

HSC Industrial Technology: Timber Memorise Pack (Chunked)

Timber Products and Furniture Technologies • plug-and-play answers • written exam Wed 4 Nov 2026, 1:55–3:30 pm (confirm on your Students Online timetable)

The written paper (40 marks, 1 h 30 min + 5 min reading)

Section	What	Marks	Time
I	10 multiple-choice (tools, joints, timber, boards, adhesives, finishes)	10	~20 min
II	5 short answers, Q11–15, 1–5 marks each (Timber content)	15	~35 min
III	Q16 extended response on the Industry Study, (a) 3–5 + (b) 10–12	15	~35 min

The Major Project (folio and product) is worth the other 60% of the HSC exam mark and is marked separately; this pack is only for the 40-mark written paper.

Contents

- Section III (Industry Study):** S1 WHS legislation • S2 safety strategies • S3 risk assessment • S4 one new technology • S5 mass production/automation/technical factors • S6 historical developments • S7 legislation and sustainability • S8 location • S9 environmental strategies/resource management • S10 structure, marketing, restructuring • S11 structure and efficiency • S12 industrial relations • S13 careers and training • S14 resistance to new technology
- Section II (Timber):** T1 air seasoning • T2 kiln/EMC • T3 quarter sawing • T4 plywood/veneers • T5 manufactured boards • T6 laminating/bending • T7 knock-down fittings • T8 carcass/dovetail • T9 widening joints • T10 rebate and mortise and tenon • T11 finishing • T12 machine WHS • T13 recycled-timber WHS • T14 recycled/environment • T15 tool comparisons • T16 calculations
- One-page cram sheet** (last page)

Learn in this order (most likely, most marks): S5 → S6 → S2 → S9 → S7 → S13 → S11 → T6 → T4 → T1 → T5 → T12/T13 → T16 → the rest.

How to use: learn one chunk at a time from its **bold cue**, tick ☐ when you can say it word for word, then recite the whole answer from the cues alone. In Section III, always (1) use the exact verb (describe, explain, analyse, discuss, evaluate), (2) name **timber/furniture examples**, and (3) end with a judgement. *Italic = check before relying on it.*

S1 • WHS legislation: its role in a timber and furniture workplace (5 marks)

Fits: 2022 Q16(a) (5). Also 2016 Q16(a) • 156 words • 5 chunks • in the exam write continuous prose: no numbers, no cues

☐ S1.1 • Law

In NSW, the Work Health and Safety Act 2011 and the WHS Regulation make the business (the "person conducting a business or undertaking", PCBU) legally responsible for ensuring, as far as reasonably practicable, the health and safety of workers.

☐ S1.2 • Duties

The law requires a furniture factory to provide safe machinery with guards, safe systems of work, training and supervision, PPE, first aid, safety signage and consultation with workers through health and safety representatives or committees.

☐ S1.3 • Example

For example, wood dust (especially hardwood dust) is classified as a cause of nasal cancer, and noise from saws and planers damages hearing. The legislation therefore requires dust extraction, hearing protection and monitoring to control these hazards.

☐ S1.4 • Workers

Workers also have duties: to follow safe work procedures, use PPE and report hazards.

☐ S1.5 • Policing

SafeWork NSW polices the law through inspections, improvement and prohibition notices, fines and prosecution. This gives employers a strong financial and legal reason to comply and reduces injuries and lost time.

S2 • Strategies to improve safety in a timber and furniture workplace (10 marks)

Fits: 2022 Q16(b) (10). Also 2016 Q16(a), 2025 Q15 • 289 words • 9 chunks • in the exam write continuous prose: no numbers, no cues

☐ S2.1 • Thesis

A timber and furniture workplace has serious hazards: rotating blades, kickback, wood dust, noise, manual handling of heavy sheets, and flammable finishes. Safety is best improved by applying the hierarchy of control, backed by training and a positive safety culture.

☐ S2.2 • Eliminate

Elimination and substitution: the most effective strategies remove the hazard. For example, buying panels pre-cut to size removes a dangerous manual ripping task, and switching from solvent-based to water-based finishes removes flammable, toxic fumes.

☐ S2.3 • Engineer

Engineering controls: these isolate workers from hazards without relying on behaviour. Examples are blade guards, riving knives, and table saws with flesh-sensing blade-brake technology (such as SawStop), which stops the blade on skin contact.

☐ S2.4 • Engineer 2

Dust extraction and spray booths remove carcinogenic dust and fumes, and vacuum lifters and roller tables reduce manual handling of heavy 2400 × 1200 mm sheets. CNC machining centres also keep operators away from the cutting zone.

☐ S2.5 • Admin

Administrative controls: risk assessments and safe work procedures for every machine, induction and machine-specific training with sign-off, signage, lockout/tagout for maintenance, and job rotation to reduce repetitive strain.

☐ S2.6 • Admin 2

Regular WHS committee meetings and reviewing the accident and near-miss log help identify hazards early. These are cheaper but depend on people following them, so supervision is essential.

☐ S2.7 • PPE

PPE: as a last line of defence, workers wear safety glasses, hearing protection, P2 dust masks, steel-capped boots and gloves where appropriate (never near rotating blades).

☐ S2.8 • Culture

Culture and consultation: involving workers in identifying hazards, rewarding safe behaviour and making managers model safe practice builds a culture where safety is normal, not an afterthought.

☐ S2.9 • Judgement

Overall, the most effective strategy is to combine engineering controls, which work every time, with thorough training and consultation. This reduces injuries, lost-time costs, workers' compensation premiums and the risk of prosecution, while improving productivity.

S3 • Risk assessment: purpose, with an industry example (5 marks)

Fits: 2016 Q16(a) (5) • 127 words • 4 chunks • in the exam write continuous prose: no numbers, no cues

☐ S3.1 • Purpose

The purpose of risk assessment is to identify hazards, assess how likely and how severe the harm could be, and decide on controls to eliminate or minimise the risk before work starts.

☐ S3.2 • Steps

It follows four steps: identify the hazard, assess the risk (likelihood × consequence), control it using the hierarchy of control, and review the controls.

☐ S3.3 • Example

For example, before a cabinet maker uses a spindle moulder, a risk assessment identifies hazards such as contact with cutters, kickback, noise and dust. It rates the risk as high and sets controls: guards and power-feed, dust extraction, hearing and eye protection, and only trained, authorised operators.

☐ S3.4 • Outcome

This protects workers, meets the employer's legal duty under the WHS Act, and reduces injuries, sick leave and costs, making the business more efficient.

