In the Workshop
Practical Workbook
In the Workshop

Practical Workbook
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Contents

Section 1 – Introduction 5
Section 2 – Use furniture-making-sector hand tools and power tools 7
Section 3 – Sharpening plane blades 13
Section 4 – Sharpening chisels 21
Section 5 – Sharpening drill bits 27
Section 6 – Sharpening cabinet scrapers 33
Section 7 – Apply sheet laminates by hand 41
Section 8 – Join solid timber 45
Section 9 – Hand make timber joints 51
Section 10 – Prepare surfaces for finishing 57
Section 1 – Introduction

This practical workbook contains activities designed to assess your skills in the practical competencies comprising the furnishing training package. In order to be assessed as competent, you are required to demonstrate a sound understanding of:

- the range, characteristics, uses and limitations of hand tools, power tools and basic static equipment
- characteristics of materials and the uses of products produced
- general workplace quality standards and procedures
- workplace guidelines regarding acceptable tolerance levels
- workplace safety policies and procedures
- procedures for reporting machinery faults and material defects.

As part of the assessment requirements for this training package, you must be able to:

- interpret work orders and locate and apply relevant information
- read and interpret cutting lists and job specifications to prepare for work
- apply safe handling procedures for equipment, products and materials, including use of personal protective equipment
- identify materials used in the work process
- follow work instructions, operating procedures and inspection practices to:
  - minimise the risk of injury to self or others
  - prevent damage to goods, tools, equipment or products
  - maintain required production output and product quality
- adopt and carry out correct procedures before and during the use of hand tools, power tools and basic static equipment
- produce a minimum of four different joint types in accordance with industry standards on tolerance, with at least two produced substantially by hand operations for furniture items
- utilise at least three different adhesive types
- apply and finish laminates to at least three different surfaces, including at least two requiring laminate edging
• join at least four solid timber panels of a minimum of three sections and using a minimum of four different widening joints
• prepare surfaces on a minimum of four occasions for finishing
• work effectively with others
• modify activities to cater for variations in workplace context and environment.
Section 2 – Use furniture-making-sector hand tools and power tools

Complete the following three tasks, each of which consists of a number of exercises.
See your lecturer/trainer for further information and/or guidance throughout the tasks.

**Task 1**

Face and edge one piece of rough-sawn pine to a size of 45 mm × 20 mm.
Once this is done, complete the following exercise using this piece of timber.

*Note* Gaps in the finished join should not exceed 0.5 mm.

**Exercise 1**

Manufacture either a **tee halving** or **cross halving** joint and also a **dovetail halving** joint (see diagram below). Refer to the section ‘Hand make timber joints’ for detailed drawings of tee halving and cross halving joints (pages 51–2).

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**Diagram**

![Dovetail halving joint diagram]

**Fig 2.1 Dovetail halving joint**

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Exercise 2

Manufacture either a through mortise and tenon joint or a haunched mortise and tenon joint and also a tee bridle joint. Refer to the section ‘Hand make timber joints’ for detailed drawings of a tee bridle joint and a haunched mortise and tenon joint (pages 52).

Exercise 3

Manufacture a dowelled mitre joint and a biscuited (plate) mitre joint from a piece of dressed pine measuring 300 mm × 60 mm × 20 mm.

WOT – width of timber

![Diagram of Dowelled Mitre Joint]

WOT – width of timber

![Diagram of Biscuited Mitre Joint]
Exercise 4

Manufacture the project assigned to you by your lecturer/trainer that contains the following list of joints and processes as a minimum requirement. Finish the project to a polishable finish, using power sanders where appropriate.

- dowelled butt joint
- biscuited (plate) joint
- widening (butt and glue) joint
- dovetail joint
- housing joint
- rebate joint
- mitre joint
- use of nail gun for temporary fixing as required
- use of staple gun for fixing sheet materials

Summary

Throughout exercises 1–4 you are required to demonstrate safety practices in accordance with work health and safety Regulations and industry expectations. You are also required to demonstrate the correct use and application of hand tools for the successful completion of the tasks.
**Task 2**

From material supplied by your lecturer/trainer, set up and use various power tools.

