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

# Create an Isometric Object

**(Mechanical and Architectural CAD)**

## Description

In this activity students will demonstrate drawing an isometric object.

## Lesson Objectives

The student will be able to:

* Define *isometric drawing*
* Change to an isometric snap
* Toggle between right, left, and top isometric cursor
* Make appropriate changes to the bottom toolbar
* Draw an isometric view of an object

## Assumptions

The student will:

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

## Terminology

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

**Isometric drawing**: a two-dimensional drawing that looks 3D. This drawing will show three sides of the object in one view, and will be created using lines primarily at 30 and 90 degrees

(Figure 1). When drawing on paper, you will use a 30/60/90 triangle.



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30º

30º

**Figure 1**

**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 is 8.5" × 11".

**Limits**: the extents of your drawing space (and of your zoom). Limits can be modified to suit each individual drawing.

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

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

**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.

**Rise**: the vertical height of a stair, or set of stairs.

**Run**: the horizontal depth of a stair, or a set of stairs.

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

## Estimated Time

90 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:

* 6.1 Creating an Isometric Drawing

## Teacher-led Activity

Use a computer with a projector to demonstrate how to:

* Open the imperial border file with layers
* Change drafting settings to isometric snap
* Use F5 to toggle between right, left, and top isometric cursor
* Adjust bottom toolbar settings as necessary
* Draw an isometric view of the object
* Save the file as an isometric drawing

## Student Activity

Students will follow video tutorials and an activity to create an isometric drawing of the object in the activity.

## Extension Activity

Have students create different isometric views of the same object, such as the left isometric view. They could also create an isometric drawing of a different object.

## Assessment

Students will show the teacher that their isometric drawing is completed and saved.

# Student Activity: Draw an Isometric Object

Using the software, draw an isometric view of the object in this activity. A video to support the lesson is located in Resources.

## Commands to Use/Learn

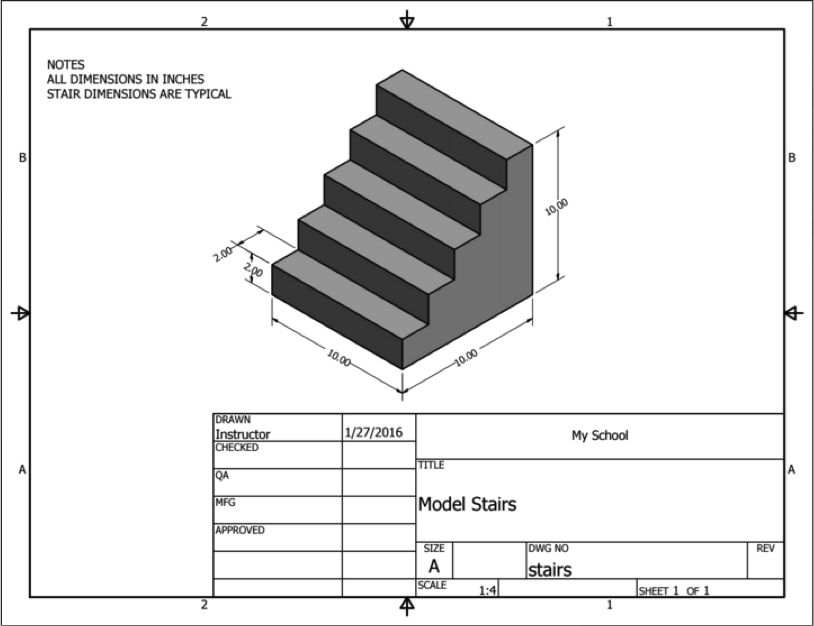
### ISOdraft LINE

**DS** (Drafting Settings)

**F5** (toggle between different isometric cursor views)

## Procedure

1. Open up your CAD software, and watch the tutorial video as the software loads. Once the software has loaded, open up your inches border file with layers.
2. After the drawing file is open, change the drawing settings to allow you to draw in isometric by opening the Drafting Settings window. To do so, type **DS (enter)**. Once the Drafting Setting window is open, select Isometric Snap, rather than Rectangular Snap as shown in the video. Click **OK**.
3. Once you close the drafting setting window, you will notice that the grid and your cursor have changed. This is an isometric grid and snap.
4. Next, try pressing **F5**. Doing so will toggle between three different cursors: right, left, and top. Select the appropriate cursor depending on which side you are drawing. You can also click the ISOdraft icon on the bottom toolbar, then select between the three cursor settings.
5. At this point, look at which settings you have selected on the bottom toolbar. Change the settings as shown in the video or to your drawing preference.
6. Following the steps in the video clip, draw the isometric object below



**Figure 2**—An isometric view

1. Once you have completed drawing the isometric object, save the file as

*isometric drawing.dwg*.

1. Show your instructor your completed isometric drawing.