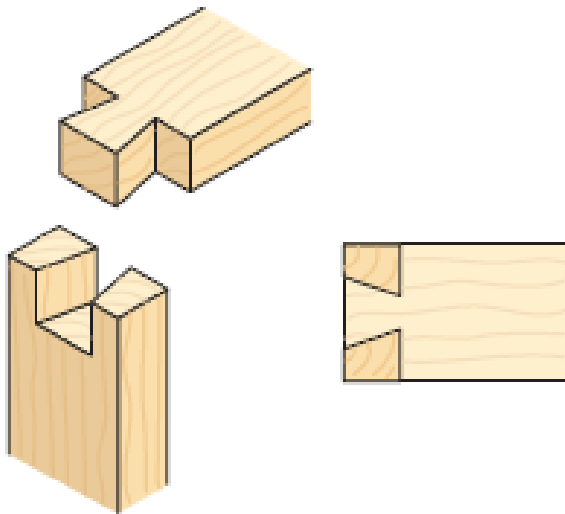
Softwood slope 1:6



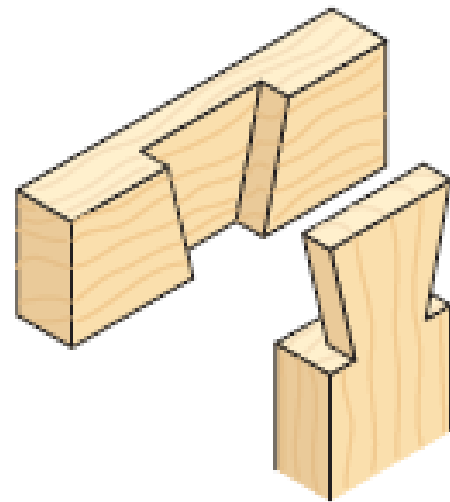
Hardwood slope 1:8

Dovetail joints

- **Single through dovetail joint**
- Uses
 - Corners of boxes
 - Where rails meet legs



