Learning Unit 2 Construct widening joints

Widening Joints are used to make wider boards by joining narrower one edge to edge. Whichever jointing method is chosen, care should be taken to ensure the curve of the **Annular Rings** is reversed on adjacent boards as shown.

As timber dries out, its **Annular Rings** will tend to try and straighten. Reversing their direction in this way minimises the degree to which the widened board will ***cup*** or ***warp***.

Note: Although now almost universally replaced by **MDF**, solid timber window sills would be positioned 'heart side up'. This ensures that if there is any movement as the **Annular Rings** tend to straighten, the sill would 'bow' upwards in the centre rather than 'cup' and hold moisture.

To avoid this problem almost completely, choose boards which have been sliced ***radially*** from across the centre of the tree, and whose **Annular Rings** are therefore close to being at right angles to each face *(these boards are known as **Quarter Sawn** and **Rift Sawn** - they are much sought-after and will be hard to find!)*

It is important to ensure joining surfaces are straight and **square** and to arrange boards such that their **Grain** goes in the same direction - this is so any subsequent planing and finishing is made easier. Check for **Squareness** by balancing one board on top of another and testing with a straight edge.

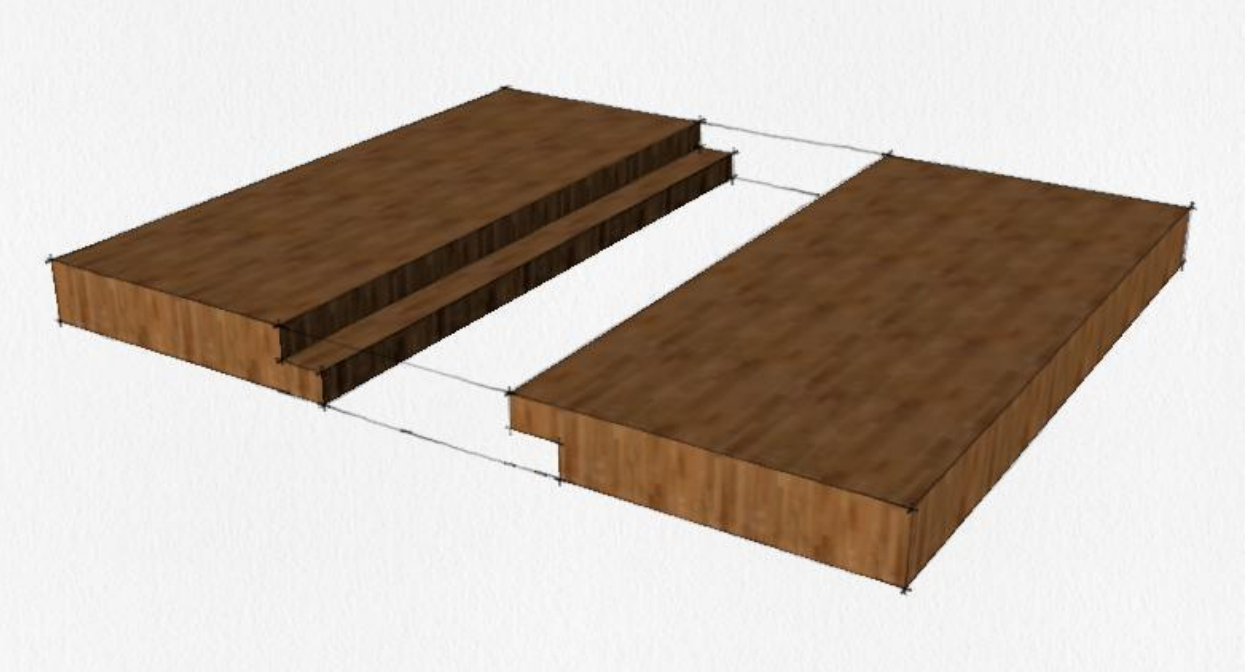
Some **planing** will be needed after jointing to ensure the finished boards surfaces are flat, so choose boards somewhat thicker than the required finished size to start with.

