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# **Construction and Carpentry 10, 20, 30**

## **Curriculum Guide**

### **A Practical and Applied Art**

**Saskatchewan Education**  
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## Introduction

Within Core Curriculum, the Practical and Applied Arts (PAA) is a major area of study that incorporates five traditional areas of Home Economics Education, Business Education, Work Experience Education, Computer Education, and Industrial Arts Education. Students must have two credits from PAA and/or Arts Education in order to graduate from secondary school in Saskatchewan. Saskatchewan Education, its educational partners, and other stakeholders have collaborated to complete the PAA curriculum renewal. Some PAA curriculum guides have been updated; some components have been integrated, adapted, or deleted; some Locally Developed Courses have been elevated to provincial status; and some new guides have been developed.

A companion *Practical and Applied Arts Handbook* provides background on Core Curriculum philosophy, perspectives, and initiatives. The Handbook articulates a renewed set of goals for PAA. It presents additional information about the PAA area of study, including guidelines about work study, the survey approach, extended survey, and related Transition-to-Work dimensions. In addition, a PAA Information Bulletin provides direction for administrators and others regarding the implementation of PAA courses. Lists of recommended resources for all guides will be compiled into a PAA Bibliography with periodic updates.

## Philosophy and Rationale

The *Construction and Carpentry Curriculum Guide* is designed to create an appreciation of the industry and to develop entry level skills within the construction industry. Opportunities to develop skills for personal use and to make a smooth transition from school to the workplace or post-secondary institutions will be presented to students enrolled in these courses.

The Construction and Carpentry courses are designed to provide the Level I apprenticeship theory content within the trade. Practical experience may be gained within the school, as well as through optional work study modules that may include using community resources under the guidance of an accredited or journeystatus instructor or mentor.

## Aim, Goals, and Foundational Objectives

### Aim

The *Construction and Carpentry Curriculum Guide* will create an awareness of opportunities within approximately twenty trade areas that comprise the construction industry. This guide incorporates new developments and practices related to computer software, flooring and truss systems, sound proof construction, workplace safety, and machine fastening systems.

### Goals

**Personal Skills:** To develop practical skills for personal use and to enhance employment opportunities.

**Awareness:** To foster an awareness of the impact of construction technologies on society today.

**Communication:** To enhance communication skills and students' ability to read and to interpret building plans and related documents within the construction trade.

**Career and Employment:** To help students explore career and personal pathways.

**Personal Development:** To enhance self-esteem through success with the equipment, materials and techniques used.

**Mathematics:** To practise applications of mathematical computations used in the construction industry.

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**Health and Safety:** To follow acceptable health and safety procedures in the classroom and work environment.

### **Foundational Objectives**

Foundational objectives are the major, general statements that guide what each student is expected to achieve for the modules of the PAA curriculum guide. Foundational objectives indicate the most important knowledge, skills, attitudes/values, and abilities for a student to learn in a subject. Content foundational objectives include:

- To create an awareness about building code requirements, as applied to residential construction.
- To use construction industry terminology in context.
- To be knowledgeable of basic construction concepts and technologies.
- To develop safe and knowledgeable use of hand and power tools in the construction industry.
- To increase self-esteem from success with the equipment, materials and techniques used.
- To develop skills in the use of equipment and materials common to the construction industry.
- To handle, use, and dispose of materials safely.
- To demonstrate knowledge of different building materials and their applications in the construction industry.
- To identify post-secondary program opportunities in the construction industry.
- To be knowledgeable about the impact of new technologies in the construction industry.
- To become aware of the variety of jobs and career opportunities in the construction trades.
- To create an awareness of apprenticeship programs and opportunities in Saskatchewan.

### **Common Essential Learnings (CELS)**

The incorporation of the Common Essential Learnings (CELS) into the instruction and assessment of the Practical and Applied Arts (PAA) curriculum offers many opportunities to develop students' knowledge, skills, and abilities. The purpose of the CELs is to assist students with learning concepts, skills, and attitudes necessary to make the transition to career, work, and adult life.

The CELs also establish a link between the Transition-to-Work dimensions and the Practical and Applied Arts curriculum content. The Transition-to-Work dimensions included in the PAA courses are: apprenticeship, career development, community project(s), employability skills, entrepreneurial skills, occupational skills, personal accountability, processing of information, teamwork, and work study/experience.

Throughout the PAA curricula, the CELs objectives are stated and coded as follows:

COM	=	Communication
NUM	=	Numeracy
CCT	=	Critical and Creative Thinking
TL	=	Technological Literacy
PSVS	=	Personal and Social Values and Skills
IL	=	Independent Learning

It is anticipated that teachers will find additional ways to incorporate the CELs into their classroom instruction.

All of the subject and CELs Foundational Objectives are stated explicitly at the beginning of each module.

## **Course Components and Considerations**

Teachers need to determine the material and equipment needs for each module and then take an inventory of the resources available at the school and in the community before choosing the modules that they will teach. A work study module is highly recommended. It is difficult to provide in a school setting experiences

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that are representative of the wide range of materials, equipment and technologies encountered in the construction industry.

Construction and Carpentry 10 provides students with the introductory level skills necessary in the industry using theory and practice that allows students to develop skills using practical projects. Introductory modules that have been covered at the Middle Level need only be reviewed to emphasize safety considerations.

Construction and Carpentry 20 and 30 permits students to expand their knowledge based on the previous level and to provide advanced project work and an optional work study component.

The Extended Study module(s) and Survey course configurations are possible options for PAA courses. For further information consult the *Practical and Applied Arts Handbook*.

### **Recommended Drafting and Computer-Aided Design Modules**

The ability to interpret drawings is a fundamental skill for people working in construction and related industries. It is recommended that students complete modules from the Drafting Guide. The suggested time for the modules imported into this guide from the *Drafting and Computer-Aided Design 10, 20, 30 Guide* has been adjusted. If students do not have the opportunity to take a drafting course, then drafting modules should be incorporated into the Construction and Carpentry courses. The following modules are recommended for study from *Drafting and Computer-Aided Design Guide*, but are not required for Construction Level I apprenticeship articulation.

Module 1: Computer-Aided Drafting Basics (10 to 20 hrs) or Module 2: Basic Manual Drawing Tools and Procedures (5 to 15 hrs)

Module 3: Sketching and Freehand Drawing Fundamentals (5 - 10 hrs)

Module 6: Basic Dimensioning (5 - 10 hrs)

Module 12: Working Drawings (5 - 10 hrs)

Module 13: Floor Plans (5 - 10 hrs)

Module 14: Foundation Plans (5 - 10 hrs)

Module 15: Wall Sections (5 - 10 hrs)

Module 16: Elevations (5 - 10 hrs)

Module 29: Surveying (5 -10 hrs)

Module 31: Reading Technical Documents (2 - 5 hrs)

### **Required Welding Module**

(for purposes of articulation)

Module 5: Oxy-Acetylene Start-up, Shut-down and Cutting (2 - 4 hrs)

### **Work Study**

Work Study provides students with opportunity to enhance personal skills and to develop skills using industry equipment and standards not available in a school setting. Refer to the Work Study Guidelines, a section of the *Practical and Applied Arts Handbook* and the *Work Experience Education Guide* (1989), for information on required and best practices for student preparation, employer partnerships, and teacher responsibilities.

Note: the *Work Experience Education Guidelines* are being renewed as the *Career and Work Exploration Curriculum Guide*.

### **Resources**

To support the principle of Resource-based Learning a variety of instructional resources have been evaluated and

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recommended to support the teaching and learning of Construction and Carpentry. See the initial list for Construction and Carpentry 10, 20, 30 that will eventually be compiled into a PAA bibliography.

Teachers should also check the department's Learning Resources Distribution Centre (LRDC) catalogue. An on-line ordering service is available.

The on-line version of this Guide is accessible at [www.sasked.gov.sk.ca/docs/paa.html](http://www.sasked.gov.sk.ca/docs/paa.html). It will be "Evergreened", as appropriate.

## Assessment and Evaluation

Student assessment and evaluation is an important part of teaching as it allows the teacher to plan and adapt instruction to meet the specific needs of each student. It also allows the teacher to discuss the current successes and challenges with students and report progress to the parent or guardian. It is important that teachers use a variety of assessment and evaluation strategies to evaluate student progress. Additional information on evaluation of student achievement can be found in the Saskatchewan Education documents entitled *Student Evaluation: A Teacher Handbook*, 1991, and *Curriculum Evaluation in Saskatchewan*, 1991.

It is important that the teacher discuss the evaluation strategies to be used in the course, when the evaluation can be expected to occur, the weighting of each evaluation strategy, and how it relates to the overall student evaluation. The weighting of the evaluation should be determined in relation to the amount of time spent and emphasis placed on each area of the course, as suggested in the modules of the curriculum guide.

The *Construction and Carpentry 10, 20, 30 Curriculum Guide* suggests many opportunities for teachers to use a variety of instructional and evaluation strategies. Assessment tools useful for teaching are included in the *Practical and Applied Arts Handbook*. The checklists and templates for general student skills and work experiences are included for teachers to adapt and use. Industry specific skills are reflected in the training plan (Appendix B).

A sample evaluation scheme for a course appears below:

Written Tests	15%
Time Management and Planning Tasks	15%
Project Work	40%
Assignments	20%
Class Presentations	10%

Note: if an optional Work Study module (25 hours minimum) is used, it should reflect 25% of the mark.

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## Module Overview

Module Code	Modules	Suggested Time (hours)
CONS01	Module 1: Introductory Safety (Core)	5-8
CONS02A	Module 2A: Introductory Wood Theory (Core)	5-8
CONS02B	Module 2B: Intermediate Wood Theory (Core)	3-5
CONS02C	Module 2C: Advanced Wood Theory (Core)	3-5
CONS03	Module 3: Lay Out and Hand Tools (Core)	5-10
CONS04A	Module 4A: Portable Power Tools (Core)	5-8
CONS04B	Module 4B: Advanced Portable Power Tools (Core)	5-8
CONS05A	Module 5A: Stationary Power Tools (Core)	5-8
CONS05B	Module 5B: Advanced Stationary Power Tools (Core)	5-8
CONS06A	Module 6A: Introductory Wood Projects (Optional)	25-50
CONS06B	Module 6B: Intermediate Wood Projects (Optional)	25-50
CONS06C	Module 6C: Advanced Wood Projects (Optional))	25-50
CONS07	Module 7: Concrete, Components, and Mixing (Core)	5-10
CONS08	Module 8: Fasteners and Adhesives (Core)	2-6
CONS09	Module 9: Project Finishing (Optional)	5-10
CONS10	Module 10: Construction and Careers (Core)	2-6
CONS11A, B	Module 11A, B: Work Study Preparation and Follow-up Activities (Optional)	5-10
CONS12A, B	Module 12A, B: Work Study (Optional)	25-50
CONS13	Module 13: Structural Framing and Sheathing (Core)	10-15
CONS14	Module 14: Workshop and Construction Site Safety (Core)	5-10
CONS15A	Module 15A: Roof Framing (Optional)	10-15
CONS15B	Module 15B: Advanced Roof Framing (Optional)	10-15
CONS15C	Module 15C: Roofing Materials and Installation (Optional )	2-7
CONS16	Module 16: Concrete Foundations and Finishing (Core)	2-5
CONS17	Module 17: Interior and Exterior Finishing (Optional)	10-15
CONS18	Module 18: Stair Framing (Optional)	10-15
CONS19	Module 19: Insulation and Installation (Optional)	5-10
CONS20	Module 20: Building Lay Out (Core)	10-15
CONS21A	Module 21A: Introductory Cabinet Making (Optional)	10-15
CONS21B	Module 21B: Cabinet Making: Doors and Drawers (Optional)	10-15

## Suggested Course Configurations

Module Code	Suggested Modules	Suggested Time (hours)
<b>Construction and Carpentry 10</b>		
CONS01	Module 1: Introductory Safety (Core)	5-8
CONS02A	Module 2A: Introductory Wood Theory (Core)	5-8
CONS03	Module 3: Lay Out and Hand Tools (Core)	5-10
CONS04A	Module 4A: Portable Power Tools (Core)	5-8
CONS05A	Module 5A: Stationary Power Tools (Core)	5-8
CONS06A	Module 6A: Introductory Wood Projects (Optional)	25-50
CONS07	Module 7: Concrete, Components, and Mixing (Core)	5-10
CONS08	Module 8: Fasteners and Adhesives (Core)	2-6
CONS09	Module 9: Project Finishing (Optional)	5-10
CONS10	Module 10: Construction and Careers (Core)	2-6
CONS21A	Module 21A: Introductory Cabinet Making (Optional)	10-15
DRAF01 or DRAF02	Module 1 or 2: CAD Basics or Manual Drawing Tools and Procedures (Optional)	5-15 or 10-20
DRAF03	Module 3: Sketching and Freehand Drawing Fundamentals (Optional)	5-10
DRAF06	Module 6: Dimensioning (Optional)	5-10
	<b>Minimum</b>	100
<b>Construction and Carpentry 20</b>		
CONS01	Module 1: Introductory Safety (Core)	Review-5
CONS04B	Module 4B: Advanced Portable Power Tools (Core)	5-8
CONS05B	Module 5B: Advanced Stationary Power Tools (Core)	5-8
CONS06B	Module 6B: Intermediate Wood Projects (Optional)	25-50
CONS11A	Module 11A: Work Study Preparation and Follow-up Activities (Optional)	5-10
CONS12A	Module 12A: Work Study (Optional)	25-50
CONS13	Module 13: Structural Framing and Sheathing (Core)	10-15
CONS14	Module 14: Workshop and Construction Site Safety (Core)	5-10
CONS15A	Module 15A: Roof Framing (Optional)	10-15
CONS21B	Module 21B: Cabinet Making: Doors and Drawers (Optional)	10-15
DRAF12	Module 12: Working Drawings (Optional)	5-10
DRAF13	Module 13: Floor Plans (Optional)	5-10
DRAF15	Module 15: Wall Sections (Optional)	5-10
DRAF31	Module 31: Reading Technical Drawings (Optional)	2-5
	<b>Minimum</b>	100

