SERIOUS BUSINESS

In the previous lessons you have been having fun learning most of the basic commands that AutoCAD offers and you have been using a template that included preset layers and drawing settings etc. But now it is time to get down to the "serious business" of setting up your own drawing from "scratch".

Starting from scratch means you will need to set or create the following:

Items 1 through 5 you have learned in previous lessons

1. Drawing Units (Lesson 4)
2. Snap and Grid (Lesson 2)
3. Create Text styles (Lesson 25)
4. Create Dimension Styles (Lesson 16)
5. Create new layers and load linetypes.

Items 6 through 9 will be learned in this lesson

6. Create a "Layout" for plotting.
7. Create a "Floating Viewport" in the Layout.
8. Create a "Page Setup" to save plot settings.
9. Plot the drawing from Paper space.

After reading pages 26-3 through 26-22 start Exercise 26A and work your way through to 26D. When you have completed Exercise 26E you will have created a master template named, "**My Decimal Setup**". This master template will have everything set, created and prepared, ready to use each time you want to create a drawing using decimal units and to be plotted on an 8-1/2 X 11 inch sheet.

This means, for future drawings you merely select **File / New** and "**My Decimal Setup.dwt**" and start drawing. No time consuming setups. It is all ready to go.

In Lesson 27 you will create a master template for "feet and inches".

So take it one page at a time and really concentrate on understanding the process.

Note:
I am using sheet size 8-1/2 X 11 so you may print the exercises on your printer. After you understand the page setup concept you will be able to assign a larger sheet size to conform to any large format printer that you may use in the future.

MODEL and LAYOUT OPTIONS

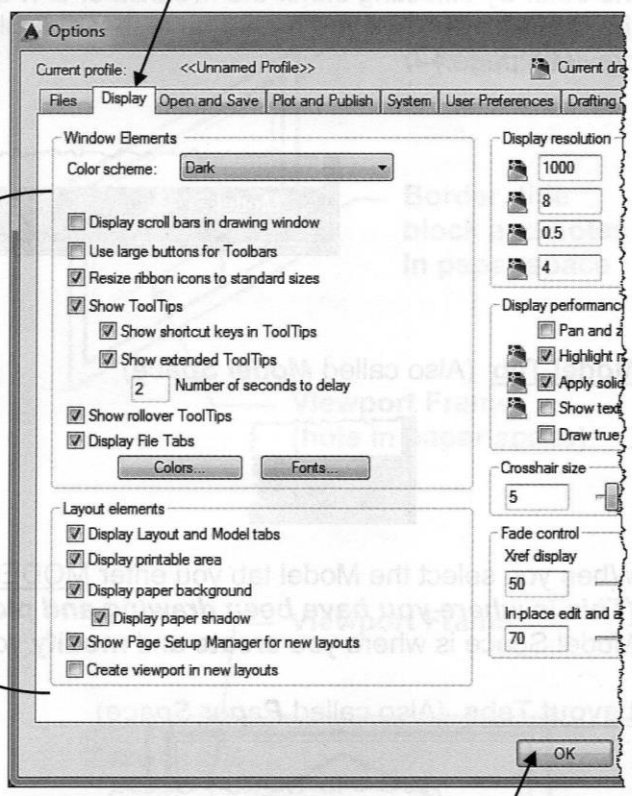
Very important:
*Before I discuss Model and Layout I need you to confirm **Model and Layout tabs** are displayed.*

This will just take a minute.