S4 • ONE new technology improving the industry (3–5 marks)

Fits: 2023 Q16(a) (3), 2019 Q16(a) (5) • 114 words • 4 chunks • in the exam write continuous prose: no numbers, no cues

☐ S4.1 • Name

A CNC (computer numerically controlled) nesting router is one new technology transforming furniture and cabinet manufacturing.

☐ S4.2 • How

Parts are designed in CAD, and CAM nesting software arranges them on the sheet with the least waste. The machine then cuts, drills and grooves whole sheets of board automatically, with vacuum hold-down and automatic tool changes.

☐ S4.3 • Improve

This improves the industry by increasing accuracy and repeatability, cutting material waste and labour time, and allowing custom-sized kitchen and wardrobe cabinets to be produced quickly at mass-production cost.

☐ S4.4 • Others

Other examples to name: handheld CNC routers (Shaper Origin), drones and LiDAR to map forests and count trees, laser cutting and engraving, 3D printing for prototypes, edge-banding automation, and microwave timber modification.

S5 • Mass production, automation and technical factors: impact on the industry (10–12 marks)

Fits: 2023 Q16(b) (12), 2017 Q16(b) (10), 2015 Q16(b) (10), 2019 Q16(a) • 294 words • 10 chunks • in the exam write continuous prose: no numbers, no cues

☐ S5.1 • Thesis

Mass production and automation have had a largely positive impact on the timber products and furniture industry. They have greatly increased efficiency, consistency and affordability, although they have reduced customisation and some jobs and require large investment.

☐ S5.2 • Define

Mass production makes large numbers of identical products from standardised parts. Automation uses computer-controlled machines (CNC routers, beam saws, edge banders) with little human input; mechanisation (e.g. a forklift) uses machines operated by people.

☐ S5.3 • Effic 1

Impact on efficiency and cost: a CNC beam saw or nesting router can cut and drill a full sheet of particleboard in minutes, run long shifts and reproduce parts exactly.

☐ S5.4 • Effic 2

Flat-pack manufacturers such as IKEA combine mass-produced board components with knock-down fittings, so furniture is cheap to make, store and ship. Lower unit costs mean lower prices and wider access for consumers.

☐ S5.5 • Quality

Impact on quality and waste: automation removes human error, so every part is identical and joints fit, improving quality control. CAM nesting software minimises offcuts, reducing material costs and environmental impact.

☐ S5.6 • Workforce 1

Impact on the workforce: automation reduces demand for unskilled machine operators and traditional hand skills, causing job losses and resistance.

☐ S5.7 • Workforce 2

It also creates new skilled roles in CNC programming, CAD design and machine maintenance, and removes workers from dangerous tasks at saws, improving WHS.

☐ S5.8 • Limits

Limitations: automated lines are very expensive for small businesses, and mass production suits standard products rather than one-off pieces. Small workshops survive by making bespoke solid-timber furniture.

☐ S5.9 • Specialise

Specialisation, where workers repeat one task, increases speed but can cause boredom and repetitive strain, so many firms now multi-skill workers instead.

☐ S5.10 • Judgement

Overall, mass production and automation have transformed the industry from craft workshops into efficient factories. Their benefits in productivity, consistency, safety and price outweigh the costs, provided businesses retrain workers and keep space for customised, high-value products.

S6 • Historical developments and advances in manufacturing processes (10 marks)

Fits: 2025 Q16(b) (10), 2016 Q16(b) (10). Tip: compare old vs new method for each change (NESA 2025) • 299 words • 10 chunks • in the exam write continuous prose: no numbers, no cues

☐ S6.1 • Thesis

Historical developments in manufacturing processes, materials and work practices have moved the timber and furniture industry from hand craft to automated mass production. This has made furniture more affordable, consistent and safe, although it has reduced traditional skills and some jobs.

☐ S6.2 • Hand era

Before the Industrial Revolution, furniture was made by hand by skilled craftsmen using hand saws, planes and chisels. Production was slow and expensive, and quality depended on the individual maker.

☐ S6.3 • Steam

The Industrial Revolution brought steam-powered sawmills and machinery, such as the circular saw and powered planers, which greatly increased output.

☐ S6.4 • Thonet

In 1859 Michael Thonet's steam-bent beech No. 14 chair was made from a few standard parts by semi-skilled workers and shipped in parts. This early mass production and flat-pack thinking made furniture affordable.

☐ S6.5 • Electric

In the 20th century, electric motors made individual machines and portable power tools (routers, drills, biscuit jointers) common. This improved precision, reduced physical labour and allowed small workshops to mechanise.

☐ S6.6 • Boards

Manufactured boards were a major materials development: plywood, then particleboard and MDF from the mid-20th century. They used waste and small logs, came in large stable sheets and suited fast assembly with knock-down fittings, which led to flat-pack firms such as IKEA.

☐ S6.7 • CNC

In the late 20th century, CNC machining and CAD/CAM allowed highly precise, repeatable and complex cuts and custom sizing at factory speed. Today CNC nesting routers, automatic edge banders and engineered timbers such as glulam and CLT (used in International House Sydney, 2017) continue this change.

☐ S6.8 • Work

Work practices changed with the technology: specialised production-line jobs replaced the all-round craftsman, and later multi-skilling, WHS law and training in CNC programming emerged.

☐ S6.9 • Negative

Negative effects include loss of hand skills and jobs, environmental pressure from mass consumption, and lower-quality disposable furniture.

☐ S6.10 • Judgement

Overall, historical developments have shaped the industry positively, greatly improving productivity, precision, safety and affordability.

S7 • Legislation: effects on sustainable practices and environmental impacts (5 marks)

Fits: 2025 Q16(a) (5). Also 2020 Q16(a) legislative dot point • 174 words • 6 chunks • in the exam write continuous prose: no numbers, no cues

☐ S7.1 • Federal

Federal: the Illegal Logging Prohibition Act 2012 makes it an offence to import or process illegally logged timber, and requires importers and processors to carry out due diligence on where timber comes from.

☐ S7.2 • Fed effect

This has pushed furniture businesses towards certified timber (FSC or Responsible Wood/PEFC), reducing support for illegal logging and the deforestation and biodiversity loss it causes overseas.

☐ S7.3 • State

State: Victoria and Western Australia ended commercial native forest logging from 1 January 2024. This protects habitat and carbon stores, but it forced manufacturers to switch to plantation, imported or recycled timber and caused mill closures and job losses.

☐ S7.4 • Pollution

Pollution control: under the NSW Protection of the Environment Operations Act 1997, sawmills, board plants and finishing operations may need EPA licences and must control dust, noise, solvent emissions and waste. This drives investment in dust extraction, spray booths and low-VOC finishes.