LO 2.1 Identify types of widening joints

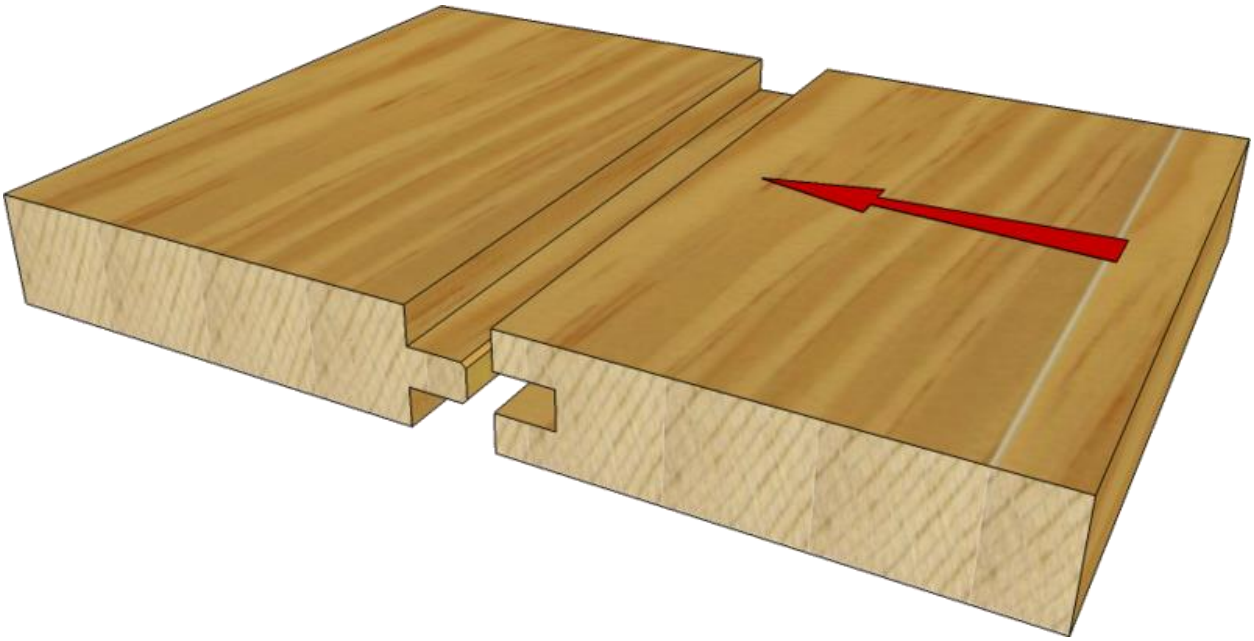
- **Types of widening joints :**

Rebate Joint

The Rebate joint is sometimes used to widen timber. It is not as strong and requires nails and glue to hold it together losing most of its aesthetic appeal