**Exercise 1**

Rebate a piece of 45 mm × 25 mm pine timber with a 10 mm × 10 mm rebate and complete a **dowelled long and short shoulder** edge joint.

![Fig 2.4 Dowelled long and short shoulder edge joint](image)

**Exercise 2**

Set up a trimmer with a profile cutter, and neatly trim and file a laminate edge to acceptable industry standards.

**Exercise 3**

Set up a drop saw to accurately cut timber repeatedly to a given length.

**Exercise 4**

Manufacture the project assigned to you by your lecturer/trainer that requires you to demonstrate the safe and effective use of the following power tools.

- drop saw
- hand drills and battery drills
- router
- trimmer
- jigsaw
- belt sander
- palm sander
- biscuit machine
Exercise 5

Remove, replace and set correctly all cutters, blades and belts for the tools listed below.

Identify to your lecturer/trainer any maintenance requirements for those tools.

- router
- trimmer
- circular saw
- jigsaw
- biscuit machine
- belt sander
- palm/orbital sander
- planer.

Summary

Throughout exercises 1–5 you are required to demonstrate safety practices in accordance with work health and safety Regulations and industry expectations. You are also required to demonstrate the correct use and application of power tools for the successful completion of the tasks.
Section 2  Use furniture-making-sector hand tools and power tools

Notes
Section 3 – Sharpening plane blades

The process of sharpening consists of three parts – grinding, sharpening and honing.

Grinding

The grinding process is used to form or restore the cutting angle of the blade/cutting iron. The following faults can be remedied by grinding:

- gapped cutting edge
- worn cutting angle as a result of repeated sharpening
- cutting edge out of square with the edge of the blade/cutting iron
- the sharpening angle rounded by careless sharpening.

Grinding angles

The grinding angle is produced by one of two methods:

- The blade is ground at an angle of 25° and then sharpened on an oilstone to a steeper angle.
- The blade is hollow ground and sharpened to the same angle.

For plane blades, an angle of 25° to 30° is satisfactory.
Key stages in the sharpening process

Stage 1 – Grinding the plane blade

The purpose of grinding is to make the honing process easier and quicker. Grinding is usually carried out on a bench grinder. It is necessary only when the sharpening facet has become too large for easy honing, or when the cutting edge is chipped, out of square or rounded due to poor sharpening.

Note Safety glasses must be worn when using a grinding machine.

The important parts of a bench grinder are the:

- motor
- two grinding wheels – one is usually fine grade and the other coarse grade
- two adjustable rests
- two adjustable eye shields and wheel guards
- water trough. (Although, not all designs have one.)

Fig 3.3 The bench grinder
Stage 2 – Minimising burning

The wheels of the grinder rotate at a very high speed that tends to burn or ‘draw’ the temper of the blade. If burning occurs, the steel will soften, making it difficult to maintain a cutting edge on the tool.

Burning is identifiable by a change in colour of the metal, and can be minimised if the precautions below are followed.

• Do not try to grind too quickly or apply too much pressure on the tool.
• Move the blade from side to side. Do not let it stay in one position.
• Frequently cool the blade in the water trough, if there is one.
• Do not grind right through to the cutting edge.
• Keep the face of the wheel flat and sharp using a dressing tool.
• Adjust the rest to the required cutting angle.
• Adjust the eye shield appropriately.
• Switch on the motor.
• Hold the blade with the index finger and thumb.

Fig 3.4 Holding the blade for grinding
• Start the grinding process.
• Switch off the machine when you have completed the task.

![Fig 3.5 Grinding the blade](image)

**Stage 3 – Honing the plane blade**

The plane blade angle can be:

• the same as the grinding angle
• slightly steeper than the grinding angle.

If using the second method, modify the following sharpening procedure by increasing the bevel by approximately 2°.

Proceed as follows:

1. Clean and lubricate the oilstone.

2. Hold the blade perfectly flat and rub it up and down the full length of the stone until the burr is removed. This is called ‘backing off’.

3. Once the burr has been removed, turn the blade over and make the grinding angle slightly steeper.

4. Maintain this angle and rub the blade up and down the full length of the stone. If the blade is narrower than the stone, work evenly over the full width of the stone.