☐ S7.5 • Local

Local: councils require development approval and environmental impact assessment for new factories.

☐ S7.6 • Judgement

Overall, legislation has made sustainable sourcing and pollution control compulsory, improving the industry's environmental footprint at the cost of higher compliance costs.

S8 • Location: environmental factors, land costs and transport when choosing a site (5 marks)

Fits: 2020 Q16(a) (5), 2018 Q16(a) (5) • 163 words • 7 chunks • in the exam write continuous prose: no numbers, no cues

☐ S8.1 • Land

Land costs and availability: land near Sydney is expensive, while regional land (e.g. near mills in Oberon or Tumut) is cheaper and allows larger factories and storage yards.

☐ S8.2 • Transport

Transport facilities: timber products are bulky and heavy, so access to highways, rail and ports cuts freight costs and emissions. A site near the sawmill reduces raw material transport, while a site near the city reduces delivery costs and time to customers.

☐ S8.3 • Trade-off

The business must weigh cheaper land against higher distribution costs.

☐ S8.4 • Neighbours

Impact on the surrounding population: noise, dust and truck movements mean factories should be in industrial zones away from homes.

☐ S8.5 • Env check

An environmental impact assessment checks threatened species, waterways and pollution risk, and the site needs waste management and room for dust extraction.

☐ S8.6 • Workforce

Workforce and resources: the site needs access to skilled workers (cabinet makers, CNC operators) and reliable power and water.

☐ S8.7 • Judgement

Overall, the best location balances land and transport costs with environmental and community impact, which directly affects the viability of the business.

S9 • Strategies to minimise environmental impact / resource management (10 marks)

Fits: 2020 Q16(b) (10), 2018 Q16(b) (10). Also 2021 Q15, 2022 Q14 • 271 words • 9 chunks • in the exam write continuous prose: no numbers, no cues

☐ S9.1 • Thesis

A timber and furniture company can significantly reduce its continuing environmental impact through sustainable sourcing, waste minimisation, cleaner energy and processes, and responsible finishing. Each strategy has costs as well as benefits.

☐ S9.2 • Source

Sustainable materials: buying FSC or Responsible Wood certified, plantation or recycled timber protects native forests and meets the Illegal Logging Prohibition Act. This also attracts environmentally aware customers, although certified timber can cost more and supply can be limited.

☐ S9.3 • Waste

Waste minimisation: CAD/CAM nesting software and economical cutting lists reduce offcuts. Sawdust and shavings can be sold for particleboard, animal bedding or burnt in a biomass boiler to heat kilns.

☐ S9.4 • Waste eval

This reduces landfill and saves money, but nesting software and CNC machines need large up-front investment.

☐ S9.5 • Energy

Energy: installing rooftop solar with batteries, LED lighting, efficient motors and running energy-hungry kilns off-peak cut greenhouse emissions and power bills. The payback period may be several years.

☐ S9.6 • Finish

Finishes and pollution: switching to low-VOC water-based finishes, using filtered spray booths and taking solvents to approved chemical waste facilities reduces air and water pollution and protects workers. Water-based finishes may need more coats.

☐ S9.7 • Resource

Resource management: CNC beam saws and computerised stock and administration systems track materials accurately and reduce over-ordering, waste and labour. A paperless office and efficient truck routing reduce resource use further.

☐ S9.8 • Product

Product design: durable, repairable furniture, flat-pack transport to reduce freight emissions, and take-back or buy-back schemes extend product life and keep timber out of landfill.

☐ S9.9 • Judgement

Overall, the most effective strategies are those that cut costs as well as impact, such as waste minimisation, energy efficiency and sustainable sourcing. A formal environmental policy ensures the company complies with legislation and continually improves.

S10 • Organisation structure: marketing, restructuring and quality control (5 marks)

Fits: 2024 Q16(a) (5), 2015 Q16(a) (5) • 161 words • 5 chunks • in the exam write continuous prose: no numbers, no cues

☐ S10.1 • Hierarchy

A partnership with a hierarchical structure (e.g. a large furniture manufacturer) has many management levels and specialised departments. Its marketing is formal and planned: decisions pass through several levels, and specialised teams handle market research, branding and larger campaigns (TV, catalogues, showrooms, trade fairs), which is thorough but slow.

☐ S10.2 • Flat

A sole trader with a flat structure (e.g. a custom furniture maker) makes marketing decisions personally and quickly. They rely on low-cost social media, a website, word of mouth and their portfolio, and can react fast to trends and client feedback, but have a smaller budget and reach.

☐ S10.3 • Compare

So the hierarchical firm has greater reach and consistency, while the flat firm has greater flexibility and personal service.

☐ S10.4 • Restructure

Restructuring and quality control: restructuring (changing roles, teams, machinery or layout) can first lower quality because workers moved to new tasks lack skills and morale drops.

☐ S10.5 • Restructure 2

With retraining, specialised teams and new machinery such as CNC, it can then improve accuracy and consistency, raising quality.

S11 • Organisational structure: effect on production and efficiency (10 marks)

Fits: 2024 Q16(b) (10). Also 2015 Q16(a) • 255 words • 7 chunks • in the exam write continuous prose: no numbers, no cues

☐ S11.1 • Thesis

The organisational structure of a furniture business strongly influences how it organises production and how efficiently it operates. Hierarchical structures favour standardised, high-volume efficiency, and flat structures favour flexibility and speed of response.

☐ S11.2 • Decisions

Decision-making: in hierarchical Organisation A, approvals for new products, machinery or schedule changes pass through several managers, which slows responses. In flat Organisation B, the owner decides immediately, so it can change a job or accept a custom order the same day.

☐ S11.3 • Specialise

Specialisation and production: Organisation A can afford specialised departments (design, CNC programming, assembly, finishing, quality control) and mass-production equipment, producing large volumes at low unit cost. Organisation B's few multi-skilled workers do many tasks and suit one-off custom pieces, but at a higher cost per unit.

☐ S11.4 • Quality

Quality control: A can run formal QC with inspectors, standards and documented procedures, giving consistency. B relies on the owner's personal checks, which are flexible and personal but less systematic and harder to keep consistent as it grows.

☐ S11.5 • Resources

Resources and cost: A's extra management layers add overhead costs, and communication can be slow or distorted. B has low overheads and direct communication, but limited capital limits investment in efficient technology such as CNC routers.

☐ S11.6 • Innovate

Innovation and motivation: B's workers often have more autonomy and job satisfaction, encouraging ideas. A can fund research and development, but rigid procedures may discourage individual initiative.

