Design Studies 10, 20
Curriculum Guide

A Practical and Applied Art

Saskatchewan Education
2000
ISBN: 1-894116-29-1

Acknowledgements

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Saskatchewan Education wishes to thank many others who contributed to the development of these guidelines:

- Greg Plosz, seconded developer/writer, Regina School Division #4
- Jay Dolmage, seconded developer/writer, Indian Head School Division #19
- the Practical and Applied Arts Program Team
- field test/pilot teachers, and
- other field personnel.

Saskatchewan Education would especially like to acknowledge the Minister of Learning, Province of Alberta, Canada for permission to adapt content from the Career and Technology Design Studies (CTS) Curriculum.

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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 guidelines have been updated; some components have been integrated, adapted, or deleted; some Locally Developed Courses have been elevated to provincial status; and, some new guidelines 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 study and related Transition-to-Work dimensions. In addition, the *PAA Information Bulletin* provides direction for administrators and others regarding the implementation of PAA courses. Lists of recommended resources for all guidelines will be compiled into a PAA Bibliography with periodic updates.

Philosophy and Rationale

Design plays an important role throughout our lives everyday. The clothes we wear, the places we live, and the machines we use are all the end result of design.

Design has helped to shape our world. Sometimes that impact is very simple; for example, the utensils we use to prepare or eat a meal feel comfortable in our hands – the result of skillful design. Other examples of "good design" have a more dramatic affect on our lives. The invention and evolution of the automobile has drastically changed our lives. The impact of the car affects how and where we live (suburbia), the landscape, (freeways), our concept of time and distance, and the way we do business. The evolution of housing design has seen houses with large front porches that were built close to the street being replaced by houses set well back from the street with garages in front to buffer road noise.

The process of design is all about problem solving. It begins with a perceived need and results in a product or a change to an existing product. Every design has an end product reflecting historic, aesthetic, psychological, monetary, material, and environmental considerations.

Design Studies allows students to gain an appreciation for the **design fundamentals**. Learning how to manipulate and apply the design fundamentals in a variety of problem-solving situations is a major focus of this curriculum.

Creativity and problem solving are tools of design. Developing theoretical solutions to problems and testing those ideas using a variety of methods, materials, and processes helps students to evaluate and make decisions as to what is a good design. The students will solve visual, structural, and organizational problems. Students will have the opportunity to solve design problems making choices, compromises and decisions.

Aim, Goals, and Foundational Objectives

Aim

The aim of Design Studies is to provide experiences for developing proficiency in problem solving, goal setting, critical thinking, and to provide opportunities to develop co-operative work skills and technical skills using a design process.

Goals

Awareness and Understanding: To acquire the knowledge, skills, and abilities related to design.

Careers and Employment: To develop an awareness of how knowledge and skills in design may be applied to various jobs and careers.

Communication: To develop the communication skills required to be effective in various design situations.

Employment Skills: To develop team-building skills by working in groups to plan, design, and create various products; to develop capacities for critical and creative problem solving using the concepts and processes of design.

Personal Skills: To promote self-esteem and confidence with the development of professional portfolios and presentations.

Applied Technology: To develop proficiency in the use of various tools in planning, designing, and creating various products.

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 guidelines. Foundational objectives indicate the most important knowledge, skills/abilities, attitudes/values for a student to learn in a subject. Both the Foundational Objectives for Design Studies 10, 20 and the Common Essential Learnings (CELs) Foundational Objectives to be emphasized are stated in this document. Some of these statements may be repeated or enhanced in different modules for emphasis. The Foundational Objectives of the Design Studies 10, 20 curriculum include:

- To understand and apply the design process.
- To use a variety of materials and fabrication processes to design and create a product.
- To understand and appreciate the relationship between function and aesthetics.
- To understand how human, environmental, and ergonomic factors impact on design solutions.
- To understand and appreciate how design is affected by culture and society demanding different social solutions.
- To design and produce scale models.
- To maintain and present a design portfolio.
- To develop and practise the skill to critique designs in a positive manner.
- To use various techniques and media to make high quality presentations.
- To develop skills through the study of design that may lead to a variety of career pathways.
- To research post-secondary training and business or career opportunities in the field of design.
- To develop skills that may lead to successful employment.

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

Common Essential Learnings Foundational Objectives (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 transitions to career, work, and adult life.

The CELs 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 curricula are: apprenticeship, career exploration/development, community project(s), employability skills, entrepreneurial skills, occupational skills, personal accountability, processing of information, teamwork, and work study/experience.

The CELs are coded in this document, 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.

Course Components and Considerations

Design Studies should be promoted within the school and the community so participants (students, parents and business partners) understand the purpose of the course. Design Studies is not a manufactured project or product curriculum. It is a course that encourages students to be creative, and to work cooperatively with others to solve problems. Some of activities suggested in the course may be difficult to accommodate within the school and may require community partnerships.

The courses provide background and skill for related programs at post-secondary institutions. Examples of related programs could include graphic arts, drafting, as well as any of the fabrication skill areas.

Content Emphasis

There are four major content areas in Design Studies:

- Design fundamentals
- Problem solving
- Skill development
- Presentations

Work Study Component

This module permits the student to apply academic and school-based learning to workplace settings in the community. Students are provided with an opportunity to experience the optional work study component through appropriate placements. The application of the design process is present in many workplaces; for example, engineering firms, architectural firms, interior decorating businesses, landscaping businesses, theatre groups, farm equipment manufacturers, and graphic arts businesses. The community placement may be with volunteer or amateur organizations in addition to professional establishments. Module 16: Work Study Preparation and Follow-up Activities must be taught if the students have not participated in a work study module prior to enrolling in this course. If students have completed a previous work study module in another course, less time needs to be spent in work study preparation, thus allowing more time for other modules. See the *Practical and Applied Arts Handbook* for detailed information under the "Work Study Guidelines". Students who have previously taken a work study module are expected to cover content developed by Saskatchewan Labour found in the *Career and Work Exploration Curriculum Guide* and the *PAA Handbook.* These content references include:

- Labour Standards
- Occupational Health and Safety Act, and
- Workplace Hazardous Materials Information System (WHMIS).

Portfolios

A portfolio is a valuable organizer of student projects and assignments. Envelopes, files, binders, or folders serve to compile information over a term for each student. Each student should have a portfolio representing his or her work during the course. Students may construct portfolios in which to keep their work and assessments throughout the term. Two portfolios may be valuable: a "working portfolio" to collect ideas observations, notes and critiques, and a "presentation portfolio" to maintain completed work. By keeping track of this material, students are able to monitor their level of achievement. Additions to and revisions of the portfolio should be done at the end of each module.

The portfolio should include evidence of work from each stage of the design process. If the students are preparing a portfolio for the first time, the teacher may wish to create a list of things that might be in a portfolio. The portfolio should demonstrate that the student understood what was required; knew the design process used; gathered and used information to make decisions; developed drawing, sketching, and fabrication skills; and, was able to work cooperatively with others.

When a teacher examines a student's portfolio in order to make a decision regarding student progress, the information it contains becomes documented evidence for the evaluation.

A daily journal may also become a part of a working portfolio as a means of tracking the student's use of time and to record progress on ideas that are being developed. This will provide the student with a focus for self-directed or independent learning as well as an anecdotal record for part of the student's evaluation.

Design Studies is 200 hours of curriculum and instruction within the Practical and Applied Arts requiring 100 hours of instruction per course credit. Modules 1, 2 and 8 are core (prerequisite) modules requiring 35-60 hours of study. Other core and optional modules may be selected to complete the remainder of the course(s). The optional work study module provides students with the opportunity to apply classroom learning in a workplace setting and to investigate career development further.