5. A burr will develop on the back of the cutting edge. Remove this by rubbing the back of the blade lightly over the stone.

6. Repeat these steps until the burr is removed from the edge.
Lubricate the stone.

Maintain a firm, steady pressure.

Do not lift the blade – keep it perfectly flat and bevel-up.

The fine strand of burr or wire must be removed to obtain true cutting.

Watch out for the removal of burr.

Fig 3.6 Honing the plane blade
Section 3

Sharpening plane blades

Stage 4 – Inspecting the plane blade

The blade must be inspected for:

- a sharp, clean cutting edge
- the correct profile of the cutting edge – the profile is different for all types of planes.

![Fig 3.7 Blade inspection](image)

The fine shiny line shows the edge is blunt and requires further sharpening.

The cutting edge

- Hold the blade in front of you and inspect its front face. A fine, shiny line along the cutting edge indicates that the blade requires further sharpening.
- Turn the blade and look along its edge. There must be no burr at the cutting edge along the face of the blade.

![Fig 3.8 The cutting edge](image)

Move the blade until its cutting edge can be examined.

cutting edge square

90°
Stage 5 – Replacing the blade

To replace the blade of a metal bench plane, follow these directions.

1. Hold the blade with the bevels on the topside and the cap iron with the screw on the topside. Place the blade over the screw with the blade and cap iron at right angles.

2. Push the blade forward and then line up the blade and cap iron.

3. Turn the blade and the cap iron to within the required distance from the end of the blade (about 2 mm). Tighten the cap iron screw.

4. The blade and the cap iron can now be fixed together and inserted into the plane, with the cap iron on the top. Check that the Y lever and the lateral adjusting lever are properly engaged.

5. Place the lever cap in position and clip the lever down, listening for a snap to indicate the correct pressure. Adjust the blade to give the correct depth of cut.

Task 3

Grind various cutting edges of tools. Complete the following exercises (only after you have received the appropriate training):

Exercise 1

Dismantle a hand plane; grind, sharpen and hone the blade; and reassemble the plane. Demonstrate the condition of the refurbished cutting edge to your lecturer/trainer for an assessment and further action if required.
Notes
Section 4 – Sharpening chisels

The process of sharpening consists of three parts – grinding, sharpening and honing.

Grinding

The grinding process is used to form or restore the cutting angle to the chisel. The following faults can be remedied by grinding:

- gapped cutting edge
- worn cutting angle as a result of repeated sharpening
- cutting edge out of square with the edge of the chisel
- the sharpening angle rounded by careless sharpening.

Grinding angle

The grinding angle is produced on a grindstone by hollow grinding the face of the chisel’s blade to approximately 20° to 25°.

For registered mortise chisels, an angle of 25° to 30° is satisfactory.
Key stages in the sharpening process

Stage 1 – Grinding the chisel

The purpose of grinding is to make the honing process easier and quicker. Grinding is usually carried out on a bench grinder. It is necessary only when the sharpening facet has become too large for easy honing, or when the cutting edge is chipped, out of square or rounded due to poor sharpening.

**Note** Safety glasses must be worn when using a grinding machine.

The important parts of a bench grinder are the:

- motor
- two grinding wheels – one is usually fine grade and the other coarse grade
- two adjustable rests
- two adjustable eye shields and wheel guards
- water trough. (Although, not all designs have one.)

![Fig 4.3 The bench grinder](image)

Stage 2 – Minimising burning

The wheels of the grinder rotate at a very high speed that tends to burn or ‘draw’ the temper of the blade. If burning occurs, the steel will soften, making it difficult to maintain a cutting edge on the tool.
Burning is identifiable by a change in colour of the metal, and can be minimised if the precautions below are followed.

- Do not try to grind too quickly or apply too much pressure on the tool.
- Move the face of the chisel from side to side. Do not let it stay in one position.
- Frequently cool the chisel in the water trough, if there is one.
- Do not grind right through to the cutting edge.
- Keep the face of the wheel sharp using a dressing tool.
- Adjust the rest to the required cutting angle.
- Adjust the eye shield appropriately.
- Switch on the motor.
- Hold the chisel with the index finger and thumb.

