Building and Construction Skills 2019 v1.0

Sample module of work

Module 3: Residential homes — Tiling and carpentry

Overview

Module 3: Residential homes — Tiling and carpentry
Module description This module builds on prior learning of industry practices and construction processes used in the safe creation of quality structures. Trades are sequenced to efficiently and competitively create quality structures using construction processes that recognise industry costs, price, competition and customer expectations of value. **Time allocation** 55 hours

Elective/s	Underpinning factors
• Carpentry • Concreting • Tiling	☒ Applied learning ☒ Community connections ☒ Core skills for work ☒ Literacy ☒ Numeracy

Assessment

Assessment number	Assessment description	Technique and mode	Assessment conditions	Dimensions and objectives
5	Demonstrate tiling skills and procedures to complete a tiled wet area from specifications. (Visual evidence is collected through annotated photographs or teacher observations annotated on the instrument-specific standards.)	Practical demonstration	• Individual response • A set period of in-class time (approx. 10 hrs)	• Knowing and understanding – demonstrate fundamental construction skills – interpret drawings and technical information • Analysing and applying – select and apply construction skills and procedures in construction tasks – use visual representations and language conventions and features to communicate for particular purposes • Producing and evaluating – plan and adapt construction processes – create structures from specifications – evaluate industry practices, construction processes and structures, and make recommendations
6	In teams, plan and construct a simulated section of a residential room. This includes laying a concrete slab, framing and sheeting a timber stud wall from detailed drawings and technical information.	Project	• Multimodal component — non-presentation Digital portfolio (photographic production journal with annotations) Individual response. Maximum: 8 A4 pages (or equivalent) • Product component — Simulated section of a residential room. Scope of work assigned to individual students.	• Knowing and understanding – describe industry practices in construction tasks – demonstrate fundamental construction skills – interpret drawings and technical information • Analysing and applying – analyse construction tasks to organise materials and resources – select and apply construction skills and procedures in construction tasks – use visual representations, language conventions and features to communicate for particular purposes • Producing and evaluating – plan and adapt construction processes – create structures from specifications – evaluate industry practices, construction processes and structures, and make recommendations

Teaching and learning sequence

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
3 hours	**Core topic 1 — Building and construction enterprises** Building and construction enterprises are important to the economy of Australia and employ a broad range of people in many different occupations (C1.1).	• overview of building and construction enterprises and their contribution to the economy • organisational structure of building and construction workplaces • career options and pathways	**Module orientation** Introduce the module, outline learning goals and success criteria and link the module to prior learning. Organise an excursion/guest speaker to present information about the project builder profession in the building and construction industry, including career pathways; construction skills and processes; current workplace, health and safety procedures; cost of structures and quality expectations. Students: • use appropriate industry terminology when working on construction tasks • discuss class protocols and relate these to industry workplace health and safety procedures, selection and maintenance of tools and storage of stock and product • identify and describe the roles, responsibilities and sequence of different trades involved in construction projects for a project builder (including employees, contractors and subcontractors), e.g. plumber, electrician, tiler, plasterer, carpenter, concreter • develop a list of personal protective equipment (PPE) required when undertaking a variety of construction tasks in the construction industry • describe building standards and safe work procedures related to constructing wall frames and concreting • identify different types of plans, specifications and drawings used in the residential sector of the industry • describe build quality and customer expectations and the range of new home prices • analyse the impact of building codes and standards on construction projects • discuss the role of the building certifier when undertaking approvals and inspections • discuss and practise skills of communicating and working in teams and the

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
	Core topic 1 — Workplace health and safety Workplace health and safety legislation, rules and procedures must be followed in building and construction industry workplaces (C1.2).	• employer and employee responsibilities, rights and obligations under the *Work Health and Safety Act 2011* • industry-specific requirements • risk assessments to identify hazards • safe working practices and procedures	importance of teamwork in residential construction.
2 hours	**Core topic 1 — Workplace health and safety** Workplace health and safety legislation, rules and procedures must be followed in building and construction industry workplaces (C1.2).	• industry-specific requirements • risk assessments to identify hazards • safe working practices and procedures	**Skill development** Revise relevant construction skills and procedures. Describe, explain and demonstrate safe operating procedures for tools and machinery to construct a timber concrete float as a skill exercise. Students: • identify tools and apply procedures appropriate for marking and cutting to construct a timber concrete float • apply and demonstrate standard operating procedures (SOP) for each power tool/machine, analysing a range of risks associated with each power tool/machine and considering the hierarchy of hazard control and the safety of working with the power tool/machine • analyse efficient cutting layout (numeracy exercise), i.e. efficiency of breaking down materials, possible waste associated with materials and the economic benefits of waste minimisation.
	Core topic 2 — Tools Tools have specific functions and are selected and safely operated for particular procedures (C2.2).	• identification, safety and maintenance of tools and machinery • marking-out procedures and skills using relevant tools • cutting procedures and skills using relevant tools • joining procedures and skills using relevant tools	

