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

# Scale Your Border and Title Block

**(Mechanical and Architectural CAD)**

## Description

In this activity the teacher will demonstrate how to scale the border and title block to fit your orthographic drawing.

**Note:** Activity Plans 7–10 are not to prevailing industry standards. However, since paperspace and modelspace are not available in all CAD software, these activities have been designed to be accessible to everyone. For further explanation, view this AutoCAD tutorial demonstrating paperspace and modelspace according to Standard: https://[www.youtube.com/watch?v=SuyvnxBXvsA](http://www.youtube.com/watch?v=SuyvnxBXvsA)

## Lesson Objectives

The student will be able to:

* Use scale
* Move your objects inside the border

## Assumptions

The student will:

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

## Terminology

**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.

**Letter-sized sheet**: a standard sized sheet that is 8.5" × 11".

**Origin**: the point where x and y axes meet, which has a coordinate value of (0,0).



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

**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

30 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 tutorial videos

## Resources

Instructional video for teacher and students to follow:

* 7.1 Scaling Your Title Block

## Teacher-led Activity

Use a computer with a projector to demonstrate how to:

* Open the orthographic drawing
* Draw the letter-sized sheet of paper
* Scale the border by a factor of four
* Move your objects into the border
* Re-save the file as an orthographic drawing

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**Student Activity**

Students will follow the video tutorial and activity in order to scale their title block and border to fit their object. Then they will move their orthographic drawing inside the border.

## Extension Activity

Have students open their isometric drawing, determine the appropriate scale, and then scale the border and move the drawing inside the border.

## Assessment

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

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**Student Activity: Scale Your Border and Title Block**

Using the software, scale your border and title block so your orthographic drawing can be moved inside. A video to support the lesson is located in Resources.

## Commands to Use/Learn

### SCALE MOVE RECTANG

**Procedure**

1. Open up your CAD software and watch the tutorial video as the software loads. Once the software loads, open up your orthographic drawing file.
2. Once the drawing file is open, you must draw a rectangle the size of a piece of letter-sized paper around the border. It is important to scale your paper and your drawing together.
3. Next, determine how large to scale your title block and border.
4. Follow the steps in the video tutorial to scale your title block and border.
5. Follow the steps in the video to move your objects inside the scaled border. The views may need to be moved closer together to fit inside the border.
6. Show your instructor your completed scaled border with the orthographic drawing inside.

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