Fig 4.4 Holding the chisel for grinding

- Start the grinding process.
- Switch off the machine when you have completed the task.

Fig 4.5 Grinding the chisel
Stage 3 – Honing the chisel

The chisel angle can be:

- the same as the grinding angle
- slightly steeper than the grinding angle.

If using the second method, modify the following sharpening procedure by increasing the bevel by approximately 2°.

Proceed as follows:

1. Clean and lubricate the stone.

2. Hold the chisel perfectly flat and rub it up and down the full length of the stone until the burr is removed. This is called ‘backing off’.

3. Once the burr has been removed, turn the chisel over and make the grinding angle slightly steeper.

4. Maintain this angle and rub the chisel up and down the full length of the stone. If the chisel is narrower than the stone, work evenly over the full width of the stone.

5. A burr will develop on the back of the cutting edge. Remove this by rubbing the back of the chisel lightly over the stone.

6. Repeat these steps until the burr is removed from the edge.
Lubricate the stone.

Maintain a firm steady pressure.

Do not lift the chisel – keep it perfectly flat and bevel-up.

Watch out for the removal of burr.

The fine strand of burr or wire must be removed to obtain true cutting.

Stage 4 – Inspecting the chisel

The chisel must be inspected for:

- a sharp, clean cutting edge
- the correct profile of the cutting edge – the profile is different for all types of chisels.

A fine shiny line shows the edge is blunt and requires further sharpening.

Fig 4.6 Honing the chisel

Fig 4.7 Chisel inspection
The cutting edge

- Hold the chisel in front of you and inspect its front face. A fine, shiny line along the cutting edge indicates that the blade requires further sharpening.

- Turn the chisel and look along its edge. There must be no burr at the cutting edge along the face of the chisel.

Move the chisel until its cutting edge can be examined.

Exercise 2

Grind, sharpen and hone a wide and narrow chisel.

Present the refurbished cutting edge to your lecturer/trainer for an assessment and further action if required.
Section 5 – Sharpening drill bits

Drill bit (cone point)

Grinding points

- The drill point angles should be 59° equally on both sides for a total of 118°.
- The cutting edges should be of equal length.
- The clearance angle should be approximately 8° to 12°.
- Clearance must be achieved along the cutting lip to ensure a clear cutting edge.
- The cutting edge is to be held off the tool rest during the grinding process.
- Do not allow the drill bit to become overheated. (Frequently cool it in the water trough, if there is one.)
- Making very light passes over the grinding wheel with the drill bit will also allow you to keep it cool.

Fig 5.1 Grinding points
Sharpening a drill bit (cone point)

A drill bit (cone point) can be sharpened on a bench grinder using the following method.

- Keep the face of the wheel sharp using a dressing tool.
- Adjust the rest to the required cutting angle.

**Note** Safety glasses must be worn when using a grinding machine.

Establishing the cutting angle

- Hold the drill bit at about one-quarter of its length from the point, between the thumb and index finger of your right hand.
• Position the drill bit to the left, with the cutting edge horizontal and the axis of the drill at an angle of approximately 59°.

• Move the shank of the drill bit in a downward direction while simultaneously rotating it.

**Exercise 3**

Grind a 10–15 mm-diameter drill bit to a cone point.

Present it to your lecturer/trainer for an assessment and further action if required.
Drill bit (dowel point)

Grinding points

- The grinding wheel must have the correct corner radius and be clean.
- The grinding must be done softly and without force, or the drill bit will overheat and burn.
- **Do not** allow the drill bit to become overheated. (Continually dip it in water to cool.)
- The leading point must be *exactly* in the centre. If the land on the left is just visible as you grind, the centre tip will be at the correct angle.
- The scribing points must be of equal heights **lower** than the centre point and **higher** than the heel.
- The cutting edges must have the **same** radius and height.
- The heel must be kept **below** the height of the cutting edge.

![Diagram of a drill bit showing scribing point, cutting edge, body clearance, diameter, leading point, cutting edge clearance, clearance angle, 3-4 mm clearance, and 30° angle.](image-url)
Sharpening a drill bit (dowel point)

A drill bit (dowel point) can be sharpened on a bench grinder using the following method.

