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

# Set Up Your Model Space

## Description

In this activity, students will learn to set up a model space in CAD software by setting limits, grid, snap, layers, and object snap.

## Lesson Objectives

The student will be able to:

* Set model space limits
* Set grid spacing
* Set snap spacing
* Set up five layers and change colour, linetype, and lineweight
* Input using keyboard commands and icons
* Explore object snap options

## Assumptions

The student will:

* Know how to login to a computer and open up the software
* Be familiar with navigating the software (Activity 1)
* Know how to input coordinates and use drawing commands (CAD Orientation activity)

## Terminology

**Grid**: a pattern of dots or lines within the work area of the software that can be used to aid in drawing.

**Imperial file**: a CAD drawing file that is set up in imperial measure: inches, or feet and inches. Often an imperial file is defaulted to inch input.

**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".

**Limits**: a command to set the size of the drawing space for your drawing.

**Linetype**: In CAD software, there are many different linetypes, both solid and broken, most commonly including continuous, hidden, and centre. Linetypes represent different aspects of an entity.

**Lineweight**: the assigned thickness of a line.



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**Model space**: your drawing space in CAD software.

**Object snap** (**Osnap**): a mode that allows you to “snap” to an object (line) at its endpoint, midpoint, etc.

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

**Snap**: used to limit your movement of the crosshairs of the cursor to a predetermined interval to aid in drawing to specific measurements.

**Template**: a CAD file with pre-set parameters, possibly including layers, limits, border, font, title block, etc.

## 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 video tutorials

## Resources

Instructional videos for teacher and students to follow:

* + 3.1: Setting Up Your Model Space (Part 1)
  + 3.2: Setting Up Your Model Space (Part 2)

## Teacher-led Activity

Use a computer with a projector to demonstrate the following:

* + Open an imperial/inches drawing file
  + Set up limits
  + Set up grid and snap
  + Set up five layers and modification of lineweight, linetype, and colour
  + Explore object snap properties

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## Student Activity

Students will follow video tutorials, complete the activity sheet, and set up their model space.

## Extension Activity

Have students make more layers, or draw and modify drawings using the object snap properties.

## Assessment

Students will show the teacher that their imperial model space is set up and saved.

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# Student Activity: Set Up Your Model Space

Using the software, set up your model space according to this activity sheet. Videos to support the lesson are located under Resources.

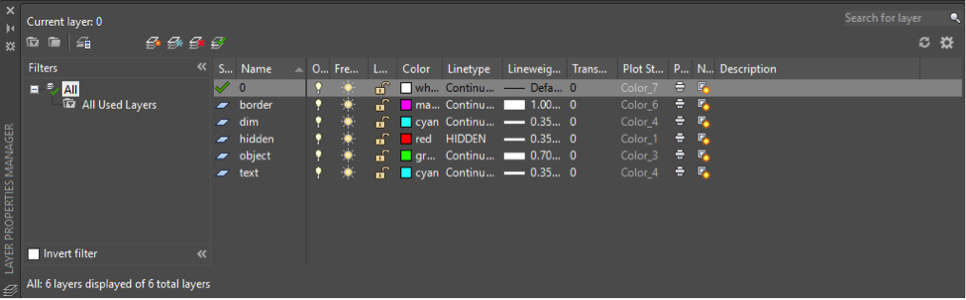
## Commands to Use/Learn

### GRID LAYER LIMITS OSNAP SNAP STARTUP

**Procedure**

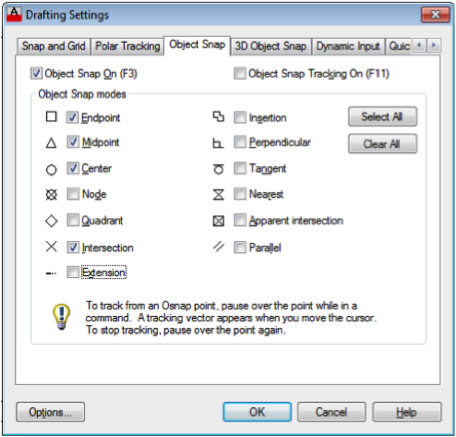
1. Open up your CAD software, and while the software loads watch the tutorial video “Setting Up Your Model Space,” Part 1.
2. Once the software has loaded, select an imperial or inches file. If your software opens to a default and does not allow you to select the file, type **STARTUP (enter)** into the command bar, and change the default to **1 (enter)**. Then you can open a new file, and the option to select an imperial or metric file will pop up.
3. Once the drawing file is open, set up your drawing space limits. Type **LIMITS (enter)**, then set your origin **0,0 (enter)**. Then type your upper right corner **11,8.5 (enter)**. Now your drawing space is set to the same size as a letter-sized piece of paper.
4. Next type **GRID (enter)**, and set spacing to **0.5 (enter)**. You may have to turn the grid on; you can to this by typing **GRID (enter) ON (enter)**. You should be able to see a series of dots spaced in half-inch intervals on your page.
5. Type **SNAP (enter)**. Set spacing to **0.5 (enter)**. When you open any drawing command your cursor will hop and snap in half-inch intervals. This is a handy tool to turn on when you are drawing. If you decide that you no longer want your snap on, you can turn it off by typing **SNAP (enter) OFF (enter)**. Sometimes the software will have icons at the bottom of the page that you can turn on and off.
6. Watch the video “Setting Up Your Model Space,” Part 2, and then set up your layers using the steps below.

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**Figure 1**

1. To set up your layers, use the Layer command. It will open up the layer manager video (Figure 1). Set up the five layers as demonstrated in the video, starting with **BORDER** and ending with **TEXT**. It is important to set the lineweight and linetype as listed for each layer.
2. Finally, set up your object snap properties to fit your drawing needs. Type **OSNAP**; the object snap properties window will open. Select whatever object snap modes you think will be useful. Commonly used modes include endpoint, midpoint, centre, and intersection. You can also edit your snap and grid settings in the Drafting Settings window (Figure 2).



**Figure 2**—Drafting Settings window

1. When finished hit **OK**, and then save the file as *imperial template-name.dwg*.

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