**About This Resource**

Open School BC’s Youth Explore Trades Skills resource development project involves creating learning resources to support the implementation of the BC Ministry of Education’s *Youth Explore Trades Skills* Program Guide.

On December 7-9, 2015 a Drafting and Design resource development planning session took place in Victoria, B.C. The purpose of the planning session was to develop an instructional design plan and draft Activity Plans for a Design and Drafting module, to be used within the Youth Explore Trades Skills course. The planning session brought together Drafting and Design educators who teach their students about the design process, as well as fundamental drafting (drawing) skills needed within all trades.

These resources have been designed to meet a range of students’ and teachers’ needs. Each activity has been created as a foundation lesson, many with suggested extension activities for students to further expand their knowledge.

This module introduces students to Board Drafting and Computer Aided Drafting (CAD). The Activity Plans cover both Architectural and Mechanical standards. Activity Plans are designed with flexible use in mind; lesson content has been divided into discrete chunks to allow for standalone use for ease of navigation by teachers, but can also be followed in sequence.

The Architectural Drafting Activity Plans can align directly to the Carpentry, Plumbing and Electrical modules of Youth Explore Trades Skills. The Mechanical Drafting module correlates with the Automotive module, but can also compliment the Metal Work module.

The planning team created broad activites in order that teachers can use the equipment available to them—both manual/board drafting equipment and computer software.

In this resource you will find:

* Detailed terminology related to the fields of design and drafting
* Detailed lists and descriptions of board drafting equipment
* Detailed information regarding current CAD software programs
* Detailed Activity Plans with activities, images and supporting instructional videos

All Activity Plans are available in both PDF Format and Word formats on the Youth Explore

Trades Skills website: <http://www.mytrainingbc.ca/skills-exploration/index.html>



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**Module Structure**

The Design and Drafting module is structured as follows:

# Design

Defining Design

Working as a Designer

Design Challenge – the Gift-Giving Experience

Design and Social Responsibility – Disaster Relief Shelter

# Information Handouts

Problem-Solving Models

The Design Process in Manufacturing

# Drafting

Drafting Careers

## 2D Architectural Board Drafting

* 1. Drafting Dictionary

Drafting Dictionary PPT resource

* 1. Introduction to Title Blocks
  2. Drawing Objects
  3. Scale and Dimensioning
  4. Orthographic Drawing
  5. Isometric Drawing

## 2D Mechanical Board Drafting

1. Drafting Dictionary

Drafting Dictionary PPT resource

1. Introduction to Title Blocks
2. Drawing Objects
3. Scale and Dimensioning
4. Orthographic Drawing
5. Isometric Drawing

**2D Mechanical and Architectural CAD**

1. Computer and Network Orientation
2. CAD Orientation

[Teacher Video 2.1 - Intro to CAD Software for the Teacher-3](https://youtu.be/cN4HhzQwrfQ)  [2.1 CAD Program Interface (MCAD)](https://youtu.be/PZgId9MSx9A)

[2.2 Basic Command Line Entry and Page Setup for Activity 2 (MCAD)](https://youtu.be/RZpLg1gDcbw)  [2.3 Absolute and Relative Coordinate Entry (MCAD)](https://youtu.be/fzxuwtiYxBU)

[2.4 Polar Coordinate Entry and Mouse Entry (MCAD)](https://youtu.be/vTNWwmey1SI)  [2.5 Offset Command-2 (MCAD)](https://youtu.be/BTg37XuTJ0c)

* 1. [Fillet Command (MCAD)](https://youtu.be/n6vhs5NlptI)
  2. [Move Command and Object Snap (MCAD)](https://youtu.be/egXxizTTZmQ)  [2.8 Trim Command (MCAD)](https://youtu.be/lDpX9GB8NSk)
  3. [Drawing a Simple Border (MCAD)](https://youtu.be/0wpqwbaIlIk)
  4. [Inserting Text into a Title Block (MCAD)](https://youtu.be/iL7B37H7ha0)  [2.11 Plotting or Printing Your Drawing-2](https://youtu.be/S-KNDhwQDN8)