- Keep the face of the wheel flat and sharp using a dressing tool.
- Adjust the rest to the required cutting angle.

**Note** Safety glasses must be worn when using a grinding machine.

![Sharpening a drill bit (dowel point)](image)

Establishing the cutting angle

- Hold the drill bit at about one-quarter of its length from the point, between the thumb and index finger of your right hand.

![Establishing the cutting angle](image)
• Support the hand you have on the grinder with the other fingers.
• Hold the shank of the drill bit between the thumb and fingers of the left hand.
• Keep both elbows against your sides.

The drill bit should be held in a horizontal position. The curvature of the wheel will then produce the correct grinding angle.

**Exercise 4**

Grind a 10–15 mm-diameter drill bit to a dowelling point.

Present it to your lecturer/trainer for an assessment and further action if required.
Section 6 – Sharpening cabinet scrapers

Scrapers are used to remove small scratches, bruises, machine marks, interlocking grain, paint or polish from timber, in order to prepare its surface for sanding.

Flat cabinet scraper

The flat cabinet scraper is a piece of high tensile steel measuring approximately 125 mm × 75 mm × 1 mm. In order for the scraper to produce a shaving, the cutting edge is curved by hand pressure (of the thumb and fingers) and may be pushed or drawn across the surface.

It is usual for all four edges (not ends) to be sharpened, as the cutting edge generates heat when in use. Rather than risk burning the fingers, you must rotate the scraper after a time to engage a cooled edge. The cutting edge is tilted to approximately 60° to produce a planing action when in use.

Uses

The flat cabinet scraper is used to remove small scratches, bruises, machine marks and interlocking grain before abrasives are used.

Curved scraper blades for hollows and convex shapes

To complement flat scrapers, curved scrapers have three profile curves – for creating a wide variety of convex and concave shapes. They are available in two sets (the three shapes in both) and in two different thicknesses – 0.4 mm or 0.6 mm thick – to cover all contingencies.
Sharpening the flat cabinet scraper

Step 1 – File the edge

- Place the scraper in the vice.
- File the edges square and straight using a mill file.

![Fig 6.3 Filing the edge](image)

Step 2 – Hone the edge

- Filing the scraper leaves a rough finish. To remove the file marks, hone the filed edge on an oilstone until all the file markings are gone.

![Fig 6.4 Honing the edge](image)

**Note** Care must be taken to hold the scraper at 90° to the face of the oilstone. When honing, use the full area of the stone. (A small planed block may assist in keeping the scraper at 90°.)
Step 3 – Hone the face

![Image of honing the face](image)

Fig 6.5 Honing the face

- After you’ve honed the edge of the scraper, small burrs will be left. To remove these, place the face of the scraper flat across the oilstone, apply even pressure and lightly work along the stone until the burrs have been removed and all four edges are smooth and square.

Step 4 – Draw the edge

![Image of drawing the edge](image)

Fig 6.6 Drawing the edge

- When the burrs have been removed, the corners will be square to the face.
- Place the scraper face-down on a flat surface.
- Place the burnisher on the scraper and, tilting slightly (at approximately 2°), draw the burnisher along the edge.
Step 5 – Turn the edge

Fig 6.7 Turning the edge

- At this stage, the 90° corner has been drawn out to a point along the edge. Hold the scraper and place the burnisher at 80° to the face. Draw the burnisher along the edge towards you. This will turn the cutting edge ready for use.

**Scraper plane**

The handled scraper eliminates the possibility of thumb burn from the heat of the cutting edge and is useful where considerable scraping is required.

Uses

The scraper plane is used for the removal of adhesive, paint or polish and timber before a flat scraper and abrasive paper are applied.
Sharpening the scraper plane’s blade

Steps 1 to 3 – below – are similar to those for sharpening a plane blade or chisel, except that the filing angle is 45° and the honing angle is between 45° and 50°.

Step 1 – File the edge

- Place the scraper plane’s blade in the vice.
- File a bevel of about 45° using a mill file. File towards the cutting edge.

Step 2 – Hone the edge

- Hone the bevel side of the blade on the oilstone at the same angle as, or slightly more than, the filing angle.

