Industry Related Manufacturing Technology

Focus Area: Timber Products and Furniture Technologies (Preliminary)

Students learn about:	Students learn to:
Materials *Timber and timber products* • structure: – sapwood – heartwood – earlywood – latewood – cambium layer – growth ring – pith – xylem and phloem – bark – photosynthesis	• describe the growth of trees and identify and recognise the various parts of a tree
• properties and characteristics of hardwoods or softwoods: – figure – grain direction – texture – colour – strength – durability – weight – hardness – weathering	• identify the properties of hardwoods and softwoods and apply them to practical projects • discuss the properties of hardwoods and softwoods and apply them to practical projects
• timber industry terms relating to: – grade – sizes: o timber boards o manufactured boards	• discuss and use timber industry terms in relation to timber sizes and selection • identify the range of sizes of timber boards and manufactured boards and make economical use of them in practical projects
• timber defects – splits – checks – warping – shakes – bowing – knots – twists and winds	
• manufactured boards, their manufacture, properties and use – plywoods – medium density fibreboards (MDF) – particle boards	• apply the properties of manufactured boards and use them in practical projects • describe the range of manufactured boards available

Students learn about:	**Students learn to:**
Fittings and allied materials • hardware – screws – nails – nuts – bolts – knockdown fittings – hinges – handles – knobs – staples/staple guns • other materials – composite materials – glass – metal – polymers – upholstery materials – adhesives	• identify and select appropriate fittings and allied materials to use in practical projects
Processes, tools and machinery *Processes* • planning – sketches – working drawings – materials lists – calculations – costing • preparation of timber – dressing – thicknessing – face – edge • manufacture of individual components as part of a project: – legs – rails – drawers – doors – tops – panels • widening joints – dowelled butt – tongue and groove – rebate – groove and feather – biscuit • framing joints – mitre – halving joints – dowelled – box pin – mortise and tenon joints – bridle joints	• use a broad range of processes through a variety of practical projects • identify and apply appropriate finishes to completed projects • use the appropriate industry processes, where possible, in the production of projects • discuss processes used in industry, appropriate to the practical activities being undertaken, which may not be possible in the school

Students learn about:	**Students learn to:**
• carcase joints – rebate – scribed – dovetail – housing • construction techniques, including: – sawing – drilling – edge treatments – nailing and screwing – sanding – scraping • other construction techniques – turning – carving – inlaying – marquetry – veneering – parquetry and intarsia – laminating – bending – routing • assembly of components, including: – test, fit and check joints – dry cramp – use of cramps – testing for square and flatness • finishing – preparation – staining – filling – oils – finishes (oil and water-based) – shellac – french polish – spray finishes	
Tools and machinery • the use and maintenance of the tools and machinery involved in the processes listed above	• safely and competently use a wide a range of tools and machinery • conduct basic maintenance procedures on tools and machinery • describe tools and machinery used by industry, not available in the school, but appropriate to the practical activities being undertaken

Industry Related Manufacturing Technology

Focus Area: Timber Products and Furniture Technologies (HSC)

Students learn about:	Students learn to:
Materials • terminology associated with the timber industry	• understand and use timber industry terms when selecting and using timber and timber products for the Major Project
• timber recovery and conversion – sawing: o live o quarter o back – flitches and burls – stability – seasoning: o air o kiln – equilibrium moisture content (EMC)	• describe how timber is recovered and converted into boards • select the most appropriate timber boards and apply them to the Major Projects
• timber selection considerations – plantation timbers – exotic timbers – recycling/reusing timbers – 'green' timbers – economical usage/waste minimisation – environmental issues/pollution – sustainability – WHS issues	• describe the considerations and issues related to selecting appropriate timbers for the Major Project • describe and apply principles of economical use, sustainability, plantation and 'green' timbers, minimising waste and pollution • apply the considerations and issues related to selecting appropriate timbers to the Major Project
• manufactured boards – construction and manufacture, veneers, plywood, particle board, fibre boards, block and lamiboards – glues – environmental/WHS issues	• describe the cutting of veneers • describe the manufacture of various boards • select and use the most appropriate manufactured boards • discuss the environmental issues related to the manufacture, use and disposal of manufactured boards
Fittings and allied materials • hardware and fittings – screws – nails – nuts – bolts – knockdown fittings – hinges – handles – knobs – staples/staple guns – drawer runners – table clips – latches – catches – shelf hangers	• select and competently use the most appropriate hardware items in the Major Project

Students learn about:	**Students learn to:**
• additional materials applied to timber and timber-based projects – glass – metal – polymers – upholstery materials – composite materials	• describe additional materials and their application in timber projects • competently use and justify the selection of the most appropriate additional materials in the Major Project
• adhesives: – PVA – epoxy resin – hot melt – urea-formaldehyde – resorcinol – contact	• competently use and justify the selection of the most appropriate adhesives in the Major Project
Processes, tools and machinery *Processes*	
• planning – sketches – working drawings – materials lists – calculations – costing	• plan the Major Project thoroughly before commencing construction, using appropriate planning techniques
• preparation of timber – dressing – thicknessing – face – edge	• identify and use appropriate preparation techniques for the Major Project
• manufacturing individual components as part of a project – legs – rails – drawers – doors – tops – panels	• select and construct component parts of a project using appropriate techniques
• widening joints – dowelled butt – tongue and groove – rebate – groove and feather – biscuit	• select and construct appropriate widening joints for the Major Project
• framing joints – mitre – halving joints – dowelled – box pin – mortise and tenon joints – bridle joints	• select and construct appropriate framing joints for the Major Project

Students learn about:	**Students learn to:**
• carcase joints – rebate – scribed – dovetail – housing	• select and construct appropriate carcase joints for the Major Project
• construction techniques, including: – sawing – drilling – edge treatments – nailing and screwing – sanding – scraping	• select and use construction techniques appropriate for timber projects
• other construction techniques – turning – carving – inlaying – marquetry – veneering – parquetry and intarsia – laminating – bending – routing	• identify, select and use other techniques to construct the Major Project as appropriate
• construction techniques using manufactured boards – economical sheet layout – cutting sheet material – handling sheet material – assembly of components	• select and use construction techniques appropriate for manufactured boards • describe and sketch different parts of the assembly process and explain their importance
• assembly of components, including: – test, fit and check joints – dry cramp – use of cramps – testing for square and flatness	• select and apply assembly techniques suitable to the Major Project
• finishing – preparation, staining, filling, oils, finishes (oil and water-based), shellac, french polish, spray finishes – environmental issues associated with finishing – industrial processes	• select and apply finishing techniques suitable to the Major Project as appropriate • identify the environmental issues relating to the use, application and cleaning up of finishes

Students learn about:	**Students learn to:**
Tools and machinery • the use and maintenance of the tools and machinery involved in the processes listed above • tools and machinery used in industry that are not available in the school	• use appropriate machines to complete the Major Project • use tools and machinery safely and correctly • recognise the need for, and perform, maintenance procedures on tools and machinery as required • describe tools and machinery used by industry, not available in the school, but appropriate to the Major Project • outsource appropriate expertise where necessary to complement personal practical skills to complete the Major Project