☐ S11.7 • Judgement

Overall, the hierarchical structure is more efficient for high-volume, standardised production, while the flat structure is more efficient for small-batch, customised work. Each firm is most efficient when its structure matches its market.

S12 • Industrial relations issues when a company modifies its operations (5 marks)

Fits: 2021 Q16(a) (5). Also 2019 Q16(b) • 143 words • 5 chunks • in the exam write continuous prose: no numbers, no cues

☐ S12.1 • Downsize

If demand falls and the company downsizes, redundancies must follow the Fair Work Act 2009 and the relevant award (e.g. the Timber Industry Award 2020), including consultation, notice and redundancy pay. The selection of who is retrenched must be fair and non-discriminatory.

☐ S12.2 • Unions

Unions represent workers in negotiating these changes, redundancy packages and new enterprise (group) agreements. Disputes can arise if consultation is poor, possibly leading to industrial action and lost production.

☐ S12.3 • Expand

If demand rises and the company expands, it must recruit fairly under equal employment opportunity (EEO) and anti-discrimination law. It may negotiate overtime, shift work and new individual or group contracts.

☐ S12.4 • Change

Introducing new technology or roles changes job descriptions and pay rates, so the employer must consult workers and unions to avoid disputes.

☐ S12.5 • Exam tip

Describe each issue in context, not as a list, and use more than one IR issue (NESA 2021 feedback).

S13 • Career and training opportunities; importance of training (5–10 marks)

Fits: 2021 Q16(b) (10), 2017 Q16(a) (5) • 223 words • 8 chunks • in the exam write continuous prose: no numbers, no cues

☐ S13.1 • Thesis

When a furniture company modifies its operations, for example by expanding production and introducing CNC technology, it creates significant career and training opportunities that benefit both workers and the business.

☐ S13.2 • Apprentice

Apprenticeships and recruitment: expansion creates entry-level jobs and apprenticeships, such as a Certificate III in Cabinet Making through TAFE NSW, combining paid on-the-job work with off-the-job study. This builds a skilled workforce for the future.

☐ S13.3 • Upskill

Upskilling on new technology: introducing a CNC router means existing workers need training in CAD/CAM programming, machine operation and maintenance, through supplier training (e.g. the machine manufacturer) or short courses. This keeps experienced workers employed in higher-skilled, better-paid roles.

☐ S13.4 • Multi-skill

Multi-skilling: training workers across several machines or stations lets the company move staff where demand is greatest, improving efficiency and making workers more secure and employable.

☐ S13.5 • Lead

Career progression: expansion creates supervisor, quality control, production planning and management roles. Workers who complete leadership or project management courses can be promoted, and the firm keeps knowledge in-house.

☐ S13.6 • Downsize

If the company downsizes instead, retraining and redeployment can replace redundancies, and workers who keep their skills current are less likely to be made redundant.

☐ S13.7 • WHS

Training is also legally required for WHS: induction and machine-specific competency training reduce injuries.

☐ S13.8 • Judgement

Overall, training and career opportunities are vital: they increase productivity, quality and safety for the business and give workers job security, higher pay and promotion.

S14 • Overcoming employee resistance to new technology (10 marks)

Fits: 2019 Q16(b) (10) • 245 words • 7 chunks • in the exam write continuous prose: no numbers, no cues

☐ S14.1 • Thesis

Employees often resist new technology such as CNC routers or automated edge banders because they fear job loss, loss of status or having to learn new skills. An employer can overcome this resistance with consultation, training, job security measures and sharing the benefits, though each strategy has costs.

☐ S14.2 • Consult

Consultation and communication: involving workers and unions early, explaining why the technology is needed and how it will affect jobs, builds trust and meets legal consultation requirements under the Fair Work Act and WHS Act. It takes time but greatly reduces disputes.

☐ S14.3 • Train

Training and upskilling: providing paid training in CAD/CAM programming and machine operation lets existing workers move into higher-skilled roles. It costs money and lost production time, but keeps experienced staff and their product knowledge.

☐ S14.4 • Secure

Job security and redeployment: guaranteeing no forced redundancies, redeploying workers to new roles or offering voluntary redundancies to those who prefer to leave reduces fear. However, it may limit the labour savings from the technology.

☐ S14.5 • Share

Sharing the benefits: point out that automation removes dangerous, dusty, repetitive tasks, improving WHS, and that productivity gains can fund pay rises, bonuses or more interesting work.

☐ S14.6 • Trial

Trial and gradual introduction: piloting the technology with willing "champions" before full rollout lets others see that it works and lowers anxiety.

☐ S14.7 • Judgement

Overall, consultation combined with training is the most effective strategy, because it addresses the real causes of resistance. The employer gains efficiency and the workers gain skills and security, so the technology is accepted rather than resisted.

T1 • Air seasoning: explain the process (5 marks)

Fits: 2023 Q15 (5). Also 2015 MC6, 2021 Q12, 2022 Q12. • 247 words • 6 chunks • in the exam write continuous prose: no numbers, no cues

☐ T1.1 • Purpose

Seasoning is the controlled removal of moisture from green timber until it is close to the equilibrium moisture content (EMC) of the place where it will be used. This reduces later shrinkage, warping and checking, and makes the timber lighter, stronger and easier to machine, glue and finish.

☐ T1.2 • Site

After conversion, the boards are stacked outdoors on a level, well-drained site, raised off the ground on bearers. This lets air circulate underneath and keeps the stack away from ground moisture and termites.

☐ T1.3 • Stickers

Each layer of boards is separated by stickers, which are thin battens of equal thickness placed at regular intervals and lined up vertically one above the other. Stickers let air flow over every face of every board and keep the stack flat so boards do not bow or twist.

☐ T1.4 • Cover

A roof or cover protects the stack from rain and direct sun, and weights on top hold the upper layers flat. The board ends are sealed with wax or paint to slow end drying, which prevents end splits and checks.

☐ T1.5 • Time

The stack is left for many months, or years for thick hardwood, while moisture slowly evaporates. Air drying can only bring timber down to the EMC of the outside air, so furniture timber is often finished in a kiln.

☐ T1.6 • Judgement

Air seasoning is cheap because it uses little energy, and slow drying causes less internal stress. However, it is slow, needs a lot of yard space and gives less control over the final moisture content than kiln seasoning.