- **Tee dovetail halving joint**

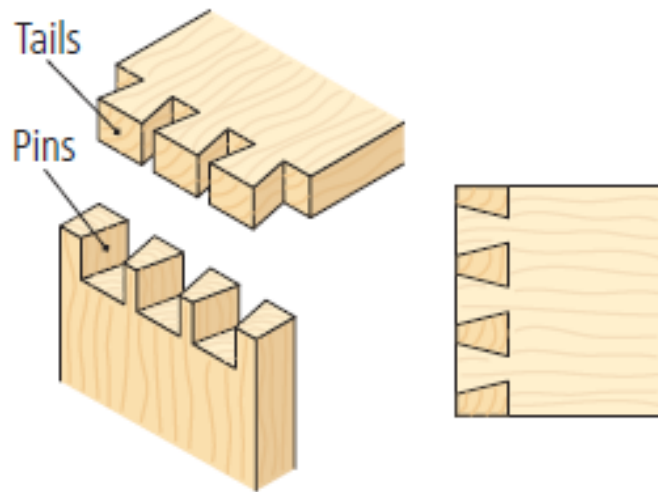


Dovetail joints

- **Through dovetail joint**

- Uses

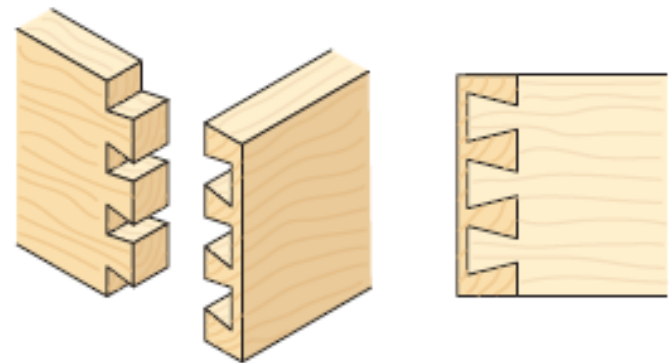
- Box carcasses
- Drawer carcasses



- **Lapped dovetail joint**

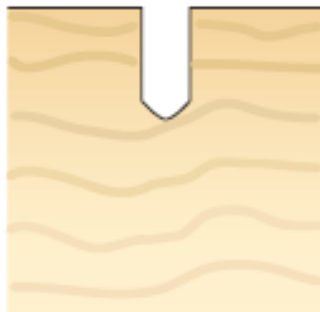
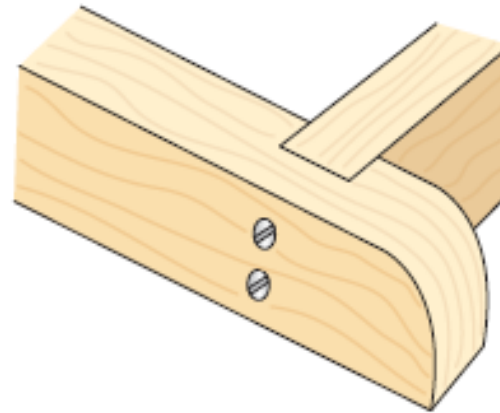
- Used

- Where strength is needed, but the front end grain of the tails has to be hidden
- Drawer fronts

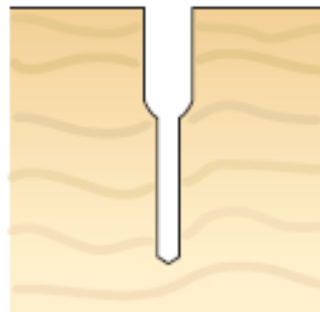


Screws

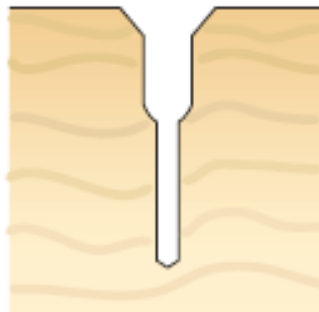
- Screws are used to hold a joint together
- First, a pilot hole is drilled and then countersunk



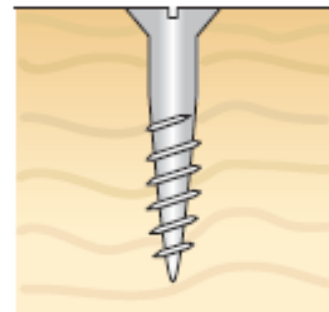
Bore a hole to take the shank of the screw



Bore a hole smaller than the thread of the screw



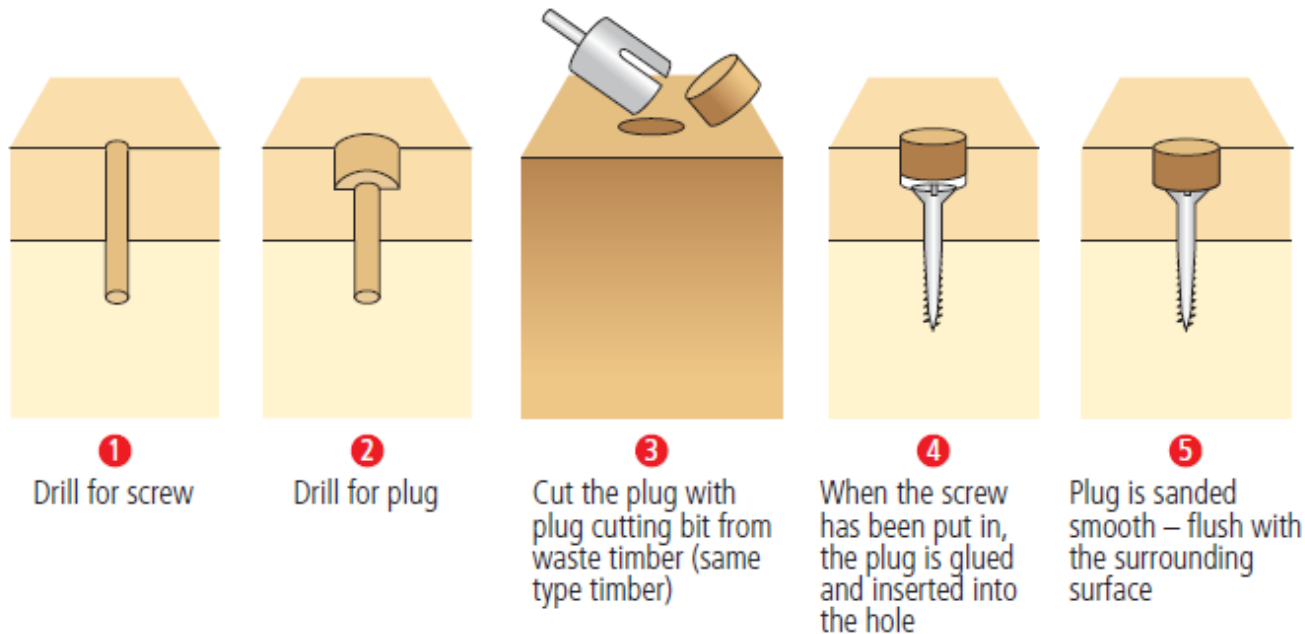
Countersink the hole with a countersink bit