<b>Module Code</b>	<b>Suggested Modules</b>	<b>Suggested Time (hours)</b>
<b>Construction and Carpentry 30</b>		
CONS01	Module 1: Introductory Safety (Core)	Review-5
CONS02B	Module 2B: Intermediate Wood Theory (Core)	3-5
CONS02C	Module 2C: Advanced Wood Theory (Core)	3-5
CONS06C	Module 6C: Advanced Wood Projects (Optional)	25-50
CONS11B	Module 11B: Work Study Preparation and Follow-up Activities (Optional)	5-10
CONS12B	Module 12B: Work Study (Optional)	25-50
CONS15B	Module 15B: Advanced Roof Framing (Optional)	10-15
CONS15C	Module 15C: Roofing Materials and Installation (Optional)	2-7
CONS16	Module 16: Concrete Foundations and Finishing (Core)	2-5
CONS17	Module 17: Interior and Exterior Finishing (Optional)	10-15
CONS18	Module 18: Stair Framing (Optional)	10-15
CONS19	Module 19: Insulation and Installation (Optional)	5-10
CONS20	Module 20: Building Lay Out (Core)	10-15
DRAF14	Module 14: Foundation Plans (Optional)	5-10
DRAF16	Module 16: Elevations (Optional)	5-10
DRAF29	Module 29: Surveying (Optional)	5-10
WELD05	Module 5: Oxy-Acetylene Start-up, Shut-down and Cutting (Core)	2-4
	<b>Minimum</b>	100

Codes:

CONS = Construction and Carpentry

DRAF = Drafting and Computer-aided Design

WELD = Welding

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## Core and Optional Modules

### Module 1: Introductory Safety (Core)

**Suggested time:** 5 - 8 hours

**Level:** Introductory

**Prerequisite:** None

#### Module Overview

This module will introduce shop and site safety. The module stresses that safety needs to be a habit and a consideration throughout daily living as well as in work environments.

#### Foundational Objectives

- To develop safe work habits with hand tools, portable and stationary power tools, and appliances.
- To develop skills with the use of construction equipment and common industry procedures.

#### Common Essential Learnings Foundational Objectives

- To use industry-related terms, and use them in context. (COM)
- To develop an awareness of personal responsibility for safety. (PSVS)

Learning Objectives	Notes
1.1 To understand that safe practices are required at all times.	Model safe practices.  Show students where necessary safety equipment is located.  Invite people who have been injured at work to share their experience with students.  Discuss hazard recognition within the trade.
1.2 To identify unsafe practices and unsafe work environments.	Encourage students to examine a work area for potential safety risks. Show examples of cluttered work areas, unsafe electrical extension cords, loose clothing, long hair, protection equipment (eye, hearing, air quality, etc.)  Discuss the reasons for the safety rules required when working in a construction environment.
1.3 To become aware that distractions may cause an accident. (PSVS)	Discuss "horse play" and the potential risk.  <b>Stress "No physical contact at any time."</b>  Discuss possible consequences of talking to someone while using tools or tossing a piece of scrap wood, etc.  Discuss the damaging effect of loud noises. Display protective devices that can be worn by the worker.

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<b>Learning Objectives</b>	<b>Notes</b>
1.4 To describe the safe use of hand tools. (COM)	<p><b>The safe handling of hand tools includes using appropriate safety appliances.</b></p> <p>Discuss the need to respect hand tools.</p>
1.5 To list the safety rules for portable power tools.	Discuss using the appropriate tool for the job. Injuries often occur when tools are used for a function for which they were not designed.
1.6 To describe the safe use of stationary tools.	<p><b>Discuss "kickback" caused by binding the cutting blade or drill bit.</b></p> <p>Introduce stationary tools before using portable power tools. In most cases it is preferable to use a stationary tool if one is available.</p>
1.7 To describe the correct procedures in the case of fire.	Point out where fire alarms, fire extinguishers, and exits are located. Discuss fire evacuation procedures and the effects of equipment and power cut-off in case of a fire.
1.8 To demonstrate the correct procedure for dealing with an injury.	<p>The first step is to make sure that the cause of the injury is no longer a threat to anyone. Point out power safety cut off switches, eye wash stations, etc.</p> <p><b>Caution students about helping people who are in contact with an electrical source.</b> Remind students that people striving to help have been killed or seriously injured.</p> <p><b>All injuries must be reported immediately and documented.</b></p> <p><b>Caution students about the dangers of coming in contact with blood of an injured party.</b></p>
1.9 To list the basic safety equipment/clothing required to work on a construction site.	<p>Occupational Health &amp; Safety (OHS) have requirements for workers on a work site that may include: hard hat, safety glasses, hearing protection, steel toed boots and gloves.</p> <p>Consult OHS resources on the Saskatchewan Labour website -- <a href="http://www.labour.gov.sk.ca">www.labour.gov.sk.ca</a>.</p>

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## Module 2A: Introductory Wood Theory (Core)

**Suggested time:** 5 - 8 hours

**Level:** Introductory

**Prerequisite:** None

### Module Overview

The majority of construction projects involve the use of wood products and a basic understanding of wood as a material is essential. Such terms as: softwood, hardwood, strength, defects, grain, and characteristics will be defined. Note: the foundational objectives apply to parts 2A, 2B, and 2C.

### Foundational Objectives

- To demonstrate knowledge of different building materials and their applications in the construction industry.
- To be knowledgeable of some basic construction concepts and technologies.
- To be aware of the impact of new technologies in the construction industries.

### Common Essential Learnings Foundational Objectives

- To use common terms that describe characteristics of wood. (COM)
- To describe reforestation practices. (PSVS)
- To explain where wood comes from, its composition, and how it is processed to produce building materials. (COM)

	<b>Learning Objectives</b>	<b>Notes</b>
2.1	To use common terms used to describe wood. (COM)	Students could research what types of wood are available locally and the most common use of the types.  Students need to identify all parts of a tree.
2.2	To define and identify characteristics of hardwood and softwood.	It is important that students realize that the terms do not necessarily describe characteristics of the wood, but refer to the two main categories of tree species from which the wood originates.  Compare characteristics of hard and soft woods. List examples of hard and soft woods.
2.3	To describe the effects of moisture content on wood.	Discuss the methods of drying and storing dimensional lumber.  Explain how moisture affects wood.
2.4	To describe how different wood products are prepared for construction purposes.	Video resources are recommended. They are available from forestry companies.  Students should follow the various milling procedures used to turn raw logs into a variety of products (plywood, oriented-strand board (OSB), and dimensional lumber).

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**Learning Objectives****Notes**

- |     |   |   |
|-----|---|---|
| 2.5 | To describe good reforestation practices. (PSVS)                      | There is much controversy about the meaning of “good forestry practices”.<br><br>The important issue is to understand that wood/lumber is a renewable resource, but care must also be taken not to change the ecology in which trees prosper. Outline reforestation practices in Saskatchewan.<br><br>Refer to the <i>Forestry Studies Curriculum Guide</i> , Module 4. |
| 2.6 | To describe the need for and use of lumber and plywood grading. (COM) | Students should know how wood products are measured, graded and sold.<br><br>See the resource materials for grading information.  |

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## Module 2B: Intermediate Wood Theory (Core)

**Suggested time:** 3 - 5 hours

**Level:** Intermediate

**Prerequisite:** Module 2A

### Module Overview

Students will learn to identify various types of wood and their characteristics.

	<b>Learning Objectives</b>	<b>Notes</b>
2.7	To recognize varieties of wood available locally.	<p>Have samples of the most common varieties of wood available.</p> <p>Label the wood samples and let the students examine them. Later, rearrange the samples and cover the labels. Now have the students identify the samples and then compare their choices with the original labels.</p> <p>Suggested varieties include: ash, birch, douglas fir, maple, oak, pine, hemlock, red cedar, spruce, and walnut.</p>
2.8	To identify characteristics and the common uses for varieties of wood. (COM)	<p>Students should be able to identify the characteristics of the wood that lend themselves to the particular use.</p> <p>Make coupons (a piece of material 100mm x 20mm x 3mm) of different species. Test a number of wood varieties for characteristics that might include: colour, hardness and odor. Destructive tests could measure hardness (denting with a nail set) and flexibility (measure deflection to the point of breaking). (TL)</p>
2.9	To suggest relative costs of various woods.	<p>Have students research the cost of locally available varieties and make cost comparisons for a project based on their findings.</p>

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## Module 2C: Advanced Wood Theory (Core)

**Suggested time:** 3 - 5 hours

**Level:** Advanced

**Prerequisite:** Module 2B

### Module Overview

Students will learn to identify various defects of wood and their characteristics. As well, students will learn to use and calculate board measure.

Learning Objectives	Notes
2.10 To recognize defects of wood available locally. (CCT)	Define: warp, bow, check, crack, crook, cup, knots, stain, pitch, pith, twist, and wane.  Display examples of lumber with the various defects.
2.11 To identify the common grades of lumber and their use.	Define the grades: select, construction, standard, utility, and economy. (COM)  Have students identify the lowest grade that will satisfy a job requirement.  Have students do a price comparison of the same kind of wood in the various grades.
2.12 To measure lumber and convert the measurements to board measure. (NUM)	Prepare several problems as examples for students to practise calculating board measure. After they are competent at making the calculation, have them measure actual boards and do the calculation of board feet. It would also be valuable to have students calculate the cost of varieties of wood based on price per board foot. This would help to reinforce the reasons for careful use of material.

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## Module 3: Lay Out and Hand Tools (Core)

**Suggested time:** 5 - 10 hours

**Level:** Introductory

**Prerequisite:** Module 1

### Module Overview

The variety of hand tools covered should include: hammer, wood saw, wood chisel, screwdriver, plane, sanding block, rasp, and lay out tool.

### Foundational Objectives

- To develop safe and knowledgeable use of woodworking hand and power tools used in the construction industry.
- To develop skills in the use of equipment and materials common in the construction industry.

### Common Essential Learnings Foundational Objectives

- To use hand tools in a safe and productive manner to complete a project. (TL)
- To understand the use of technology and its impact on the construction industry. (TL)

	Learning Objectives	Notes
3.1	To name common woodworking tools and describe their function. (COM)	Includes: hammers, wood saws, wood chisels, screwdrivers planes, sanding blocks rasps, and lay out tools. (TL)  Identification of types of measurement tools is important: tapes, rules, squares, etc.
3.2	To describe safety precautions for each tool. (PSVS)	<b>It is important for students to realize that safety appliances must be used in a work environment and that the appliances protect those near by, as well as the person using a tool.</b>
3.3	To choose and use hand tools appropriately for the intended operations. (TL)	Using the wrong tool can result in personal injury or damage to the project.  Demonstrate the use of bench vices and clamps to hold material to be cut.  Develop and practise skills with measuring, cutting, lay out, and smoothing hand tools.

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## Module 4A: Portable Power Tools (Core)

**Suggested time:** 5 - 8 hours

**Level:** Introductory

**Prerequisites:** Modules 1 and 3

### Module Overview

The variety of portable power tools covered should include: drill, jigsaw, laminate trimmer, orbital sander, palm sander, belt sander, router, biscuit joiner, and cordless (battery powered) tools. Note: The foundational objectives apply to parts 4A and 4B.

### Foundational Objectives

- To develop safe and knowledgeable use of portable power tools used in the construction industry.
- To be knowledgeable about different materials and their applications in the construction industry.

### Common Essential Learnings Foundational Objectives

- To identify the names of portable power tools. (COM)
- To use portable power tools in a safe and productive manner to complete a project. (PSVS)

	Learning Objectives	Notes
4.1	To name common carpentry portable power tools and to describe their uses. (COM)	<p>Suggested tools may include: jigsaw (sabre saw), orbital sander, drill, router, and other tools needed to complete the chosen product.</p> <p>Discuss basic electrical safety (including extension cords), so students are able to determine if tools are in safe operating condition.</p>
4.2	To describe safety precautions for each tool.	<p>Demonstrate how to safely change blades, bits, sandpaper, etc. (TL)</p> <p>Discuss types of blades, grades of sandpaper, etc.</p>
4.3	To choose and use portable power tools appropriately for the intended operations.	<p>Students should list the general rules that apply to portable power tools. Refer to the handbook or manual that comes with the power tool.</p> <p>Demonstrate the use of bench vices and clamps to hold material to be cut.</p> <p>Students should be capable of adjusting or changing features for the tool to meet their needs. (CCT)</p>

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## Module 4B: Advanced Portable Power Tools (Core)

**Suggested time:** 5 - 8 hours

**Level:** Advanced

**Prerequisite:** Module 4

### Module Overview

The variety of portable hand tools covered should include: circular saw, chain saw, belt sander, heavy-duty drill, power plane, nailing gun, powder actuated tools, and reciprocating saws.

Learning Objectives	Notes
4.4 To name common wood portable power tools and to describe their function. (COM)	Suggested tools include: circular saw, belt sander, heavy-duty drill, power plane, nailing gun, reciprocating saw, and other tools need to complete the chosen product.  Discuss extension cord safety inspection.
4.5 To describe safety precautions for each tool. (PSVS)	Demonstrate how to change blades, bits, sandpaper, etc.  Discuss types of blades, sandpaper, etc.
4.6 To choose and use portable power tools appropriately for the intended operations.	Demonstrate the use of bench vices and clamps to hold material to be cut.  Demonstrate the safe setup to use sawhorses.
4.7 To describe the procedures required to operate powder-actuated tools safely.	Equipment manufacturers may provide demonstrations and conduct a safety course for the use of powder-actuated tools.  To operate powder-actuated tools, workers should be certified. There is a short course offered by the companies who manufacture the tools.

