Chapter 5

Unit 115: Produce woodworking joints

When discussing woodwork joints, it is important to consider the properties of timber and timber products and how these affect workability (how easy a particular timber is to cut and shape using tools). An understanding of how the seasoning (drying) and conversion (cutting up of a log) process, as well as an awareness of possible defects that can be found will help greatly when selecting timber and forming joints.

By reading this chapter you will know how to:

1. Select and store materials used to produce woodworking joints.
2. Select and use hand tools to produce woodworking joints.
3. Identify resources required to mark out woodworking joints.
4. Mark out woodworking joints.
5. Select and use hand tools and materials to produce basic woodworking joints.
6. Form a frame using woodworking joints.

SELECT AND STORE MATERIALS USED TO PRODUCE WOODWORKING JOINTS

TIMBER

INDUSTRY TIP

Balsa wood is a hardwood but a very soft timber.

All timber falls within two main categories, hardwood and softwood. The names imply that these materials are hard or soft, but this is not necessarily the case. The terms refer to the type of tree that the timber has been cut from. Softwood comes from coniferous trees, which are generally evergreen, have needle-like leaves and, in the case of pine trees, produce pinecones. Hardwood comes from deciduous trees. These are generally broad-leaved trees which tend to lose their leaves in the autumn, like oak (but this is not always the case). These two types of tree are different and the timber contained within has a different structure.

Workability

How easy types of timber are to work

Durability

How resistant types of timber are to fungal and insect attack

The following table shows different types of wood and a description of their **workability** and **durability**.

Wood type	Description
White wood 	A type of softwood most commonly used for carcassing (studwork, joists and rafters). It is quite soft, but the knots are very hard. It is difficult to neatly work it with a chisel. This wood is non-durable and requires treatment if used in damp conditions.
Redwood 	A type of softwood commonly used for joinery. It is easier to work with than white wood and is somewhat more durable, but still requires treatment if used in damp conditions.
Douglas fir 	A high quality expensive softwood used for joinery and can be used 'green' (un-seasoned) for heavy construction timbers. It will require treatment for use outdoors.

Wood type	Description
Cedar 	A softwood for exterior use. It is quite soft and not particularly easy to work with. However, it is very durable and will last many years outside without treatment.
Yellow pine 	An expensive softwood highly prized for its decorative straight grain with very few knots.
Beech 	A hardwood used for good quality interior joinery and furniture. Mallets are commonly made from beech. Oak timber is nondurable, so it will go black and rot quite quickly if used outside. It works well and gives a good finish.
Oak 	A very strong hardwood, often referred to as 'the king of hardwoods'. It is very durable and is used for heavy duty timber framing, joinery and furniture. It is difficult to work with due to its hardness, although it is easier to work when green.
Ash 	A good quality hardwood, which is not very durable so is only used in dry areas. However, it will give a high quality finish, and is easy to work with.

ACTIVITY

Follow this link and plan out a wood of your choice, identifying the types of trees you would plant, how many, and why those choices. You have an area of three acres.

www.woodlandtrust.org.uk/en/planting-woodland/planting%20and-management-advice/choosing-trees/Pages/default.aspx

Wood type	Description
Sapele 	A type of mahogany. This hardwood has a distinctive red colour and stripy grain. It is used for joinery and extensively for veneer work. It is durable and relatively easy to work with, but the interlocking grain can cause problems with finishing.
Birch 	A hardwood that is used extensively for the manufacture of high quality plywood. It is used in joinery and furniture manufacture.

PROCESSING OF TIMBER

Trees are not really useable until the timber inside is processed. This involves cutting up the log into useable sizes (conversion), and drying it (seasoning). Structural timber (timbers used to carry a load such as a roof or floor) are then tested for strength (stress graded) and sometimes pressure treated with preservative to increase durability.

- *Durability*. Different timber species have differing resistance to fungal and insect attack. Timbers which are resistant are known as durable while timbers that rot easily are known as non-durable. Preservatives can be applied to such timbers to increase their durability.
- *Workability*. Some timbers are easier to work with than others. Factors that affect workability can be sloping or interlocked grain, resin content, amount of knots and other defects.

INDUSTRY TIP

Pressure treated timber is where the timber has had a preservative forced into the cells of the timber in a vacuum tank.

ACTIVITY

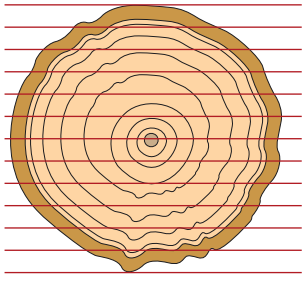
Is there any timber in the room where you are sitting? What type is it? Why do you think that this timber been chosen?

ACTIVITY

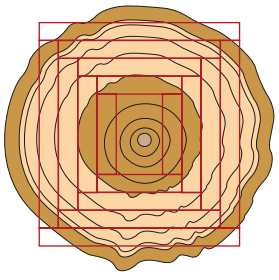
Using www.forestry.gov.uk see if you can correctly identify trees in your local area.

TIMBER CONVERSION

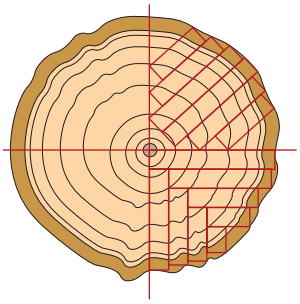
A tree log can be cut up in the following ways:



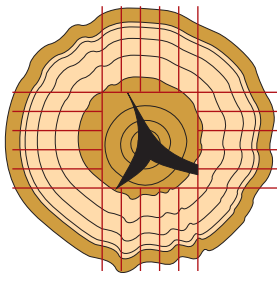
Through-and-through conversion (tangential and some radial boards)



Tangential cuts (heart is boxed)



Quarter sawn, showing two different cuts (radial boards)



Boxed heart

- *Through-and-through* is the most common form of conversion. It gives an efficient use of the log – very little is wasted. The boards towards the edge of the tree are liable to become cupped in shape, this is due to the grain shape within the board. Some logs that have been cut up this way become **boules**.
- *Tangential* conversion is used for structural timbers (like floor joists) as the grain configuration makes the most of the tree ring's strength.
- *Quarter sawn* is rather wasteful, with a lot of the timber being thrown away. However, it is used for certain hardwoods such as oak because this shows up the 'figure' (medullary rays) of the timber, an attractive pattern of rays that runs radial from the centre of the tree.
- *Boxed heart* is a combination of other methods but avoiding the heart of the tree. This method is used if the heart of the tree is defective (ie rotted).

Boule

A log that has been sawn through-and-through and restacked into the original shape of the log

ACTIVITY

Follow this link and watch an oak log being processed:
www.youtube.com/watch?v=yigFtAuUPDE&feature=player_detailpage

The tables below show the standard width and thickness for sawn softwood boards, and the standard lengths.