Insert the screw

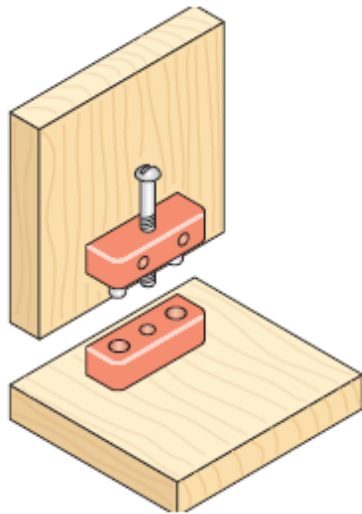
Screws and plugs

- Screw is hidden with a round wooden plug

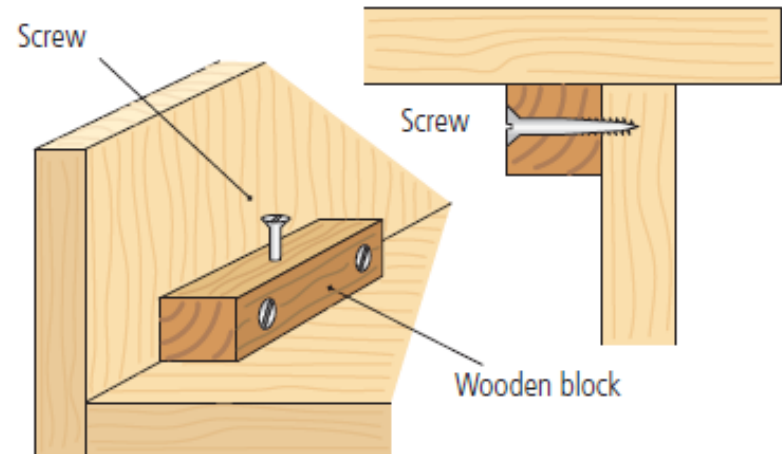


Joint block

- Allow pieces to be taken apart
- Not very strong or attractive



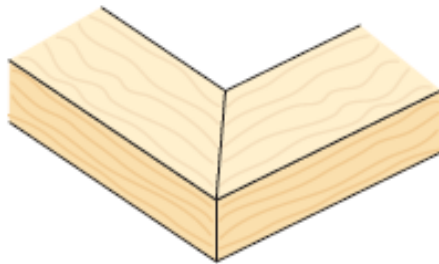
- **Knock-down fitting**



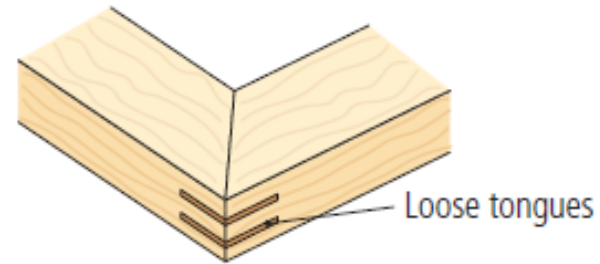
- **Wooden blocks** can also be made to do the same thing