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
1 hour	**Core topic 1 — Building and construction enterprises** Building and construction enterprises are important to the economy of Australia and employ a broad range of people in many different occupations (C1.1).	• organisational structure of building and construction workplaces	**General technical knowledge** Explain and demonstrate interpretation and analysis of house plans, highlighting aspects such as symbols, abbreviations, measurements, elevations, site plans, sectional views and how they are used to determine construction task requirements, e.g. materials, tools, quantities. Revise relevant mathematical formulas such as linear equations, area, volume, and Pythagorean theorem. Provide feedback to students about the quality of their analysis, evaluation and recommendations in relation to construction task requirements and the application of mathematical formulas. Students: • use provided house plans to interpret symbols, abbreviations, measurements, elevations, site plans, sectional views and their use to determine construction task requirements, e.g. materials, tools, quantities • analyse house plans to determine concrete requirements, e.g. type of concrete, amount required, type of reinforcing, required MPa strength (metric unit for pressure or stress for compressive strength) • apply formulas such as linear equations, area, volume and Pythagorean theorem by completing numeracy exercises • complete an evaluation with recommendations and record potential future improvements for the construction task.
	Core topic 2 — Specifications Specifications are communicated through industry-specific drawings and technical information (C2.1).	• interpretation of sketches and technical drawings • technical information accessed from charts, manuals, tables and books	

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
2 hours	**Core topic 2 — Specifications** Specifications are communicated through industry-specific drawings and technical information (C2.1).	• interpretation of sketches and technical drawings • technical information accessed from charts, manuals, tables and books	**Revision of measuring and levelling** Lead a discussion about the importance and types of measurements and levelling required in industry building and construction. Demonstrate relevant mathematical formulas and levelling techniques required in a range of construction tasks, such as concreting, framing and tiling. Students: • demonstrate taking measurements, calculating using mathematical formulas (such as addition, subtraction and Pythagorean theorem) and converting decimals to fractions across various numeracy exercises • apply levelling skills by transferring levels, recording height differences, and checking accuracy using the following techniques – a spirit level and straight edge – levelling with water – laser levelling – optical levelling • check the accuracy of levelling equipment, e.g. conduct a two-peg test with an automatic level to confirm the instrument meets manufacturing tolerances.
	Core topic 2 — Tools Tools have specific functions and are selected and safely operated for particular procedures (C2.2).	• identification, safety and maintenance of tools and machinery • marking-out procedures and skills using relevant tools • preparing procedures and skills using relevant tools and equipment	
2 hours	**Core topic 1 — Building and construction enterprises** Building and construction enterprises are important to the economy of Australia and employ a broad range of people in many different occupations (C1.1).	• organisational structure of building and construction workplaces • career options and pathways.	**Concreting** Revise relevant concreting skills and processes, such as • constructing formwork for concreting • preparing, mixing and pouring concrete • finishing off — screeding, floating, edging, expansion joints, surface finish • clean-up — choosing equipment and materials considering environmental requirements and controls