T2 • Kiln vs air seasoning (2 marks) + EMC (2 marks)

Fits: 2021 Q12 (2), 2022 Q12 (2), 2015 MC6 • 124 words • 4 chunks • in the exam write continuous prose: no numbers, no cues

☐ T2.1 • Kiln faster

Kiln seasoning is much faster than air seasoning (days or weeks instead of months or years) because temperature, humidity and airflow are controlled inside a chamber.

☐ T2.2 • Kiln control

It can dry timber to a precise, lower moisture content suited to indoor furniture, which air drying cannot reach. The heat also kills insects and fungi, and less yard space and stock are tied up.

☐ T2.3 • EMC meaning

Equilibrium moisture content (EMC) is the moisture content at which timber neither gains nor loses moisture to the surrounding air.

☐ T2.4 • EMC importance

Timber should be selected and seasoned close to the EMC of where the product will be used. If it is too wet it will shrink after construction, causing gaps, loose joints and cracks; if too dry it will swell, causing cupping and buckling.

T3 • Quarter-sawn timber for fine furniture (3 marks)

Fits: 2015 Q14 (3). Also 2016 MC4, 2017 MC4, 2019 MC2, 2021 MC10 • 139 words • 4 chunks • in the exam write continuous prose: no numbers, no cues

☐ T3.1 • Define

Quarter-sawn timber is cut so that the growth rings run at a steep angle, close to 90°, to the wide face of the board. Back-sawn timber has the rings roughly parallel to the face, and live sawing cuts straight through the log, giving a mix.

☐ T3.2 • Stable

Because the rings run through the thickness, quarter-sawn boards shrink and swell much less in width and are far less likely to cup or warp. This keeps table tops, panels and joints flat and tight.

☐ T3.3 • Figure + wear

Quarter sawing exposes the medullary rays, giving an attractive ray figure on species such as silky oak, and the edge-grain surface wears more evenly.

☐ T3.4 • Trade-off

The trade-off is that quarter sawing is slower and wastes more of the log, so the boards cost more. That is why it is chosen for fine furniture, where stability and appearance justify the price.

T4 • Plywood: from log to sheet (4 marks) + cutting veneers (4 marks)

Fits: 2019 Q14 (4), 2021 Q14 (4), 2023 Q14 (4). Also 2017 MC2, 2023 MC8, 2015 MC9 • 187 words • 6 chunks • in the exam write continuous prose: no numbers, no cues

☐ T4.1 • Log prep

Logs are debarked, cross-cut into billets and softened by soaking or steaming so the veneer peels cleanly without splitting.

☐ T4.2 • Rotary peel

For plywood, the billet is spun on a rotary lathe against a long knife, which peels a continuous ribbon of veneer like unrolling paper. Decorative face veneers are instead sliced (flat/crown, quarter or rift slicing) or half-round cut to show figure.

☐ T4.3 • Clip + dry

The ribbon is clipped into sheets, dried in a veneer dryer to a low moisture content, then graded, and defects are patched.

☐ T4.4 • Lay-up

Glue is spread and the veneers are laid up with the grain of each layer at 90° to the next, using an odd number of plies so the two face grains run the same way. Cross-graining gives strength in both directions and resists splitting and warping.

☐ T4.5 • Press + finish

The lay-up is hot-pressed so heat and pressure cure the adhesive (urea-formaldehyde for interior grades, phenol-formaldehyde for exterior and marine grades). The sheets are then trimmed to size, sanded to thickness, graded and stamped.

☐ T4.6 • Exam tip

If the question asks only about cutting veneers, describe peeling and slicing in detail; do not drift into the whole plywood process (NESA feedback, 2023).

T5 • Manufactured boards: advantages, environment, wet areas (2–5 marks)

Fits: 2016 Q15 (5), 2018 Q13 (3), 2023 Q12 (2), 2019 Q11 (1). Also 2022 MC7, 2025 MC7 • 201 words • 7 chunks • in the exam write continuous prose: no numbers, no cues

☐ T5.1 • Stable

Manufactured boards are dimensionally stable: cross-laminated veneers (plywood) or randomly arranged particles and fibres (particleboard, MDF) stop the board shrinking, swelling, cupping or warping like a wide solid board.

☐ T5.2 • Large sizes

They come in large sheets, such as 2400 × 1200 mm, so a dining table top can be one piece with no widening joints. This saves labour and avoids glue lines opening.

☐ T5.3 • Uniform

They have uniform strength and no knots, splits or shakes, and plywood can be screwed or nailed near its edges without splitting.

☐ T5.4 • Cost + look

They are usually cheaper than solid timber, and a thin veneer of figured timber on a board gives the look of an expensive species economically.

☐ T5.5 • Environment

Environmentally, boards make fuller use of each tree: particleboard and MDF use sawmill residues, chips, thinnings and small plantation logs that would otherwise be wasted, so fewer large trees are needed.

☐ T5.6 • Wet area

For a bathroom cabinet, choose HMR (high moisture resistant) particleboard or MDF, or marine/exterior plywood. They are made with water-resistant resins that resist swelling, and melamine-faced HMR is easy to clean; edges should be sealed with edge banding.

☐ T5.7 • Limitation

Limitations: raw edges swell if wet, screws hold poorly in particleboard edges, and some boards release formaldehyde, so low-emission (E0/E1) boards should be chosen.

T6 • Laminating a curved component, plus other bending methods (4–5 marks)

Fits: 2015 Q15 (5), 2017 Q15 (5), 2025 Q14 (4). Also 2025 MC5 • 243 words • 8 chunks • in the exam write continuous prose: no numbers, no cues

☐ T6.1 • Former

First, make a former (mould) to the required curve, often from layers of MDF glued together, cut on the bandsaw and smoothed. Allow a little extra curve for springback.

☐ T6.2 • Strips

Rip thin strips of straight-grained timber on the table saw or bandsaw, thin enough to bend around the curve without cracking. Keep them in order so the grain matches.

☐ T6.3 • Dry clamp

Dry-clamp the strips to the former to check that they bend and fit before any glue is used.

☐ T6.4 • Glue

Spread a rigid, slow-setting adhesive on the mating faces; urea-formaldehyde or epoxy are suited because they give long working time and resist creep. Then stack the strips.

☐ T6.5 • Clamp

Clamp the stack to the former, working from the centre outwards to squeeze out air and excess glue, or use a vacuum bag over the mould. Wipe off squeeze-out and leave the glue to cure fully.

☐ T6.6 • Clean up

Remove the blank, clean the edges on the jointer or with a router and template, cut to final length and shape, check the curve against the template, then sand and finish.

☐ T6.7 • Why stronger

Laminated parts are strong because the grain follows the curve, and any defect is limited to one thin layer (2025 MC5).