1. Set Up Your Model Space
   1. [: Setting Up Your Model Space (Part 1)](https://youtu.be/D7mRmFP4tNw)  [3.2: Setting Up Your Model Space (Part 2)](https://youtu.be/oA2IPDA2HMI)
2. Draw Your Border
   1. [Open a Drawing Template](https://youtu.be/yyp8aMXaGtY)
   2. [Draw a Border and Title Block](https://youtu.be/cRXEJ-AMoqs)
   3. [Complete the Lines of the Title Block](https://youtu.be/TqPW8PM6H_w)  [4.4 Inserting Labels into Your Title Block](https://youtu.be/uVmKhXHx7mI)
   4. [Drawing a Logo to Complete the Title Block and Border](https://youtu.be/hZjgFhoVFP0)
   5. [Save Your Completed Border and Title Block as a Drawing Template](https://youtu.be/wh_3NtyCZJs)
3. Create an Orthographic Drawing
   1. [Creating an Orthographic Drawing (Part 1)](https://youtu.be/HYm9pRCn_fs)  [5.2 Creating an Orthographic Drawing (Part 2)](https://youtu.be/ctD8hYSxoFc)  [5.3 Creating an Orthographic Drawing (Part 3)](https://youtu.be/xEnvsDu9B9s)
4. Draw an Isometric Drawing
   1. [Creating an Isometric Drawing](https://youtu.be/2L47O98K6WE)
5. Save Your Border and Title Block [7.1 Scaling Your Title Block](https://youtu.be/oX2ZutvZil8)
6. Dimension an Orthographic Drawing
   1. [Dimensioning an Orthographic Drawing](https://youtu.be/PiqJC9D4YK8)
7. Fill in Your Title Block, Including Scale [9.1 Filling in Your Title Block](https://youtu.be/0JAkCPm_ltM)
8. Set Up Your Plot Window, Print on 8.5 × 11 Paper [10.1 Plotting Your Drawing](https://youtu.be/JRssftQSFR4)

Extension Activity – Setting Up to Export to Other Programs [1. AutoCAD to Laser](https://youtu.be/hpZzspU9zrA)

[2. Exporting a Drawing](https://youtu.be/38RJ5auKm-w)

## 3D Modelling – Architectural CAD

1. Symbols and Standards
   1. [: Changing Your Model Space](https://youtu.be/oX2ZutvZil8)
   2. : Drawing Architectural Blocks for a Building
2. Drawing a Simple Building
   1. : Drawing the External Walls of a Building 12.2: Placing Architectural Blocks into a Drawing

12.3: Scaling Your Border and Dimensioning a Floor Plan

1. Exploring SketchUp Make
   1. : Exploring SketchUp Make
2. Creating a Simple Architectural Structure
   1. [Creating a Simple Architectural Structure (Part 1)](https://youtu.be/qd1wDnZwuVw)  [14.2 Creating a Simple Architectural Structure (Part 2)](https://youtu.be/a05JfSeHtVU)  [14.3 Creating a Simple Architectural Structure (Part 3)](https://youtu.be/jWcZkCEgRBk)  [14.4 Creating a Simple Architectural Structure (Part 4)](https://youtu.be/ZQT5ilVnXGc)
3. Modelling Your Structure
   1. : Modelling Your Structure

Extension Activity – Prototyping Your Model Using Printing and CNC Technology

## 3D Modelling (Inventor) – Mechanical CAD

1. 3D Modelling a Set of Stairs

11.1: Constraining and Dimensioning 2D Sketches 11.2: Drawing Your Stairs

11.3: Extruding Your Stairs

1. Drawing and Assembling
   1. : Drawing Side 1 of the Die
   2. : Adding a Sketch to a Surface of a Part 12.3: Assembling Your Die

Extension Activity – 3D Mode to 3D Printer – CNC Software Exporting Your Final Part or Assembly to 3D Printer Software

Extension Activity – 3D Model to Laser Engraver Software Exporting Parts to Be Cut on a Laser Engraver MCAD