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
	Core topic 1 — Workplace health and safety Workplace health and safety legislation, rules and procedures must be followed in building and construction industry workplaces (C1.2).	• industry-specific requirements • risk assessments to identify hazards • safe working practices and procedures	Explain the variety of approaches to foundations and concrete slabs used by project builders, including engineering and costs. Discuss what should be included in the production plan for a construction task. Provide feedback to students about the quality of their analysis, evaluation and recommendations for the production plan. Students, in pairs: • analyse and adapt the production plan for a construction task (e.g. laying a slab, making concrete pavers) to include the following – description of the tasks and job for each student, including project foreman or forewoman – description of required workplace health and safety, hazards, risks and safe work practices – interpretation of specifications from drawings, notes and descriptions – interpretation of finishes and tolerances identified from the project specifications – organisation of materials, tools and equipment required to complete the construction task • set out the site — slab position, site boundaries • prepare the foundations — level, grade, base compacting • set up boxing — measure, position and level slab; prepare and reinforce (water barrier, reo, chairs) • prepare, mix and pour concrete • apply a finish — screed, float, edge, expansions joints, surface finish • clean up equipment and materials, considering environmental requirements and controls, e.g. washing off concrete • clean-up site — remove boxing, excess materials, rubbish, barriers and fencing • evaluate and make recommendations to suggest improvements and/or alternatives to the production plan.
	Core topic 2 — Specifications Specifications are communicated through industry-specific drawings and technical information (C2.1).	• interpretation of sketches and technical drawings • technical information accessed from charts, manuals, tables and books	
	Core topic 2 — Tools Tools have specific functions and are selected and safely operated for particular procedures (C2.2).	• identification, safety and maintenance of tools and machinery • marking-out procedures and skills using relevant tools • preparing procedures and skills using relevant tools and equipment • cutting procedures and skills using relevant tools • joining procedures and skills using relevant tools • finishing procedures and skills using relevant tools	

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
	Core topic 2 — Materials Materials are selected and safely manipulated based on industry-specific applications (C2.3).	• types of materials • properties of materials • sections, shapes and sizes of products • logistics • industry applications and manipulation procedures • consumables • safety data sheets	
2 hours	**Core topic 1 — Workplace health and safety** Workplace health and safety legislation, rules and procedures must be followed in building and construction industry workplaces (C1.2).	• industry-specific requirements • risk assessments to identify hazards • safe working practices and procedures	**Framing a simulated wall with a window** Lead a class activity to build the framing for a simulated wall with a window, using relevant construction skills and procedures. Provide feedback to students about the quality of the frame. Students, in pairs: • discuss job descriptions and tasks for each student, including the project foreman • interpret specifications identified from drawings, notes and descriptions to determine dimensions and required materials • demonstrate established safety rules and regulations to maintain a safe and clean environment • describe the selection of timber required for framing the simulated wall with window • demonstrate measuring and marking using tools such as squares, measuring tape, spirit level, pencil and marking gauge, and analyse the most effective way to safely mark out to increase efficiency and minimise waste • shape or cut materials to specified measurements using hand tools, machines, or power saws, and analyse the most effective tool, machine or power saw to use • assemble and fasten materials together using hand tools and wood screws, nails, dowel pins or glue
	Core topic 2 — Specifications Specifications are communicated through industry-specific drawings and technical information (C2.1).	• interpretation of sketches and technical drawings • technical information accessed from charts, manuals, tables and books	
	Core topic 2 — Tools Tools have specific functions and are selected and safely operated for particular procedures (C2.2).	• identification, safety and maintenance of tools and machinery • marking-out procedures and skills using relevant tools • preparing procedures and skills using relevant tools and	

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
		equipment • cutting procedures and skills using relevant tools • joining procedures and skills using relevant tools • finishing procedures and skills using relevant tools	• install a window using hand or power tools • evaluate and make recommendations to suggest improvements and/or alternatives for construction skills and procedures used when framing a wall with a window.
	Core topic 2 — Materials Materials are selected and safely manipulated based on industry-specific applications (C2.3).	• types of materials • properties of materials • sections, shapes and sizes of products • logistics • industry applications and manipulation procedures • consumables • safety data sheets	
30 hours	**Core topic 1 — Personal and interpersonal skills** Personal and interpersonal skills, including teamwork and communication skills, are essential for effective participation in building and construction workplaces (C1.3).	• work-readiness skills • teamwork in the workplace • workplace communication using industry-specific terminology including written, graphical, verbal and non-verbal	**Assessment 5: Simulated section of a residential room** **Project — Carpentry and Concreting electives** Introduce the assessment task and clarify the group work component. Provide a house plan that details the section of wall to be constructed. Lead discussion of the assessment standards, including where evidence of individual student achievement will be found in the product and multimodal components. Organise students into groups. Provide class time for the construction of the product and the multimodal component.