☐ T6.8 • Steam bend

Alternatives: steam bending softens solid timber in a steam box, then it is bent quickly around a form using a metal strap and clamped until dry. Kerf bending cuts a series of saw kerfs on the inside of the curve so the board can bend, then the kerfs are glued and clamped.

T7 • Knock-down fittings and modern alternatives to traditional joints (3–5 marks)

Fits: 2022 Q15 (5), 2015 Q13 (3). Also 2021 MC8, 2018 MC7 • 181 words • 7 chunks • in the exam write continuous prose: no numbers, no cues

☐ T7.1 • Examples

Knock-down (KD) fittings are mechanical fasteners that let furniture be assembled and taken apart, such as cam lock and dowel fittings, cross dowels and connector bolts, threaded inserts and corner brackets.

☐ T7.2 • Flat-pack

They allow flat-pack furniture: parts are shipped flat, which takes much less space, so freight and warehouse costs fall, for example at IKEA.

☐ T7.3 • Easy assemble

Customers can assemble the product with basic tools, and it can be dismantled to move house or replace a part.

☐ T7.4 • Production

Holes for KD fittings are drilled quickly and accurately by CNC or multi-boring machines, so parts are interchangeable and suited to mass production. This lowers labour cost and price.

☐ T7.5 • Boards

KD fittings suit particleboard and MDF, where traditional joints such as mortise and tenons are weak or impractical.

☐ T7.6 • Limits

Limitations: KD joints are usually weaker than glued traditional joints, can loosen with use and look less refined.

☐ T7.7 • Alternative

An alternative to a traditional mortise and tenon is the Festool Domino: a machine cuts matching mortises and a glued loose tenon (domino) is inserted. It is fast and accurate, and the large gluing area keeps the joint strong (2015 marking guidelines).

T8 • Carcase joints and dovetail drawers (2–4 marks)

Fits: 2025 Q12 (2), 2017 Q14 (4), 2019 Q12 sketch (2). Also 2018 MC4, 2022 MC2, 2025 MC1, 2021 MC7 • 149 words • 5 chunks • in the exam write continuous prose: no numbers, no cues

☐ T8.1 • Carcase

Carcase joints join wide boards or panels at right angles to form a box or cabinet: the sides, top, bottom and shelves. Examples are the housing, rebate, dovetail and scribed joints.

☐ T8.2 • Character

Their key characteristic is that they join the full width of a panel and support load across it, holding shelves and resisting racking so the carcase stays square.

☐ T8.3 • Shelf

For a fixed shelf, sketch a housing (trench) joint: label the trench, about one-third of the side's thickness deep, and the shelf end fitting in it. A stopped housing hides the joint at the front edge.

☐ T8.4 • Dovetail 1

Dovetails are used in drawers because of mechanical strength: the flared tails and pins interlock, so the front resists being pulled off every time the drawer is opened, without relying on glue alone.

☐ T8.5 • Dovetail 2

They are also attractive, showing craftsmanship and quality, and can be cut by hand or with a router jig for production.

T9 • Widening joints: why alternate growth rings, and how to make one with a portable power tool (3 marks)

Fits: 2015 Q12 (3), 2016 Q12 (3). Also 2019 MC7, 2024 MC2, 2018 MC10 • 140 words • 4 chunks • in the exam write continuous prose: no numbers, no cues

☐ T9.1 • Why move

Timber moves as its moisture content changes, and back-sawn boards tend to cup away from the heart.

☐ T9.2 • Alternate

When widening boards for a table top, alternate the growth rings (heart side up, then down). Each board then cups in the opposite direction to its neighbour, so the movement balances out and the top stays flat.

☐ T9.3 • Biscuit

To make the joint with a biscuit jointer: dress the edges straight and square, lay the boards out, and mark biscuit positions across each joint about 150–200 mm apart. Cut the slots in both edges with the biscuit jointer referenced from the face side.

☐ T9.4 • Glue + cramp

Glue the slots and edges, insert biscuits, and cramp with sash cramps, alternating cramps above and below to keep the top flat. Then check for flatness and clean off excess glue. Dowels, a Domino, or a router-cut tongue and groove also work.

T10 • Producing a rebate joint, and a mortise and tenon (4–5 marks)

Fits: 2019 Q15 (5), 2020 Q14 (4). Also 2025 MC9, 2015 MC2, 2017 MC7 • 202 words • 6 chunks • in the exam write continuous prose: no numbers, no cues

☐ T10.1 • Rebate mark

For a corner rebate joint in 16 mm plywood with hand and portable power tools, mark the rebate width (the thickness of the mating board) and depth (about half to two-thirds of the board's thickness) with a marking gauge.

☐ T10.2 • Rebate cut

Clamp the board securely and cut the rebate with a hand-held router fitted with a rebating bit, or a straight bit guided by the fence, taking several shallow passes to reduce tear-out.

☐ T10.3 • Rebate fit

Check the fit by dry assembly, then glue and nail or screw through the side into the rebate. Cramp, check for square by measuring the diagonals, and clean off excess glue.

☐ T10.4 • Tenon size

For a mortise and tenon, make the tenon about one-third of the rail's thickness; this leaves enough timber either side of the mortise for maximum strength and stability.

☐ T10.5 • Mortise

Mark out with a mortise gauge set to the chisel width. Cut the mortise with a mortise chisel and mallet, a drill press with a mortising attachment, or a hollow chisel mortiser, to slightly deeper than the tenon length.

☐ T10.6 • Tenon cut

Cut the tenon cheeks with a tenon saw and the shoulders square, or use a tenoning jig on the table saw. Pare to a firm push fit, dry assemble, then glue and cramp.

T11 • Finishing: outdoor finish steps; oil vs water-based; finishing and the environment (3–5 marks)

Fits: 2020 Q15 (5), 2016 Q13 (3), 2017 Q13 (3). Also 2025 MC10, 2023 MC10, 2021 MC9, 2022 MC9 • 226 words • 7 chunks • in the exam write continuous prose: no numbers, no cues

☐ T11.1 • Name

For an outdoor hardwood bench, use a penetrating exterior oil or decking oil with UV and water-repellent additives.

☐ T11.2 • Prepare

Preparation: fill any holes with exterior filler, then sand through the grits, for example 120 to 180, with the grain. Raise the grain with a damp cloth, let it dry and sand lightly again, then remove all dust.

☐ T11.3 • Apply

Apply the oil with a brush or cloth along the grain, let it soak in for the recommended time, and wipe off the excess. Apply two or three coats, allowing drying time between coats, and re-oil regularly as it weathers.