Width	Thickness
75mm	16mm
100mm	19mm
115mm	22mm
128mm	25mm
138mm	32mm
150mm	38mm
175mm	47mm
200mm	50mm
225mm	65mm
	75mm
	100mm

Length
1800mm
2100mm
2400mm
2700mm
3000mm
3300mm
3900mm
4200mm
4500mm
4800mm
5100mm
5400mm

INDUSTRY TIP

'Wrot' timber is timber that has been planed, and 'unwrot' timber is timber that has been planed.

INDUSTRY TIP

Planed all round (PAR) is timber which has been planed on all four sides. Planed square edge (PSE) is timber which has been planed with a square face and edge.

INDUSTRY TIP

The most common form of green timber is green oak, which is used in timber frame construction.

DRYING

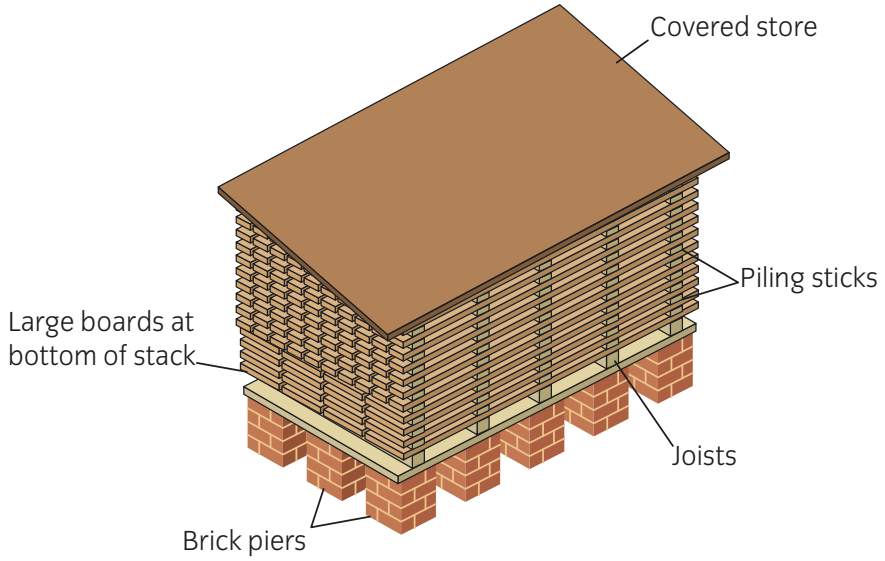
When a tree is cut down, it is full of water and sap (this can be up to 200% of the dry weight). This needs to be removed before the timber is useable through a process known as drying or seasoning. Green timber (un-seasoned) is heavy, usually difficult to work and is prone to rot or insect attack. Green timber will also move after it has been used resulting in warping and splitting. However, some timbers, such as oak, can be used 'green', and the splitting and warping process is deemed to be attractive.

Drying or seasoning can be done naturally or artificially. The aim of drying timber is to ensure the finished product is suitable for its intended task. The main reasons being:

Moisture meters are used to measure moisture in timber

- To reduce the moisture content to below 20%, this is the threshold of dry rot.
- To reduce the likelihood of shrinkage.
- To enable good surface finish to be achieved both by machine tools and hand.
- To help with decorative finish that will be applied to the finished product.

The natural process is known as air seasoning (drying) which is where the freshly cut timbers are placed under a cover but air is allowed to pass through the stack. Slowly the timber dries out.



Air is able to pass through the boards when timber is correctly stacked with piling sticks

Case hardening

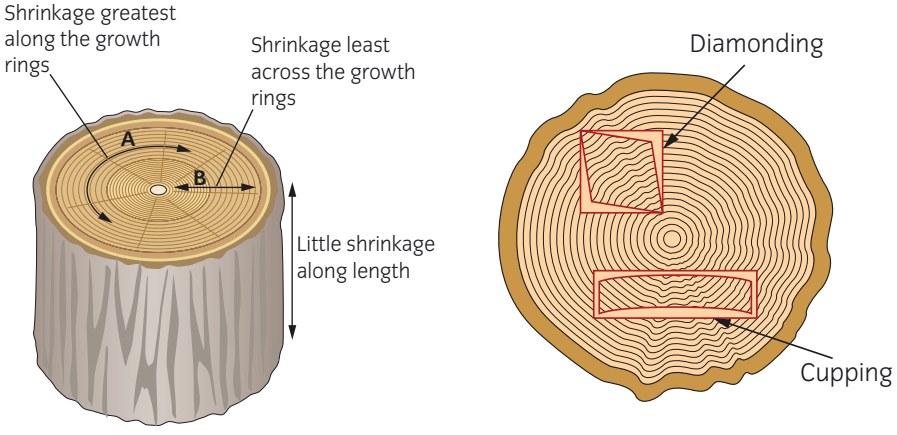
A defect caused by timber being kiln dried too rapidly, leaving the outside dry but the centre still wet

This results in stable material, but it can take a long time. Modern kiln drying involves the use of ovens and is much quicker but the timber can sometimes have some serious seasoning defects, such as **case hardening**, if care isn't taken during the drying process.

A kiln oven used for drying

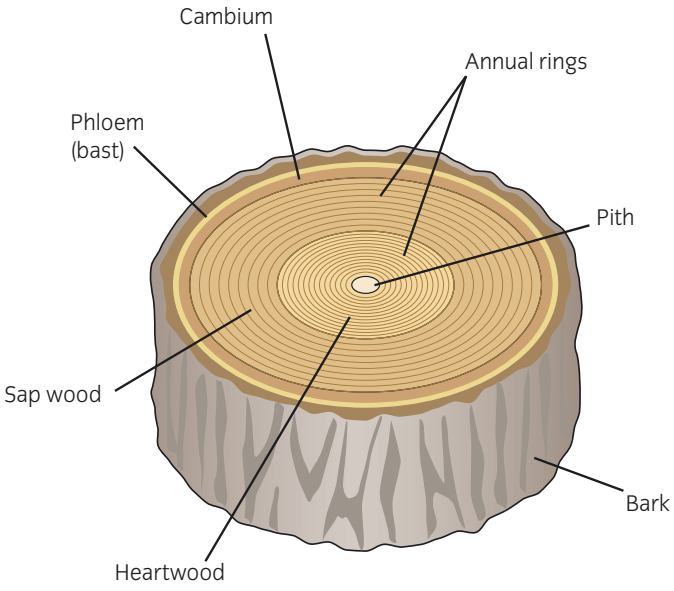
Shrinkage

Shrinkage of timber is twice as much along line A as it is along line B, in the image below on the left. This causes timber to change shape in the following ways in the image on the right.