Extended Study Modules

Each Extended Study Module (DEST 18A, B) suggests 10-20 hours of instruction. These optional modules can be used for a variety of purposes and at different levels. These modules may provide opportunities for students to do project or innovative work that can not otherwise be accommodated by the current curriculum. See Module 18 for more details, and the *PAA Handbook* for additional information.

Important considerations for these modules are:

- open-ended problem solving to stimulate creative solutions and "team work"
- use of or involvement with community industries, human resources, and related support services in order to provide relevant examples of the concepts presented in the course
- continued integration of career development ideas, and
- the application of effective visual and oral communication skills.

Resources

To support the principle of Resource-based Learning, a variety of instructional resources have been evaluated and recommended for the teaching and learning of Design Studies. See the initial list for Design Studies 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. 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.

Assessment and evaluation throughout the Design Studies 10, 20 courses should be based on the learning objectives that are outlined in the curriculum. It is important to use a variety of assessment techniques to ensure accurate student evaluation. The design of an evaluation matrix/scheme should reflect the amount of time devoted to each of the modules taught in the course. For example, if work study were a 25 hour module offered in the course, it could represent 25% of the student evaluation in a 100 hour course offering.

Here is a sample evaluation scheme.

Tests (written)		15%
Project work		25%
Information Research		10%
Homework and Assignments		10%
Classroom Presentations		15%
Work Study	25%	

If work study was not offered, then time could be used for project development involving larger projects that might include an optional module DEST18 found in this guide.

For more information about student evaluation refer to the *Practical and Applied Arts Handbook* (Saskatchewan Education, Draft 2000) or *Student Evaluation: A Staff Development Handbook* (Saskatchewan Professional Development Unit, 1999).

For information about program evaluation refer to the *Saskatchewan School-Based Program Evaluation Resource Book* (1989).

For information about curriculum evaluation refer to *Curriculum Evaluation in Saskatchewan* (Saskatchewan Education, 1991).

Module Overview

Module Code	Modules	Suggested time (hours)
DEST01	Module 1: The Design Process (Core)	15-25
DEST02	Module 2: Design Fundamentals (Core)	15-25
DEST03	Module 3: Sketching and Freehand Drawing Fundamentals (Optional)	5-15
DEST04	Module 4: Modeling (Optional)	10-20
DEST05	Module 5: Historical/Cultural Design (Optional)	10-15
DEST06	Module 6: Two-dimensional Design Applications (Optional) *prerequisite Module 1 and 2	15-25
DEST07	Module 7: Three-dimensional Design Applications (Optional) *prerequisite Module 1 and 2	15-25
DEST08	Module 8: Business and Profession of Design (Core)	5-10
DEST09	Module 9: Two-dimensional Design Processes and Materials (Optional) *prerequisite Module 6	15-25
DEST10	Module 10: Three-dimensional Design Aesthetics (Optional) *prerequisite Module 7	10-15
DEST11	Module 11: Three-dimensional Design Processes and Materials (Optional) *prerequisite Module 7	15-25
DEST12	Module 12: Human Environments (Optional)	15-25
DEST13	Module 13: Design Rendering and Presentation (Optional)	15-25
DEST14	Module 14: Human Factors and Communication (Optional) *prerequisite Module 12	15-25
DEST15	Module 15: Intermediate Three-dimensional Modeling (Optional) *prerequisite Module 4	15-25
DEST16	Module 16: Work Study Preparation and Follow-up Activities (Optional)	5-8
DEST17	Module 17: Work Study (Optional) *prerequisite Module 16	25-50
DEST18A, B	Module 18A, B: Extended Study (Optional)	10-20

Selecting Modules

All students taking a pure Design Studies course are required to take Core Modules 1, 2 and 8. If the students have had the opportunity in previous Middle Level courses to do some Design Studies, a review of the core modules may still be necessary. Teachers and administrators are encouraged to assess the resources of the school and community prior to selecting the Design Studies modules. In addition, integration of knowledge and ideas from other subject area curricula may be incorporated to facilitate the solution of specific design problems.

Suggested Course Configurations

Module Code	Modules	Suggested time (hours)
	Design Studies 10	
DEST01	Module 1: The Design Process (Core)	15-25
DEST02	Module 2: Design Fundamentals (Core)	15-25
DEST03	Module 3: Sketching and Freehand Drawing Fundamentals (Optional)	5-15
DEST04	Module 4: Modeling (Optional)	10-20
DEST05	Module 5: Historical/Cultural Design (Optional)	10-15
DEST06	Module 6: Two-dimensional Design Applications (Optional)	15-25
DEST07	Module 7: Three-dimensional Design Applications (Optional)	15-25
DEST08	Module 8: The Business and Profession of Design (Core)	5-10
DEST12	Module 12: Human Environments (Optional)	15-25
DEST18A	Module 18A: Extended Study (Optional)	10-20
	Minimum	**100**
	Design Studies 20	
DEST09	Module 9: Two-dimensional Design Processes and Materials (Optional)	15-25
DEST10	Module 10: Three-dimensional Design Aesthetics (Optional)	10-15
DEST11	Module 11: Three-dimensional Design Processes and Materials (Optional)	15-25
DEST13	Module 13: Design Rendering and Presentation (Optional)	15-25
DEST14	Module 14: Human Factors and Communication (Optional)	15-25
DEST15	Module 15: Intermediate Three-dimensional Modeling (Optional)	15-25
DEST16	Module 16: Work Study Preparation and Follow-up Activities (Optional)	5-8
DEST17	Module 17: Work Study (Optional)	25-50
DEST18B	Module 18B: Extended Study (Optional)	10-20
	Minimum	**100**

Core and Optional Modules

Module 1: The Design Process (Core)

It is recommended that work from this module be included in a design portfolio.

Suggested time: 15 - 25 hours **Level:** Introductory
Prerequisite: None

Module Overview
This module will introduce design terminology and the stages of the design process that could be used to develop design ideas.

Foundational Objective
- To understand and apply the design process.

Common Essential Learnings Foundational Objectives
- To demonstrate skills and attitudes that contribute to the development of positive human relationships. (IL, PSVS)
- To understand and use vocabulary related to design. (COM)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
1.1	To recognize the steps in the design process.	List the steps in the design process. The steps/headings include: Determine the Need, Brainstorm, Design the Brief, Research, Plan, Fabricate, and Evaluate, followed by product Presentation. Different situations may require a change to the steps or sequence in the process. Before preparing design briefs, the students should conduct simple market surveys to determine the need for the product idea. Use the design brief to describe the problem. Teachers may wish to limit the tools and materials that students can use for projects.
1.2	To explore the steps in the design process. (CCT, TL, NUM)	Have the students develop a flow chart that illustrates the steps in a design process and describe each step. Using small working groups, have students develop a solution to a simple problem. Suggested ideas for two-dimensional designs: poster, CD cover, brochure, logo, a pattern or plan for an article to be constructed or fabricated, a floor plan for a kitchen, etc. Suggested ideas for three-dimensional designs: a rubber band powered model, a CO_2 powered model, a wind powered electrical generator, a kitchen cutting board, a chair, desk organizer, etc.