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## Module 5A: Stationary Power Tools (Core)

**Suggested time:** 5 - 8 hours

**Level:** Introductory

**Prerequisite:** Modules 1, 3, and 4

### Module Overview

The variety of stationary tools covered should include: band saw, drill press, scroll saw, and disc/belt sander. Note: The foundational objectives apply to parts 5A and 5B.

### Foundational Objectives

- To develop safe practices in the operation of portable power tools used in the construction industry.
- To increase self-esteem from success with the equipment, materials, and techniques used.

### Common Essential Learnings Foundational Objectives

- To identify the names of stationary power tools used in different contexts. (COM)
- To use stationary power tools in a safe and productive manner while producing a product. (IL)

	Learning Objectives	Notes
5.1	To name common wood stationary power tools and to describe their function. (COM)	Students should know about proper dress and safety equipment necessary to operate large power equipment.  Include the band saw, drill press, scroll saw, disc/belt sander, and other tools need to complete the chosen product.
5.2	To describe safety precautions for each tool.	Demonstrate the use of the possible adjustments on available stationary power tools.  Emphasize keeping the work area(s) clean. (IL)  Demonstrate how to change blades, bits, sandpaper, etc.
5.3	To choose and use stationary power tools appropriately for the intended operations. (CCT, IL)	Demonstrate the proper adjustment of equipment including the use of fences, clamps and guides as well as other safety features such as feather-boards.

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## Module 5B: Advanced Stationary Power Tools (Core)

**Suggested time:** 5 - 8 hours

**Level:** Advanced

**Prerequisite:** Module 5A

### Module Overview

The stationary tools covered may include: grinding wheel, jointer, lathe, mitre saw, panel saw, radial arm saw, shaper, table saw, and thickness planer.

	<b>Learning Objectives</b>	<b>Notes</b>
5.4	To name common wood stationary power tools and to describe their function. (COM)	<p>Includes: grinding wheel, jointer, lathe, mitre saw, panel saw, radial arm saw, shaper, table saw, thickness planer, and other tools need to complete the chosen product.</p> <p>Review previously covered power equipment.</p>
5.5	To describe safety precautions for each tool. (PSVS)	<p>Discuss evaluation of the safety condition of the power tool before it is put to use.</p> <p>Demonstrate the safe use of the stationary tools.</p> <p>Emphasize keeping the work area(s) clean.</p> <p>Demonstrate how to change blades, bits, sandpaper, etc.</p> <p>Review the need for eye and hearing protection.</p>
5.6	To choose and use stationary power tools appropriately for the intended operations.	<p>Demonstrate the use of vices, clamps, guides, and proper adjustment of equipment.</p> <p>Make certain all necessary guards are in place.</p>

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## Module 6A: Introductory Wood Projects (Optional)

**Suggested time:** 25 - 50 hours

**Level:** Introductory

**Prerequisites:** Modules 1, 3, and 4

### Module Overview

Students will complete a project or projects that can be produced using the tools they have learned to identify and use. Sample project plans appear in Appendix D. Note: The foundational objectives apply to parts 6A, 6B, and 6C.

### Foundational Objectives

- To use tools in a safe and productive manner while making a wood product.
- To develop safe and knowledgeable use of portable power tools used in the construction industry.
- To increase self-esteem from success with the equipment, materials, and techniques used.
- To demonstrate knowledge of different building materials and their applications in the construction industry.

### Common Essential Learnings Foundational Objectives

- To measure and cut material as needed. (TL, NUM)
- To take pride in the completed project. (PSVS)

	Learning Objectives	Notes
6.1	To measure and cut material, lumber, and sheet goods. (NUM)	<p>Students need to be familiar with imperial and metric measurements. <i>Measure twice and cut once.</i> (TL)</p> <p>Review the necessary math skills (perimeter, area, volume and circumference) from the Geometry-Measurement strand of the Mathematics curriculum grades 6-9, available at <a href="http://www.sasked.gov.sk.ca/docs/math.html">www.sasked.gov.sk.ca/docs/math.html</a>.</p>
6.2	To use tools in a safe and productive manner.	<p>Continually monitor student work habits. Ensure that students wear protective safety equipment when working in the shop.</p>
6.3	To take pride in the completed project(s). (IL, PSVS)	<p>Attention to details include: being square, checking proper size, fit and sanding, etc. before assembly is completed.</p> <p>See Module 9 for finishing details.</p> <p>Provide assistance as necessary to ensure a satisfactory product. Do not allow students to take an inferior product home. Work with the student to bring the work up to an acceptable standard. <i>"It's only good enough if it's the best they can do!"</i></p> <p>Display student projects in school display cases whenever possible.</p> <p>Ask students to evaluate their project and state what they would change if they were to make the project again.</p>

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## Module 6B: Intermediate Wood Projects (Optional)

**Suggested time:** 25 - 50 hours

**Level:** Intermediate

**Prerequisite:** Module 6A

### Module Overview

Students will complete a project or projects that can be produced using the tools they have learned to identify and use. Sample project plans appear in Appendix D.

	Learning Objectives	Notes
6.5	To measure lay out and to cut material. (NUM)	Use both metric and Imperial measurements. <i>Measure twice and cut once.</i>
6.6	To use tools in a safe and productive manner.	Continually monitor student work habits. Ensure that students wear protective safety equipment.
6.7	To assemble the project. (IL)	Check attention to detail such as being square, proper sanding, etc. before assembly.
6.8	To take pride in the completed project(s). (PSVS)	<p>Provide assistance as necessary to ensure a satisfactory product. Do not allow students to take an inferior product home. Work with the student to bring the work up to an acceptable standard. <i>"It's only good enough if it's the best they can do"</i>.</p> <p>Display student projects in school display cases whenever possible.</p> <p>Ask students to evaluate their project and describe how they could improve on their project if they were to make it again.</p>

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## Module 6C: Advanced Wood Projects (Optional)

**Suggested time:** 25 - 50 hours

**Level:** Advanced

**Prerequisite:** Module 6B

### Module Overview

Students will complete a major project that can be produced using the tools they have learned to identify and use in Construction 10 and 20. Sample project plans appear in Appendix D.

	<b>Learning Objectives</b>	<b>Notes</b>
6.9	To measure lay out and to cut material. (NUM)	Use both metric and Imperial measurements. Students should be able to prepare material and cutout lists for their project. <i>Measure twice and cut once.</i>
6.10	To use tools in a safe and productive manner.	Continually monitor student work habits. Reinforce the necessity for constant attention to safety.
6.11	To assemble the project. (IL)	Provide assistance as necessary to insure a satisfactory product. Do not allow students to take an inferior product home. Work with them to bring the work up to an acceptable standard.
6.12	To take pride in the completed project(s). (PSVS)	Display student projects in school display cases whenever possible.  Ask students to evaluate their project and prepare a project plan that includes a write-up detailing how they could improve on their project if they were to make it again. (CCT)

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## Module 7: Concrete, Components, and Mixing (Core)

**Suggested time:** 5 - 10 hours

**Level:** Introductory

**Prerequisite:** None

### Module Overview

Students will learn how to mix concrete, make forms, and finish the concrete.

### Foundational Objectives

- To demonstrate knowledge of different building materials and their applications in the construction industry.
- To be knowledgeable of the basic construction concepts and technologies.
- To develop skills in the use of equipment and materials common to the construction industry.

### Common Essential Learnings Foundational Objectives

- To use industry-related terms when discussing concrete. (COM)
- To take pride in the completed project. (PSVS)

Learning Objectives	Notes
7.1 To describe how concrete is made.	Discuss how to handle cement safely to avoid breathing cement dust. Proper lifting techniques should be demonstrated to avoid back injury.  Discuss how Portland and other types of cement are manufactured. The Internet may provide additional resource sites.
7.2 To measure and mix materials to produce concrete.	Discuss the effects that ratios, additives, types of cements, sand, aggregate size, pit run gravel, colourants, and water quality can have on the finished product.  Concrete can be mixed in a wheelbarrow, box, or "cement mixer".  Discuss the advantages of ordering concrete from a concrete batch plant vs. mixing your own.
7.3 To build forms to contain concrete.	If a project in the community is unavailable for demonstration, students can build forms on the school property to complete small projects such as patio blocks.  Forms can be bought or made to produce items such as benches, paving stones, and walk-way forms. Entrepreneurial opportunities may be investigated related to this activity.

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<b>Learning Objectives</b>	<b>Notes</b>
7.4 To describe concrete specifications.	Discuss concrete specifications and testing such as slump tests, core samples, etc.  Discuss the use of re-bar and other methods, including chemical additives used to increase the strength of concrete.
7.5 To finish the concrete project.	Demonstrate mixing, slump testing, placing, and finishing concrete with hand tools.  Discuss mechanical methods of placing concrete.  Discuss the application of sealing products and their advantages.  It is recommended that students visit a community project where concrete is being placed and finished, if possible.

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## Module 8: Fasteners and Adhesives (Core)

**Suggested time:** 2 - 6 hours

**Level:** Introductory

**Prerequisite:** Module 1

### Module Overview

Students will learn about nails, wood screws, adhesives, nailing gussets, hollow and solid wall fasteners, connector plates, and joist hangers.

### Foundational Objectives

- To develop skills in the use of equipment and materials common to the construction industry.
- To demonstrate knowledge of different building materials and their applications in the construction industry.

### Common Essential Learnings Foundational Objectives

- To use industry-related terms when discussing joining material. (COM)
- To use adhesives and fasteners for the correct application. (CCT)

	Learning Objectives	Notes
8.1	To choose nails appropriate to intended use. (CCT)	Show students a wide range of nails including: spiral, coated finishing, roofing, flooring, siding, staples, etc. Discuss how to choose the proper nail for a given application.  Discuss setting finishing nails and filling the resulting hole.
8.2	To select and use wood screws.	Screws are also defined by the type of tool used to drive them; e.g., Robertson, Philips, etc. (COM)  Discuss the colour coding of the handles of screwdrivers.  Discuss the various types of metal used for screws and the reasons for the different types. (CCT)  Demonstrate drilling guide holes and countersinking screws using high speed drills and combination bits.
8.3	To choose an adhesive for an application involving joining wood.	Discuss glue staining, strength, drying time, clamping, exterior, marine applications, etc.  Review safety concerns with some types of rapid setting adhesives.
8.4	To be knowledgeable about the use of gussets, nailing plates, and joist hangers.	Demonstrate the use of gussets, nailing plates, and joist or rafter hangers as well as truss rafters. Explain that building codes specify the length and numbers of nails required.  Use an example from a building code book for a reference.

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## Module 9: Project Finishing (Optional)

**Suggested time:** 5 - 10 hours

**Level:** Introductory

**Prerequisite:** None

### Module Overview

Students will learn about priming, painting, staining, urethane, lacquer, fillers, waxes, and rubbing compounds, etc. Students will have spent many hours completing projects. Proper finishing can result in a project that is viewed as a masterpiece to be preserved.

### Foundational Objectives

- To develop safe and knowledgeable use of hand and power tools used in the construction industry.
- To develop skills in the use of equipment and materials common to the construction industry.
- To handle, use, and dispose of materials safely.

### Common Essential Learnings Foundational Objectives

- To determine safety hazards associated with finishing products and know how to manage them. (CCT)
- To dispose of waste products in an environmentally sensitive manner. (PSVS)
- To use industry-related terms when discussing finishing. (COM)
- To take pride in the completed project. (PSVS)

Learning Objectives	Notes
9.1 To explain the advantages and disadvantages of oil based and water based products.	Discuss the need to prepare a project properly for finishing by sanding to at least 250 grit before applying a finish. (CCT)  Discuss the use and application of fillers.  Demonstrate the use of stains and their application.  Consider having a painter or paint salesperson discuss and demonstrate products to students.
9.2 To choose an appropriate product to use for a project and a work space to apply the finish safely. (CCT)	The choices for solid colours are oil or water based paint, stains, or lacquer. The choice of mat, semi-gloss, or glossy finish will also have to be made. (COM)  <b>Caution students about the hazards of applying finishes by spraying. Point out that proper air ventilation, the use of safety appliances, and the need to be sure that there is no open flame or potential for electric arc in the spray area are critical safety needs. (PSVS)</b>  Choices for clear finishes include: shellac, varnish, urethane, oil, wax, and lacquer.  Dust is a factor in choosing a product. If dust is a problem, choose a semi-gloss or mat finish that will dry rapidly. Products that penetrate the wood are also an option thus preventing dust from being a problem.

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<b>Learning Objectives</b>	<b>Notes</b>
<p>9.3 To choose the correct method for applying products.</p>	<p>Products are applied with a lint free cloth, roller, brush, or sprayer.</p> <p>The use of rubber gloves is highly recommended with all types of finishing products.</p> <p>Brushes and rollers come in several types and must be matched to the product being applied.</p>
<p>9.4 To describe and practise proper clean-up and disposal of the products used. (PSVS)</p>	<p>Solvents should not be disposed off through domestic sewer systems.</p> <p><b>Caution students about disposal of rags used to cleanup solvent based products. Rags must be put in metal containers with tight lids to avoid spontaneous combustion.</b></p> <p>Spray equipment that is not cleaned properly after use may not be able to be cleaned or may require the replacement of parts, an expensive and time consuming procedure.</p>

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## Module 10: Construction and Careers (Core)

**Suggested time:** 2 - 6 hours

**Level:** Introductory

**Prerequisite:** None

### Module Overview

Students will learn of the multitude of career possibilities in the construction industry. The range of opportunities runs from helpers, to employees, to owners of businesses. In addition to the traditional carpenter's trade, there are many related trades such as: bricklayer, cement finisher, crane operator, drywall and acoustical mechanic, electrician, flooring installer, glazier, insulator, ironworker (reinforcing re-bar), ironworker (structural worker), locksmith, painter-decorator, plasterer, plumber, roofer, sheet metal worker, and tilesetter. As well, there are many support positions such as: sales people, clerical people, building inspector, draftsman, architect, truck driver, etc.