☐ T11.4 • Order

Correct general finishing order: sand, raise the grain, sand, apply finish, then buff/polish (2025 MC10).

☐ T11.5 • Oil-based

Oil-based finishes give a warm amber depth, flow out well and are very hard-wearing. However, they dry slowly, smell strongly, are flammable, need mineral turpentine to clean up and yellow over time.

☐ T11.6 • Water-based

Water-based finishes dry quickly, have low odour, stay clear and clean up with water. However, they need more coats, can raise the grain and lack the rich glow of oil.

☐ T11.7 • Environment

To reduce environmental harm: choose low-VOC water-based products, apply only the amount needed, use spray booths with filters, and never pour solvents down the drain. Take waste finish, solvents and soaked rags to an approved chemical-waste facility. Store oily rags flat to dry or in a sealed metal container, because they can self-ignite.

T12 • WHS: high-risk machinery set-up, start-up, maintenance (5 marks)

Fits: 2025 Q15 (5). Also 2016 Q16(a) risk assessment • 148 words • 5 chunks • in the exam write continuous prose: no numbers, no cues

☐ T12.1 • Set-up

Set-up: only trained, authorised operators use the machine. Check the work area is clear and well lit with non-slip floors, dust extraction connected, and the correct blade or cutter fitted, sharp and tightened, with all guards in place and adjusted.

☐ T12.2 • Start-up

Start-up: wear the required PPE (safety glasses, hearing protection, dust mask) with no loose clothing or jewellery. Test the emergency stop, let the machine reach full speed before cutting, and use push sticks and fences.

☐ T12.3 • Operate

During use, follow the safe work procedure for that machine, keep hands clear of the cutting zone, and never leave it running unattended.

☐ T12.4 • Maintenance

Maintenance: isolate the power and lock out and tag out before any adjustment or blade change. Inspect belts, blades and guards, lubricate moving parts, empty the dust collector, and replace worn parts.

☐ T12.5 • Records

Keep a maintenance log and report and tag out faulty equipment. Regular maintenance prevents breakdowns, kickback and injuries.

T13 • WHS risks of preparing and using recycled timber (5 marks)

Fits: 2024 Q15 (5) • 150 words • 5 chunks • in the exam write continuous prose: no numbers, no cues

☐ T13.1 • Metal

Risk 1, hidden metal: recycled timber often contains nails, screws, bolts and staples. If a saw, planer or thicknesser blade hits metal, the blade can shatter or chip and throw fragments, or the board can kick back, causing eye, face and hand injuries.

☐ T13.2 • Control 1

Control: inspect each board, scan it with a metal detector, and remove all metal with a pinch bar or nail punch before any machining. Wear eye and face protection.

☐ T13.3 • Contamination

Risk 2, contamination: old boards may be coated in lead-based paint, treated with CCA (copper chrome arsenate) preservative, or contaminated with mould or asbestos. Sanding or machining them creates toxic dust that can be breathed in.

☐ T13.4 • Control 2

Control: find out the timber's history, test paint for lead, don't machine or burn CCA-treated timber, and use dust extraction with a P2 respirator. Dispose of waste correctly.

☐ T13.5 • Exam tip

Link each risk specifically to recycled timber, not general workshop risks (NESA feedback, 2024).

T14 • Recycled timber, recycling/reusing, and environmental factors in making furniture (2–5 marks)

Fits: 2017 Q12 (2), 2022 Q14 (4), 2021 Q15 (5). Also 2024 MC6, 2024 Q12 • 216 words • 9 chunks • in the exam write continuous prose: no numbers, no cues

☐ T14.1 • Recycled +

Recycled timber is old, well-seasoned and stable, often from species that are now hard to obtain, and it has a rustic character customers value. Reusing it means fewer trees are felled and the carbon stored in the timber stays locked up instead of going to landfill.

☐ T14.2 • Shortages

To address timber shortages, recycling means reprocessing waste (offcuts, sawdust, chips) into particleboard, MDF or fuel. Reusing means salvaging whole members, such as beams, floorboards and wharf timbers, for new furniture and flooring.

☐ T14.3 • Shortage link

Both stretch the limited supply of new logs, which became tight after plantations were burnt in the 2019–20 bushfires and demand rose in the 2021 housing boom.

☐ T14.4 • Select

Environmental factors when making furniture: (1) timber selection: choose plantation, recycled or certified timber (FSC or Responsible Wood/PEFC) rather than illegally logged or rare exotic species.

☐ T14.5 • Waste

(2) Economical use: plan sheet layouts and cutting lists to minimise offcuts, and reuse offcuts.

☐ T14.6 • Boards

(3) Manufactured boards: choose low-formaldehyde (E0/E1) boards.

☐ T14.7 • Finishes

(4) Finishes: use low-VOC water-based finishes and dispose of waste chemicals correctly.

☐ T14.8 • Life cycle

(5) Life cycle: make durable, repairable products, transport efficiently (e.g. flat-pack), and design for disassembly and recycling at end of life.

☐ T14.9 • Waste strategy

One strategy to minimise wastage: draw an economical sheet layout or cutting list before cutting, so parts are nested together and offcuts are reused for small components (2024 Q12).

T15 • Tools and machines: quick comparisons (1–4 marks)

Fits: 2025 Q13, 2024 Q13, 2024 Q14, 2022 Q11, 2021 Q11, 2018 Q11, 2017 Q11, 2016 Q14 • 292 words • 7 chunks • in the exam write continuous prose: no numbers, no cues

☐ T15.1 • Band v table

Band saw versus table saw: the band saw is used for curves, irregular shapes and resawing thick stock. The table saw is used for precise straight cuts, ripping along the grain and cross-cutting large boards and sheets (describe uses, not looks: NESA 2025).

☐ T15.2 • Mitre saws

Mitre versus compound mitre saw: a mitre saw pivots to cut angles across the face of a board, such as 45° picture-frame mitres. A compound mitre saw also tilts (bevels), so it can cut a mitre and a bevel at the same time, for example for crown mouldings or splayed legs.

☐ T15.3 • Router

Router features: choose a plunge router for cutting stopped grooves and mortises in the middle of a board; a fixed-base or trim router is lighter for edge work. Variable speed lets large-diameter bits run slower to prevent burning, and a 12.7 mm (1/2") collet holds larger bits more rigidly than 6.35 mm (1/4").

☐ T15.4 • Dress + misc

Industry machine to dress timber: a planer/jointer (to face and edge) and thicknesser, or a four-sided moulder. Rebate for glass: router. Internal curve in plywood: jigsaw (or scroll saw).