	Learning Objectives	Notes
		Suggested ideas for two and three-dimensional designs: a model of a Styrofoam glider that has a logo on it, packaging for a commercial product (a cereal box), or a display about a social issue such as drinking and driving. Students need to become aware of ethical, societal and cultural influences in design (PSVS). Researching fashion changes, advertisements, or perhaps comparing the designs of buildings used by various religious groups may help students to see some of these influences. Teachers may wish to invite a professional designer from the community as a resource; e.g., if the project is to design an automobile powered by electricity, having an electrical engineer work with the students would be a valuable asset. To give students a sense of manufacturing, students could plan and make a snack food or an item such as a simple stool, or a lighting fixture, etc. See the *Entrepreneurship 30 Curriculum Guide*, regarding "Ideas and Innovations".
1.3	To discuss the project with the teacher using appropriate terminology.	Verbal discussion of their work allows students to share ideas, develop cooperative work skills, develop presentation skills, and gain confidence in expressing themselves. (COM) Student will discuss two- and three-dimensional designs with the teacher or do a presentation to the class. This assignment may be displayed in the school for others to see. (Use Education Week or a parent interview day.)
1.4	To discuss the project with other students. (PSVS)	Constructive criticism and feedback from peers provides positive reinforcement.
1.5	To maintain a written journal and a design portfolio. (COM)	A portfolio is a common tool used in the design occupations. Students will need guidance as to what they should include in a portfolio. Students should keep a record of the steps they followed, materials and processes they used to reach a solution for their design problem. Students may want to divide the portfolio – one part for presentation work and one part for work in progress.

	Learning Objectives	Notes
1.6	To conduct a presentation for a project outlining the design process development as it applies to the project. (IL)	Students will present and analyze their designs as they relate to the design process. This objective will be repeated each time a project presentation is conducted throughout the course.

Module 2: Design Fundamentals (Core)

Suggested time: 15 - 25 hours **Level:** Introductory
Prerequisite: Module 1

Module Overview
Students will practise sketching, drawing and modeling skills and apply the design process to solve a variety of two- and three-dimensional design problems.

Foundational Objectives
- To understand and apply the design process.
- To maintain and present a design portfolio.

Common Essential Learnings Foundational Objective(s)
- To use scale and proportion appropriately in a design problem. (NUM, TL)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
2.1	To identify and describe the components of the design process.	Have the students describe the processes for each step in the design process.
2.2	To recognize and use elements of design.	Have the students define the elements of design - line, space, form, shape, pattern, texture, colour. Use visual media to illustrate the elements of design. Refer to the *Interior Design 30 Curriculum Guide*, Module 1 learning objectives 1.1 – 1.19. Students can define the principles of design (proportion and scale, balance, emphasis and harmony, contrast rhythm). Use visual media to introduce design principles.
2.3	To use the design process to create a solution to a problem. (CCT, NUM, TL)	The problem may be two- or three-dimensional or a combination of two- and three-dimensional ideas. See learning objective 1.2 in this guide. Students may wish to interview groups identified in the design brief that are the consumers the product is intended to serve. Teachers may wish to invite a professional designer from the community as a resource to speak about design in their work. Students need to become aware of ethical, societal, and cultural influences that affect design. (PSVS) Cooperative work skills are important employment entry level skills. At least one of the design briefs students choose should be planned and completed by a small group.

	Learning Objectives	Notes
2.4	To discuss the project with the teacher prior to doing a class presentation.	Discussion of their work allows students to share ideas, develop cooperative work skills, develop presentation skills and gain confidence in expressing themselves. Students should be encouraged to use as many visuals in their presentations as possible. A multimedia program could be used to enhance the presentation.
2.5	To maintain a design portfolio and journal. (COM)	A portfolio should contain all the ideas and the steps followed that each project generates. It is very important that the portfolio be maintained regularly and contain all work relevant to each design problem. A daily journal entry allows students to review planning and refer back to see their growth as well as assess their own work progress.

Module 3: Sketching and Freehand Drawing Fundamentals (Optional)

Suggested time: 5 - 15 hours **Level:** Introductory
Prerequisite: None

Module Overview
Students develop sketching and drawing skills that can be used to illustrate ideas and enhance design activity. The ability to communicate an idea using a sketch or drawing is a fundamental communication skill.

Foundational Objectives
- To apply the design process to creating visual art.
- To develop and practise the skill to critique designs in a positive manner.

Common Essential Learnings Foundational Objective(s)
- To use scale and proportion appropriately when sketching. (NUM, TL)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
3.1	To sketch and shade a natural form.	Start with pencil sketches. The use of a floodlight to delineate shadows will enhance the observational skills of students. Plants or fruit are good choices for subject matter. Images should be recognizable and demonstrate a sense of proportion and scale. Refer to the *Drafting and Computer-Aided Design 10, 20, 30 Curriculum Guide,* Module 3 Sketching.
3.2	To sketch and shade a manufactured form. (COM, TL)	Choose a manufactured item that has painted or polished surfaces that reflect light and create highlights. Items should include a variety of shapes, materials, textures and reflective properties. Articles that depict a wide range of contrast provide better subject matter.
3.3	To sketch with soft media, hard media, and wet media.	Examples of soft media are: pencil, charcoal, Conté crayons, or pastels. An example of hard media is a marker. An example of wet media would be ink applied with a brush. Students should be encouraged to keep their sketches monochromatic. Students who are skilled may want to use mixed media. Color harmonies such as monochromatic have been previously studied in the Middle Level Arts Education Curriculum. Students should develop sketches using a variety of media and place these in their portfolio.
3.4	To critique the work of other students in a positive manner.	Students need to learn how to be constructively critical of their work and the work of others. (COM)

	Learning Objectives	Notes
3.5	To present their work and discuss it.	Model critiquing: Be sure to emphasize good technique and methods that might improve the image. Initially, discussing work with pairs of students will allow students to practise critiquing work before engaging in a class presentation. Create or locate mats or frames of an appropriate size to display the sketches and drawings. Careful preparation of a presentation often enhances drawings and creates a professional appearance. See the *Photography Curriculum 10, 20, 30 Guide*, Module 20. Do not allow students merely to say they like something but have them express why they like a design. They must state certain criteria. As part of Resource-based Learning, teachers may wish to invite a professional designer from the community to act as a resource. Students must update their portfolios continuously.

Module 4: Modeling (Optional)

Suggested time: 10 - 20 hours **Level:** Introductory
Prerequisite: None

Module Overview
Students will build scale models to depict buildings or designed objects.

Foundational Objectives
- To apply the design process to creating visual art.
- To develop and practise the skill to critique designs in a positive manner.

Common Essential Learnings Foundational Objective(s)
- To use scale and proportion appropriately when sketching. (NUM, TL)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
4.1	To develop a three-dimensional model using a variety of materials. (TL, NUM, CCT)	Have students, individually or in groups, build a model of a building, a chair and/or desk, cutlery, a teapot, the interior of a building, or a stage set. Students will need to understand the concept of scale. Have students examine an object (a toy truck, a doll, etc.) and determine how many times as big it would need to be to be life-size. Measure a doorway and discuss what would be a suitable scale to make the doorway in a model. Introduce the use of a scale ruler to illustrate how a scale drawing may be prepared. (NUM) Refer to Module 2 in the *Drafting and Computer-Aided Design 10, 20, 30 Curriculum Guide*. If students choose to make a model of the exterior of a building, have them develop the landscaping around the building using appropriate materials. It may be possible to link the model to other subject topics (e.g., a model of the Parthenon, a stage set for a Shakespearian play, a river dam). Discuss how shadow and reflection of light from an object affects our perception about texture or shape. Storage and damage are always a concern for projects. Have students construct their models in boxes with lids and one or more sides that fold down. This will allow the stacking of projects and provide protection for the models. Suggest materials that are easily cut, painted, and glued. Encourage the students to experiment. Cutting stryrofoam to shape and gluing elevations to the block is one technique.

	Learning Objectives	Notes
4.2	To present their work and to discuss it. (COM)	Students need to learn how to be constructively critical of their work and the work of others. Explain how critiques are necessary to the design process to refine ideas. Model critiquing. Be sure to emphasize constructive comments as a good technique and method that might improve the model. Initially, discussing work with pairs of students will allow students to practise critiquing work before engaging in a class presentation. Have all groups present solutions to alleviate some of the pressure students may feel doing presentations. As part of Resource-based Learning, teachers may wish to invite a person from the community; e.g., die maker, architect, interior designer, model railroader, dentist, denture technician, wood carver, metal caster, stage manager, car or model club member. To see the everyday uses of models is important for students to make connections to actual situations in a workplace. This can be reinforced during work study.