The student can become familiar with training requirements, develop an understanding of the components for a variety of jobs in the construction industry, and understand the prerequisites and programs in a variety of post-secondary training institutions.

### Foundational Objectives

- To be knowledgeable of the variety of jobs and career opportunities in the construction industry.
- To create an awareness of apprenticeship programs and opportunities in Saskatchewan.
- To identify post-secondary program opportunities in the construction industry.

### Common Essential Learnings Foundational Objectives

- To enable students to use language (listening, speaking, reading, writing) for differing audiences and purposes that are relevant to the construction industry. (COM)
- To develop students' abilities to meet their own learning needs. (IL)
- To promote both intuitive, imaginative thought and the ability to evaluate ideas, processes, experiences and objects in meaningful contexts. (CCT)
- To support students in coming to a better understanding of the personal, moral, social and cultural aspects of the world of work. (PSVS)

	<b>Learning Objectives</b>	<b>Notes</b>
10.1	To explore apprenticeable trades.	<p>Students will try to define apprenticeship. Generate a list of apprenticeable trades. Obtain a current, official list from the Apprenticeship and Trade Certification Commission.</p> <p>Outline the advantages and disadvantages of pursuing a career through apprenticeship.</p> <p>Teachers could extend an invitation to an apprenticeship representative in the area to speak about apprenticeship programs.</p>
10.2	To explore how the high school curriculum articulates with Level I apprenticeship.	Show students the training plan in Appendix B. Explain how completing all the objectives and covering the appropriate modules can prepare them to challenge the Level I apprenticeship examination for Construction.
10.3	To generate a list of career opportunities related to the construction industry.	Students will create a list of different career opportunities in the construction industry. Encourage students to use a variety of sources for information: guidance counsellors, career software packages, personal interviews, government resources, websites, etc.

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## Learning Objectives

## Notes

10.4 To identify personal skills and interests that may lead to career exploration.

Ask each student to create an inventory/list of activities and interests.

Have each student examine his/her list to determine how these activities may be done using a variety of computer software packages.

Once students have determined an area of interest related to the construction industry, they should research their career using available resources in the library, in the community, and on the Internet.

10.5 To determine skills and interests that enhance career choices.

From the list created, ask the students to select two choices of possible careers for further research. Investigate the career choices including:

- description of work duties
- what personal qualities individuals should possess
- process to become certified within the trade/career
- length of education and training
- school locations
- cost of education and upgrading
- trends within the business or career
- the best and worst parts of the job
- beginning salary
- opportunities for advancement

If a student engages in work study, he or she may investigate career links within the community for other possible work study placements. The student may conduct an interview of the professional/tradesperson as part of his or her training plan.

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## Module 11A, B: Work Study Preparation and Follow-up Activities (Optional)

This module is used to prepare students for work study placement. Learning objectives include pre-placement information, preparation for interviews, and expectations for the workplace experience.

**Suggested time:** 5 - 10 hours

### Foundational Objective

- To develop workplace skills in the construction or related industries.

### Common Essential Learnings Foundational Objective

- To become aware of employability skills for the workplace. (CCT, COM, PSVS, TL)

Learning Objectives	Notes
11.1 To create an awareness of the expectations of each of the partners in the work study component.	In order to establish a successful working relationship with all of the partners involved in the workplace, it is important to define the expectations of each partner.  Refer to the Work Study Guidelines, a section of <i>the Practical and Applied Arts Handbook</i> for roles and expectations of business, student, teacher monitor, and school.
11.2 To determine factors that would affect the student contribution in the workplace. (CCT)	The students may formulate a list of what they can bring to the workplace and how each item may impact on their job(s). <ul style="list-style-type: none"><li>• school subjects</li><li>• past experiences</li><li>• self-concept and personality</li><li>• needs, values, and interests</li><li>• knowledge skills and attitudes</li><li>• career goals and plans</li></ul> Ask students to do a self-assessment of skills using the items in the above list as a guide. They are to explain how these skills would be valuable to the construction industry. Try to incorporate the value of communication and teamwork in the discussion.
11.3 To foster an awareness of building good communication in the workplace.	Discuss verbal and non-verbal communication. List some ways in which negative non-verbal communication may be displayed.  Encourage students to role play ways of demonstrating effective techniques of verbal communication on the job when giving or receiving instructions, and when resolving conflict. With the use of case studies, divide the students into groups and role play to show how effective communication can be used to resolve conflict on the job.

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## Learning Objectives

## Notes

11.4 To develop a resumé and cover letter that can be forwarded to a potential employer.

The student will develop a resumé and cover letter using the correct format. Construction and Carpentry teachers can work with other staff members to ensure resumé and cover letter preparation is covered. The resumé and cover letter is also covered in English Language Arts B10, 20, B30, Information Processing, and Career and Work Exploration 20.

Students should develop their resumé on a computer disk and update the resumé during this course, as work placement references are accumulated.

If students have already completed the resumé and cover letter in another course, the teacher may do a review and encourage students to update their resúmes. Each student shall submit a resumé for teacher approval prior to going to the workplace.

The resumé and cover letter may be used as an introduction to the employer in a workplace site prior to an interview with the student.

Through a classroom discussion or in groups, students should generate a list of guidelines for an interview. After the students formulate their list, the instructor may add missing items to the list.

11.5 To create a student guide in preparation for an interview.

Outline and describe the three stages of an interview. Point out to the students where stage(s) of their guide will be used.

- The **greeting** involves an introduction between the student and employer. Discuss or demonstrate how this should be done.
- The **exchange** is where the employer asks a series of questions and engages in a conversation with the student about information on the resumé and other matters relating to the job placement.
- The **parting** brings the interview to a close. It can be just as important as the greeting. Explain how this may be done.

Provide the students with a list of questions frequently asked by employers or ask students to formulate a list as a group and role play the stages of the interview.

11.6 To discuss the post interview.

After the student has completed the interview with the employer, do a follow-up activity. Review the interview with the student using the three stages as points for discussion.

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## Learning Objectives

## Notes

11.7 To develop a procedural guide for the work site.

Discuss the following work site items with students.

- transportation
- hours of work
- absence and tardiness
- procedures for conflict resolution
- role of the student, teacher, and work place supervisor
- dress code
- job description
- school and employer expectations

11.8 To relate feedback from the work placement.

Students provide feedback about work placement including: where they were placed, type of business, duties, most rewarding experience, most difficult situation, and how they handled it.

Note: It is recommended that each student send a thank you note or card to the employer upon the completion of each work placement. If more than one placement has been made in the course, follow-up activities must be completed after each placement.

Ensure that students understand these guidelines by asking students to describe each of these items.

Note: Look for opportunities to introduce and reinforce ideas about Labour Standards, Occupational Health and Safety, and WHMIS. Use the *Career and Work Exploration Curriculum Guide*, the *PAA Handbook*, the Saskatchewan Labour website (<http://www.readyforwork.sk.ca>), and other recommended resources.

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## Module 12A, B: Work Study (Optional)

**Suggested time:** 25 - 50 hours

### Module Overview

Students will be placed in the construction or a related industry for a time (not less than 25 hours) as determined by agreement of the student, the supervising teacher, and the employer. Such placements must follow the Work Study Guidelines in the *Practical and Applied Arts Handbook* and/or guidelines in *Career and Work Exploration*.

### Foundational Objectives

- To learn the safe operation of the many tools used in the construction industry.
- To become knowledgeable about safe work practices in the construction environment.
- To become knowledgeable about skills practised in the construction industry.
- To become knowledgeable about the post-secondary training opportunities in the construction trades.

### Common Essential Learnings Foundational Objectives

- To communicate in the workplace using technical language. (TL, COM)
- To appreciate the concept of density of pollutants with regard to safety. (NUM, PSVS)
- To understand the necessity of analyzing work environments for safety. (CCT, PSVS)
- To recognize the importance of respecting the safety of others when engaging in work. (PSVS)

Note: Other CELs may be emphasized.

For more information about implementing work study in schools see the Work Study Guidelines included in the *Practical and Applied Arts Handbook*. Teachers need to select (from modules) or design appropriate learning objectives for this module; for instance, to demonstrate the ability to follow a “Training Plan”.

Note: Consult the renewed/new *Career and Work Exploration Curriculum Guide* and the Department of Labour for content about Labour Standards, Occupational Health and Safety, and WHMIS. If you offer several work studies during grade 11 or 12 in a course series, add more depth to the next experience.

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## Module 13: Structural Framing and Sheathing (Core)

**Suggested time:** 10 - 15 hours

**Level:** Intermediate

**Prerequisites:** Modules 1, 3, and 4

### Module Overview

Students will learn common framing terms and practices.

### Foundational Objectives

- To use construction industry terminology in context.
- To develop skills in the use of equipment and materials common to the construction industry.
- To be knowledgeable of basic construction concepts and technologies.

### Common Essential Learnings Foundational Objectives

- To measure material accurately and use tables to determine dimensional lumber needs. (TL, NUM)
- To exercise care and to work in a safe manner. (PSVS)

	Learning Objectives	Notes
13.1	To use framing terms in context. (COM)	Define: on centre, trimmers, headers, cripples, joists, sill, truss, span, etc.  Obtain Canadian references (building codes) that students can refer to for information about materials required for spanning openings, etc.
13.2	To be knowledgeable about common framing materials. (CCT)	Discuss: dimensional lumber, steel framing, sheathing, insulation, building wrap, trusses, etc.  Introduce lay out tools such as a framing square, chalk lines, etc.  Discuss truss systems, in addition to using dimensional lumber for floor lay out.  If space, time, or materials do not allow a large project, students could work on partial assemblies.
13.3	To be knowledgeable about the types, thickness, and applications of sheathing materials used for framing. (CCT)	Discuss materials, adhesives, nailing, etc.  Discuss sheathing types, adhesives, and nails.  Make certain proper terms are used to describe framing elements.

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Learning Objectives	Notes
13.4 To describe and demonstrate the lay out for framing a floor.	<p>Discuss the different materials available, lumber, I-beams, floor trusses, etc.</p> <p>Discuss how appropriate dimensions for floor joists, (lumber, I-beams, and trusses) are determined.</p> <p>Discuss framing around stairwells, etc.</p> <p>Discuss a typical floor section, materials, adhesives, nailing procedures, etc.</p>
13.5 To describe and demonstrate the sheathing for a floor. (TL)	Sketch the lay out for the sheathing procedure.
13.6 To describe and demonstrate the lay out for framing a wall.	<p>Discuss framing around openings, at corners etc.</p> <p>Discuss a typical wall section, materials, adhesives, nailing pattern, etc.</p>
13.7 To describe and or demonstrate the exterior sheathing for a wall.	Discuss various methods of arrangement and application of sheathing to structural framing.
13.8 To describe and demonstrate the lay out for framing a simple gable roof.	<p>Discuss the use of a rafter system and a truss system.</p> <p>A diagram showing tension and compression would show how loads are distributed in a truss.</p>
13.9 To describe and demonstrate the sheathing for a roof. (COM)	Discuss materials, clips, nailing, etc.
13.10 To describe and demonstrate the safe procedures for lifting walls and trusses. (COM)	<p>Use video and demonstrations in school or at a local worksite.</p> <p>Building garages, boathouses, garden sheds, or greenhouses are ideal projects. The project can be prefabricated and assembled on site.</p>
13.11 To demonstrate the safe use of the required tools and use of safety appliances. (PSVS)	<p>Discuss safety appliances or clothing that are worn by trades people on construction sites.</p> <p>Review the necessity for tool guards and tools in good repair.</p>

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## Module 14: Workshop and Construction Site Safety (Core)

**Suggested time:** 5 - 10 hours

**Level:** Intermediate

**Prerequisite:** Module 1

### Module Overview

Students will review introductory safety and then move on to shop, construction site, WHMIS, OHS, and emergency procedures.

### Foundational Objectives

- To understand and apply safe working practices in the construction environment.
- To be knowledgeable about the use of power fastening systems.

### Common Essential Learnings Foundational Objective

- To be knowledgeable about terms used in WHMIS and Occupational Health and Safety (OHS) guides and work site safety manuals. (COM)

Learning Objectives	Notes
14.1 To describe WHMIS and its importance.	Refer to the Saskatchewan Labour website/resources at <a href="http://www.labour.gov.sk.ca/safety/fast/WHMIS.HTM">http://www.labour.gov.sk.ca/safety/fast/WHMIS.HTM</a>
14.2 To describe and demonstrate the safe use of ladders and scaffolding of various types.	This objective is a key requirement for Level I Apprenticeship. Tour a website to observe the assemblage of scaffolding if the equipment is not in the school.
14.3 To describe and demonstrate safe lifting practices.	It may be necessary to do the scaffolding instruction on a building site. Demonstrate safe lifting of heavy objects and items such as wall sections that require teamwork, blocking, and bracing.
14.4 To describe safe use of power fastening systems.	Discuss how to become certified to use power fastener systems – pneumatic and powder actuated.
14.5 To describe the function of an Occupational Health and Safety (OHS) Committee.	Discuss the requirement that every employer have an OHS committee and that issues of workplace safety should be brought to the attention of the committee, if they can not be resolved on the job.

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**Learning Objectives****Notes**

- 14.6 To be aware that it is the responsibility of every worker to review the work environment for hazards and to correct dangerous situations. (PSVS)
- For more resources, refer to the Saskatchewan Labour website, <http://www.readyforwork.sk.ca>.
- 14.7 To become knowledgeable about the Workers' Compensation Board (WCB) regulations.
- For more resources, refer to the Saskatchewan Labour website, <http://www.readyforwork.sk.ca>.

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## Module 15A: Roof Framing (Optional)

**Suggested time:** 10 - 15 hours

**Level:** Intermediate

**Prerequisite:** Module 13

### Module Overview

Students will learn common framing terms and practices as applied to various roof designs. Note: these foundational objectives apply to parts 15A, 15B, and 15C.