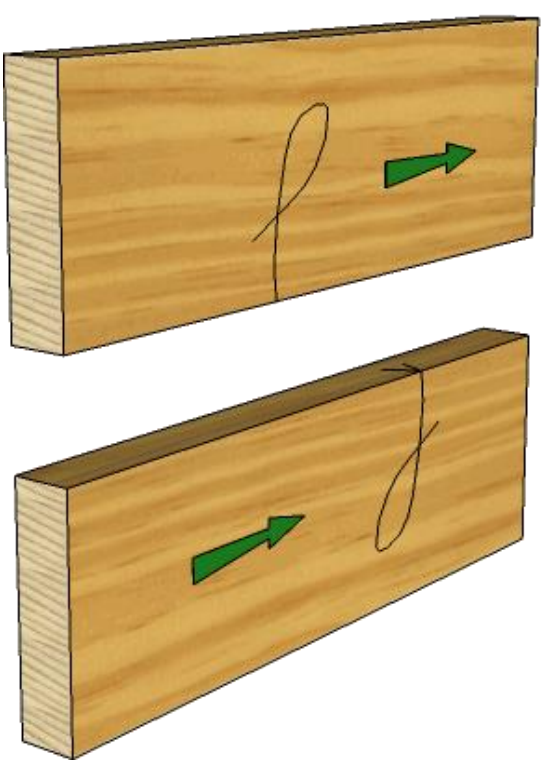
 Tongue and Groove Joint

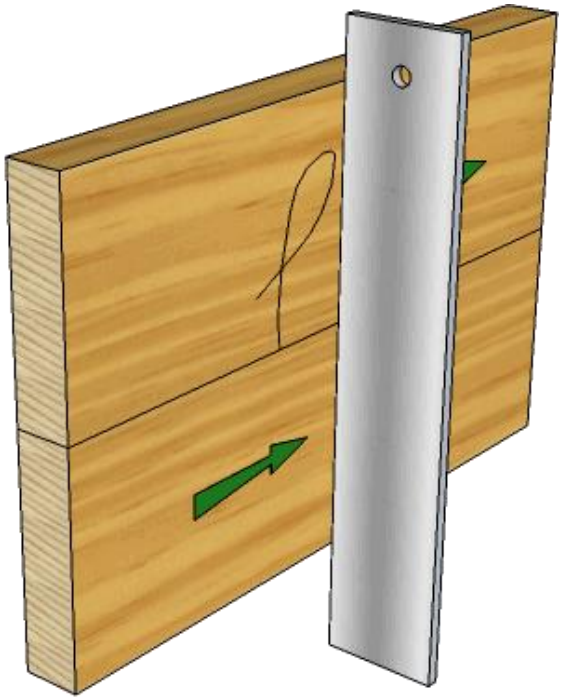


A traditional floor-boarding joint *(now largely superseded by **Chipboard** panels but still a useful and strong method of joining together boards)*. The **Groove** should be approximately one third the thickness of the joining edges and cut with a **Plough Plane** using the nearest width blade. The **Tongue** can be cut to match in the form of two **Rebates** but shaped and matching blades are

available for **Combination Planes** to ensure a close fitting joint. They can also be machined using a **Router**.

- Edge to edge but joint: is the simplest Widening Joint but with careful preparation and modern Adhesives can be very strong





- Prepare the joining edges, **Gauge** their centres, then hold them together with ends overlapping about 12mm as shown.
- Use a **Try Square** to **square** lines across where the screws are to be positioned.
- On one piece only, **square** lines across about 14mm - 16mm to one side of each of the screw centres to mark the ends of the slots.
- Drill pilot holes for the screws in one piece and holes to clear the screw-heads in the second piece 10mm - 12mm deep.
- Drill holes to clear the screw shank, also 10mm to 12mm deep, at the ends of the slots.
- Using a thin **Mortise Chisel** cut the slots through to the screw-head clearance holes to a width equal to the screw shank. *(click on images to enlarge for clarity)*

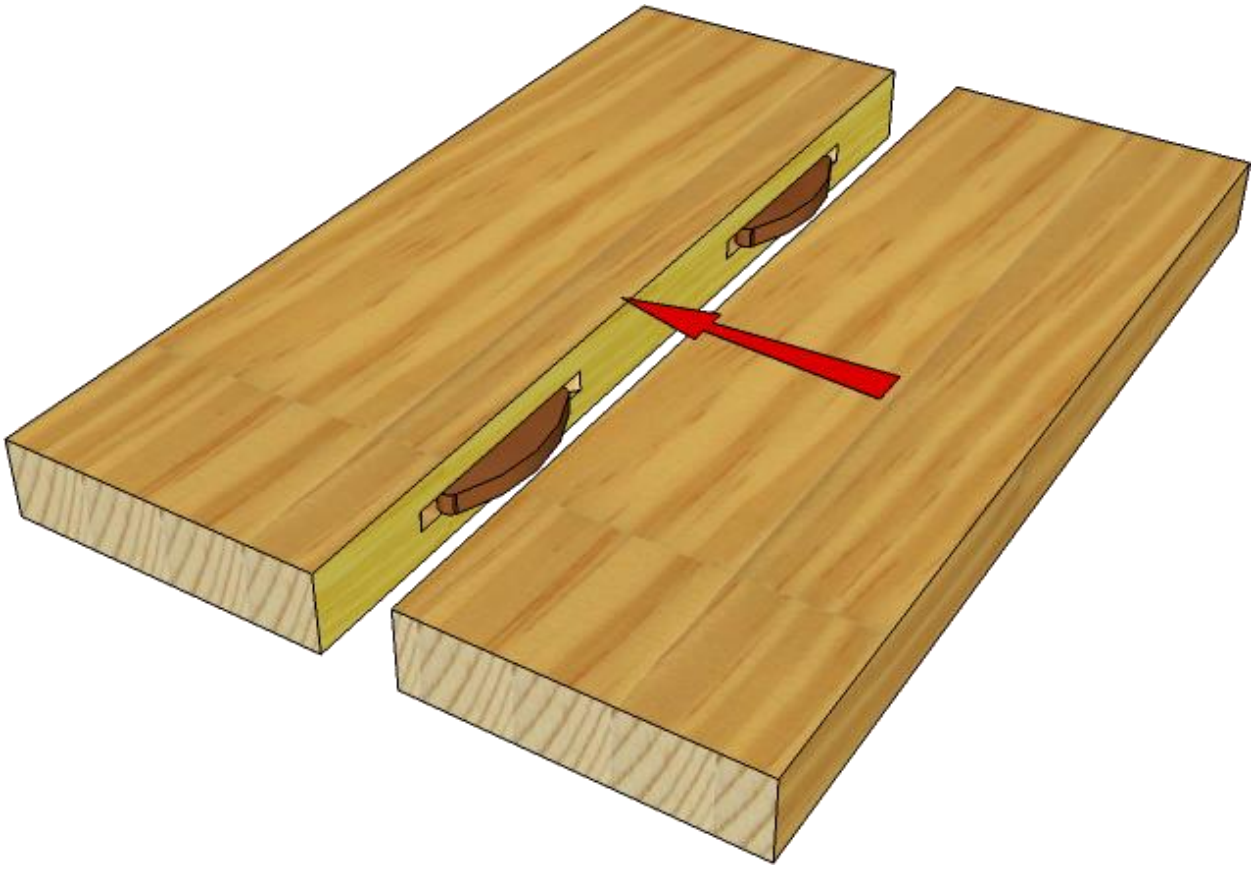
- Screw a screw into a scrap piece of wood to a depth of 8 or 9mm and use this to cut the screw head grooves by placing it down into the screw-head clearance hole and tapping along the slot with a **Hammer**.
- Use the same scrap of wood, with screw, to set the height of the screw-heads in the second piece of timber.
- Bring the two pieces together and lightly **cramp**, then using a **Mallet**, drive the screws along the slots to bring the timber ends together.
- if required after this *dry run*, take apart the joint, add glue and re-assemble.