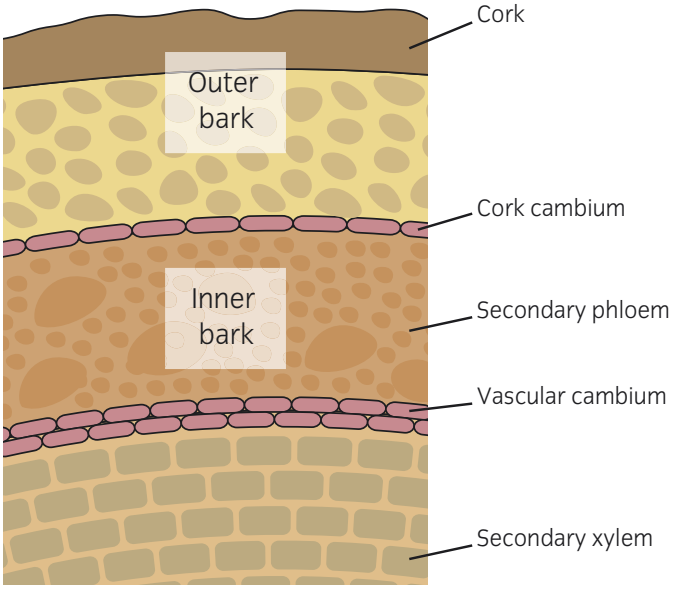


Growth rings

Every year a tree grows it adds a ring and increases in diameter. An annual ring consists of winter growth and summer growth. In softwoods, the winter growth is the darker part and is stronger than the summer growth, therefore slower grown softwoods are stronger because there are more rings in a section. The bark of the tree has a number of layers. Each layer is made up of cells which help the tree protect itself and supply it with nutrients. The images on the next page show you the different structure of tree bark.



Inside a tree trunk



Structures within the layers of bark

STRESS GRADING

Stress grading is usually done by passing the timber through rollers under pressure. The deflection (bend) the timber shows is measured. The greater the deflection, the weaker the timber is, and the lower the grade of the timber. The grade is stamped on the timber which is either C16 (lower grade structural timber) or C24 (higher grade structural timber).

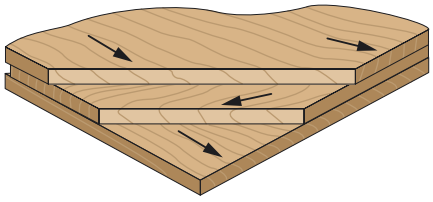
C16 and C24 stamps on timber

OUR HOUSE

Timber floorboards have shrunk after being laid in a house. You have been asked to list possible reasons for this and also to find a solution so it does not happen again. For help with this, take a look at the boards in 'Our House'.

BOARD MATERIALS

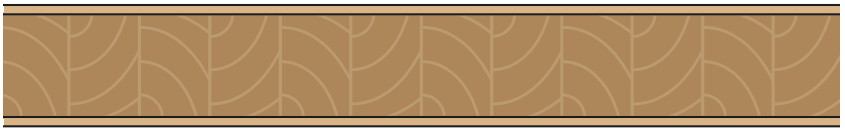
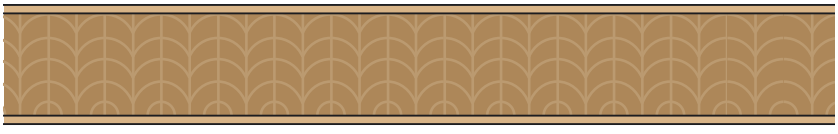
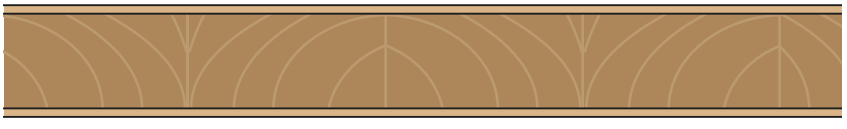
Timber can be further processed into board materials. Common types of manufactured board are:

Board type	Description
MDF 	MDF stands for medium density fibreboard. It is a very common material made by breaking the timber down into fibres using water. These fibres are then dried and pressed into boards using adhesive. MDF produces a lot of dust when cut.
Chipboard 	Chipboard is made from small chips of wood, bonded (stuck) together with adhesive. It is cheap, but quite brittle. Chipboard can be coloured green to show that it has been treated to be moisture resistant, or coloured red to show that it is fire resistant.
OSB 	Orientated strand board is similar to chipboard but has much larger chips which makes the resulting board much stronger. OSB is often used for structural purposes.
Plywood 	Plywood is made from many thin layers (or laminates) stuck together at right angles to each other, making it strong. Plywood usually has an odd number of plies or layers which makes the board stable.  Layers within plywood Plywood is stronger than chipboard. The quality of the resulting product depends on the quality of the timber and adhesives used. WBP (water/weather boil proof) uses an external grade adhesive that enables it to be used inside or outside. Moisture resistant (MR) plywood has reduced resistance to water. INT (interior grade) is only suitable for internal use, it will not stand up to damp conditions.

The following are other types of plywood:

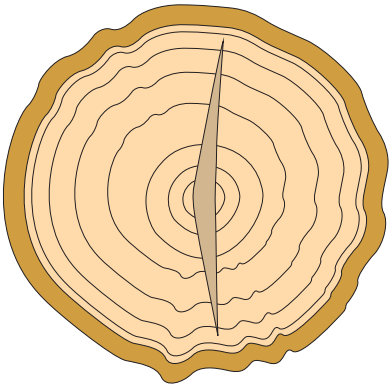
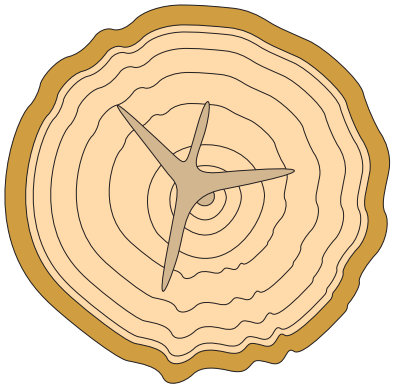
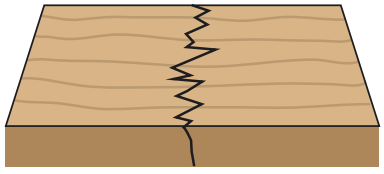
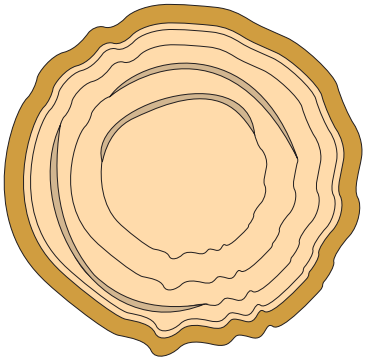
Plywood type	Description
Marine ply 	A very high grade plywood with an excellent resistance to delaminating (coming apart) in extreme conditions.
Birch ply 	A high quality plywood used for furniture.
Flexi ply 	A soft, flexible plywood used for forming shapes.