Mitre joint

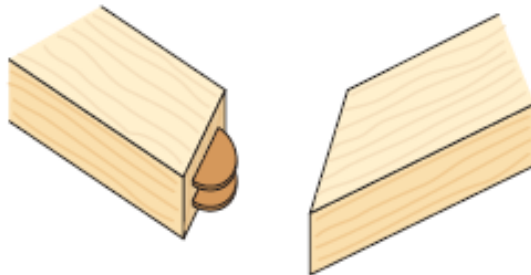
- A simple form of joint that can be strengthened with loose tongues, biscuits or dowels



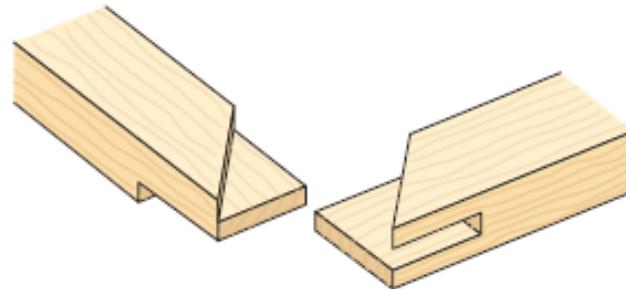
Mitre joint



Mitre joint with loose tongues



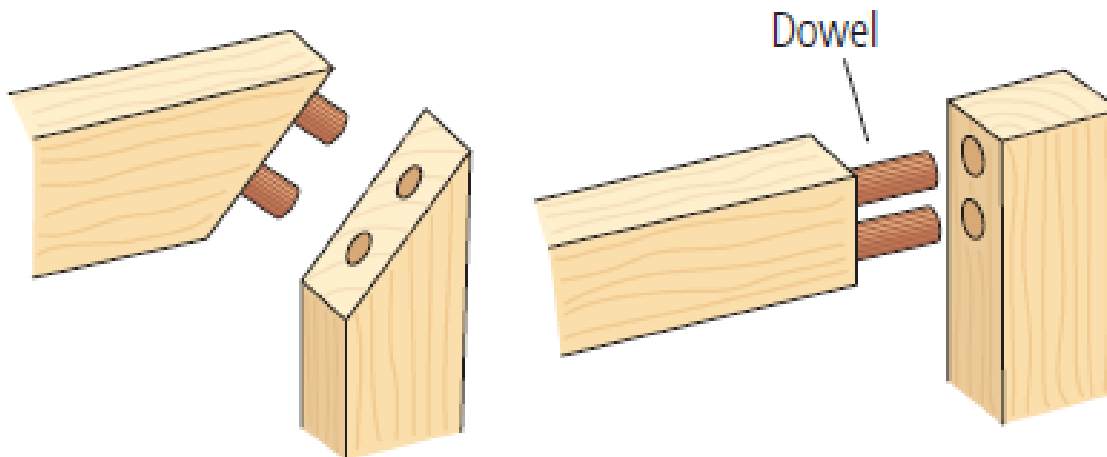
Mitre strengthened using biscuits



