

<b>Instructor:</b> John M. Berner	<b>Unit Title:</b> Creating Layers
<b>Course:</b> Design and Drafting	<b>Lesson Number:</b>
<b>Grade Level:</b> 11 <sup>th</sup> Grade	<b>Time Allotted:</b> 55 minutes
<b>WI Standards:</b> 12.4	<b>STL:</b> #8
<b>Rigor/Relevance:</b> A B <u>C</u> D	

By the end of grade 12 students will be able to evaluate the relative appropriateness of a given technology by comparing the risks with the benefits or the advantages with the disadvantages.

Students will develop an understanding of the attributes of design.

**Objectives and/or Purpose:**

- 1) Given a new drawing in AutoCad, students will be able to create at least seven layers appropriate for drawing three dimensional objects with three views.
- 2) Given two or more layers in a completed drawing, students will be able to demonstrate that they can turn off at least one layer of the drawing.
- 3) Given two or more layers in a completed drawing, students will be able to demonstrate that they can freeze at least one layer in their drawing.
- 4) Given two or more layers in a completed drawing, students will be able to demonstrate that they can lock at least one layer in their drawing.
- 5) Given two or more layers in a completed drawing, students will be able to demonstrate that they can change the color of at least one layer in their drawing.
- 6) Given a segmented layer from a completed drawing, students will be able to select a visible scale line type for their drawing.

**Terms to Know:**

- Object Line
- Construction Line
- Hidden Line
- Dimension Line
- Phantom Line
- Section Line
- Center Line
- Line Type
- Line Type Scale
- Line Weight
- Hatching

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**Method/Procedure:** - - - - - see back - - - - -

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<b>Materials</b>	<b>Time Estimate</b>	<b>Assignment</b>
Problem #40 from Exploring Drafting Textbook	55 minutes	Draw three views of Problem #40 from Exploring Drafting

AutoCad Computer with a large Monitor		Textbook
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### **Formative Assessment**

What is the purpose for using different layers?

Why might choosing red or blue line colors be more appropriate than choosing a yellow one?

How might the turning off of layers, freezing them or locking them be useful in creating detailed drawings?

### **Summative Assessment**

Have the students successfully created seven layers?

Do all of the layers have the correct line types?

Do all of the layers have the correct line weights as specified in class?

Do all of the layers use basic colors that can easily be seen by a plotter?

Have the students created a multi view drawing using each of the layers created?

Have the students demonstrated that they can freeze, lock, and turn off specified layers?

### **Method/Procedure:**

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#### **Pre-assessment**

How many students know what a drawing layer is?

How many students have created drawings using layers?

#### **Overview**

By the end of this lesson, you will have a NewDrawing.dwg file created that will have all of the layers that you will have created saved for use on future drawings. These layers will be used to show details such as hidden parts and dimensioning of your drawings.

#### **Introduction/Motivation/ Set Induction:**

Create a drawing of Problem #40 in the Exploring Drafting textbook with all the layers that will be covered in class. Before instructing the class on how to create layers, you will show how layers are used. Turn off all the layers of your drawing. Turn on each layer one by one so that the students see the parts of the drawing appear before their eyes. A preferred order would be object lines, hidden lines, center lines, dimension lines, phantom lines, and then section lines. Let the students evaluate the colors you chose, and change them to a color that the class votes on. This will open discussion for appropriate colors. The color they choose will be the color that will be expected to be used for every student in the class.

## **Content Presentation**

1. Creating Layers
  - 1.1. Object Lines
    - 1.1.1. Line Style and Scale- Solid
    - 1.1.2. Line Weight- .35 mm
    - 1.1.3. Line Color- Black
  - 1.2. Construction Lines
    - 1.2.1. Line Style and Scale- Solid
    - 1.2.2. Line Weight- Default
    - 1.2.3. Line Color – Any color of student’s choice
  - 1.3. Hidden Lines
    - 1.3.1. Line Style and Scale- Hidden 2x
    - 1.3.2. Line Weight- .25 mm
    - 1.3.3. Line Color- Green
  - 1.4. Center Lines
    - 1.4.1. Line Style and Scale- Center 2x
    - 1.4.2. Line Weight- .25 mm
    - 1.4.3. Line Color- Blue or Red
  - 1.5. Dimension Lines
    - 1.5.1. Line Style and Scale- Solid
    - 1.5.2. Line Weight- .25 mm
    - 1.5.3. Line Color- Blue or Red(same as center lines)
  - 1.6. Phantom Lines
    - 1.6.1. Line Style and Scale- Phantom 2x
    - 1.6.2. Line Weight- .50 mm
    - 1.6.3. Line Color- Blue
  - 1.7. Section Lines
    - 1.7.1. Line Style and Scale- Solid
    - 1.7.2. Line Weight- .25 mm
    - 1.7.3. Line Color- Orange or Pink
2. Controlling Layers
  - 2.1. Changing Layers on an Existing Drawing
  - 2.2. Turning Layers On and Off
  - 2.3. Freezing and Thawing Layers
  - 2.4. Locking and Unlocking Layers

## 2.5. Changing the Color of Layers

### **Repetition & Review – Feedback**

Allow the students to practice changing layers and experiment with object snap capabilities in the different layer modes.

### **Application & Practice/Learning Activities:**

Complete Drawing #40 in the Exploring Drafting Textbook using the different layers.

### **Closure/Summary**

After saving the NewDrawing.dwg document with all the layers we have just created, you will be able to use it to start any future drawing using the same size paper format. The layers serve two purposes: they make drawing easier by being able to control each layer and they help to better visualize three dimensional items in a two dimensional world.