### Foundational Objectives

- To use construction industry terminology in context.
- To demonstrate knowledge of different building materials and their application in the construction industry.
- To create an awareness about building code requirements.

### Common Essential Learnings Foundational Objectives

- To measure in metric or imperial units. (TL, NUM)
- To use tables to determine dimensional lumber needs. (NUM)
- To exercise care and to work in a safe manner. (PSVS)

Learning Objectives	Notes
15.1 To identify roof types.	Identify eight common roof types.  Define: butterfly, gable, gambrel, hip, intersecting, mansard, shed dormer, and cottage. (COM)
15.2 To be knowledgeable about common roof framing terms.	Define: bird's mouth cut, ceiling joist, collar ties, common rafter, gable end, hip jack rafters, hypotenuse, knee wall, level cut, line length, lookouts, overhang, pitch, plumb cut, rafter, ridge, rise, rise per foot run, seat cut, span, total rise, total run, unit of run, wood I- beam, etc.  See Module 13. (COM)
15.3 To use a framing square to lay out rafters. (NUM)	Demonstrate the use of the framing square. Then have students practise laying out common rafters for various roof slopes and spans.
15.4 To lay out the rafters for a gable roof and a gambrel roof.	Students can create small rafters that span a short distance.  Building a garden shed is a possible project that will demonstrate a variety of roof styles.

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**Learning Objectives****Notes**

15.5 To describe a roof truss and its design. (COM)

Attention should be given to tension and compression, as well as snow-load.

Obtain Canadian references (building codes) that students can refer to for information about materials required for spanning openings, etc.

15.6 To describe and demonstrate the use of metal or wood gussets (fastener plates).

If space, time, or materials do not allow a large project, students could work on partial assemblies.

Students could tour a truss manufacturing plant to observe how trusses are laid out and assembled.

Discuss materials, adhesives, nailing, etc.

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## Module 15B: Advanced Roof Framing (Optional)

**Suggested time:** 10 - 15 hours

**Level:** Advanced

**Prerequisite:** Module 15A

### Module Overview

Students will learn common framing terms and practices as applied to various roof designs.

Learning Objectives	Notes
15.7 To create a diagram for a hip roof design.	Consult the recommended resources (list).  Have the students create a plan with only the rafters in place that would be assembled first, and then use transparent overlays indicating first the common rafters, and then the hip rafters.  Students need to think about the order of work, as well as what the finished product will be.
15.8 To lay out the rafters for a hip roof.	Students can lay out a sample rafter on the floor to match required specifications.
15.9 To create a diagram for a hip roof with an intersecting dormer.	This is best accomplished as a demonstration with student help as the procedure requires fairly advanced knowledge.
15.10 To lay out the rafters for a hip roof with an intersecting dormer.	See the recommended resources.  Do a demonstration with the lay out on the floor.  Define a valley rafter.

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## Module 15C: Roofing Materials and Installation (Optional)

**Suggested time:** 2 - 7 hours

**Level:** Advanced

**Prerequisite:** Module 13

### Module Overview

Students will learn common terms and practices as applied to the roofing of buildings.

Learning Objectives	Notes
15.11 To be knowledgeable of terms used in the industry to describe the installation of roofing. (COM)	Define: asphalt shingles, courses, coverage, drip edge, exposure, felt flashing, lap, low slope, ridge cap, roofing cement, roofing fasteners, roll roofing, wood shingles, “square”, starter strip, underlayment, wood shakes, etc.
15.12 To identify types of roofing and common applications for each type.	Other materials such as clay tile, cement tile, metal roofing, etc. can be discussed.
15.13 To describe the sequence of layers and components for roofing with asphalt shingles.	Shingle bundles often have installation information printed on the wrapper. Refer to the instructions included with the shingles.
15.14 To install asphalt shingles.	Discuss safe handling of roofing materials, use of ladders, safe practices when working on roofs, etc.  A visit to a construction site is recommended.  See the recommended video resources.  Demonstrate how to shingle a roof with three tab shingles.
15.15 To describe the installation of eavestroughs and downspouts.	Familiarize students with the need to keep water away from the foundation and the need for slope to the eavestrough.

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## Module 16: Concrete Foundation and Finishing (Core)

**Suggested time:** 2 - 5 hours

**Level:** Advanced

**Prerequisite:** Module 7

### Module Overview

Students will learn how to use cardboard forms for pilings, forms assembled for concrete basement walls, forms for large pads or floors, ready-mix trucks, pumps, and buckets to place concrete, and power trowels to finish large floor areas.

### Foundational Objectives

- To demonstrate knowledge of different building materials and their applications in the construction industry.
- To use construction industry terminology in context.
- To be knowledgeable of the basic construction concepts and technologies.

### Common Essential Learnings Foundational Objectives

- To use industry-related terms when discussing concrete. (COM)
- To use numeracy when performing tasks in the construction industry. (NUM)
- To take pride in the completed project. (PSVS)

Learning Objectives	Notes
16.1 To describe the process for pouring concrete pilings, basement walls, and large pads. (COM)	If projects in the community are unavailable, use video resources to familiarize students with concrete practices.  Discuss continuous pouring.  Discuss concrete specifications and testing such as slump tests, core samples, etc.  Discuss the use of re-bar and other methods to increase the strength of concrete.  Demonstrate mixing, pouring, and finishing concrete.  Discuss the application of sealing products and their advantages.
16.2 To describe finishing procedures for large areas. (COM)	If possible, demonstrate the use of power trowels or visit a work site where power trowels are being used.

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## Module 17: Interior and Exterior Finishing (Optional)

**Suggested time:** 10 -15 hours

**Level:** Advanced

**Prerequisite:** None

### Module Overview

Students will learn about common materials and procedures for finishing the interior and exterior of buildings.

### Foundational Objectives

- To develop skills in the use of equipment and materials common to the construction industry.
- To develop safe and knowledgeable use of hand and power tools in the construction industry.
- To demonstrate knowledge of different building materials and their applications in the construction industry.
- To become aware of the career opportunities in the construction industry. (TL)

### Common Essential Learnings Foundational Objectives

- To use industry terms in context. (COM)
- To be knowledgeable regarding the various aspects of interior and exterior finishing. (TL)
- To develop an understanding of how technology has shaped the construction industry. (TL)

	<b>Learning Objectives</b>	<b>Notes</b>
17.1	To identify common exterior finishing materials. (COM)	Start with foundation finishes and work up to roofing materials.  Discuss advantages and disadvantages of the various materials.  Discuss wall and floor finishing materials.
17.2	To identify common interior finishing materials.	Discuss the apprenticeable trades that relate to material installation.
17.3	To describe different millwork applications and installations including windows and doors.	Students may trim out a typical door or window application.
17.4	To describe and demonstrate safe practices for lifting and holding gypsum wallboard in place until fastened.	Discuss the availability of equipment for rental or loan from suppliers. (TL)  Discuss the safe use of ladders and scaffolding.
17.5	To demonstrate safe procedures for scribing and cutting gypsum wallboard as panels and around electrical boxes.	<b>Eye safety protection is required.</b>

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### Learning Objectives

### Notes

17.6 To demonstrate taping, filling, and sanding of gypsum wallboard. (TL)

If possible, have students complete a small framed building. If that is not possible, completing even a corner cross section is useful. Small quantities of materials can often be scrounged from contractors or suppliers.

**Dust particle masks are required for this work.**

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## Module 18: Stair Framing (Optional)

**Suggested time:** 10 - 15 hours

**Level:** Advanced

**Prerequisite:** Module 13

### Module Overview

Students will learn common stair framing terms and practices as applied to various roof designs.

### Foundational Objectives

- To use construction industry terminology in context.
- To demonstrate knowledge of different building materials and their application in the construction industry.
- To create an awareness of building code requirements.

### Common Essential Learnings Foundational Objectives

- To measure in metric or imperial units. (TL, NUM)
- To use tables to determine dimensional lumber needs. (NUM)
- To exercise care and to work in a safe manner. (PSVS)

Learning Objectives	Notes
18.1 To be knowledgeable of terms used in the industry to describe stair construction.	Define: finished flooring, glue block, groove, housed finished stringer, housing, nosing, platform, rabbet and groove, rise, rough stringer, run, stair carriage, stair horse, stairwell, storey pole, header, straight, sub-floor, total rise, total run, tread, etc. (COM)
18.2 To lay out a carriage (stringer) for a straight stairway. (NUM)	Discuss how to determine the riser height and the tread run.  Tape paper to a wall and draw a stair opening to full scale. Have the students take measurements from the plan drawing.  One rise plus one tread run should equal about 43 to 46 cm, (17 to 18 inches). Most building codes specify a maximum rise of 21 cm, (8 1/4 inches) and a minimum tread run of 23 cm, (9 inches).  Discuss appropriate angles for stairways and headroom. Headroom of 2.15 metres (7 feet) or more is preferred.  Students could draw a story pole using dividers placed on the wall.
18.3 To create and assemble a complete stair assembly.	Have the student(s) do a lay out on a 1 x 10 and cut the bottom and top ends and then place it against the full scale drawing for fit. How does one determine that the tread is level?  Students can make a stool with two or three risers that could be used in a shop or kitchen to access higher shelves. (TL)

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## Module 19: Insulation and Installation (Optional)

**Suggested time:** 5 - 10 hours

**Level:** Advanced

**Prerequisite:** Module 13

### Module Overview

Students will learn common terms and practices as applied to the insulation of buildings.

### Foundational Objectives

- To use construction industry terminology in context.
- To be knowledgeable of basic construction concepts and technologies.
- To demonstrate knowledge of different building materials and their applications in the construction industry.

### Common Essential Learnings Foundational Objectives

- To enable students to use vocabulary of the construction trade. (COM)
- To develop an awareness of safety practices in the construction industry and to determine how to identify potential hazards. (CCT)

	Learning Objectives	Notes
19.1	To be knowledgeable of terms used in the industry to describe the installation of insulation. (COM)	Define: acoustical insulation, building paper, flexible, furring strips, loose fill, foamed-in-place, sprayed rigid, ridge vent, roof ventilators, R value, soffit-vent, vapour barrier, ventilation, batt, blanket, etc.
19.2	To identify types of insulation and common applications for each type. (COM)	Discuss the various materials from which each type may be made.  <b>Discuss safe handling of insulating materials, fire hazards, etc.</b> (PSVS)  Spun fiberglass insulation work should be done with maximum skin protection from the insulation, as well as wearing a dust particle mask.
19.3	To describe the components of an insulated foundation, wall, and roof section.	A visit to a construction site is recommended.  See video resources.  Discuss both concrete and wood foundations requirements.
19.4	To describe the dangers of inadequate ventilation or poorly installed moisture barriers. (CCT)	See the recommended resources.
19.5	To be aware of the economic and environmental advantages of a well insulated structure.	Students could research economic factors in their own community such as heat source, super insulated homes, etc.

## Module 20: Building Lay Out (Core)

**Suggested time:** 10 - 15 hours

**Level:** Advanced

**Prerequisite:** Modules 1 and 3

### Module Overview

Students will become familiar with the procedures involved to conduct a site investigation, check available services and to locate a building accurately within a building site.

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### Foundational Objectives

- To use construction industry terminology in context.
- To develop skills in the use of equipment and materials that are common to the construction industry.
- To increase self-esteem from success with the equipment, materials and techniques used.

### Common Essential Learnings Foundational Objectives

- To measure and cut material as needed. (TL, NUM)
- To conduct a site investigation and building lay out properly for a residential building. (CCT)

Learning Objectives	Notes
20.1 To describe the procedure for conducting a site investigation. (COM)	<p>Students should examine different types of soils to determine whether they would be suitable to support a building and its foundation.</p> <p>Climatic change or frost, for example, will affect soil and building movement.</p> <p>Students need to be familiar with imperial and metric measurements. <i>Measure twice and cut once.</i></p> <p>Review the math skills (perimeter, area, volume and circumference) covered in the Geometry-Measurement strand of the Mathematics curriculum grades 6-9, available at: <a href="http://www.sasked.gov.sk.ca/docs/math.html">www.sasked.gov.sk.ca/docs/math.html</a>.</p>
20.2 To describe the various permits and documents that are required to build a residential structure.	<p>Students should be familiar with building permits, zoning by-laws, and plot plans.</p> <p>The students could collect samples of the various documents that are required to gain permission to build a residence.</p>
20.3 To lay out a rectangular building on a residential sized lot.	<p>This objective will require student to work outside and locate the corners for an excavation using batterboards.</p> <p>Using appropriate leveling tools, locate the foundation wall corners using intersecting building lines attached to the batterboards.</p> <p><b>Accuracy is very important and should be emphasized as these techniques are the basis for locating and leveling the foundation.</b></p>

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**Learning Objectives****Notes**

20.4 To describe the correct method for excavating a foundation for a residence.

Accurate calculations must be included in the report to determine the excavation location and depth so the foundation walls will be the correct height above finished grade.

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## Module 21A: Introductory Cabinet Making (Optional)

**Suggested time:** 10 - 15 hours

**Level:** Introductory

**Prerequisite:** Modules 1, 2, 3, 4, and 5

### Module Overview

Students will learn about basic carcass construction used in cabinetry and furniture manufacture. Note: the foundational objectives apply to parts 21A and 21B.

### There are two options available for this module:

- 1) Frame construction: laminated material.
- 2) Non-frame or box construction: plywood, melamine, MDF, etc.

### Foundational Objectives

- To use construction industry terminology in context.
- To develop safe and knowledgeable use of hand and power tools in the construction industry.
- To be knowledgeable of basic construction concepts and technologies.
- To increase self-esteem from success with the equipment, materials and techniques used.