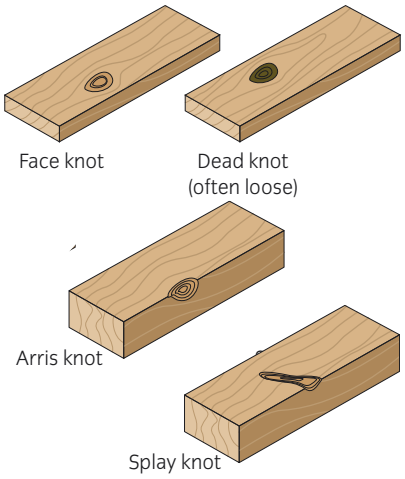
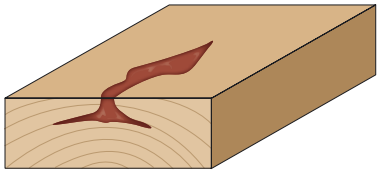
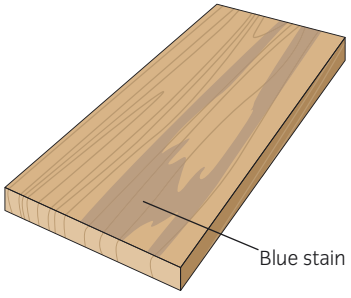
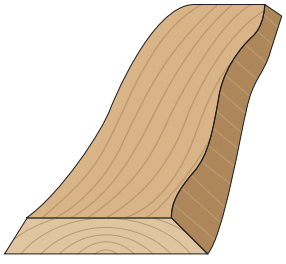
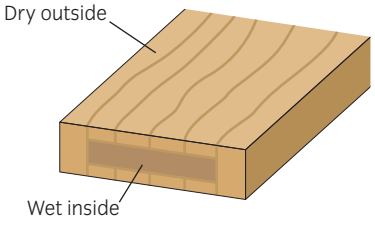
The following are other types of laminated board:

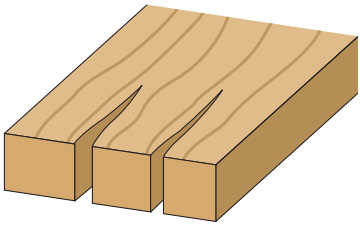
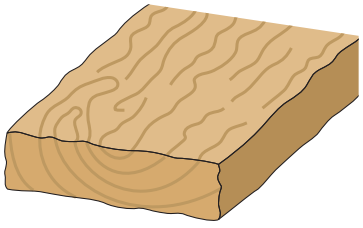
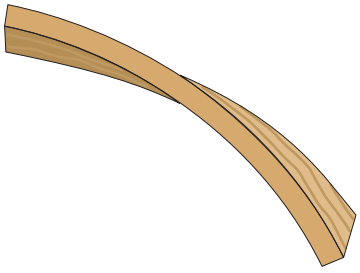
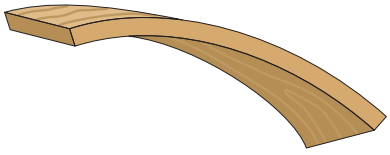
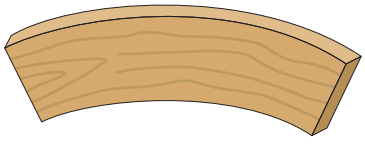
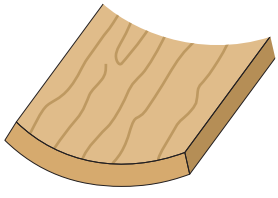
Laminated board type	Size and description
Blockboard 	Strips of board are up to 25mm wide. Good quality hardwood veneers are sometimes used for this board.
Laminboard 	Strips of board are 7–8mm wide. This size produces a better quality board.
Battenboard 	Strips of board can be up to 75mm wide. This size produces a poorer quality board.

TIMBER DEFECTS

The following are common natural defects that occur in timber:

Defect	Description
Heart shake 	A defect that occurs from the centre of the tree (in the heartwood), sometimes associated with decay.
Star shake 	Shakes in the timber radiating from the centre. A star shake is a collection of two or more heart shakes.
Thunder shake 	A crack across the grain. Also known as an upset.
Cup shake 	When the growth rings start to come apart, causing a shake that runs the circumference of the growth rings. Also known as ring shake.

Defect	Description
Knots  	Knots are where the tree's branches grow out of the trunk. They reduce the strength of the timber and can be difficult to finish with paint as they tend to contain a lot of resin. Face knots appear on the face of the timber, arris knots appear between the face and the edge, and splay knots are knots that have been cut through their length. Dead knots are knots that have separated from the rest of the wood, and so are liable to fall out.
Resin pocket 	A pocket of sticky resin commonly found in softwoods. Also known as a sap duct.
Blue stain  	A blue or green fungus that grows inside the timber.
Waney edge 	When the bark and sapwood are visible along the edge of the timber.
Case hardening  	A defect caused by timber being kiln dried too rapidly, leaving the outside dry but the centre still wet.

Defect	Description
End splitting 	Shakes due to loss of moisture at the end of a plank.
Collapse 	Where the cells in the timber are dried out too quickly resulting in the destruction of the timber's structure.
Twisting 	A defect where the timber distorts in such a way that the timber becomes shaped like a propeller.
Bowing 	A curvature (where the wood curves or bends) along the board's face (the flat of the timber) from one end to the other.
Springing 	A curvature along the board's edge, from one end to the other, but the face is still flat.
Cupping 	Where timber 'cups' over the face of the board. Wide boards that are cut tangentially will usually cup over time.

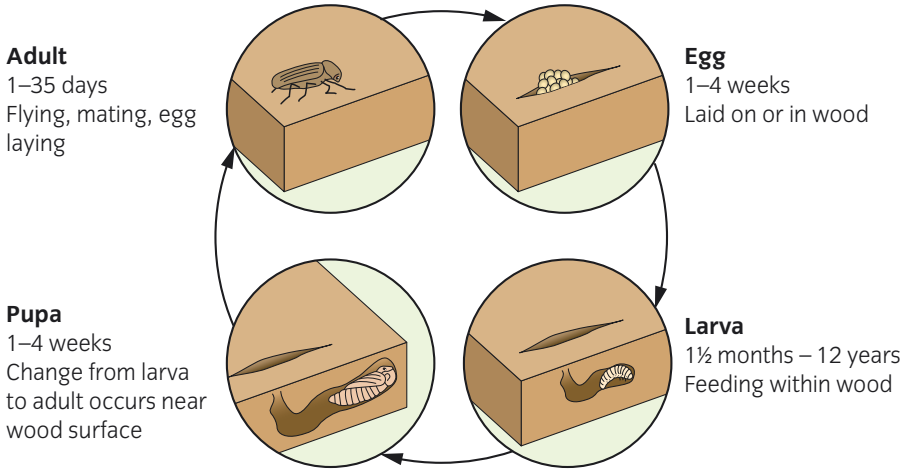
ACTIVITY

Look in the timber store at your training centre or place of work.

- How many of the timber defects can you find?
- How will these defects affect the work produced?
- How could the timber be used to minimise the effect of these defects?

Enemies of timber

Timber can be rendered unusable by rot and by insect attack. There are two main types of rot caused by fungus: dry rot and wet rot. Dry rot will stop as soon as the source of dampness is stopped, and only badly damaged parts require replacement. Dry rot is much more serious than wet rot and it requires specialist treatment which involves the removal of unaffected timber near to the attack, which is either disposed of in a controlled manner to prevent spread of spores or it is burned. There are a few insects that attack timber: the most common is the furniture beetle, which attacks both softwood and hardwood. The image below shows a wood boring insect's life cycle.