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
	Core topic 1 — Workplace health and safety Workplace health and safety legislation, rules and procedures must be followed in building and construction industry workplaces (C1.2).	• industry-specific requirements • risk assessments to identify hazards • safe working practices and procedures	Describe, explain and demonstrate safe operating procedures for tools and machinery. Monitor students' use of tools and machinery. Give feedback to students on drafts, including proposed use of tools, machinery, materials and construction procedures. Students: • using a provided house plan, work in teams of four to plan and construct a simulated section of a new residential dwelling. This includes laying a concrete slab and framing and sheeting a timber stud wall • compile an individual digital portfolio throughout the construction of the concrete slab and frame that includes – organisation of materials, tools and time including a cost estimate – a step-by-step plan that analyses the construction process – photographs and sketches with annotations of the construction sequence that communicate the individual student's production role. Photographs/sketches should clearly show the construction procedures selected and used – evaluation processes that test and check that the concrete slab and frame matches the house plan – recommendations for improvements and/or alternatives to the construction processes used • construct a concrete slab and a framed and sheeted timber stud wall with a window opening from house plans. This involves – demonstrating safe concreting and carpentry skills and procedures – identifying safety requirements and maintenance of tools and machinery – marking-out procedures and skills using relevant tools – preparing procedures and skills using relevant tools and equipment – cutting procedures and skills using relevant tools – joining procedures and skills using relevant tools
	Core topic 2 — Specifications Specifications are communicated through industry-specific drawings and technical information (C2.1).	• interpretation of sketches and technical drawings • technical information accessed from charts, manuals, tables and books	
	Core topic 2 — Tools Tools have specific functions and are selected and safely operated for particular procedures (C2.2).	• identification, safety and maintenance of tools and machinery • marking-out procedures and skills using relevant tools • preparing procedures and skills using relevant tools and equipment • cutting procedures and skills using relevant tools • joining procedures and skills using relevant tools • finishing procedures and skills using relevant tools	

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
	Core topic 2 — Materials Materials are selected and safely manipulated based on industry-specific applications (C2.3).	• types of materials • properties of materials • sections, shapes and sizes of products • industry applications and manipulation procedures • consumables • safety data sheets	– finishing procedures and skills using relevant tools • interpret house plans to create structures • organise materials and resources • select and apply construction skills and procedures to create structures • plan and adapt construction processes to ensure a quality product is constructed on time and to the plan specifications • use industry terminology and language to communicate the skills used to construct the simulated room.
	Core topic 1 — Product quality The quality of structures depends on customer expectations of value, which affects and industry construction processes (C1.4).	• quality standards of buildings and other structures are derived from customer expectations of value based on factors such as needs, trends, budget, covenants and competition • structures are constructed to predefined specifications that detail the expected quality standards • building and construction enterprises make decisions about construction processes that affect quality based on a range of factors	

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
2 hours	**Core topic 1 — Workplace health and safety** Workplace health and safety legislation, rules and procedures must be followed in building and construction industry workplaces (C1.2).	• industry-specific requirements • risk assessments to identify hazards • safe working practices and procedures	**The role of a subcontractor (tiler)** Lead a class activity and discussion about the requirements for working as a tiling subcontractor for a project builder, including role description, costs, quality expectations, payment process and taxation. Introduce the construction task of sheeting and tiling a simulated wet area. Provide feedback to students about the quality of their demonstrated construction skills and procedures in relation to sheeting and tiling. Students: • take notes and describe the role of a tiling subcontractor – complete a plus–minus–interesting (PMI) chart on what it might be like working as a contract tiler for a project builder • discuss established safety rules and regulations to maintain a safe and clean environment • demonstrate cutting of wall sheeting, lifting and positioning panels and fixing them to walls using nails, screws or glue • measure walls and floor areas to calculate quantities of tiles • identify safe handling and appropriate disposal of preparatory and undercoating materials and other hazardous materials • analyse and organise a production plan for plastering and tiling a simulated wall • use communication skills and identify the importance of teamwork • evaluate a tiled wall using supervisor's instructions and make recommendations for improvements.
	Core topic 2 — Specifications Specifications are communicated through industry-specific drawings and technical information (C2.1).	• interpretation of sketches and technical drawings • technical information accessed from charts, manuals, tables and books	
	Core topic 2 — Tools Tools have specific functions and are selected and safely operated for particular procedures (C2.2).	• identification, safety and maintenance of tools and machinery • marking-out procedures and skills using relevant tools • preparing procedures and skills using relevant tools and equipment • cutting procedures and skills using relevant tools • joining procedures and skills using relevant tools • finishing procedures and skills using relevant tools	