### Common Essential Learnings Foundational Objectives

- To develop ability to measure, estimate, and interpret numerical data in the construction industry. (NUM)
- To develop students' ability to meet their own learning needs. (IL)
- To understand how technology has shaped the construction industry. (TL)

Note: Other CELs may be used here.

	<b>Learning Objectives</b>	<b>Notes</b>
	<b>Frame Construction</b>	
21.1	To prepare rough material for lamination. (IL)	Cut the material to rough length. Join a face of the material. Join one edge. Plane the material slightly thicker than the finished desired thickness. Rip to width on the table saw. Join the last edge.  If a biscuit or plate joiner is available, this is an excellent opportunity to use the tool.
21.2	To laminate solid material using appropriate tools. (TL)	Instruct students how to laminate material together. Alternate the end grain. Apply glue to both surfaces.  Refer to Module 8 Fasteners and Adhesives.
21.3	To plane laminated material to finished thickness.	Allow a slight oversize for finish sanding. (Thickness should be 5/8" or 3/4" finished.)
21.4	To cut laminated material to the finished size. (NUM)	Cut as per the dimensions of the plan being used.  Students should be able to lay out a cutting plan on the material.

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<b>Learning Objectives</b>	<b>Notes</b>
21.5 To cut a dado for the back panel.	A ¼" dado should be cut on the rear inside of both sides. It should be set in ½" from the back vertical edge. (NUM)
21.6 To construct frames.	The frames form the skeleton of the cabinet. They may be used for drawer support or to secure the top to the case. Width and length and joinery are determined by the size of the cabinet.
21.7 To construct a bottom shelf.	A laminated shelf should be the exact same size as frames. (IL)
21.8 To cut material for the back panel.	Use ¼" plywood or hardboard. The material is to fit the dado that is cut vertically in the case sides.
21.9 To assemble the cabinet case components.	Various joinery methods may be used: plate jointing (biscuit jointing), dados, rabbets, etc. Use a framing square and measure corner to corner to ensure that the cabinet is square before clamping or nailing. (TL)
21.10 To assemble face-frame stock and attach the cabinet face frame to the case.	Material should be ¾" solid stock, 1½" in width.  Pieces should be joined together (preferably biscuit joined) and fastened to the cabinet by glue and nails or brad nails.

**Non-Frame or Box Construction**

21.11 To develop the side for a cabinet.	Cut material to size using plywood or melamine (5/8" or ¾"). (NUM)  See Learning Objective 1.4 regarding a cutting plan.
21.12 To construct a top, the bottom, and shelves for a cabinet.	Special care should be taken to reduce the chipping of veneer or melamine. Consider scoring material, use of masking tape, saw blade type and cutting height, etc.

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<b>Learning Objectives</b>	<b>Notes</b>
21.13 To attach adhesive edge banding to plywood or MDF edges.	<p>An edge-banding tool or iron may be used. Trim off the excess.</p> <p>To avoid marking the edge banding be certain the heating surface is clean.</p> <p><b>Review safety precautions required when using an electric iron to melt the adhesive.</b></p>
21.14 To cut a dado for the back panel.	<p>A ¼” dado should be cut on the rear inside of both sides. It should be set in ½” from the back vertical edge to accept the back panel.</p>
21.15 To assemble the cabinet completely.	<p>Join the sides and back pieces together. Screw, brad nail, biscuit, rabbet, dado, depending on the design requirements.</p>
21.16 To attach the face frame. (Optional) (IL)	<p>The face frame will be required when a door or a drawer is to be attached to the basic case that has been constructed.</p> <p>The face frame is constructed from solid or edge banded material capable of holding hinges, handles, and latches.</p>
21.17 To construct a top and suitable finished edge.	<p>The top or counter top should be attached with screws inserted through the underside of top frame.</p> <p>The top could be constructed of laminated material, plywood, melamine, MDF, laminate (arborite), ceramic etc.</p> <p>The edge of top could be designed to student preference with a variety of profiles either purchased or produced with a router. (TL)</p>

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## Module 21B: Cabinet Making: Doors and Drawers (Optional)

**Suggested time:** 10 - 15 hours

**Level:** Intermediate

**Prerequisites:** Modules 1, 2, 3, 4, 5, and 28

Learning Objectives	Notes
21.18 To construct a drawer.	A drawer consists of two sides, a front, a back panel, and a bottom.  Various types of joinery are possible: rabbet, (front and sides), dado (back and bottom) or dovetail or finger joint joinery for edges, then fastened with glue, brad nails, staples etc. (COM)  The drawer bottom is carried in a dado.
21.19 To construct a drawer face.	Use solid stock or edge banded material as a drawer face. A profile may be added to the edge if the drawer is trimmed with solid stock.  Attach the face to the drawer with screws. (IL)
21.20 To construct rails and stiles for a door.	The door frame back should be rabbeted out to receive the raised panel insert. For advanced students, the raised panel could be inserted in a dado. (TL)
21.21 To construct raised panel inserts.	Raised panels can be constructed by using a router, table saw, or shaper, depending on the design and availability of equipment.
21.22 To develop an understanding of the different types of cabinet hardware. (CCT)	Display example of different hinges, knobs, pulls, etc. Explain the different applications of each.
21.23 To install cabinet hardware.	Various styles of hardware (hinges, knobs) may be used. European hardware and drawer slides could also be utilized.

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## Appendix A: Determining a Trade Pathway for Students

During the renewal of the Practical and Applied Arts (PAA), Saskatchewan Education has signed an articulation agreement for Construction and Carpentry with Saskatchewan Post-Secondary Education and Skills Training (SPEST), the Apprenticeship and Trade Certification Commission (ATCC), and the Saskatchewan Institute of Applied Science and Technology (SIAST).

Before school divisions start or renew a program in Construction and Carpentry, they must be aware that although *Construction and Carpentry Curriculum Guide* content requires a certain level of maturity, some modules are recommended for Middle Level grades 7-9. These are listed in the PAA “Survey Guidelines” section of the *PAA Handbook*.

Pure 100 hour full credit courses are available beginning at the grade 10 Level. Students may take Construction and Carpentry 10, 20 or 30 with no intent to pursue a Construction and Carpentry apprenticeship route.

### Articulation

Saskatchewan Education, in consultation with the PAA Reference Committee, has agreed to develop adequate hours of provincial curriculum in the various designated trades areas of the high school curriculum, along with limited practical experience, to meet the Level I requirements (or their equivalent), as outlined by the Apprenticeship and Trade Certification Commission (ATCC) in collaboration with the Trade Board (TB). Articulation agreements among these educational partners have been established to accommodate high school graduates who have met the Level I requirements outlined in the high school curricula and who have followed the procedures specified by the *ATCC’s High School to Apprenticeship: Link to the Future (1999)*. Those students may challenge the Level I trade exam. Successful students will receive Level I theory advanced standing in appropriate SIAST programs, and Prior Learning Assessment and Recognition (PLAR) time credit hours for time spent with a journeyperson in the workplace toward apprenticeship standing in the trade.

Training plans included in Appendix B have been designed to provide direction for Level I skill development in the classroom and in the workplace.

**School divisions/schools seeking Construction and Carpentry articulation with Apprenticeship for students graduating from high school may register and challenge the Level 1 exam, by completing the following steps:**

- Everyone must have studied *High School to Apprenticeship: Link to the Future (1999)*.
- The Level I theory identified below as required modules in this *Construction and Carpentry Curriculum Guide* must be covered thoroughly by the certified teacher and students.
- Practical experiences must be offered in the school setting or through the optional work study modules used in partnership with local businesses and journeypersons.
- **If the teacher is not a journeyperson, the teacher must take an approved accreditation course. This will provide the necessary background skills to evaluate Level 1 theory and practice in the school for students who are following the trade pathway to apprenticeship.**

**The course would require the approval of each of the following: Saskatchewan Education, ATCC, SIAST, Saskatchewan Industrial Education Association (SIEA) affiliated with the STF.**

- To challenge Level I, the teacher should recommend only those students who have successfully completed the Level I content, and who have aspirations of pursuing further training in the construction trade(s). Registration for the Level I exam is managed by ATCC. Students challenging the Level 1 apprenticeship theory exam must attain a mark of 70% to pass, therefore they should probably be achieving at the 80% range or higher in all aspects of the Secondary Level program.
- The students must state their intention to write the Level I exam prior to the successful completion of the final high school course(s), and they must receive permission to proceed from the qualified instructor.
- The teacher must notify ATCC at least 2 months prior to the writing of the Level I exam, stating the intention to have students write, and indicating the number of exams required. Verification of the Secondary Level course marks (high school transcript) and the examination fee must be submitted for each student eligible to write.
- The ATCC will administer the Level I exams to high school students during the January and June Departmental Examination writing sessions, as arranged. The dates for the writing sessions are established annually and distributed to the schools in the *Registrar's Handbook for School Administrators*. (Contact Student Records at Saskatchewan Education).
- Apprenticeship exams will be returned to the ATCC for grading and evaluation.
- Marks will be mailed to the student at the school. ATCC will record the marks for the Level I exams. For more information about trade articulation see the *High School to Apprenticeship: Link to the Future* document developed by ATCC.
- SIAST and ATCC will notify teachers of changes to the Level I apprenticeship requirements in the trade via the Evergreen Curriculum website at Saskatchewan Education at [www.sasked.gov.sk.ca/docs/paa.html](http://www.sasked.gov.sk.ca/docs/paa.html).
- A high school graduate who has already received all the Secondary Level credits for Construction and Carpentry and who passes the Level I exam will receive 300 hours of advanced standing in the Construction program at SIAST. Those students will also receive time credit recognition for practical experience under a journeyperson, provided appropriate documentation has been maintained.

The following Saskatchewan Education PAA *Construction and Carpentry 10, 20, 30 Curriculum Guide* modules must be successfully completed in order to meet the Level I requirements in the trade:

Module	Title	Hours
CONS01	Introductory Safety	5-8
CONS02A	Introductory Wood Theory	5-8
CONS02B	Intermediate Wood Theory	3-5
CONS02C	Advanced Wood Theory	3-5
CONS03	Lay Out and Hand Tools	2-8
CONS04A	Portable Power Tools	5-8
CONS04B	Advanced Portable Power Tools	5-8
CONS05A	Stationary Power Tools	5-10
CONS05B	Advanced Stationary Power Tools	2-5
CONS07	Concrete Components and Mixing	5-10
CONS08	Fasteners and Adhesives	2-6
CONS13	Structural Framing and Sheathing	10-15
CONS14	Workshop and Construction Site Safety	5-10
CONS16	Concrete Foundations and Finishing	2-5
CONS20	Building Lay Out	10-15
WELD05	Oxy-Acetylene Start-up, Shut-down, and Cutting	3-5

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The above modules within the *Construction and Carpentry Curriculum Guide* have been identified as core modules required for a Level I apprenticeship challenge. These modules have fidelity with the following SIAST modules:

SFTY140	Safety Awareness
EQPT140	Hand and Power Tools
MATE140	Materials and Supplies
EQPT141	Powder-actuated Tools
BLDG140	Building Lay Out
FNDT140	Footings and Foundations
CONC140	Concrete
SCAF140	Scaffolds and Ladders
FRMG140	Floor Framing
WELD140	Cutting Torch/Carpentry

## Appendix B: Training Plan

### Checklist for Construction and Carpentry 10

- To be used in the school at the 10 level, possibility for Work Study beginning at the 20 Level.
- Recordkeeping documents should be copied on school letterhead.

Student's name (print) \_\_\_\_\_

Workplace name (print) \_\_\_\_\_

Assessor's name and qualification (print) \_\_\_\_\_

<b>Module Component Construction 10</b>	<b>Observed</b>	<b>Assisted</b>	<b>Demonstrated</b>	<b>Checked by</b>
Module 1: Introductory Safety: <i>demonstrates and practises safe work habits with hand tools and power tools.</i>				
Module 3: Lay Out and Hand Tools: <i>names and works safely with hand tools.</i>				
Module 4A: Portable Power Tools: <i>demonstrates ability to work safely with smaller size portable power tools.</i>				
Module 5A: Stationary Power Tools: <i>uses band saw, drill press, belt/disc sander, sabre saw in a safe and productive manner.</i>				
Module 6A: Introductory Wood Projects: <i>demonstrates the ability to use hand tools and small power tools in a safe and productive manner to assemble a project.</i>				
Module 7: Concrete Components, and Mixing: <i>uses terminology correctly and to measure, mix, place and finish concrete.</i>				
Module 8: Fasteners and Adhesives: <i>selects the correct fastener and proper use of adhesive.</i>				
Module 9: Project Finishing: <i>demonstrates the ability to choose the correct finish for a particular project and apply it.</i>				
Module 10: Construction and Careers: <i>is knowledgeable about careers available based on this work study placement.</i>				
<b>Module Component Drafting</b>	<b>Observed</b>	<b>Assisted</b>	<b>Demonstrated</b>	<b>Checked by</b>
Module 1 or 2: CAD Basics or Manual Drawing Tools and Procedures: <i>demonstrates basic drafting skills.</i>				
Module 3: Sketching and Freehand Drawing Fundamentals: <i>sketches in 2 or 3 dimensions "accurately" without instruments.</i>				
Module 6: Dimensioning: <i>understands international standards as applied to dimensioning objects.</i>				