Note This may be more easily accomplished using a wooden sharpening block for spokeshave blades.
Step 3 – Hone the face

- Hone the cutting face of the blade flat on the oilstone to remove the wire edge.

Step 4 – Turn the edge

Fig 6.11 Honing the face

Fig 6.12 Turning the edge
• Turn the edge with a few firm strokes of the burnisher on the bevel side of the blade by drawing the burnisher over the full length of the blade.

**Note** The blade may be held during this operation in any of the three methods illustrated.

![Fig 6.13 Turning the edge](image)

• The first stroke should be made with the burnisher held at an angle slightly greater than the honing angle. The angle may be increased with each successive stroke until the last stroke, which should be about 75°.

**Note** If the angle is increased beyond 75°, the cutting edge produced will not cut into the material surface when used.
Setting the blade

The scraper blade must be set in the body of the handled scraper plane either flush or slightly proud of the bottom. To feather the edges of the shaving produced by using this scraper, tighten the adjustable thumb screw. This bends the blade and causes a deeper cut to be made by the centre of the blade.

Exercise 5

Sharpen one edge of a cabinet scraper as demonstrated by your lecturer/trainer.

Demonstrate the use of the newly refurbished cutting edge to your lecturer/trainer for assessment and further action if required.

Summary

Throughout exercises 1–5 you are required to demonstrate safety practices in accordance with work health and safety Regulations and industry expectations.
Section 7 – Apply sheet laminates by hand

Laminated plastics

Task 1

Complete the following project as the minimum requirement to meet the prerequisites of Apply sheet laminates by hand. Follow the instructions carefully.

Laminated clock

The project below is provided as a reference guide only. You may have another project that you wish to do. As long as your project incorporates three different substrates, face-to-edge joins and at least two face joins, your project may be suitable for this unit.

Ask your lecturer/trainer for further advice.

Before you start

Make sure there is plenty of room in which to operate. Laminate edges can be razor-sharp. Any manufacturing process using sheet laminates can easily result in harm to yourself or another worker, so having enough space around you is important.
Pay particular attention to the following.

- Cut sheet laminates only in the designated areas. (Large flat surfaces are often required.)
- Spray adhesives only in the designated areas and with the extraction system on to remove fumes.
- Trim sheet laminates only in the designated areas, as the waste particles created are extremely slippery.

**Step 1**

From the materials provided, cut each laminate component to 10 mm oversize.

---

Fig 7.2
Step 2

From the shades of laminate available, choose two colours that form a suitable combination. Join the sheet laminate on the face of both the back and front plates. The thickness of each piece of laminate also needs to be considered at this stage.

Check the laminate for any flaws.

List four of the flaws that can be found in sheet laminates.

1. _____________________________________________________________________
2. _____________________________________________________________________
3. _____________________________________________________________________
4. _____________________________________________________________________

Step 3

Cut the sheet laminate to the required sizes for each component using a scoring knife, and then check all the components against the substrates for size before progressing.

Step 4

Apply laminate edge strips to all the components as instructed. (Note that substrates such as MDF and chipboard need a double coating of adhesive as the first coat is usually absorbed into the material and becomes ineffective for the bond). Then trim and clean up all the edges to acceptable standards.

What adhesive is most suitable for the application of laminate to a substrate?

_____________________________________________________________________

List three ways that the adhesive can be applied to both the laminate and the substrate.

1. _____________________________________________________________________
2. _____________________________________________________________________
3. _____________________________________________________________________

Step 5

Join the laminate for the face of both the back and front plates according to the instructions. Use a block plane to join the laminate on the face of the back plate, and use a trimmer or router with a straight box-cutter to join the laminate sections on the face of the front plate. (If you are not sure how to do this, ask your lecturer/trainer.)
As laminate is a very unforgiving material, errors in joining/fitting are extremely obvious. Errors in edge trimming and cleaning up are also poor practice. Do not progress any further until your lecturer/trainer is satisfied with the quality of your work.

List three faults in laminating that are generally considered to be unacceptable.

1. 
2. 
3. 

Step 6

Stick the laminate to the face of both back and front plates as per instructions. Clean off any excess using a laminate trimmer with a profile cutter and then clean up the trimmed edges with a fine file and fine abrasive paper.