Mitre bridle joint

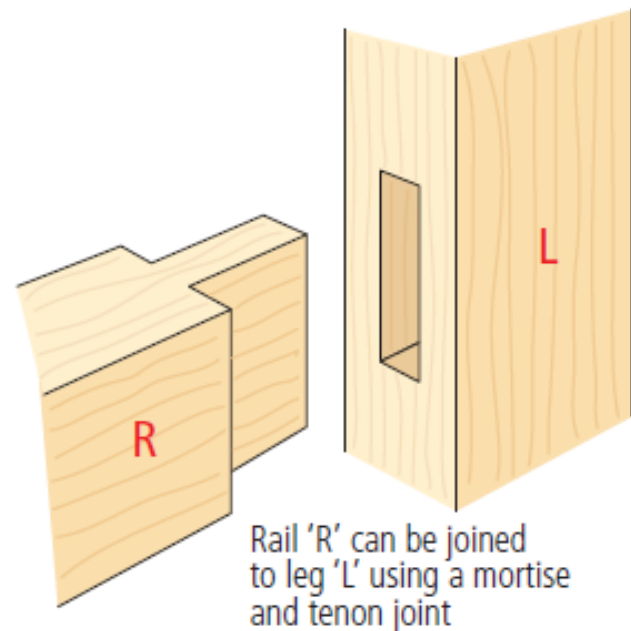
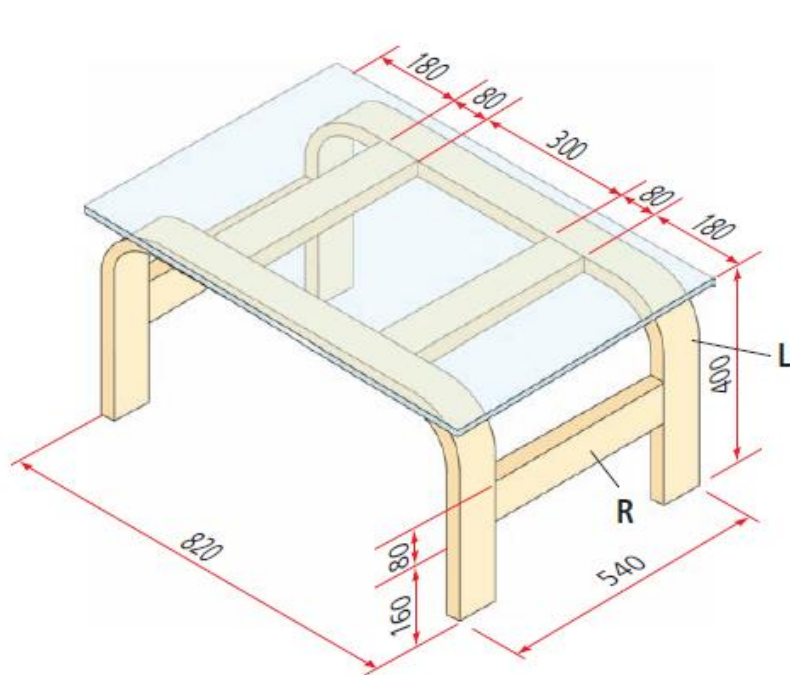
Dowel joint

- Used in place of mortise and tenon
- Dowel is a wooden cylinder
- A dowelling jig is used



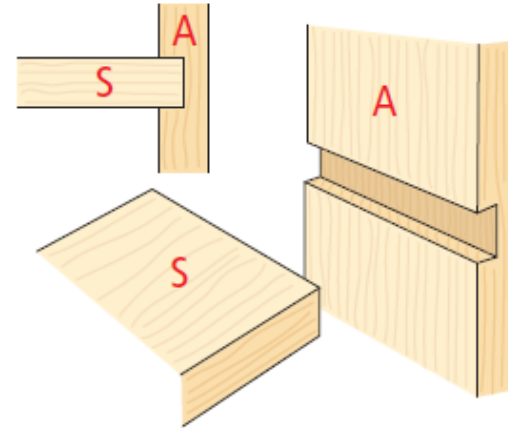
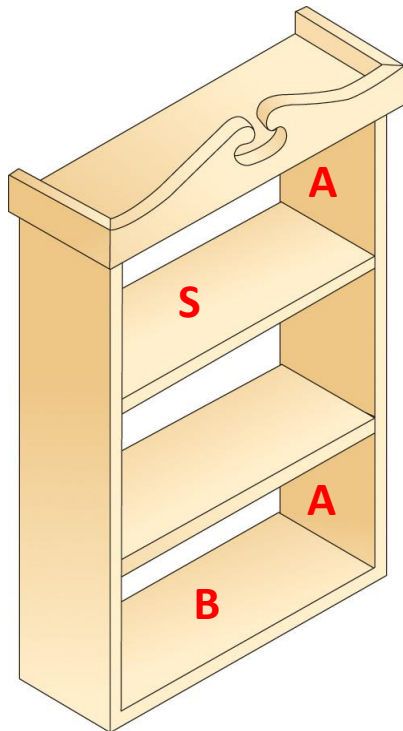
Example 1