Module 5: Historical/Cultural Design (Optional)

Suggested time: 10 - 15 hours **Level:** Introductory
Prerequisite: Module 1

Module Overview
Students will develop an appreciation for the importance and relevance of design within a cultural context, by examining past and contemporary examples of artifacts.

Foundational Objectives
- To understand and appreciate how design is affected by culture.
- To maintain and present a design portfolio.

Common Essential Learnings Foundational Objective(s)
- To explore the technical, social and cultural implications of technology. (TL)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
5.1	To describe elements and principles of design as they relate to a particular culture. (COM, PSVS)	Teachers should use visual media to demonstrate the evolution of a designed artifact from a cultural perspective: e.g., churches, traditional clothing, fabric design, housing, furniture design, apparel patterns, etc. (TL) See the *Housing 30 Curriculum Guide*, Module 2 for additional information. Students could focus on shelter, clothing, or public buildings: e.g., shelters such as the tipi or igloo, Ukrainian dance costumes, evolution of furniture styles, Shaker furniture, buildings used for religion, fabric design, blanket or quilt design, etc. Students may produce a model of a known artifact: e.g., a barn from the turn of the century, a tipi, a mud house, a tomb, a child's rattle, a cloak, etc. (TL)
5.2	To use technical skills to produce an object based on an artifact idea. (TL)	Students could incorporate traditional design elements into a modern artifact: e.g., a community centre, clothing, jewelry, housing, etc. Good examples of this are the design of the tourist centre at Wanuskewin (north of Saskatoon) and the proposed Saskatchewan Indian Federation College (SIFC) building on the University of Regina campus.
5.3	To present and discuss research findings and the model selected. (Optional)	Encourage students to use multimedia presentations to vary their presentations, and to avoid lecturing exclusively. (COM)

Module 6: Two-dimensional Design Applications (Optional)

Suggested time: 15 - 25 hours **Level:** Introductory
Prerequisite: Modules 1 and 2

Module Overview
Students will apply the design process, principles, and elements to two-dimensional projects. Communication and social issues are the predominate themes of the suggested projects.

Foundational Objectives
- To apply the design process to creating a two-dimensional design.
- To develop and practise the skill to critique designs in a positive manner.

Common Essential Learnings Foundational Objective(s)
- To demonstrate skills and attitudes that contribute to the development of positive human relationships. (IL, PSVS)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
6.1	To develop sketching and drawing skills. (COM, TL)	It should be an expectation that when students present ideas to the teacher or classmates they illustrate ideas using sketches or drawings. Students are encouraged to include examples of sketches and drawings in their portfolios to compare early works with later works and see their growth. Make suggestions for alternate media: e.g., markers, ink, paint, collage, transfers, photography, digital images, computer-generated type, etc. (TL).
6.2	To identify and use a variety of media, techniques, and resources when completing design projects.	Students planning a project should present an accurate scale representation of what they plan to do. Examples of projects could include murals that students have applied to walls and doors in the school.
6.3	To demonstrate attention to detail and accurate measurement. (NUM)	Emphasizing high quality and accurate work raises student esteem. Encourage careful work to avoid less than “best efforts”.
6.4	To use the elements and principles of design in a two-dimensional project and to be able to describe how they were used.	A review of the elements and principles of design before embarking on a project may be appropriate. See Module 2 of this guide. Review the steps in the Design Process. See Module 1.

	Learning Objectives	Notes
6.5	To engage in a design process. (TL, CCT)	Examples of possible projects are: CD covers, posters, murals, tickets, logos, team crests, labels for a product, advertisements, brochures, bulletin boards, T-shirt designs, a clock face, etc. Discuss the issues around copyright and creative ownership. Vary materials that can be used for assignments - monochromatic versus complimentary colours, watercolour versus markers, etc. Consider integrating the design with a school activity such as sports, drama presentations, graduation, or musicals. Coordinate the project with topics students may be researching in another class: e.g., healthy lifestyles, environmental issues, social issues, historical periods. (PSVS)
6.6	To participate in critiques that include input from classmates.	Establish guidelines so students understand clearly what is appropriate in a critique. The process of critiquing provides an opportunity for students to share their ideas and successes with their class. (COM) Encourage students to maintain a journal.

Module 7: Three-dimensional Design Applications (Optional)

Suggested time: 15 - 25 hours **Level:** Introductory
Prerequisite: Modules 1 and 2

Module Overview
Students will apply the design process, principles, and elements to three-dimensional projects. Problems and issues associated with product design are raised and dealt with while completing projects.

Foundational Objectives
- To apply the design process to creating a three-dimensional object.
- To develop and practice the skill to critique designs in a positive manner.

Common Essential Learnings Foundational Objective(s)
- To appreciate the aesthetics of more complex designs. (CCT, TL)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
7.1	To develop sketching and drawing skills using three dimensions.	It should be an expectation that when students present ideas to the teacher or classmates they do so using sketches or drawings completed in three dimensions using isometric, cavalier, or cabinet view drawings. See Module 5 from the *Drafting and Computer-Aided Design 10, 20, 30 Curriculum Guide.* Encourage students to include examples of sketches and drawings in their portfolios. Students will be able to compare early works with later works and see their growth.
7.2	To identify and use a variety of materials, techniques, and resources when completing three-dimensional design projects. (TL)	Make suggestions for materials that can be used, e.g., woods, metals, styrofoam, plastics, fabrics, cardboard, etc. Students might plan sitting areas, fountains, sculptures, or three-dimensional wall murals for their school. An accurate scale representation of what they plan to do could be part of a presentation.
7.3	To demonstrate attention to detail and accuracy of measurement.	High expectations are important if students are to reach their potential. High quality and accurate work raises self esteem. (PSVS) Review the elements and principles of design and the use of scale drawing in the design process. Assign a three-dimensional project to the students. Three-dimensional projects allow students to explore elements such as texture and shadow.

	Learning Objectives	Notes
7.4	To recognize and be able to identify mathematical or scientific principles as they apply to a design project. (TL, NUM)	Scientific principles should be considered when creating the three-dimensional projects. This practical application of principles such as structural strength, wind load, mass and buoyancy, etc. reinforces the understanding of theoretical learnings. Examples of possible projects are: bridges, roof truss systems, cardboard chair, cardboard sandals, CO_2 powered models, coin bank, coin sorter, cutting board with storage, gliders, folding stool, lighter-than-air vehicles, package for a fragile article (egg protector), power generation from waves, promotional packages, rubber band powered vehicles, small tourist article, snack food container, solar oven, solar powered vehicles, office or hydro towers, wind turbine, etc. Vary the materials required so students become familiar with a diversity of properties and the fabrication processes.
7.5	To engage in a design process. (CCT)	Consider coordinating the design project with school activities such as sports (design an apparatus used to develop balance and quick foot movement), drama presentations (produce stage props), and graduation (design and produce a commemorative ring). Another possibility is to support topics students may be researching in another class; e.g., simple machines, construction of pyramids, energy conservation, recycling materials.

Module 8: The Business and Profession of Design (Core)

Suggested time: 5 - 10 hours **Level:** Introductory
Prerequisite: None

Module Overview
Students will research business or career opportunities in the design sector and make a formal presentation of their findings.

Foundational Objective
- To research post-secondary training and business or career opportunities in the field of design.