- **Edge dowel joint**: Dowels provide a convenient means by which to strengthen a Butt Joint *(or **Rubbed Joint**)* but great care has to be taken to ensure accurate location of the Dowels in each piece to be joined. Choose a Dowel diameter approximately one third the thickness of the joining edges

- Prepare the joining edges, **Gauge** their centres, then hold them together in a **Vice** for example.
- Use a **Try Square** to **square** lines across where the **Dowels** are to be positioned.
- Drill holes for the **Dowels** 20mm - 25mm deep in one piece only,
- Insert **Dowel Centres** into the drilled holes and press the two halves of the joint together such that the **Dowel Centres** mark the hole positions on the second piece.
- *(an alternative is partially to drive panel pins into one half, snip off their heads and use these to mark centres on the second piece).*

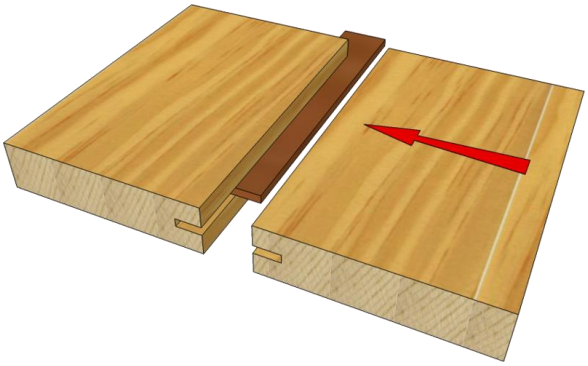
- Prepare the joining edges, **Gauge** their centres, then hold them together in a **Vice** for example.
- Use a **Try Square** to **square** lines across where the **Dowels** are to be positioned.
- Drill holes for the **Dowels** 20mm - 25mm deep in one piece only,
- Insert **Dowel Centres** into the drilled holes and press the two halves of the joint together such that the **Dowel Centres** mark the hole positions on the second piece.
- *(an alternative is partially to drive panel pins into one half, snip off their heads and use these to mark centres on the second piece).*

Biscuit Joint



Butt Joints can be reinforced by inserting dried and compressed wooden **Biscuits** into pre-cut slots or **Grooves**. The use of **Biscuits** is gaining popularity in preference to using **Dowels** because they are more forgiving and less marking out is needed *(i.e. the **Biscuit Jointer** or **Router** used has stops and fences to ensure correct positioning and often only a centre line is needed to mark the positions for the **Biscuits**).*

