**Youth Explore Trades Skills Design and Drafting – 2D Drawing**

# Dimension an Orthographic Drawing

**(Mechanical and Architectural CAD)**

## Description

In this activity students will learn how to dimension an orthographic drawing.

## Lesson Objectives

The student will be able to:

* Find the dimension tool
* Use the dimension tool
* Scale dimension text by a factor of 4
* Dimension according to general guidelines

## Assumptions

The student will:

* Know how to login to a computer and open up software
* Be familiar with all skills taught in the seven preceding activities:
  + Computer and Network Orientation
  + CAD Orientation
  + Set Up Your Model Space
  + Draw Your Border
  + Create an Orthographic Drawing
  + Draw an Isometric Object
  + Dimension an Orthographic Drawing

## Terminology

**Dimension**: the measurement value of an object.

**Dimension style**: a group of dimension settings that determines the appearance of the dimension and simplifies the setting of dimension variables.

**Layers**: CAD layers are powerful organizational tools for drawing. In graphics software, layers are the different levels at which you can place an object or image file.

**Orthographic drawing**: a two-dimensional representation of a 3D shape. Often there are multiple views, and together they make an *orthographic projection*. A complete projection will have six views: front, right side, top, left side, bottom, and back.



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**Scale**: a command used to proportionally resize objects; the multiplying factor by which you make an object larger or smaller.

**Snap**: limits the movement of the cursor crosshairs to a predetermined interval in order to aid in drawing to specific measurements. Isometric snap limits your cursor movement to align with an isometric grid.

## Estimated Time

60 minutes

## Recommended Number of Students

20, based on *BC Technology Educators’ Best Practice Guide*

## Facilities

Computer lab installed with CAD software (Google SketchUp, AutoCAD, etc.)

## Tools

Projector with computer and speakers, Internet access

## Materials

Student activity sheet, and Internet access so students can watch the tutorial video

## Resources

Instructional video for teacher and students to follow:

* 8.1 Dimensioning an Orthographic Drawing

## Teacher-led Activity

Use a computer with a projector to demonstrate how to:

* Open the orthographic drawing
* Change to DIM layer
* Using DIMSTYLE, scale dimensions by 4
* Change precision of drawing
* Insert an MTEXT for notes
* Dimension rules
* Dimension the views
* Re-save the file as an orthographic drawing

## Student Activity

Students will follow the video tutorial and activity in order to dimension their views.

## Extension Activity

Have students dimension a six-view orthographic projection of either the stair block or a different orthographic drawing. Isometric drawings are not meant to be dimensioned; please do not use isometric drawings to practise dimensioning.

## Assessment

Students will show the teacher their completed and saved orthographic drawing.

# Student Activity: Filling in a Title Block

Using the software, dimension your orthographic drawing. A video to support the lesson is located in Resources.

## Commands to Use/Learn

### DIMENSION DIMSTYLE

**Procedure**

1. Open up your CAD software and watch the tutorial video as the software loads. Once the software has loaded, open up your orthographic drawing file.
2. Once the drawing file is open, select the DIM layer.
3. Next, open the Dimension manager using the **DIMSTYLE** command. Then change the scale and precision according to the video.
4. Start dimensioning by using the **MTEXT** command to create and fill in your notes box as shown in the video.
5. There are many governing bodies that create standards in drafting, but the following dimensioning guidelines are general and apply to all standards:
   1. Start by dimensioning basic outside dimensions of an object, i.e., length, width, height.
   2. Add dimensions for the remaining features, including things like radius, chamfer, angle, and location of removed features.
   3. Wherever possible, dimensions should be between views.
   4. Wherever possible, dimensions should line up.
   5. Add general and specific notes:
      * General notes should go in the notes section.
      * Specific notes can be added using the Leader command to point to the feature. The Leader is located in the annotation tab.
6. Wherever possible avoid the following when dimensioning:
   1. Dimensioning to a hidden line
   2. Dimensioning inside an object
   3. Dimensioning between the object and the border
   4. Crossing dimensions
7. Use the Dimension command to dimension your orthographic views as shown in the video.
8. If needed, add additional information to your notes.
9. Show your instructor that you have completed and saved your dimensioned drawing.