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	Core concepts and ideas	Knowledge, understanding and skills	
	Core topic 2 — Materials Materials are selected and safely manipulated based on industry-specific applications (C2.3).	• types of materials • properties of materials • sections, shapes and sizes of products • logistics • industry applications and manipulation procedures • consumables • safety data sheets	
10 hours	**Core topic 1 — Personal and interpersonal skills** Personal and interpersonal skills, including teamwork and communication skills, are essential for effective participation in building and construction workplaces (C1.3).	• work-readiness skills • teamwork in the workplace • workplace communication using industry-specific terminology including written, graphical, verbal and non-verbal	**Assessment 6: Tiled wet area** **Practical demonstration — Carpentry and Tiling electives** Introduce the assessment task. Provide technical information and details about the tiled wet area. Lead discussion of the assessment standards, including where evidence of individual student achievement will be found in the product. Provide class time for the construction of the tiled wet area. Describe, explain and demonstrate safe operating procedures for tools and machinery. Monitor students' use of tools and machinery. Give feedback to students on the tiled wet area, including proposed use of tools, machinery, materials and construction procedures. Students: • interpret specifications from a supervisor's verbal and written instructions and sketches • construct a tiled wet area. This involves – demonstrating safe tiling and carpentry skills and procedures – identifying safety requirements and maintenance of tools and machinery – marking-out procedures and skills using relevant tools – preparing procedures and skills using relevant tools and equipment – cutting procedures and skills using relevant tools – joining procedures and skills using relevant tools
	Core topic 1 — Workplace health and safety Workplace health and safety legislation, rules and procedures must be followed in building and construction industry workplaces (C1.2).	• industry-specific requirements • risk assessments to identify hazards • safe working practices and procedures	
	Core topic 2 — Specifications Specifications are communicated through industry-specific drawings and technical information (C2.1).	• interpretation of sketches and technical drawings • technical information accessed from charts, manuals, tables and books	

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
	Core topic 2 — Tools Tools have specific functions and are selected and safely operated for particular procedures (C2.2).	• identification, safety and maintenance of tools and machinery • marking-out procedures and skills using relevant tools • preparing procedures and skills using relevant tools and equipment • cutting procedures and skills using relevant tools • joining procedures and skills using relevant tools • finishing procedures and skills using relevant tools	– finishing procedures and skills using relevant tools • select and apply construction skills and procedures to create structures • use industry terminology and language to communicate the skills used to construct the structure • plan and adapt construction processes to ensure a quality product is constructed on time and to the plan specifications • create a tiled wet area to specifications • evaluate industry practices and construction processes used to create the tiled wet area • recommend possible improvements for the tiled wet area.
	Core topic 2 — Materials Materials are selected and safely manipulated based on industry-specific applications (C2.3).	• types of materials • properties of materials • sections, shapes and sizes of products • logistics • industry applications and manipulation procedures • consumables • safety data sheets	
	Core topic 1 — Product quality The quality of structures depends on customer expectations of value, which affects and industry construction processes (C1.4).	• structures are constructed to predefined specifications that detail the expected quality standards	

Notional hours	Core topics		Learning experiences
	Core concepts and ideas	Knowledge, understanding and skills	
1 hour	**Core topic 1 — Building and construction enterprises** Building and construction enterprises are important to the economy of Australia and employ a broad range of people in many different occupations (C1.1).	• overview of building and construction enterprises and their contribution to the economy • organisational structure of building and construction workplaces • career options and pathways.	**Reflection** Lead a discussion, revisit learning goals and success criteria and link the module to future learning. Display all the simulated sections of a residential room in the construction space and invite students to inspect the products as potential customers. Demonstrate the expected quality standards of the final product and revisit the predefined specifications. Students: • use appropriate industry terminology when inspecting products • discuss class protocols and relate protocols to industry workplace health and safety procedures, maintenance of tools and storage of stock and products • identify and describe power tools/machinery used in the simulated construction product in terms of their function, reasons for use, required safety and maintenance • compare product quality of the simulated construction product against industry standards and discuss the needs of customers • describe the materials used in simulated construction for suitability, availability and cost • analyse and evaluate the simulated construction and consider the advantages and disadvantages of these materials in relation to the manufacturer's specifications and the consumer's requirements.
	Core topic 1 — Personal and interpersonal skills Personal and interpersonal skills, including teamwork and communication skills, are essential for effective participation in building and construction workplaces (C1.3).	• work-readiness skills • teamwork in the workplace • workplace communication using industry-specific terminology including written, graphical, verbal and non-verbal	