- **Loose Tongue** ***(or 'Key')***

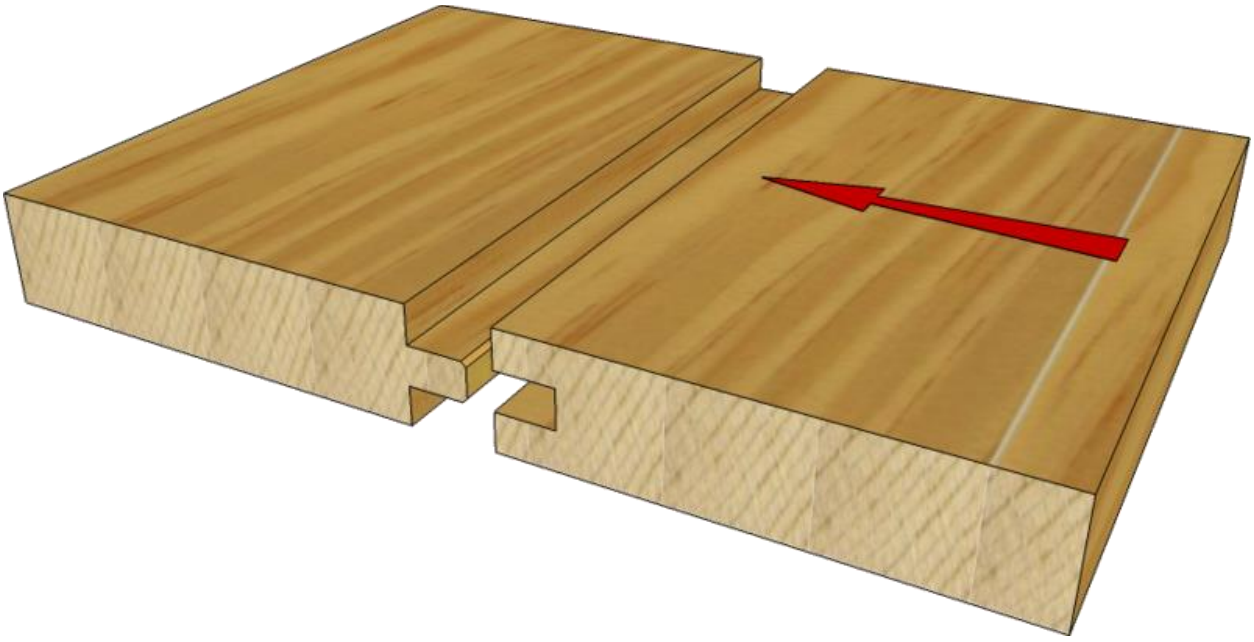


Very similar to a **Tongued and Grooved Joint** but requiring only **Grooves** to be cut into each of the joining edges thus simplifying construction. The **Tongue** is made from solid timber or **Ply** and fitted into the **Grooves** which are cut to a suitable width *(e.g. the nearest standard **Ply** thickness to approximately one third the timber thickness)*. If **Tongues** are made from solid timber, the **Grain** should be either diagonal or go across the width for strength.

LO 2.2 – Construct widening joints

● **Procedures of constructing widening joints:**

Read sketch



- Prepare timber to the required size: by marking**,** ripping, planning, squaring and cutting

- Identify the tools required: tools used to make lengthening joint are divided into two groups Which are hand tools and wood working machines

Hand tools: ex: pencil, tape measures, saw clamp, try square, planer, chalk line, screw drivers, tenon saw, back saw, hand drill, bevel, work bench, bit, axe…etc

Wood working machine: ex: surface planer machine, thicknesses machine, panel saw, mitre saw, morticing machine, tenoning machine, spindle moulding machine etc….

- Identify sides and edges Cutting joints to size: there are two sides and two edges that used to work in lengthening joints real side and off side start with real side and real edge.

LO 2.3 – Assemble parts of widening joints

● types of widening assemble:

- assembling test: (non-permanent) is the assembly made before final assembly to verify if the joint is well done.

- final assembling: (permanent) permanent fixing with glue.

More modern furniture with manufactured boards will use knock-down fittings so that parts can be easily replaced or flexibility in the modular construction and aesthetic of the items.

Glue is a chemical mixture that bonds wood surfaces together. The most common version of this is PVA (Poly Vinyl Acetate). It is very easy to apply and easy to clean off with water. And use other glue as follow: contact glue, synthetic resin glue……