## Checklist for Construction and Carpentry 20

Student's name (print) \_\_\_\_\_

Workplace name (print) \_\_\_\_\_

Assessor's name and qualification (print) \_\_\_\_\_

<b>Module Component Construction 20</b>	<b>Observed</b>	<b>Assisted</b>	<b>Demonstrated</b>	<b>Checked by</b>
Module 4B: Advanced Portable Power Tools: <i>chooses and uses the proper power tool for the intended operation.</i>				
Module 5B: Advanced Stationary Power Tools: <i>chooses and uses the proper power tool for the intended operation.</i>				
Module 13: Structural Framing and Sheathing: <i>demonstrates knowledge of the terminology and methods used to lay out and assemble:</i> <ul style="list-style-type: none"> <li>• <i>a floor system (Level I requirement)</i></li> <li>• <i>an exterior and interior wall</i></li> <li>• <i>a simple gable truss roof</i></li> </ul>				
Module 14: Workshop and Construction Site Safety: <i>demonstrates safe working practices with tools and materials for self and co-workers.</i>				
Module 15A: Roof Framing: <i>demonstrates knowledge of the terminology and methods used to lay out and assemble a rafter system for a gable roof.</i>				
<b>Module Component Drafting</b>	<b>Observed</b>	<b>Assisted</b>	<b>Demonstrated</b>	<b>Checked by</b>
Module 12: Working Drawings: <i>produces simple multi-view working drawings.</i>				
Module 13: Floor Plans: <i>produces drawings of architectural projects with appropriate symbols.</i>				
Module 15: Wall Sections: <i>draws a completed wall section to scale using the necessary symbols.</i>				
Module 31: Reading Technical Drawings: <i>understands and uses technical drawings that are common in the trade.</i>				

## Checklist for Construction and Carpentry 30

Student's name (print) \_\_\_\_\_

Workplace name (print) \_\_\_\_\_

Assessor's name and qualification (print) \_\_\_\_\_

<b>Module Component Construction 30</b>	<b>Observed</b>	<b>Assisted</b>	<b>Demonstrated</b>	<b>Checked by</b>
Module 2B: Intermediate Wood Theory: <i>identifies varieties and uses of commonly available construction materials.</i>				
Module 2C: Advanced Wood Theory: <i>identifies and selects various grades and calculates board measure.</i>				
Module 6C: Advanced Wood Projects: <i>plans and executes a project, from plan and material lists to the finished product.</i>				
Module 15B: Advanced Roof Framing: <i>lays out rafters for a hip roof design with an intersecting dormer.</i>				
Module 15C: Roofing Materials and Installation: <i>makes appropriate material selection and uses proper method of installation.</i>				
Module 17: Interior and Exterior Finishing: <i>describes and demonstrates the use of a variety of interior and exterior materials.</i>				
Module 18: Stair Framing: <i>lays out and assembles a straight stairway.</i>				
Module 19: Insulation and Installation: <i>makes an appropriate material selection and uses correct method of installation.</i>				
<b>Module Component Drafting</b>	<b>Observed</b>	<b>Assisted</b>	<b>Demonstrated</b>	<b>Checked by</b>
Module 14: Foundation Plans: <i>generates and uses foundation plans for a building.</i>				
Module 16: Concrete Foundations and Finishing: <i>identifies methods to place and finish concrete in building foundations.</i>				
Module 29: Surveying: <i>uses surveying equipment accurately.</i>				

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## Appendix C: Recordkeeping Charts

### Construction 10

(Copy to be retained in the student's record folder on school letterhead)

Student Name: \_\_\_\_\_

School Name: \_\_\_\_\_

Module Code	Module Title	Date Completed	Teacher Initial
CONS01	Module 1: Introductory Safety C *		
CONS02A	Module 2A: Introductory Wood Theory C *		
CONS03	Module 3: Lay Out and Hand Tools C *		
CONS04A	Module 4A: Portable Power Tools C *		
CONS05A	Module 5A: Stationary Power Tools C *		
CONS06A	Module 6A: Introductory Wood Projects O		
CONS07	Module 7: Concrete, Components, and Mixing C *		
CONS08	Module 8: Fasteners and Adhesives C *		
CONS09	Module 9: Project Finishing O		
CONS10	Module 10: Construction and Careers C		

C = core module

O = optional module

\* = modules required for post-secondary articulation/recognition.

### Construction 20

(Copy to be retained in the student's record folder on school letterhead)

Student Name: \_\_\_\_\_

School Name: \_\_\_\_\_

Module Code	Module Title	Date Completed	Teacher Initial
CONS04B	Module 4B: Advanced Portable Power Tools C *		
CONS05B	Module 5B: Advanced Stationary Power Tools C *		
CONS06B	Module 6B: Intermediate Wood Projects O		
CONS11A	Module 11A: Work Study Preparation and Follow-up Activities O		
CONS12A	Module 12A: Work Study O		
CONS13	Module 13: Structural Framing and Sheathing C *		
CONS14	Module 14: Workshop and Construction Site Safety C *		
CONS15A	Module 15A: Roof Framing O		

C = core module

O = optional module

\* = modules required for post-secondary articulation/recognition.

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## Construction 30

(Copy to be retained in the student's record folder on school letterhead)

Student Name: \_\_\_\_\_

School Name: \_\_\_\_\_

Module Code	Module Title	Date Completed	Teacher Initial
CONS02B	Module 2B: Intermediate Wood Theory C *		
CONS02C	Module 2C: Advanced Wood Theory C *		
CONS06C	Module 6C: Advanced Wood Projects O		
CONS11B	Module 11B: Work Study Preparation and Follow-up Activities O		
CONS12B	Module 12B: Work Study O		
CONS15B	Module 15B: Advanced Roof Framing O		
CONS15C	Module 15C: Roofing Materials and Installation O		
CONS16	Module 16: Concrete Foundations and Finishing C *		
CONS17	Module 17: Interior and Exterior Finishing O		
CONS18	Module 18: Stair Framing O		
CONS19	Module 19: Insulation and Installation O		
CONS20	Module 20: Building Lay Out C *		
CONS21A	Module 21A: Introductory Cabinet Making O		
CONS21B	Module 21B: Cabinet Making: Doors and Drawers O		
WELD05	Module 5: Oxy-Acetylene Start-up Shut-down and Cutting C *		

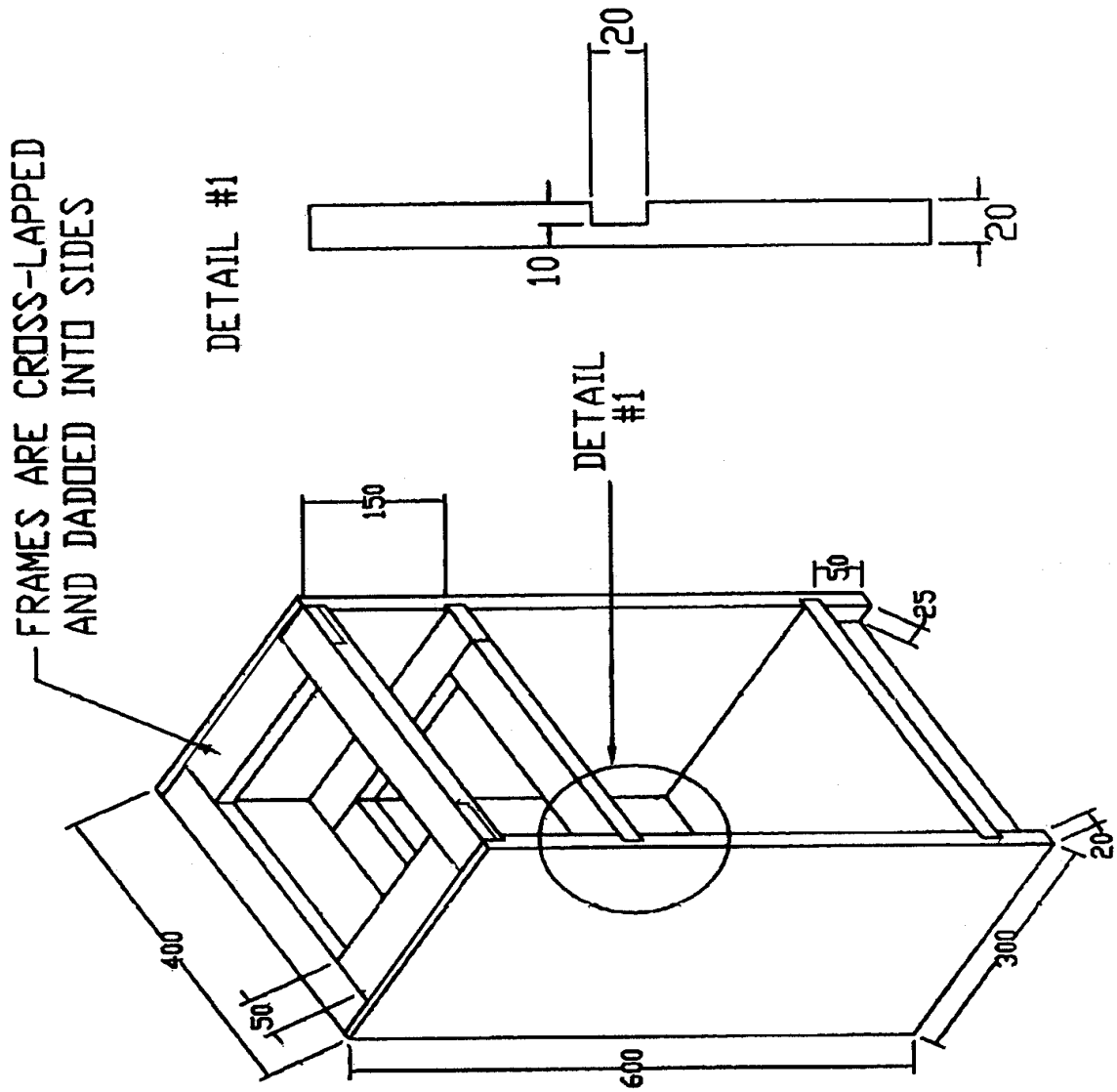
C = core module

O = optional module

\* = modules required for post-secondary articulation/recognition.

**Appendix D: Project Plans**

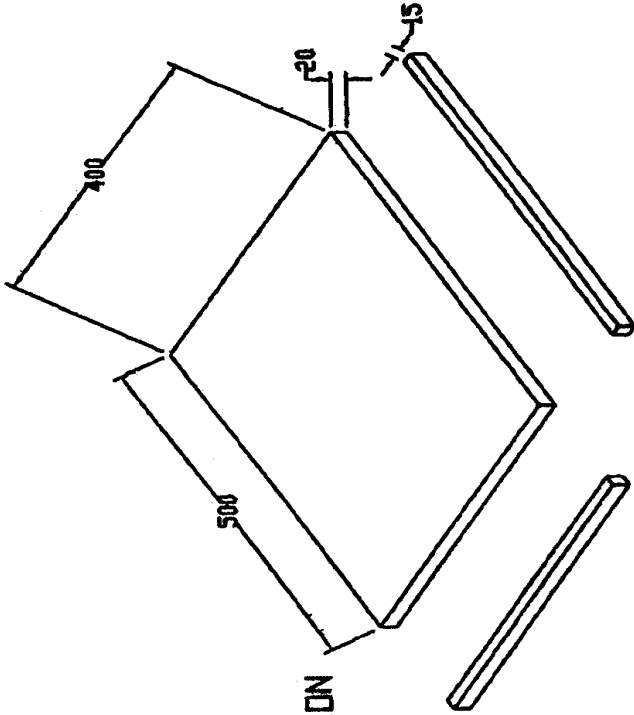
**Bedside Table (Cabinetry)**



NOTES

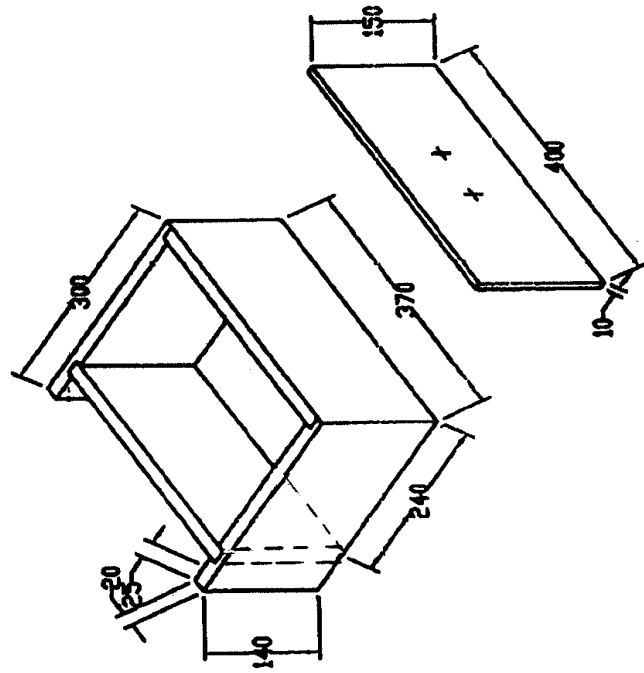
- \* BACK HARD BOARD INSET INTO SIDES
- \* BOTTOM SHELF 5mm NARROWER THAN SIDES IF THE BACK IS INCLUDED
- \* EXPOSED EDGES TRIM WITH EDGE BANDING, TRIM OR HARDWOOD TO MATCH PROJECT MATERIAL.