Life cycle of wood-boring insect

STORAGE OF TIMBER

Timber and board materials should be stored in the dry, flat and out of **twist**; sheet materials are best stored flat on bearers but can be stored short-term on upright racks. Incorrect storage will result in the material being damaged and could render it unusable. It can be damaged by water, ultra violet light (UV) or be damaged by work operations (spillages, collisions or other accidents). Materials could also be liable to theft.

Timber stored upright

Twist

A seasoning defect where there is a spiral or corkscrew distortion in a longitudal direction of the board

Incorrect storage – timber should be stored in the dry and away from UV

Very dry timber used outside is likely to swell, and wet timber used inside will shrink causing cracks. If possible, it is good to get timber acclimatised to where it will be used, for instance storing floorboards in the room where they will be laid; this is commonly termed 'second seasoning'.

SUSTAINABILITY

The planet we live on is a fixed size so resources are limited. Materials such as timber are sustainable and renewable as long as it is grown in a managed way. This means that new trees are planted as other trees are cut down. Trees absorb carbon dioxide as they grow through **photosynthesis**, are nice to look at, and are cheaper to build with than many other materials. For more information on sustainability refer to Chapter 2, pages 92–97.

ACTIVITY

With the aid of sketches, describe how each of the following materials should be correctly spread and the likely problems if they are not carefully looked after.

- MDF
- INT Plywood
- EXT Plywooduntreated softwood timber
- treated softwood timber
- freshly sawn oak boule for air seasoning.

Photosynthesis

The process by which plants convert sunlight into food. Oxygen is produced as a by-product

TYPES OF WOODWORKING JOINT

A wide variety of methods can be used to join timber, depending on the end use of the job, cost and desired quality of finish.

OUR HOUSE

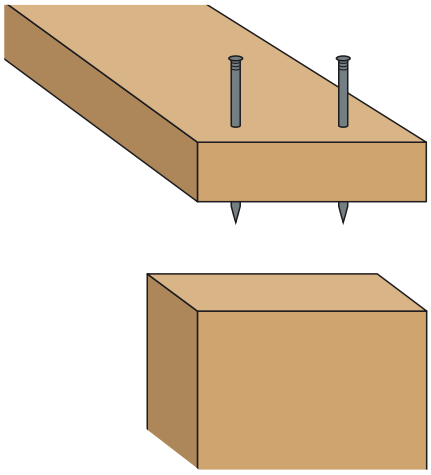
'Our House' contains a number of woodwork joints. When reading through this chapter, see if you can find each joint in the house as well.

COMMON JOINTS AND THEIR USES

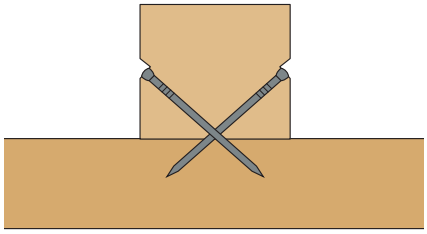
Butt joint

Butt joints are the simplest joint, where one piece butts up against another and is fixed with nails or screws. These joints are usually used for constructing studwork. The nails or screws used to fix the joints can be 'dovetailed' (skewed) in order to increase the strength of the joint.

Roof trusses are made with butt joints fixed with nail plates



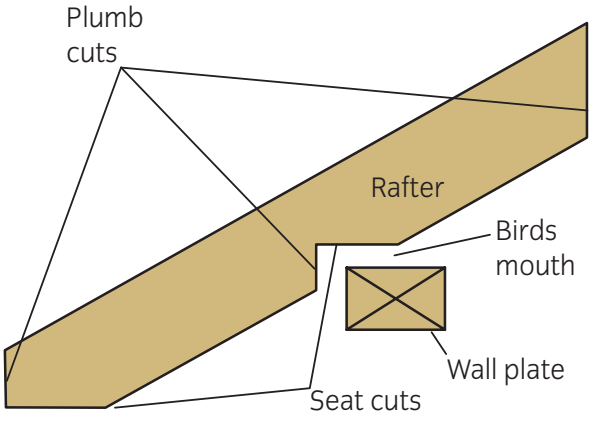
Butt joints in stud with nails



Dovetailed butt joint

Roofing joints

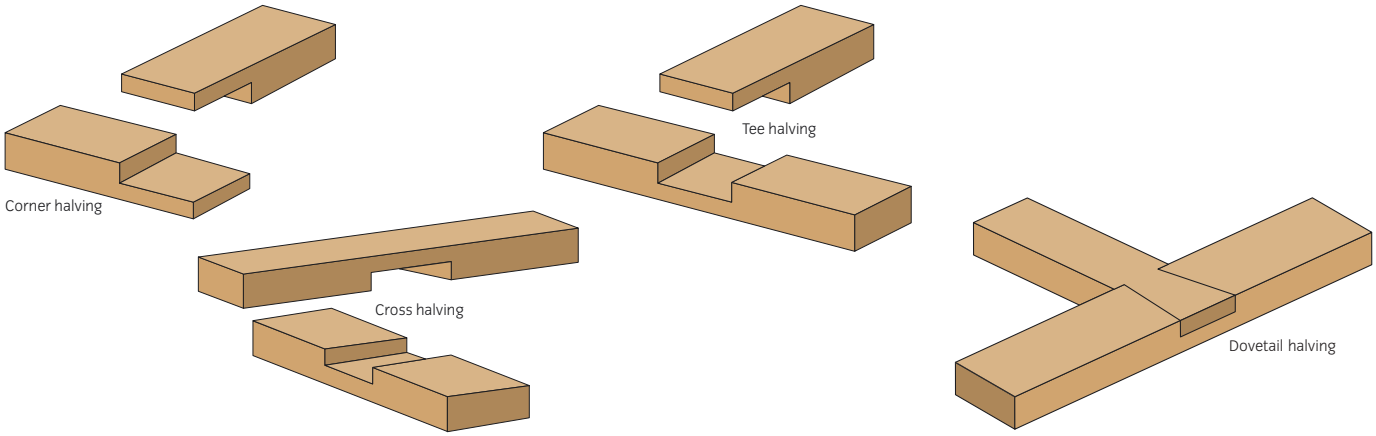
Roof rafters have these joints. Vertical cuts are called 'plumb cuts' and horizontal cuts are called 'seat cuts', and a plumb and seat cut together at the bottom of the rafter is known as a 'birdsmouth cut'.



Cuts and joints used in roof framing

Halving joint

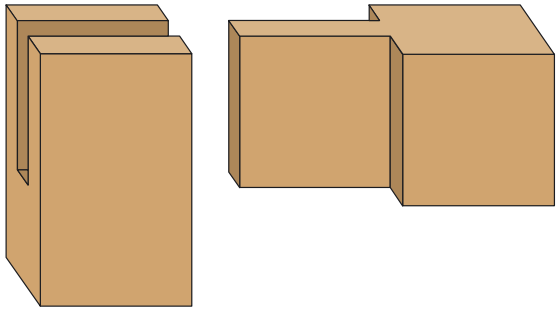
A halving joint is where half of each of the two pieces of timber being joined is removed, so that the two boards join together flush with one another. They are commonly used in jointing timber lengthways or as simple frame (corner) joints. They are not strong joints and have to be fixed in place using nails, screws or adhesive.