Common Essential Learnings Foundational Objective(s)
- To use various means to access and share information regarding post-secondary training and career opportunities in the field of design. (COM, TL, IL)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
8.1	To research the business and profession of design. (IL)	Have students interview a design professional in person. (COM) Some small manufacturers have design persons on staff. (TL)
8.2	To determine some opportunities for a design-related career in the province. (IL)	Have students research types of businesses that would employ designers. Use website resources to research careers.
8.3	To identify qualifications for some of the post-secondary training and career opportunities that exist in the design field. (IL)	Have each student research different professions and training programs to review qualifications. Sharing the information at presentation time will broaden the scope of information. Some post-secondary programs require the completion of an undergraduate degree before entering the design program. Most post-secondary design programs require the submission of a portfolio.

Module 9: Two-dimensional Design Processes and Materials (Optional)

Suggested time: 15 - 25 hours **Level:** Intermediate
Prerequisite: Module 6

Module Overview
Students will acquire and develop knowledge and skills associated with the production of two-dimensional design materials.

Foundational Objectives
- To plan and create a two-dimensional design using a variety of materials and processes.
- To maintain and present a design portfolio.

Common Essential Learnings Foundational Objective(s)
- To apply the design process to creating a two-dimensional object. (CCT, TL)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
9.1	To write design briefs and identify the design processes to be used in a product proposal. (CCT)	Have students select a relevant issue or problem and develop a design brief. The projects should result in the production of several copies of the end product. The number will vary depending on the design, the size, expense of materials, and the fabrication processes.
9.2	To identify and use appropriate materials and fabrication processes, when completing the project described in the design brief.	Possible processes are collage, digital image, photogravure, photographs, lithography, transfer lettering, transparencies, silk-screening, stencils, woodcuts, etc. It is not necessary to have the production equipment available in the school. Explore community projects and partnerships. Consider a work study. If their projects involve advanced materials and processes, students may need the assistance of technicians or the use of equipment that is not available in the school to complete their projects.
9.3	To describe the stages of production necessary to produce a product in industry.	Students should develop a product production flowchart to illustrate the stages involved in producing a finished product. Consider a tour to a production facility.

	Learning Objectives	Notes
9.4	To describe alternative materials and processes that might be used for a product to improve its quality, volume, and cost of production. (TL, NUM)	Encourage students to use different materials and processes for each project to ensure a wide range of experimentation. Students should write a project plan that includes quantities to be manufactured, steps required, a time chart, drawings, materials list, etc. Environmental impact should be considered when making choices about a product and its production.

Module 10: Three-dimensional Design Aesthetics (Optional)

Suggested time: 10 - 15 hours **Level:** Intermediate
Prerequisite: Module 7

Module Overview
Factors such as colour, shape, texture, proportion, and scale are examined with an emphasis on the feel, appearance, and attractiveness of the products designed.

Foundational Objectives
- To use a variety of materials and fabrication processes to design and create a product.
- To understand and appreciate the relationship between function and aesthetics.
- To maintain and present a design portfolio.

Common Essential Learnings Foundational Objective(s)
- To appreciate the aesthetics of a design. (COM, PSVS)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
10.1	To be aware of the relationship between function and aesthetics.	Have students define function and aesthetics and their effect on one another. (PSVS) Good design embodies both functionality and aesthetics that are pleasing. Great design solutions are elegant, simple and timeless.
10.2	To describe alternative materials and processes that might be employed. (CCT)	Students could simply describe an alternative material such as "a metal that is translucent, lighter, stronger, a good conductor of electricity, and that makes the product aesthetically more pleasing." This describes a new material that needs to be developed. (COM)
10.3	To write a design brief and then create a three-dimensional model of the proposed product.	The design brief may specify materials that are not traditionally used for the intended product. While there will be a limited range of materials and processes available within the school and local community, students could research new products and processes that could be used. CADD models may be considered, rather than physical models. (TL)

Module 11: Three-dimensional Design Processes and Materials (Optional)

Suggested time: 15 - 25 hours **Level:** Intermediate
Prerequisite: Module 7

Module Overview
Students will apply the design process, principles, and elements to a three-dimensional project. They will practise skills, techniques, and processes associated with complex three-dimensional projects. They will expand their knowledge of materials and their properties, and the fabrication/manufacturing processes.

Foundational Objectives
- To use a variety of materials and fabrication processes to design and create a product.
- To maintain and present a design portfolio.

Common Essential Learnings Foundational Objective(s)
- To understand and apply the concept of scale and proportion. (NUM)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
11.1	To become aware of the relationship between function and aesthetics. (CCT, PSVS)	Good design embodies both functionality and aesthetics that are pleasing. Great design solutions are elegant, timeless, and simple. Discuss the relationship between function and aesthetics using a design example, such as a chair, fine china, etc.
11.2	To use a variety of materials and processes to solve design problems.	Students should research each problem to gain a general familiarization with the problem and then propose materials or structures that are best suited to a solution.
11.3	To write a design brief that delineates a problem of personal choice.	Students should write a plan that includes quantities to be manufactured, steps required, a time chart, drawings, materials list, etc. Have students submit a draft of the design brief for approval before continuing with their project.
11.4	To identify appropriate materials and fabrication processes when completing the design brief.	The project should result in the production of more than one item. The number will vary depending on the process, size, and expense of materials and fabrication processes. Students may need to have the assistance of technicians from the community to complete their project. Their project may involve advanced fabrication materials and processes. A photograph of the design project should be taken and included in the student's portfolio.

	Learning Objectives	Notes
11.5	To describe the stages of production necessary to produce the product commercially.	If possible arrange a visit to production facilities in the community. Refer to Module 9.3 in this guide.
11.6	To describe alternative materials and processes that might be used for a product to improve its quality, volume of production, cost per item, etc. (CCT, NUM)	Environmental impact should be considered when making choices: • method of production • use of recycled materials • packaging

Module 12: Human Environments (Optional)

Suggested time: 15 - 25 hours **Level:** Intermediate
Prerequisite: None

Module Overview
Students will consider human, environmental, ergonomic, and other factors when examining work, living, and recreational spaces.

Foundational Objectives
- To understand how human, environmental, and ergonomic factors impact on design solutions.
- To maintain and present a design portfolio.

Common Essential Learnings Foundational Objective(s)
- To understand and appreciate how the design of spaces in which people live, work, and play contribute to the quality of their lives. (CCT, TL)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
12.1	To understand how environment impacts on design.	The buildings we live and work in are designed for our climate. Houses that are designed to be energy efficient maximize the benefits of solar energy.
12.2	To understand human design factors.	Consider: accessibility, colour, cultural, ethical, intended users, size, texture, physiological impact, etc.
12.3	To submit design proposals that exemplify environmental and human factors using design elements and principles. (TL)	Possible projects: • Develop a retrofit solution for wheelchair accessibility at a historic property, a reception area, a community centre, or a palliative care centre. • Develop a home plan for a young professional couple without children. • Develop a floor plan for a home operated business. • Develop a plan for a group home for (4-6) persons with intellectual disabilities, etc. Refer to Module 13 in the *Drafting and Computer-Aided Design 10, 20, 30 Curriculum Guide*. Students could visit and evaluate several community sites, a seniors centre, hospital, or special care home. Involve community members in the design process to work on problems and solutions for their community; for example, creating accessibility solutions for special needs people.

Module 13: Design Rendering and Presentation (Optional)

Suggested time: 15 - 25 hours **Level:** Intermediate
Prerequisite: None

Module Overview
Rendering techniques using a variety of media for technical drawings and illustrations are learned and practised. A variety of presentations are studied.

Foundational Objectives
- To use various techniques and media to make high quality presentations.
- To maintain and present a design portfolio.