- Describe a suitable method of joining the rail 'R' to the leg 'L' on the table pictured in the diagram.

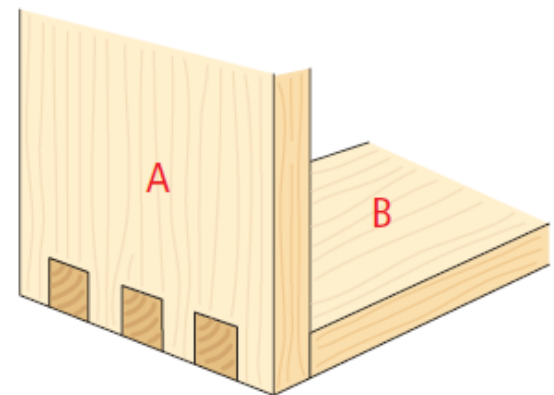


Example 2

- In the unit shown, describe a suitable method of joining:
 - Side A to the shelf S
 - Base B to side A



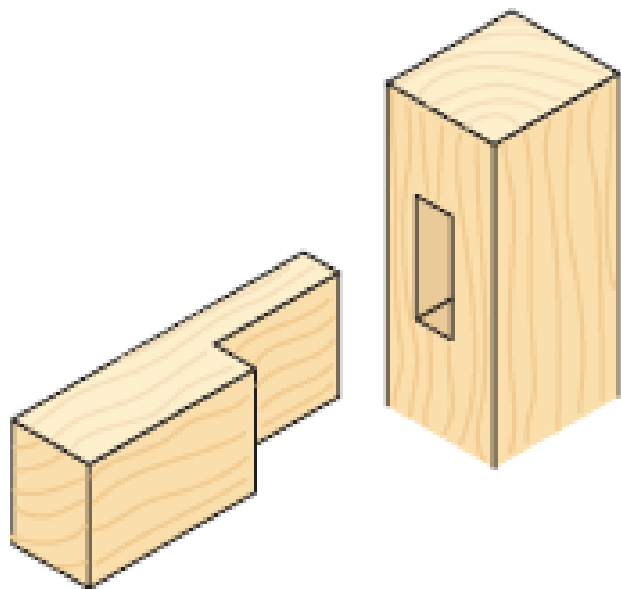
- Shelf **S** to side **A** using a housing joint



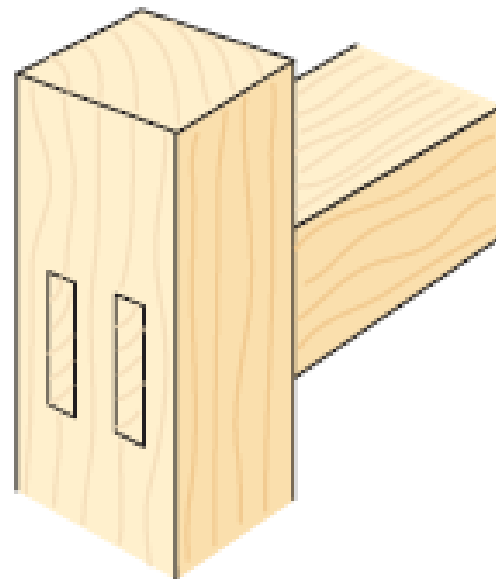
- Base **B** to side **A** with finger joints