Four types of halving joints

Bridle joint

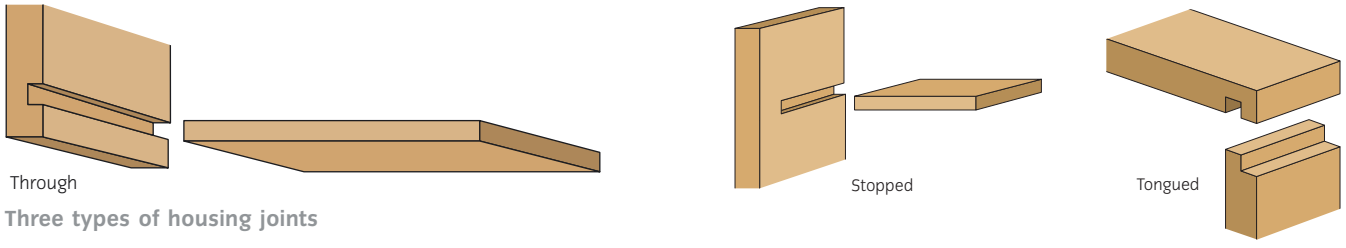
The bridle joint is a simple framing joint. The timber is divided into three equal parts in its thickness, with the centre piece removed on one part and the two outsides removed on the other. This joint is stronger than a halving joint as the glue area (contact face) is increased and, compared with the halving joint, can only be taken apart in one direction. These can be secured using nails, screws or adhesive.



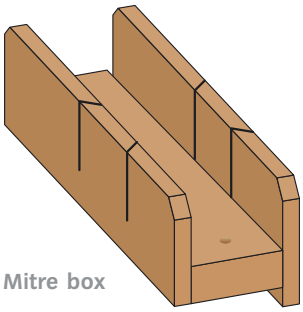
Bridle joint

Housing joint

The housing joint is a commonly used joint for wide material, eg making door linings and shelving units. Variations of the housing joint can be used to suit varying circumstance, ie through, stopped and tongued (also known as barefaced) housing joints are used for door lining, shelving/cupboard and stair construction. Again this joint can be secured with nails, screws or adhesive.



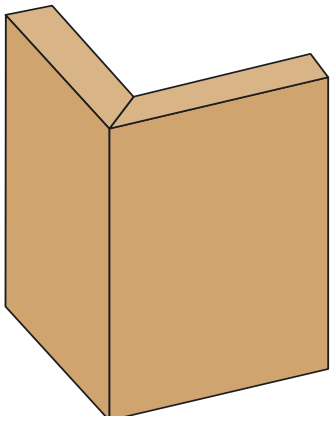
Three types of housing joints



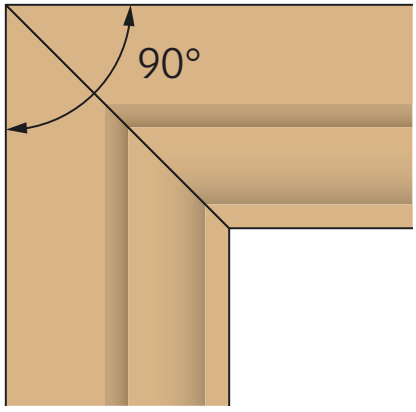
Mitre box

Mitre joint

The mitre joint is commonly used to join moulded finishes at internal and external corners such as skirting or architraves. It is fixed in place with nails or pins and adhesive is required. They can be cut by machine using a chop saw or by hand using a mitre box and shooting board (used to easily trim the mitre with a plane).



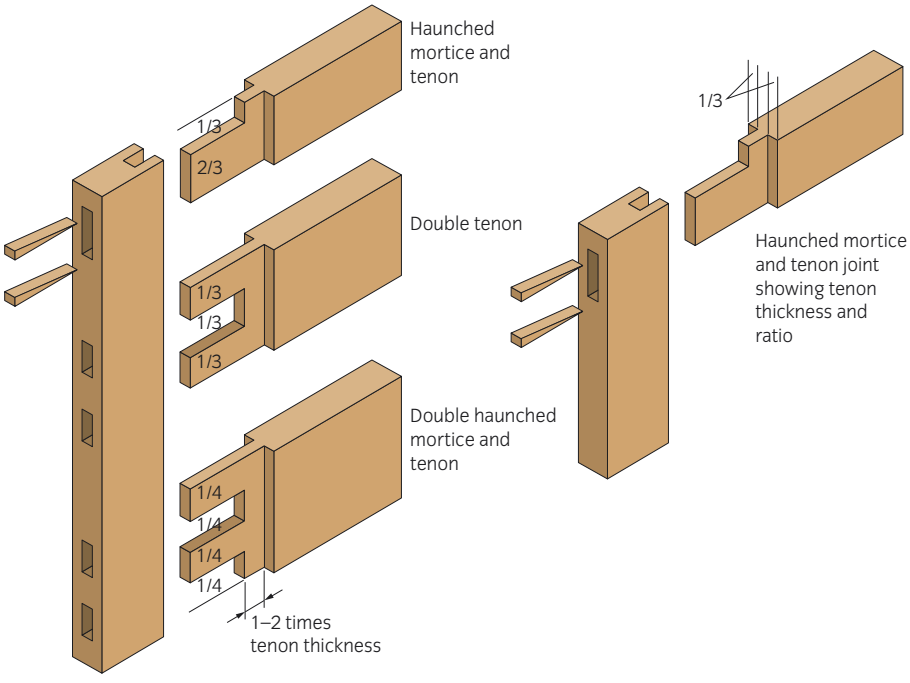
Skirting mitre



Architrave mitre

Mortice and tenon joint

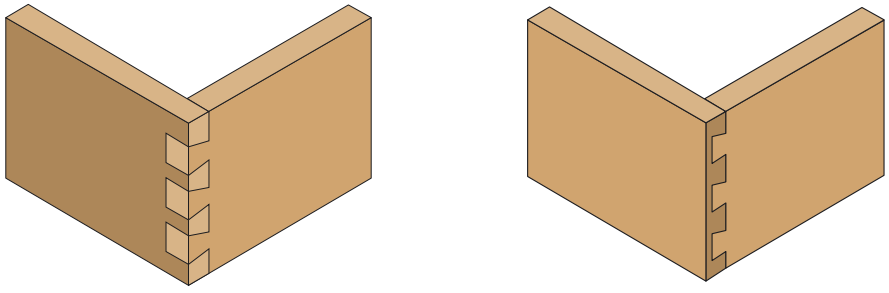
Mortice and tenon joints are the most common joint used in joinery construction. It is a very strong joint, available in many variations depending on the joinery item being constructed. The mortice is a slot, known as the female part, and the tenon fits into the slot, known as the male part. It is the principle joint used in window and door frame, door and sash construction. These can be secured using wedges, adhesive and sometimes screws nails or dowels if used in the construction of frames.