Common Essential Learnings Foundational Objective(s)
- To participate in effective demonstrations and presentations. (COM, TL)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
13.1	To use media such as markers, water colours, airbrushes, etc. to enhance drawings.	Students should take one drawing and try several different media to enhance it. Airbrushing is very effective. See the *Graphic Arts 10, 20, 30 Curriculum Guide*, Module 13 for more detail. Students may find hand-colouring of black and white photographs interesting. It was popular prior to the introduction of colour prints and is still used by some firms to produce striking photographs.
13.2	To use the addition of transfer lettering, digital images**,** raised areas, photographs, collage, etc. to enhance presentations. (TL)	The use of computer-generated images can enhance drawings by adding sketches, pictures or clip art. Three-dimensional designs could include interior, exterior, landscape, cross sections, and product illustrations. The use of mats, drymounting, frames, lighting, music, actors, and models may be included in class discussions.
13.3	To use computer software to create a visual presentation using a slide format.	Students may want to add sound or video to their computer-aided presentation. The solution of a design problem delivered through the use of *presentation software* can be very effective. Consult the *Communication Production Technology 10, 20, 30 Curriculum Guide*.

Module 14: Human Factors and Communication (Optional)

Suggested time: 15 - 25 hours **Level:** Intermediate
Prerequisite: Module 12

Module Overview
Two-dimensional design problems can address cultural and social responsibility issues and the communication of complex information in an increasingly complex global world.

Foundational Objective
- To maintain and present a design portfolio.

Common Essential Learnings Foundational Objectives
- To create a two-dimensional design that addresses a social issue. (TL, PSVS)
- To develop an awareness of ethical considerations when designing a product. (PSVS, CCT)

Note: Other CELs may be emphasized.

Learning Objectives	Notes
14.1 To create a design brief that delineates a two-dimensional project addressing a social issue. (COM, PSVS)	Have students select a current social issue and develop a design brief that addresses the issue. Possible topics might include: school or community issues such as Students Against Drunk Driving, poverty, pollution, diseases, public transportation, etc. Many organizations have competitions to encourage students to be aware of issues such as safety in the home, farm safety, fire prevention, etc. These may include poster designs, stamp designs, Remembrance Day, etc. Encourage students to become involved in these competitions. The project should demonstrate how human factors such as physical, mental, ethical, cultural, etc. have been considered and accommodated in the design project. Have students gather examples of materials that illustrate how considerations for colour, symbolism, shape, composition, gender, and sexuality may be incorporated in commercial materials.
14.2 To discuss commercially generated two-dimensional materials and describe their impact and effect. (COM, PSVS)	Students should recognize that advertising has a strong impact on people that must be considered as a designer and as a consumer. Designers create to meet the needs of a client. Students need not agree with the position they are communicating in their projects. The effectiveness of the presentation of a position will be the point of discussion, not the position itself.

Module 15: Intermediate Three-dimensional Modeling (Optional)

Suggested time: 15 - 25 hours **Level:** Intermediate
Prerequisite: Module 4

Module Overview
Students will complete detailed scale models of structures or buildings using advanced processes and materials.

Foundational Objective
- To design and produce scale models.

Common Essential Learnings Foundational Objectives
- To use scale and proportion appropriately in a design. (NUM)
- To develop the skills necessary to design and produce three-dimensional scale models. (TL)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
15.1	To describe the importance of models for design and presentation.	Have students conduct a personal interview with a designer. (engineer, architect) Students may find examples of architectural project models that have been completed in or proposed for their community.
15.2	To complete a detailed scale model. (IL, TL)	Possible models include: • alternative building structure (straw bale home, stack wall log construction, etc.) • a bridge or tower; a community project (community centre, play area, swimming pool, stadium) • a design project from a previous module; a drama set; an existing building; a historical site; a part of their school • a solar-heated structure; a solar-powered vehicle; the student's home (interior or exterior); sun room addition • clothing construction using a half scale pattern • other examples can be found in the Arts Education curriculum. Model railroad builders and magazines are excellent resources for ideas about scale modelling. Students should be aware that some materials needed to complete a model may be expensive. They should prepare a list of materials and do a cost analysis before embarking on a project. Lighting, removable sections, and a variety of textures may enhance a model. An entire structure is not necessary to demonstrate the process of modeling. For example, the model could be one corner of a building. The model could be turned to view the exterior or interior and to show structural components.

Learning Objectives	Notes
	The inclusion of objects, people, furniture, vehicles and landscaping provides a visual clue as to the relative scale of the model. One technique for presentation is to take the audience through a guided tour that highlights the details of the model. Students should document their model's progress with photographs. Including a scale in the photograph provides a visual clue as to the true size of the model. Students may want to experiment with table-top photography. Photos taken of the model from a position that replicates eye level gives the impression of how a full-scale project might appear to someone. See the *Photography 10, 20, 30 Curriculum Guide* for more information. Lighting is important to insure all details on the model are visible. Photographs of students' work should be in their portfolios.

Module 16: Work Study Preparation and Follow-up Activities (Optional)

Suggested time: 5 - 8 hours
Prerequisite: Module 10

Module Overview
Students will prepare for work study in the community. Expectations for the student, the teacher, and the employer should be discussed.

Foundational Objectives
- To develop skills that may lead to finding and maintaining employment.
- To understand how skills learned in school may apply to the workplace.

Common Essential Learnings Foundational Objective(s)
- To demonstrate skills and attitudes that contribute to the development of positive human relationships. (IL, PSVS)

Note: Other CELs may be emphasized.

	Learning Objectives	Notes
16.1	To be aware 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. For a list of roles and responsibilities of the business, personnel, manager, teacher monitor, school, parent, and student, see the Work Study Guidelines for the Practical and Applied Arts included in the *Practical and Applied Arts Handbook*.
16.2	To determine factors that may affect student contribution in the workplace. (CCT)	Brainstorm a list, then verify through experience. The list may include previous work experience, volunteer work, teamwork activities, and extra-curricular participation within the school.
16.3	To build good communication skills for the workplace. (COM, PSVS)	Discuss verbal and non-verbal communication. List some ways in which negative and positive 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 resolving conflict. Use case studies, and divide the students into groups to role play how effective communication may be used to resolve conflict on the job.

	Learning Objectives	Notes
16.4	To develop a resumé that may be forwarded to a potential employer.	The student will develop a resumé using the correct format. (IL) The resumé may be used to introduce the student to the employer of a workplace site prior to an interview. Teachers are encouraged to work with other staff members to ensure resumé preparation is taught. Resumé writing is suggested in *English Language Arts 20 and A30, Information Processing 10, 20, 30,* and *Career and Work Exploration 20*. Students should save the resumé on a computer disk and update it, as changes need to be made and references are added.
16.5	To determine student guidelines in preparation for an interview. (COM)	Through class or small group discussions, students may list guidelines for an interview. The instructor may add missing items to the list. Outline and describe the three stages of an interview. Point out to the students at what stage of the interview each of the guidelines previously discussed will be used. The **greeting** involves an introduction between the student and employer. Discuss or demonstrate how this should be done. The **exchange** is the longest part of the interview where the employer asks a series of questions and engages in a dialogue with the student about information on the resumé and other matters relating to the job. The **parting** provides closure to the interview and may 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 make a list. Students may role play the stages of the interview.
16.6	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 above as points for discussion.

	Learning Objectives	Notes
16.7	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
16.8	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.

Module 17: Work Study (Optional)

Suggested time: 25 - 50 hours
Prerequisite: Module 16

Module Overview
Students will be placed in the community working with a mentor and/or a supervisor. They may have the opportunity to learn to use software, to practise illustrating, and to learn modeling skills not available at their school. Students will be engaged in experiential activities in the workplace.

Foundational Objectives
- To be aware of the careers and opportunities in the field of interior design that exist in Saskatchewan and other provinces.
- To integrate classroom learning with work-based learning.
- To increase awareness of employability skills as they relate to the work environment.