☐ T15.5 • Chisel

Restoring a chisel edge: grind the bevel at about 25° on a wet grinder or a bench grinder (dipping it in water to stop overheating and losing temper). Hone a micro-bevel at about 30° on an oil or water stone, then remove the burr on the back with a strop or fine stone.

☐ T15.6 • Square

Checking a frame for square without a square: measure both diagonals with a tape; if they are equal (and opposite sides are equal) the frame is square.

☐ T15.7 • Drawer

Measuring for a drawer: measure the carcass opening's internal width, height and depth at several points. Subtract the clearance needed for the drawer runners (from the runner manufacturer's specification) so the drawer fits and slides freely.

T16 • Calculations: volume, cost, sheets, finish (3 marks)

Fits: 2016 MC10, 2019 Q13, 2020 Q13, 2021 Q13, 2022 Q13, 2023 Q13 • 193 words • 6 chunks • in the exam write continuous prose: no numbers, no cues

☐ T16.1 • Rule

Always convert mm to metres first, show every line of working, write the unit, and round up whole sheets and lengths.

☐ T16.2 • Volume

Volume (m^3) = $L \times W \times T$ in metres. Example (2016): $10 \text{ boards} \times 5.3 \times 0.25 \times 0.1 = 1.325 \text{ m}^3$; $\times \$100 = \$132.50$.

☐ T16.3 • Linear

Linear metre cost = total length (m) $\times$ \$/m. Example (2022 stool): top $2 \times 0.3 \text{ m} \times \$13.00 = \$7.80$; legs $4 \times 0.2 \times \$7.25 = \$5.80$; rails $4 \times 0.2 \times \$1.95 = \$1.56$; total \$15.16.

☐ T16.4 • Sheets

Sheets: pieces per sheet from the layout; total pieces $\div$ pieces per sheet, then round up. Example (2019): $150 \text{ boxes} \times 5 \text{ pieces} = 750$; 12 per sheet gives 62.5, so 63 sheets.

☐ T16.5 • Finish

Finish: area $\times$ coats $\div$ coverage = litres; $\times$ price. Example (2023): $2.5 \times 1.5 = 3.75 \text{ m}^2 \times 2 \text{ coats} = 7.5 \text{ m}^2 \div 15 \text{ m}^2/\text{L} = 0.5 \text{ L} \times \$45 = \$22.50$.

☐ T16.6 • Cutting list

Cutting list: count each part from the drawing, and remember overhangs. In 2021 the top overhung the frame by 40 mm all round, which adds 80 mm to each dimension. Read the whole description before calculating (NESA 2021 feedback).

Cram sheet: the 40 facts to read on the morning of the exam

Topic	Must-know
Seasoning	Air seasoning: stack on bearers, stickers lined up, roof, weights, end-seal; cheap but slow and only reaches outdoor EMC. Kiln: fast, precise MC, kills insects. EMC = MC where timber neither gains nor loses moisture
Conversion	Quarter-sawn = rings ~90° to face: most stable, ray figure, most waste and cost. Back-sawn = rings parallel to face: cups. Live sawing = straight through, least waste (e.g. pine palings). Burl = abnormal growth
Plywood	Debark, soften, rotary peel , clip, dry, glue, grain at 90° , odd plies, hot press (UF interior / PF exterior), trim, sand. Veneers: rotary, flat/crown, quarter, rift slicing
Boards	Stable, large 2400 × 1200 sheets, uniform, cheap, use waste/thinnings. Wet areas: HMR board or marine ply. Choose E0/E1 low formaldehyde. Disadvantage: swells/delaminates if wet
Bending	Laminate : former, thin strips, dry clamp, UF/epoxy glue, clamp centre-out or vacuum bag, cure, clean up. Steam bending: steam box + strap. Kerf bending: saw kerfs on inside of curve
Joints	Widening: dowel, biscuit, T&G, groove and feather, rebate; alternate growth rings . Framing: mitre, halving, M&T (tenon = 1/3 thickness), bridle, box pin. Carcase: housing (trench 1/3 deep), rebate, dovetail, scribed
Fittings	KD: cam lock, cross dowel, connector bolt, insert, so flat-pack, cheap freight, DIY assembly, CNC-drilled. Mechanical runners for heavy loads and smooth action. Snap-off handle screws give adjustable length
Adhesives	PVA: ready to use, water soluble, interior. Epoxy : waterproof, gap-filling, can be a feature. UF: plywood, rigid, laminating. Resorcinol: exterior/marine. Contact: laminates. Hot melt: temporary
Finishing	Sand, raise grain, sand, finish, buff . Oil-based: amber, durable, slow, smelly, yellows. Water-based: fast, clear, low odour, more coats. Shellac + methyated spirits = French polish, fast drying
Tools	Band saw = curves; table saw = straight rips. Compound mitre = mitre + bevel. Plunge router = stopped cuts. Grind ~25°, hone ~30°. Square = equal diagonals. Thicknesser = reduce thickness. Scraper = internal curves
WHS	WHS Act 2011 (NSW), PCBU duty, SafeWork NSW polices. Hierarchy of control : eliminate, substitute, engineer, admin, PPE. Wood dust is carcinogenic. Lockout/tagout. Recycled timber: hidden nails , lead paint, CCA
Calculations	$m^3 = L \times W \times T$ (m). Finish litres = area × coats ÷ coverage. Sheets: round up . Show every line and unit
Structure	Hierarchical = slow, formal, specialised, consistent QC. Flat = fast, flexible, multi-skilled, low overhead
Technical	Mechanisation (machine + operator, e.g. forklift) vs automation (computer-controlled, CNC). Mass production = cheap, consistent, less custom. Specialisation vs multi-skilling
History	Hand craft, then steam sawmills, then Thonet No. 14 (1859) steam-bent chairs shipped in parts, then electric power tools, then plywood/particleboard/MDF, then flat-pack (IKEA), then CNC + CAD/CAM , then CLT (International House Sydney, 2017)
Environment	Illegal Logging Prohibition Act 2012 (Cth): due diligence. Vic and WA ended native forest logging 1 Jan 2024 . POEO Act 1997 (NSW): EPA licences. FSC / Responsible Wood (PEFC). Nesting, solar, low-VOC finishes, sawdust reuse
Location	Land cost vs transport (near mill vs near city), workforce, neighbours (noise/dust), EIS, resources
Personnel	Fair Work Act 2009 , Timber Industry Award 2020, unions, EEO, redundancy, enterprise agreements. Cert III Cabinet Making apprenticeship (TAFE NSW). Consult + train to beat resistance