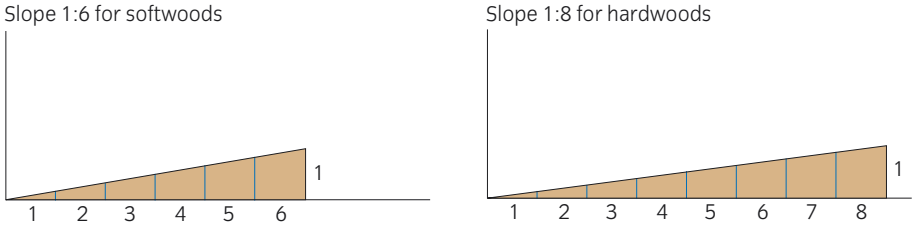
Mortice and tenon joints

Dovetail joint

A strong, high quality joint, the dovetail joint is traditionally used in the construction of drawers. The pitch (angle) of dovetails resist the joint being pulled apart under load. These joints are held together using adhesive alone, no additional fixings should be required. The pitch or slope of the dovetail should be 1:6 for softwood and 1:8 for hardwoods. Some people use the average of these two pitches (1:7) for all dovetails, whether in hardwood or softwood.



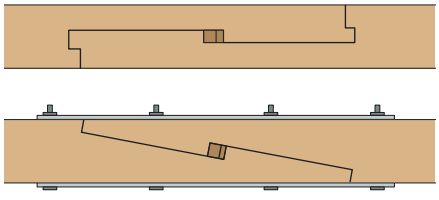
Two types of dovetail joints



Pitches for hard and softwood

Lengthening joint

Occasionally timber will require jointing in its length. Lengthening joints can be categorised as either structural or non-structural. The most common non-structural lengthening joint is called a heading joint. An example of this would be where a floor or skirting board is jointed in its length. This can be simply square or it can be improved by being 'splayed'. A structural lengthening joint would be required where load bearing components require jointing. An example of this would be jointing a ridge board or purlin used in roof construction. A scarf joint is a type of non-structural joint used for timber and veneers and commonly found on a ridge board.



Structural scarf joints

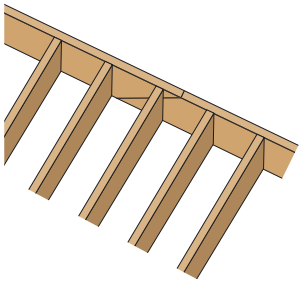
ACTIVITY

Look around you in a room.

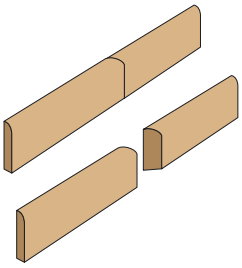
- What joints can you find?
- Why do you think these joints have been chosen?
- How are the joints fixed?

ACTIVITY

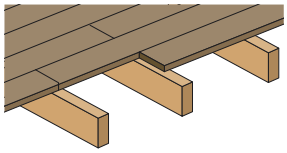
You have been asked to suggest suitable construction methods and materials for making the following items, list the types of joints you would use along with the materials you would recommend and why.



Scarf joint in ridge board at the top of a hand cut roof



Splayed heading joint in skirting board



Square heading joints in floor boards supported on joists

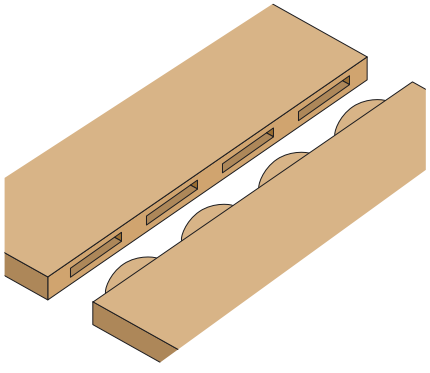
Edge joint

Edge joints are used to make timber boards wider. They can be 'rubbed' (where glue is applied and the two pieces rubbed together to ensure good coverage of the joint), tongued, biscuited or doweled to increase strength. The tongue, biscuit and dowel all increase the interconnection of the joint.

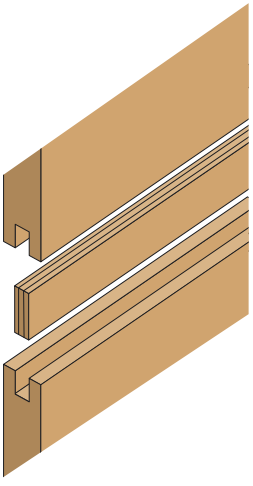
The images below show the following joints:

- *Biscuit joint*. This joint is made using a biscuit jointer power tool.
- *Loose tongue*. A groove is placed in each piece to be joined and a plywood tongue joins the two together.
- *Dowels*. Used to join boards on the edge or (as shown in the kitchen unit image) in the corners. Biscuits can also be used in this way.

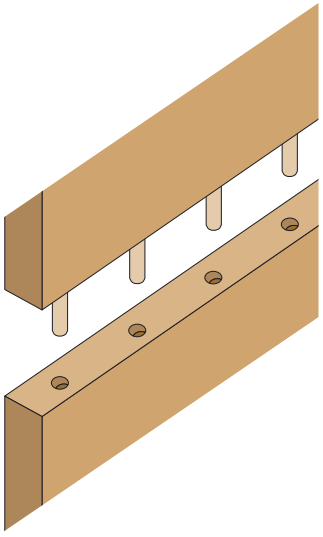
Always ensure that when gluing multiple boards together you place the growth rings (see page 197) alternatively up and down to reduce distortion.



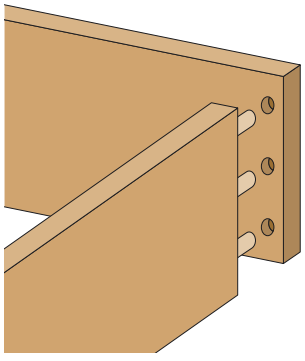
Edge joint with biscuits



Edge joint with a loose tongue



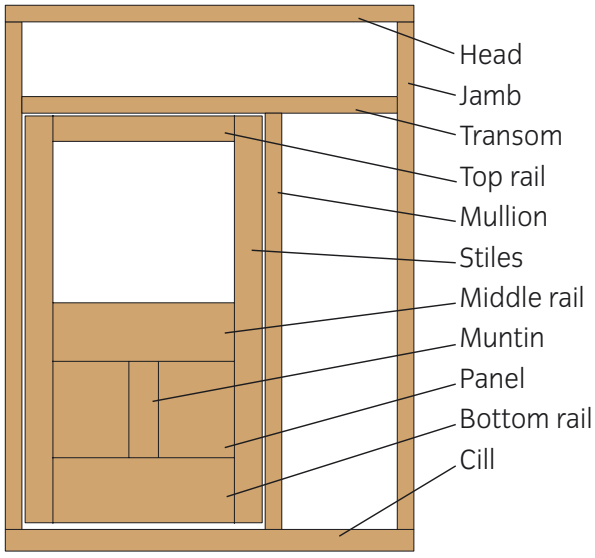
Edge joint with dowels



A kitchen unit jointed with dowels

DOOR AND FRAME COMPONENTS

It is important to know the names of the components that make up a frame before you start assembling one yourself. A door frame is shown below. The parts of a sash (the opening part of a window) also have the same names, ie stiles and rails.