Common Essential Learnings Foundational Objectives
- To engage in a work study experience and develop entry level workplace skills that may lead to sustainable employment. (PSVS)
- To expand career research beyond the classroom setting. (IL)

For more information about implementing work study in schools see the Work Study Guidelines for the Practical and Applied Arts included in the *Practical and Applied Arts Handbook.* Teachers need to use or design appropriate learning objectives for this module; for instance, to demonstrate ability to follow a "Training Plan". The training plan for the student should be designed to relate to the objectives of the course modules chosen in collaboration with the cooperating employer.

Note: the renewed/new *Career and Work Exploration 10, 20, A30, B30 Curriculum Guide* is being developed. Consult the Department of Labour for content about Labour Standards, Occupational Health and Safety, and WHMIS. If students have experienced a work study during grade 11 or 12 in other courses, add more depth to the next experience.

Module 18A, B: Extended Study Module (Optional)

Suggested time: 10 - 20 hours
Prerequisites: Selected Objectives from DEST Modules 1 and 2

Note: For additional information, consult the *PAA Handbook.*

Design Studies (DEST) Modules 18A, and/or 18B provide schools with an opportunity to meet current and future demands that are not accommodated by other modules in this PAA curriculum guide.

DEST 18A, 18B may be used with either a pure or survey course. These two 10-20 hour optional modules may be used for varying specialized purposes and at different levels. The flexibility of this approach allows a teacher to design a new module to compliment core and optional modules, thus meeting the specific needs of the students or the community. In other words, DEST 18A, 18B modules may be used to provide opportunities for students to use **a design studies curriculum approach** that would strengthen the knowledge, skills, and processes found in Design Studies.

Considerations for Planning and Preparing these Modules

Teachers using module DEST 18A and/or 18B will need to develop the module based on the format of the other modules in this guide. It is important to note that objectives 1.1, 1.2, 1.5, 1.6 and 2.1, 2.2, 2.3 from DEST are essential objectives to understand and use for the planning and development of the module. The DEST 18A, 18B modules should be used to compliment content from the other modules that are part of the course.

Teachers will need to:
- repeat DEST Foundational Objectives or borrow them from other pure PAA curricula
- develop specific learning objectives that reflect Design Studies
- use a variety of instructional approaches to meet students needs
- employ a variety of methods of assessment and evaluation ideas suggested in the *PAA Handbook* or other resources, and
- create a specific title for DEST 18A or 18B; for example, DEST 18A: Extended Study – Design a Planter.

Suggestions for DEST 18A or 18B

As examples, teachers and students could be encouraged to use this module to:
- fully develop a product idea or service for consumers
- design, develop, fabricate, test and then manufacture a product
- design a promotional package to support a product or idea that would incorporate a variety of communication techniques and strategies, and
- develop and/or apply new innovative computer software.

The module will provide an opportunity to extend previously learned content and build on the skills that were introduced in the core and optional modules of Design Studies, as well as develop knowledge and skills that might be involved in manufacturing or service delivery processes.

For example, brainstorming a product idea, developing the idea, problem-solving, and then manufacturing a product moves through the entire product development and planning process, and incorporates the use of technical skills to enhance learning. The same approach can be used to develop a service.

Projects may be developed in conjunction with community service organizations to produce a product or provide a service to be used in the community; for example, produce a full colour brochure for a community group that outlines events or activities, or build planters for a senior's home that would allow the citizens to garden from a chair.

References

Alberta Education. (1996). *Design studies*. *Career and technology studies.* Edmonton, AB: Author.

Browning, K., Heighington, G. Parvu, V., & Patillo. D. (1993). *Design and technology*. Toronto, ON: McGraw-Hill Ryerson Ltd.

Day, G. (1996). *By design: Technology exploration and integration.* Etobicoke, ON: Trifolium Books Inc.

Kaufman, A. & Flowers, J. (1996). *Technology projects for the classroom.* Ann Arbor, MI: Prakken Publications, Inc.

Mitchell, C. (1993). *Redefining designing: From form to experience.* New York, NY: Van Nostrand Reinhold.

Wallschlaeger, C. (1992). *Basic visual concepts and principles for artists, architects and designers.* Toronto, ON: McGraw-Hill, Ryerson Ltd.

Saskatchewan Education. (Draft 2000). *The practical and applied arts handbook.* Regina, SK: Author.

Saskatchewan Education. (Draft 1999). *Drafting and computer-aided design 10, 20, 30.* Regina, SK: Author.

Saskatchewan Education. (Draft 1999). *Graphic arts 10, 20, 30.* Regina, SK: Author.

Saskatchewan Education. (1999). *Housing 30.* Regina, SK: Author.

Saskatchewan Education. (1999). *Interior design 30.* Regina, SK: Author.

Saskatchewan Education. (Draft 1998). *Photography 10, 20, 30.* Regina, SK: Author.

Saskatchewan Education. (1992). *The adaptive dimension in core curriculum.* Regina, SK: Author.

Saskatchewan Education. (1991). *Curriculum evaluation in Saskatchewan*. Regina, SK: Author.

Saskatchewan Education. (1991). *Instructional approaches: A framework for professional practice*. Regina, SK: Author.

Saskatchewan Education. (1991). *Student evaluation: A teacher handbook.* Regina, SK: Author.

Saskatchewan Education. (1988). *Understanding the common essential leanings*: *A handbook for teachers*. Regina, SK: Author.

Appendix A: Recordkeeping Chart

Design Studies 10, 20

Student Name: _____

School Name: _____

Module Code	Module	Date	Teacher Initial
	Design Studies 10		
DEST01	Module 1: The Design Process C		
DEST02	Module 2: Design Fundamentals C		
DEST03	Module 3: Sketching and Freehand Drawing Fundamentals O		
DEST04	Module 4: Modeling O		
DEST05	Module 5: Historical/Cultural Design O		
DEST06	Module 6: Two-dimensional Design Applications O		
DEST07	Module 7: Three-dimensional Design Applications O		
DEST08	Module 8: Business and Profession of Design C		
DEST12	Module 12: Human Environments O		
DEST18A	Module 18A: Extended Study O		
	Design Studies 20		
DEST09	Module 9: Two-dimensional Design Processes and Materials O		
DEST10	Module 10: Three-dimensional Design Aesthetics O		
DEST11	Module 11: Three-dimensional Design Processes and Materials O		
DEST13	Module 13: Design Rendering and Presentation O		
DEST14	Module 14: Human Factors and Communication O		
DEST15	Module 15: Intermediate Three-dimensional Modeling O		
DEST16	Module 16: Work Study Preparation and Follow-up Activities O		
DEST17	Module 17: Work Study O		
DEST18B	Module 18B: Extended Study O		

C = Core module
O = Optional module

It is recommended that this document be printed on school letterhead.

Appendix B: Design Brief and Team Considerations

Writing a Design Brief

Introduction
This should be a concise description of the project, the design specifications, intended use, intended user, and performance criteria.

Here is an example.

Project: Design a container for carrying eggs.
Design Specifications: It must be light, compact, and strong.
Intended Use: By hikers and campers.
Performance Criteria: Both the eggs and the container should survive a drop from a height of 8 metres.

Due Dates
Action Plan: Day 2
Preliminary Solution: Day 8
Completion of Prototype: Day 12
Presentation: Day 15

Materials
- wood
- plastic
- stryrofoam
- adhesive
- paper
- cardboard
- rubber bands
- velcro
- tape
- paint
- ink

Possible Projects: Lighter-Than-Air Vehicles, Rubber band Powered Vehicles, Solar Powered Vehicles, Cardboard Chair, Package for Fragile Article, Cardboard Sandals, Gliders, Coin Sorter, Computer Mouse (to be used by a person without the use of a hand), Egg Protector, Cutting Board with Storage Drawer, Bridges, Promotional Packages, Solar Oven, Wind Generator, Wave Generator, Small Tourist Article, Folding Stool, Coin Bank, Snack Food, Bumper Sticker, Towers, etc.