Quiz

- Name the joints

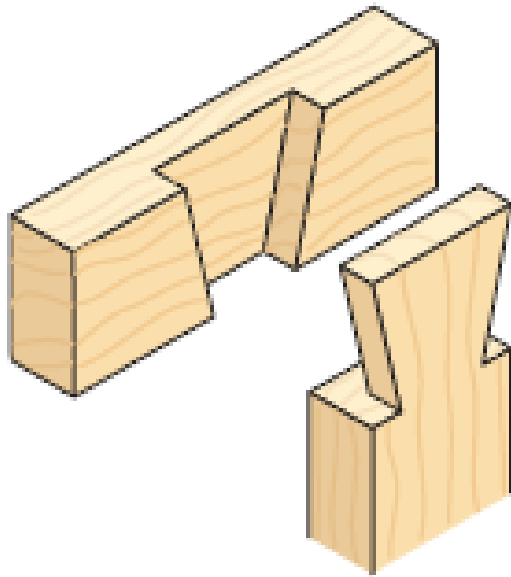


- Barefaced mortise and tenon

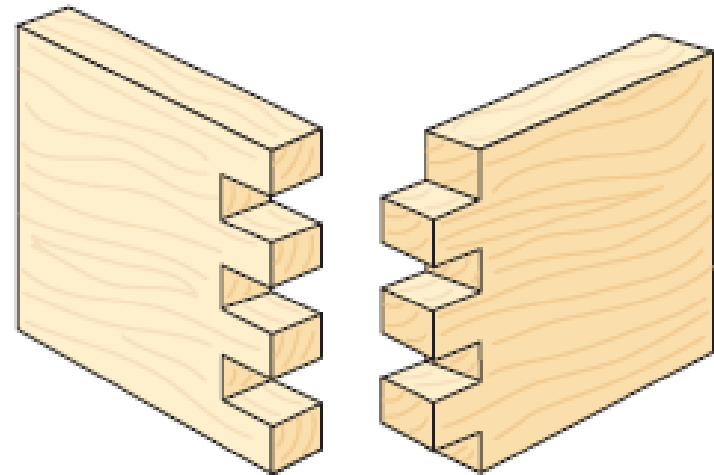


- Twin mortise and tenon

- Name the joints

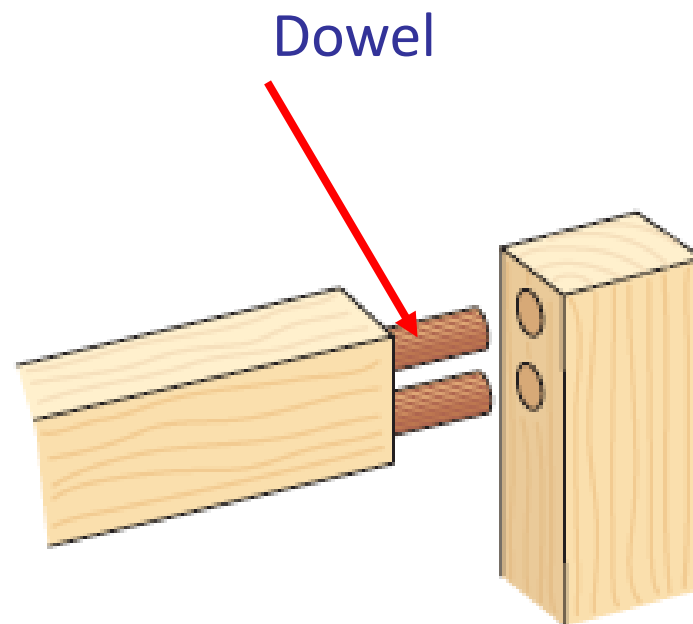
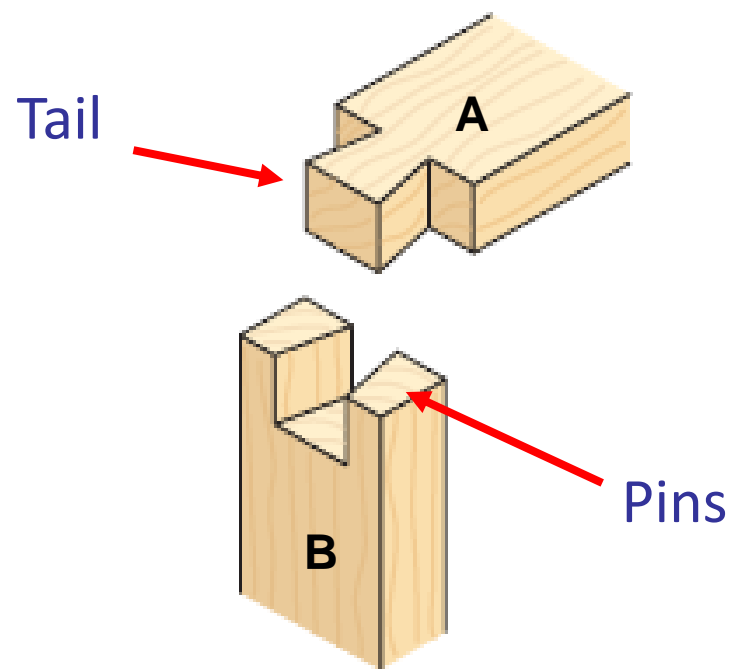