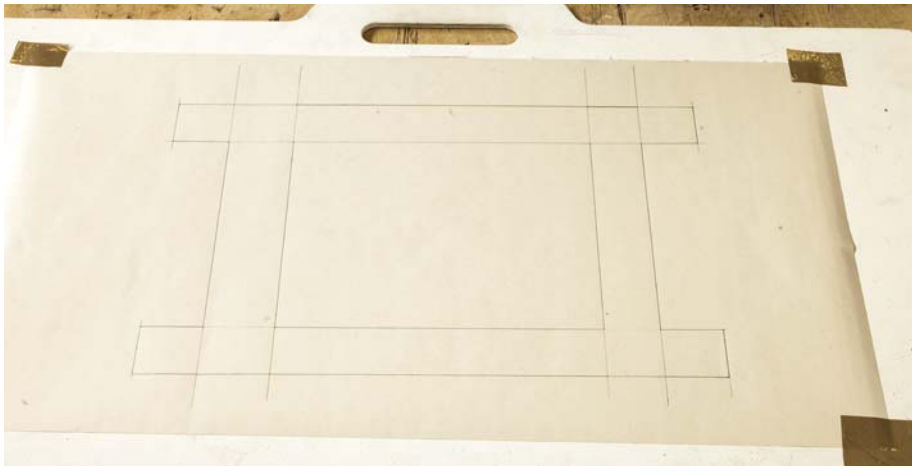
MARK OUT WOODWORKING JOINTS

Now that you know the materials, the tools (from Chapter 3) and some joints, you are ready to start making a frame. Joinery items are often constructed in the form of frames and to assist in this process it is good practice to draw a rod. This is a full-size drawing of the item to be made. On this drawing, details such as the joint proportions and the distances between shoulders can be determined.

ACTIVITY

Follow the stages to produce a frame in your workplace or place of training.

DRAWING A ROD



A rod for a frame

Using a working drawing as a guide, overall measurements are transferred to the rod. This will include the length and width of the frame, along with sizes of the materials to be used. (Rebates, mouldings and other details can be added at this stage allowing for clearance gaps around sashes or doors if so required.)

Hatch

Marking waste timber with diagonal lines. This prevents mistakes, as only the hatched area is removed

It is good practice to **hatch** parts of the rod that indicate a section. Remember to add any other details such as job name, or date. Once this has been completed, this rod will be used to mark out the timber and fill out a cutting list.

CUTTING LISTS

These are used to record the components required for a given joinery task. Included on the list are details such as name and number of the components, sizes (width, thickness and length) and comments. Additionally there may be extra columns giving the 'ex' or 'nominal' size – this refers to **sawn size**. This is often 5 or 6mm larger than the finished size.

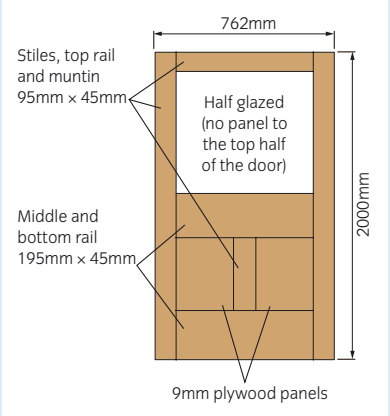
Sawn size

The timber size before planing

Cutting list								
Component	Species	Number	Length	Nominal width	Nominal thickness	Finished width	Finished thickness	Comments
Stiles	R/wood	2	2050	100	50	95	45	
Top rail	R/wood	1	800	200	50	195	45	
Mid and bottom rail	R/wood	2	800	200	50	195	45	

ACTIVITY

Produce a cutting list for this item of joinery:



'Ex' is an abbreviation of 'extracted from' and 'nominal' means before anything is taken away. Both these terms are commonly used to describe the sawn sizes prior to planing.

MARKING OUT A SIMPLE FRAME

The following step by steps show how to mark out a frame using a rod. The same process is used for marking out a door; use the stiles where jambs are mentioned.

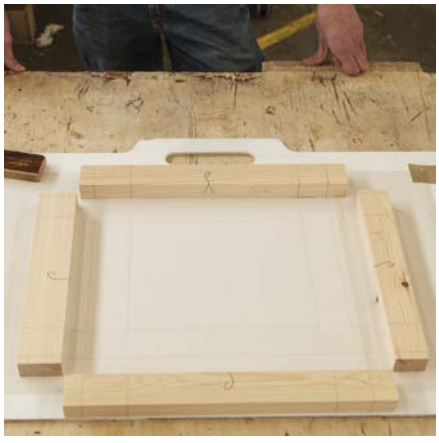
STEP 1 First select the face side and edge of all the pieces. The face side and edge are the best sides, any defects will be kept to parts of the frame least seen, eg the back of a frame or outside face, or where a moulding or rebate would remove the defect.

STEP 2 Make sure you know which piece of wood goes where. Lay them out around the rod if required, and write on the back if you wish to do so.

STEP 3 Lay one of the **jambs** onto the rod. Mark out where the shoulders should be cut, and where mortices will be created. This first piece is known as a pattern.

STEP 4 Put the two jambs together as a pair (a left hand and right hand jamb) face to face and square lines across from one to the other. This ensures the two pieces are exactly the same length – the frame will be an even size.

STEP 5 Repeat the process for all the other pieces, mark out a pattern first from the rod, then use this pattern to mark out any other pieces that have similar shoulder dimensions. Pieces with mortices can be marked in a similar way.



STEP 6 You will now have all the pieces marked out from the rod with positions of the joints.

When marking out, traditionally the components with the mortices are marked out first. These can then be given to the machinist who will mortice these while the jambs are being marked out. This speeds up production and makes the most efficient use of time.

Jambs

The vertical (upright) parts of a frame

INDUSTRY TIP

It is best to use a 2H pencil for marking out as it will leave a nice sharp line. HB is too soft and will leave a wide line leading to inaccuracy. It is also likely to smudge, leaving marks all over your wood!

INDUSTRY TIP

Remember to always set your mortice size to the size of your mortice chisel.

Marking out a mortice

Determine the position of the mortice. It is usually near the centre of the timber section, but can be moved if required. The closer to the centre the mortice is, the stronger the joint. On smaller stock the mortice is usually 1/3 the thickness of the timber but will be dictated by the size of mortice chisel available, and the mortice gauge will be set to the chisel size – '12mm' chisels can vary in actual size and be from 11mm up to 13mm.

Marking out a mortice

The following step by step guide shows you how to centralise the mortice on the timber section.

STEP 1 Set the mortice gauge to the chisel size.

STEP 2 Place on the timber and make two holes.