Design Team Evaluation Form for Initial Proposal

1. What are the prototype construction materials?

_____

_____

_____

2. How are the materials joined?

_____

_____

_____

3. Are the materials and joining processes consistent with the design brief?

_____

_____

_____

4. Will the prototype meet the performance requirements?

_____

_____

_____

5. Will the prototype be attractive to the intended consumers?

_____

_____

_____

6. Questions for the teacher?

_____

_____

_____

7. Who else could you ask for an opinion or information?

_____

_____

_____

8. Questions for persons other than the Design Studies teacher?

_____

_____

_____

Log Sheet: Knowing the Clientele

1. Who will use or purchase the product being designed?

2. Why would the client want the product?

3. What do you know about the intended user?

4. Who could you interview?

5. What questions would you ask in an interview?

6. Other?

Planning Sheet for Design Team

1. What are we going to make?

_____

_____

_____

2. What materials are we going to use to make it?

_____

_____

_____

3. How are we going to cut the material?

_____

_____

_____

4. How are we going to fasten the material?

_____

_____

_____

5. What do we need to know about the material?

_____

_____

_____

6. What does each person on the design team have to do and by when?

_____

_____

_____

7. Other?

_____

_____

_____

Oral Presentation Outline for Design Team

The following are some suggestions for components of an oral presentation. Students should feel free to change the order or add or delete items.

- Introduce the members of the design team.
- Describe some of the ideas you had at the beginning.
- Describe the process your team used to arrive at the solution.
- Describe any problems you had.
- Tell how you solved the problems.
- Explain why you chose colour, shape, size, materials, etc.
- Show the product.
- Demonstrate the product.
- Explain why the product meets the need presented in the design brief.
- Suggest improvements that might be made.
- Thank your audience or juror.

Sample Letter to Juror

Dear ----------

Thank you for volunteering to review student presentations for the Design Studies course. The students have worked diligently to prepare for the review. The review is the final step in a series of steps that have led students to a solution to a design problem that was posed to them. Attached you will find a copy of the design brief(s) that students prepared at the beginning of the module.

The design teams will each have 15 minutes to present their product. You will have the opportunity to ask questions if you wish. The students participating may be nervous, and self-conscious. Please assist them by asking questions that are specific. After all the projects have been presented, you will have an opportunity to speak to the class. It is not expected that you will rate the projects.

We look forward to your visit to our school on _____ at _____. Please go to the school office. The office staff will announce your arrival and a student will accompany you to our classroom.

Thank you for your involvement.

Sincerely,

Appendix C: Assessment Tools

Checklists for Assessment

The following boxes contain criteria to create checklists that may be useful to teachers and students. Some strategies for the classroom include: having students rate themselves, having students rate team members, using the same checklist at the beginning and near the end of a course or module to indicate growth, using simple yes/no answers, creating a rating scale, including checklists in the student's portfolio, doing random checks during class time, highlighting strengths, and highlighting areas to strengthen.

The student:	The student:	The student:
– arrives on time. – has books, pens, etc. – stays on task. – follows instructions with a minimum of supervision. – is polite.	– sets goals and has a plan to reach them. – applies knowledge, skills, and attitudes in a practical situation. – uses a variety of strategies for solving problems.	– follows detailed instructions independently. – cooperates with others. – provides leadership. – thinks critically and logically.

The student:	The student:	The student:
– meets timelines. – uses materials as directed. – uses facilities safely. – cleans up. – stores materials and tools appropriately.	– sets own timelines. – gets materials out and begins work without prompting. – cleans up without prompting. – stores materials and tools without prompting.	– prioritizes tasks. – assists others. – maintains facility and equipment. – reorganizes tools or materials that have been stored improperly.

The student:	The student:	The student:
– participates in problem solving discussions. – demonstrates a range of problem solving skills. – encourages others to participate.	– makes positive rather than negative comments during discussions. – expresses ideas clearly and concisely. – respects the opinions of others.	– suggests new and creative solutions. – takes action to facilitate work plans. – assists others in need of help. – can synthesize information.

The student:	The student:	The student:
– uses technical language in context. – listens during discussions. – helps reach consensus. – can interpret technical drawings.	– completes group commitments. – does not dominate group discussions. – values team members.	– identifies hazards. – takes action to correct hazards. – intercedes in unsafe situations. – accepts accountability for actions.

The student:	The student:	The student:
– uses appropriate materials. – understands what makes the project strong. – recognizes the source creative of energy. – considers aesthetics. – looks at social and environmental effects of his/her design.	– joins materials with appropriate methods. – recognizes design elements/principles in structures around her/him. – integrates form and function.	– tests ideas or materials and makes changes as needed. – understands what makes the project move (gears, pulleys, inclined plans, screws, hydraulics, pneumatics etc.).

Group Project Form

Group: _____

Design Project:_____

Criteria	Rating
Meets design specifications	0 1 2 3 4
Demonstrates design knowledge	0 1 2 3 4
Aesthetically pleasing	0 1 2 3 4
Technique	0 1 2 3 4

Criteria

Meets design specifications
- performs defined function
- uses materials as specified

Demonstrates design knowledge
- solution arrived at using design process
- elements and principles of design present

Aesthetically Pleasing
- good ergonomics
- balanced
- attractive to intended user

Technique
- fabrication of materials
- accuracy
- finish
- scale
- completeness

Teacher's Comments

_____

_____

_____

_____

Group Project Presentation

Group: _____

Design Project:_____

Criteria	Rating
Preparation	0 1 2 3 4
Knowledge	0 1 2 3 4
Teamwork	0 1 2 3 4
Technique	0 1 2 3 4

Criteria

Preparation
- equipment and materials ready at beginning of presentation.
- team members know their roles.
- presentation done within time frame.

Knowledge
- solution arrived at using design process.
- elements and principles of design referred to during presentation.
- evidence of research.

Teamwork
- contribution by each team member.
- exhibits basic teamwork.

Technique
- a variety of media used (multimedia).
- balanced participation.
- audience attentive.

Teacher's Comments

_____

_____

_____

_____

Rating Form

Student Name: _____

School Name: _____

Module: _____

Criteria	Rating
Work habits	0 1 2 3 4
Teamwork	0 1 2 3 4
Knowledge	0 1 2 3 4
Equipment and materials	0 1 2 3 4

Criteria

Work Habits
- is self-starting
- is organized
- follows directions
- uses time effectively
- practises safe work habits
- meets deadlines

Teamwork
- cooperates with classmates
- shares group work
- helps negotiate consensus
- respects differing opinions

Knowledge
- interprets design brief correctly
- plans response to brief using a design process
- uses elements and principles of design
- recognizes mathematical and scientific principles used in design solutions
- uses technical language and drawings to communicate ideas

Equipment and Materials
- keeps work area orderly
- does not waste materials
- uses appropriate equipment and materials

Teacher's Comments

_____

_____

_____

_____

Rating Scale Rubric

	Rubric Criteria and standard	Project	Problem solving	Use of tools and materials	Quality	Teamwork
0	Incomplete.	Not complete.		Used inappropriately.		
1	Meets minimum expectations.	Complete.	Follows a guided plan of action.	Limited range of tools**,** materials, and processes.	Acceptable.	Cooperates.
2	Meets expectations with limited assistance.	Complete.	Plans and solves problems with limited assistance.	Tools, materials, and/or processes used appropriately.	Quality and production reasonably consistent.	Works to achieve team goals.
3	Meets expectations in a self-directed manner.	Complete.	Plans and solves problems in a self-directed manner.	Works efficiently.	Good consistent quality.	Works cooperatively and participates in a positive manner.
4	Exceeds expectations. Creative, self-directed, leader.	Exceeds expectations.	Plans creatively.	Very effective and efficient use of material, tools, and/or processes.	Exceptional quality.	Leads others.