- Tee dovetail halving

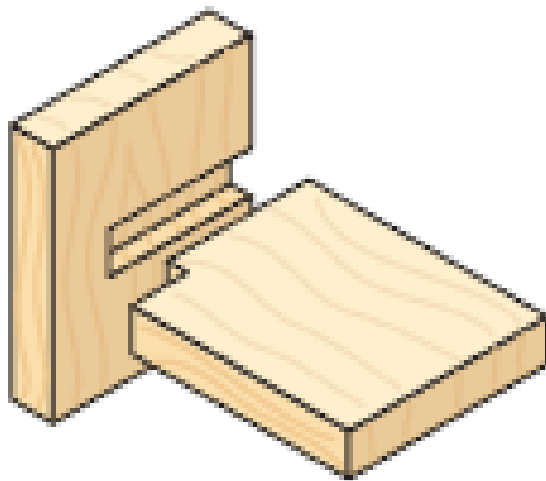


- Finger joint

- Name the parts shown



- Name the joints

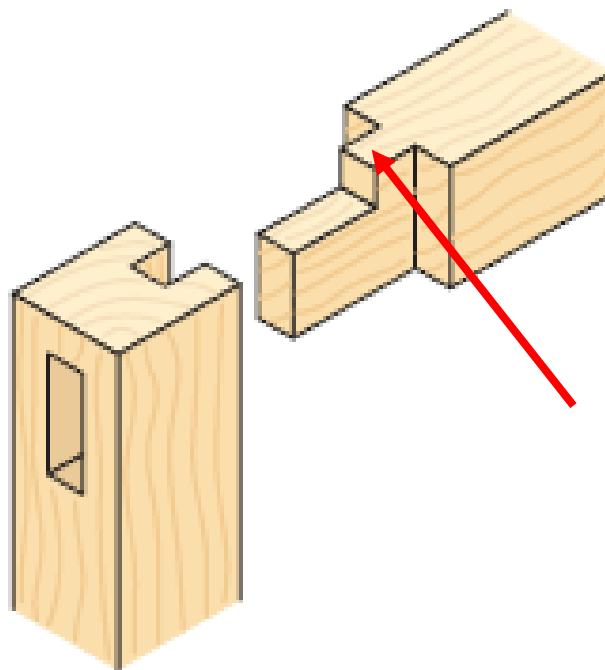


- Stopped housing joint



- Lapped dovetail

- Name the part shown



Haunch