Step 7

Join both the back and front plates as per instructions.

Step 8

Apply a single piece of laminate to the rear of the back plate to conceal the fixing points for the face plate, and then trim and clean up to an acceptable finish using a laminate trimmer with a profile cutter.

Step 9

Clean up the work areas so that each one is free of off-cuts, and place all usable pieces of sheet laminate back in the laminate rack. Return all tools to the store and report on the condition of any tools that may be faulty or blunt.

Summary

Throughout steps 1–9 you are required to demonstrate safety practices in accordance with work health and safety Regulations and industry expectations.
Section 8 – Join solid timber

Preparation sheet

Panel 1

Instructions

1. Complete the graphic to show all marking out and growth-ring configuration.
2. Insert the panel dimensions.
3. Complete the list of considerations before joining the timber.
   a) Colour-match the boards.
   b) Determine and mark the grain direction.
   c) 
   d) 
   e) 

![Image of Panel 1 marking out and growth-ring configuration]

4. Fill in the table with the material requirements.

<table>
<thead>
<tr>
<th>Number of boards</th>
<th>Length (mm)</th>
<th>Width (mm)</th>
<th>Thickness (mm)</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. What joint will you use?

__________________________________________________________

Panel 1

Requirements

Fill in the following information.

• Finished panel dimensions:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Length (mm)</th>
<th>Width (mm)</th>
<th>Thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Maximum gap in the joined panel boards: ____________________________

• Tolerance for the finished panel: ± 0.5 mm

Preparation sheet

Panel 2

Instructions

1. Complete the graphic to show all marking out and growth-ring configuration.

2. Insert the panel dimensions.

3. Complete the list of considerations before joining the timber.
   a) Colour-match the boards.
   b) Determine and mark the grain direction.
   c) ________________________________________________
   d) ________________________________________________
   e) ________________________________________________
4. Fill in the table with the material requirements.

<table>
<thead>
<tr>
<th>Number of boards</th>
<th>Length (mm)</th>
<th>Width (mm)</th>
<th>Thickness (mm)</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. What joint will you use?

Panel 2

Requirements

Fill in the following information.

- Finished panel dimensions:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Length (mm)</th>
<th>Width (mm)</th>
<th>Thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Maximum gap in the joined panel boards: ____________________________

- Tolerance for the finished panel: ± 0.5 mm
Task 2

Manufacture four panels, each with a minimum of three boards, demonstrating a different joining technique for each panel.

Panel 1 – to be planed true and square and either rubbed or glued and clamped.
Panel 2 – to be dowelled and clamped.
Panel 3 – to be either a biscuit joint or a slip-tongue joint.
Panel 4 – to be a moulded edge joint using one of the following:
  - finger joint
  - tongue-in-groove
  - lightning joint (zigzag).

Project planning exercise

In discussion with your lecturer/trainer, determine the following information for each panel.

| Panel 1 |
|-----------------|---------------------------------|
| Joint type:     |                                  |
| Location/critical dimensions: |                              |
| |                                  |
| |                                  |
| Clamping method: |                              |
| Type of adhesive: |                              |
| Other hardware:  |                                  |
| |                                  |
| |                                  |
Panel 2

Joint type: 

Location/critical dimensions: 

Clamping method: 

Type of adhesive: 

Other hardware: 

Panel 3

Joint type: 

Location/critical dimensions: 

Clamping method: 

Type of adhesive: 

Other hardware: 
### Panel 4

| Joint type: |  |
| Location/critical dimensions: |  |
| Clamping method: |  |
| Type of adhesive: |  |
| Other hardware: |  |

### Summary

Throughout this practical task you are required to demonstrate safety practices in accordance with work health and safety Regulations and industry expectations. You are also required to demonstrate the correct use and application of tools and equipment for the successful completion of the task.
Section 9 – Hand make timber joints

Task 1

From material supplied by your lecturer/trainer, complete six handmade joint exercises addressing the following criteria:

- joint square ± 1 mm
- joint free of twist ± 1 mm
- joint conforming to overall dimensions ± 1 mm
- joint gaps not exceeding ± 0.5 mm
- final product to be free of machine marks, scratches, compression marks, dirt, pencil marks and grease
- your name written clearly on each component.