Bedside Table (continued)



NOTES

TOP  
 PLYWOOD CONSTRUCTION  
 EDGE COVERED BY  
 HARDWOOD TRIM  
 MITERED CORNER

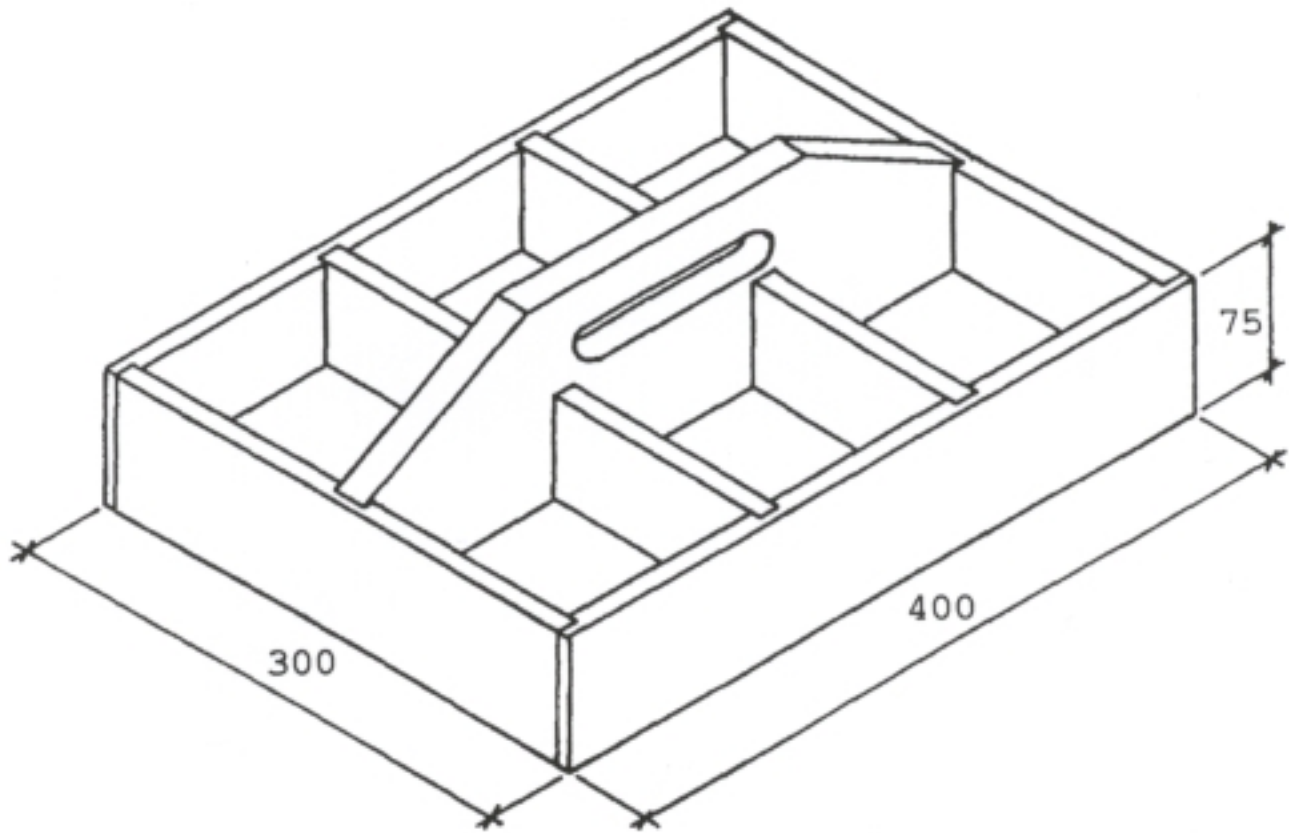


DRAWER  
 PLYWOOD  
 CONSTRUCTION  
 HARDBOARD  
 BOTTOM  
 PLYWOOD  
 FRONT



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## Parts Organizer\*



### Materials:

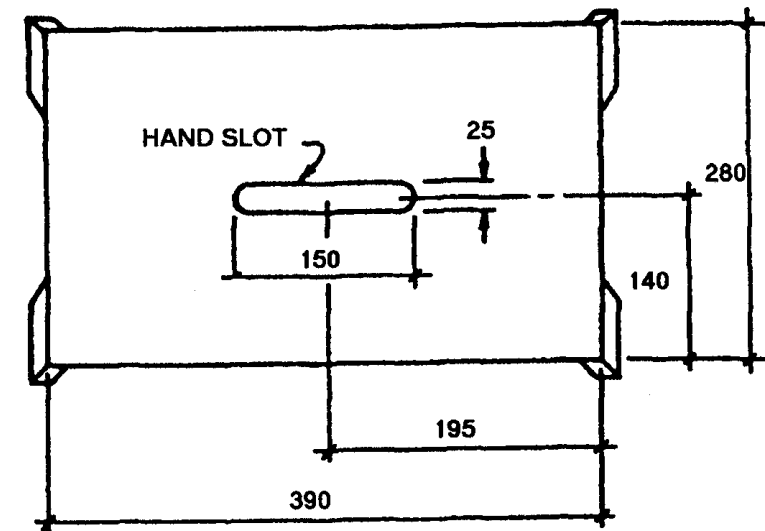
- 1 piece 14 x 89 x 2100 mm spruce (sides, ends, and dividers)
- 1 piece 19 x 140 x 400 mm spruce (handle)
- 1 piece 300 x 400 x 6 mm plywood or hardboard (bottom)

### Procedures:

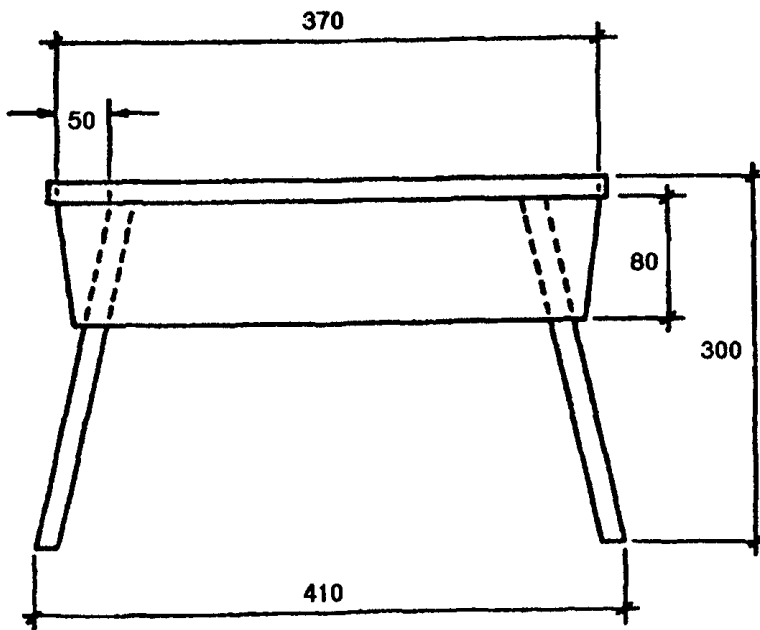
1. Prepare the wood to required sizes, using a straight grained, knot free softwood. There are seven pieces plus the bottom.
2. Prepare the dado lay out for the sides, cutting no deeper than one-half way through the side pieces.
3. The two dividers are edge lap joints at the center. Cut the center divider and the side divider no more than one-half way through the width of the two similar dividers.
4. Prepare the center divider handle, as illustrated or with a curved or rounded over edge. The hand hole is prepared with multiple boring, using a 1" bit no closer than 1" from the edge. The remaining material is removed from the handle hole with a chisel.
5. Trial fit all parts and adjust as necessary. Remember to aim for a snug fit.
6. Prepare the base from hardboard or plywood.
7. Sand edges and faces smooth using 120 grit sandpaper.
8. Glue and nail all the pieces together.
9. Round over all the outside edges with sandpaper to avoid the possibility of splinters.
10. Apply an appropriate finish.

\* Project plan used with the permission of SIAST Palliser Campus.

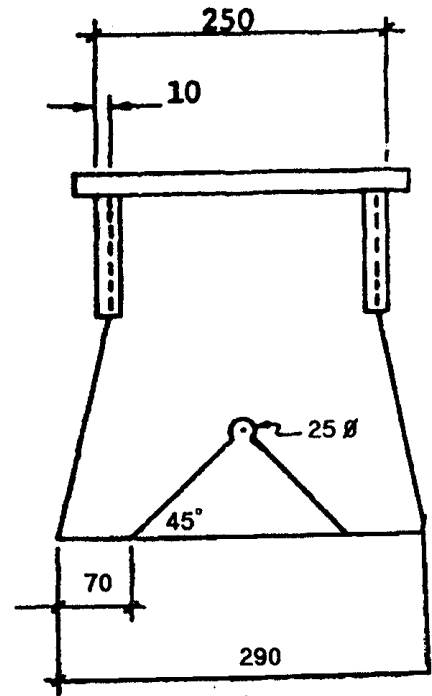
## Step Stool\*



A. TOP VIEW



B. SIDE VIEW



C. END VIEW

### Material:

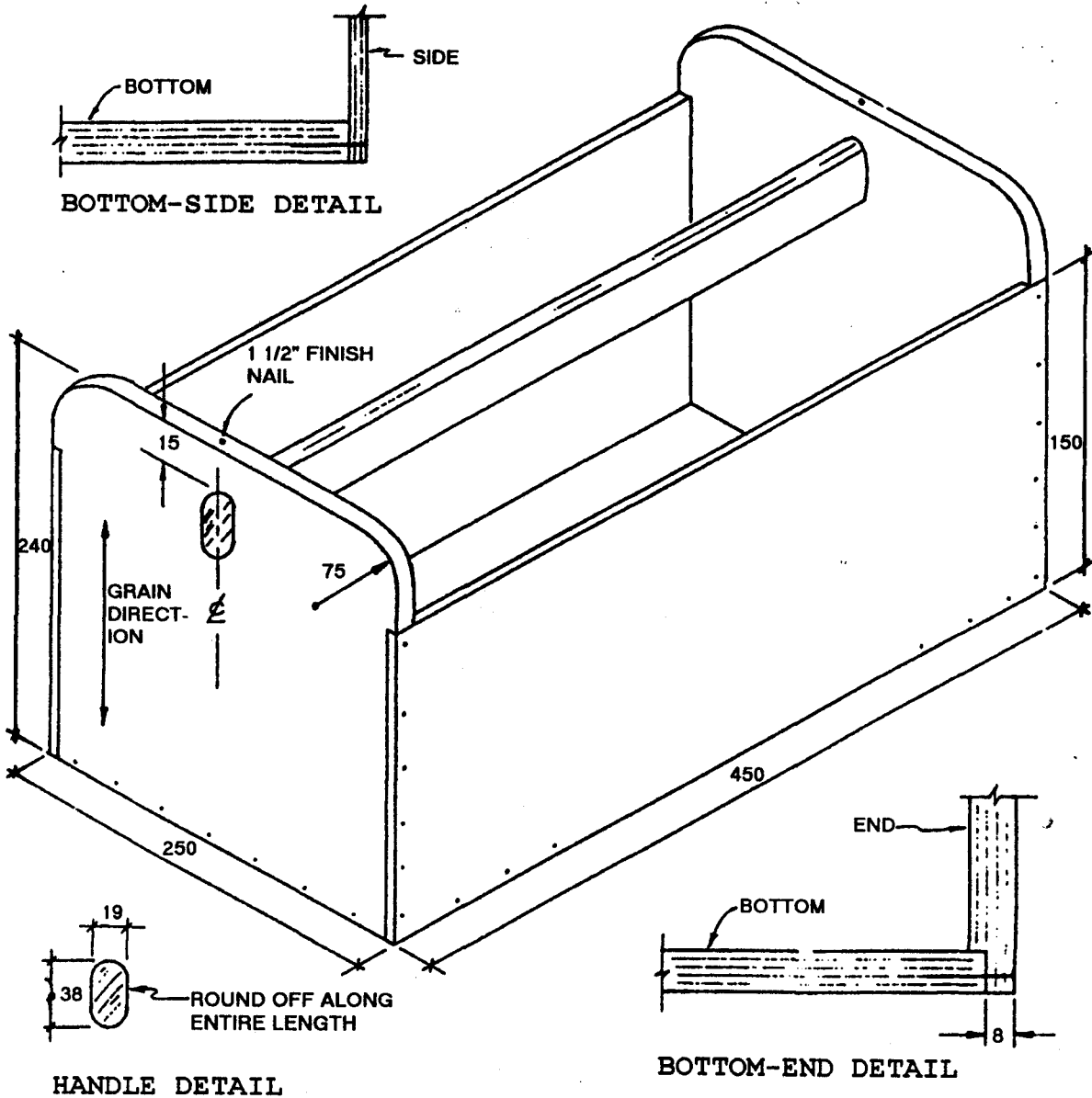
18 mm GIS plywood

### Procedures:

This project is intended for a student with intermediate skills and abilities. It is not as simple as it appears. This project provides an excellent opportunity for the student to develop his/her own time management workplan.

\*Project plan used with the permission of SIAST Palliser Campus.

## Tool Tote \*



### Materials:

- 1 piece – 20 x 40 x 450 mm hardwood (handle)
- 1 piece – 250 x 500 x 18 mm GIS plywood (ends)
- or*
- 1 piece – 18 x 250 x 500 mm softwood lumber (ends)
- 1 piece – 900 x 150 x 6 mm GIS plywood (sides)
- 1 piece – 450 x 250 x 6 mm GIS plywood (bottom)

### Procedures:

1. Use appropriate tools depending on the material selected to size to specifications.
2. Assemble parts, using standard procedures, glue, nail and finish.

\* Project plan used with the permission of SIAST Palliser Campus.

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## Tower of Babal

This project reproduces an ancient game known by many names. The object of the game is to move the eight discs from one post to either of the other two posts. The larger discs can never be placed on top of a smaller disc. The game is an excellent vehicle to teach problem solving, logic, and reasoning. The player who takes the fewest moves to complete the transfer is the winner.

This project is suitable as an introductory project for the Middle Level and can be completed with basic hand tools.

1. Prepare the base and legs to the required sizes from suitable material (pine, basswood, or other straight grained, knot free material).
2. Do the dado lay out on the base to hold the legs. Cut no further than halfway into the base. Ensure the legs fit snugly.
3. Locate the position for the holes to hold the three dowel pegs. Lay out the curve for the two ends. Cut using a bandsaw or sabre saw (jigsaw).
4. Drill three 3/8" holes, 15 mm deep. Cut three pieces of 3/8" dowel. Sand one end of each dowel to round over.
5. Sand the legs and the base to an even smooth surface.
6. Glue the dowels and legs in place. Wipe off excess glue.
7. Using hole saws of varying diameters, cut eight discs from 1/4" or 3/8" handboard. Drill out the centers to 7/16". Sand the edges.
8. Finish with oil or urethane.

See the diagrams.