Exercise 1

Given access to a piece of dressed pine measuring 300 mm × 40 mm × 20 mm, manufacture a handmade cross halving joint.

Time taken to complete the exercise: ______________________

WOT – width of timber  ■ waste removal – off-cut  ■ waste removal – joint

Fig 9.1 Cross halving joint
Exercise 2

Given access to a piece of dressed pine measuring 300 mm × 40 mm × 20 mm, manufacture a handmade **tee halving** joint.

Time taken to complete the exercise: ________________

WOT – width of timber ☐ waste removal – off-cut ☒ waste removal – joint

---

Exercise 3

Given access to a piece of dressed pine measuring 300 mm × 40 mm × 20 mm, manufacture a handmade **tee bridle** joint.

Time taken to complete the exercise: ________________

WOT – width of timber ☐ waste removal – off-cut ☒ waste removal – joint
Exercise 4

Given access to a piece of dressed pine measuring 300 mm × 40 mm × 20 mm, manufacture a handmade corner bridle joint.

Time taken to complete the exercise: __________________________

WOT – width of timber  ☐ waste removal – off-cut  ☒ waste removal – joint

Exercise 5

Given access to a piece of dressed pine measuring 300 mm × 40 mm × 20 mm, manufacture a handmade through mortise and tenon joint.

Time taken to complete the exercise: __________________________

WOT – width of timber  ☐ waste removal – off-cut  ☒ waste removal – joint

Fig 9.4 Corner bridle joint

Fig 9.5 Through mortise and tenon joint
Exercise 6

Given access to a piece of dressed pine measuring 300 mm × 40 mm × 20 mm, manufacture a handmade **stub haunch mortise and tenon** joint.

Time taken to complete the exercise: ______________


![Image of a stub haunch mortise and tenon joint](image)

**Fig 9.6 Stub haunch mortise and tenon joint**

**Summary**

Throughout exercises 1–6 you are required to demonstrate safety practices in accordance with work health and safety Regulations and industry expectations. You are also required to demonstrate the correct use and application of hand tools for the successful completion of the tasks.
Task 2

Complete the following exercise, with gaps in the joints not exceeding 0.5 mm.

Exercise 1

Manufacture the project assigned to you by your lecturer/trainer that contains the following list of handmade joints and processes as a minimum requirement. Finish the project to a polishable finish, using power sanders where appropriate.

a) two dowelled joints
b) two biscuited (plate) joints
c) two dovetail joints
d) two housing joints (through)
e) two housing joints (stopped)
f) four mitre joints (on edge)
g) four mitre joints (on flat)

Summary

Throughout exercise 1 you are required to demonstrate safety practices in accordance with work health and safety Regulations and industry expectations. You are also required to demonstrate the correct use and application of tools and equipment for the successful completion of the tasks.
Notes
Section 10 – Prepare surfaces for finishing

Task 1

Prepare the surfaces of **hardwood**, **softwood** and **veneered board**. At least four surfaces are to be prepared and must include the following:

- horizontal surface
- vertical surface
- internal surface
- curved surface (moulding).

**Exercise 1**

Prepare the surface for a project using abrasive paper.

**Exercise 2**

Prepare the surface for a project using wood grain putty.

**Summary**

Throughout exercises 1–2 you are required to demonstrate safety practices in accordance with work health and safety Regulations and industry expectations. You are also required to demonstrate the correct use and application of tools and equipment for the successful completion of the tasks.
DESCRIPTION
This practical workbook has been developed to assist in the delivery of Certificate I, II and III in furniture-making and cabinet-making qualifications within the furnishing training package. It contains activities and practical tasks for students to complete in the workshop. Your lecturer will show some presentations relating to this and other books in the series.

EDITION
Second edition

CATEGORY
Building and Construction

RELATED PRODUCTS
BC2012 Work Safely in the Furniture-Making Industry
BC2013 Join Solid Timber
BC2015 Use Furniture-Making-Sector Hand Tools and Power Tools
BC2017 Apply Sheet Laminates by Hand
BC2018 Prepare Surfaces for Finishing
BC2019 Hand Make Timber Joints