1. Type **options <enter>**
   or
   Right click and select **Options**.

2. Select the **Display** tab.

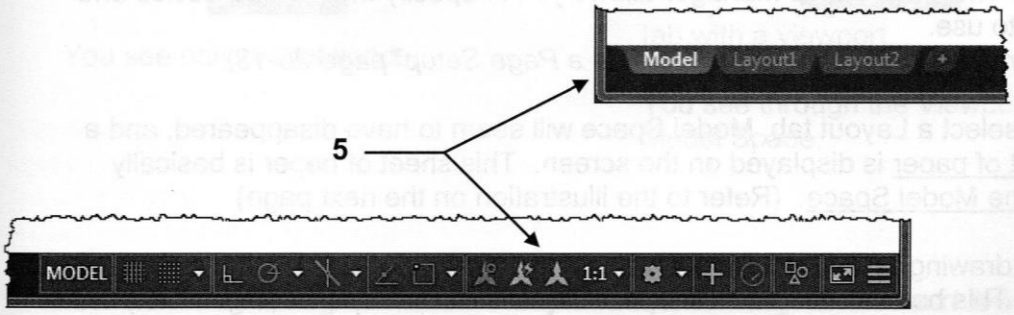
3. Check and un-check boxes as shown



3. Check and un-check boxes as shown.

4. Select the **OK** button

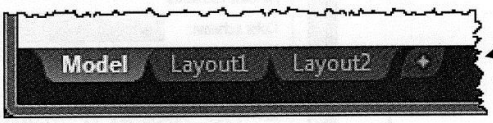
5. The lower left corner of the drawing area should display the 3 tabs Model, Layout1 and Layout2 and a few tools should be displayed in the lower right corner above the command line.



MODEL and LAYOUT tabs

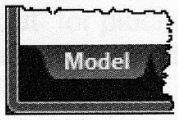
Read this information carefully. It is very important that you understand this concept. More information on the following pages.

AutoCAD provides two drawing spaces, **MODEL** and **LAYOUT**. You move into one or the other by selecting either the MODEL or LAYOUT tabs, located at the bottom left of the drawing area. (If you do not have these displayed follow the instructions on the previous page.)



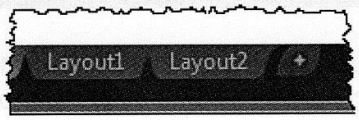
Refer to 26-3 if you do not have these.

Model Tab (Also called ***Model Space***)



When you select the Model tab you enter MODEL SPACE.
(This is where you have been drawing and plotting from for the last 25 lessons)
Model Space is where you **create** and **modify** your drawings.

Layout Tabs (Also called ***Paper Space***)



When you select a Layout tab you enter PAPER SPACE.
The primary function of Paper Space is to **prepare the drawing for plotting**.

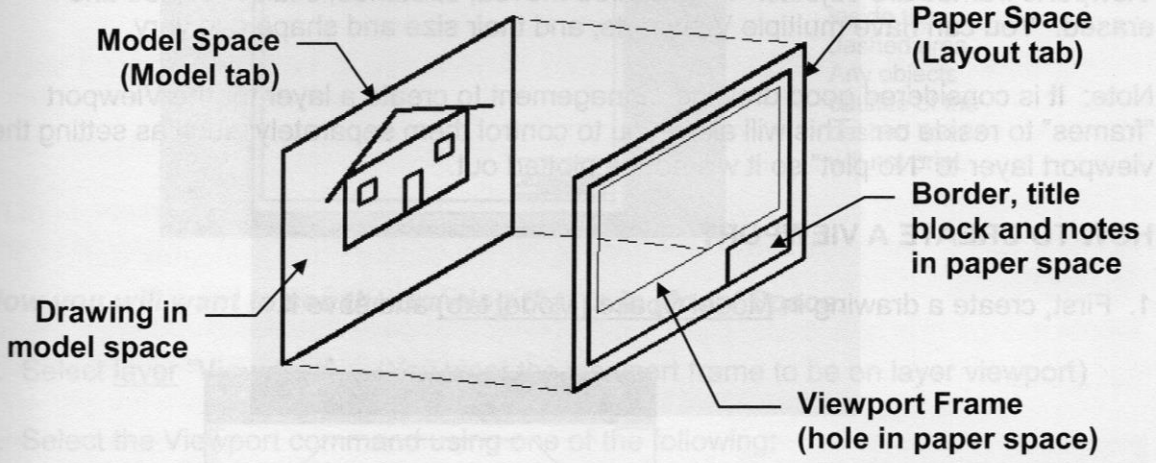
When you select the Layout tab for the first time, the "Page Setup Manager" dialog box will appear. The Page Setup Manager allows you to specify the printing device and paper size to use.
(More information on this in "How to create a Page Setup" page 26-13)

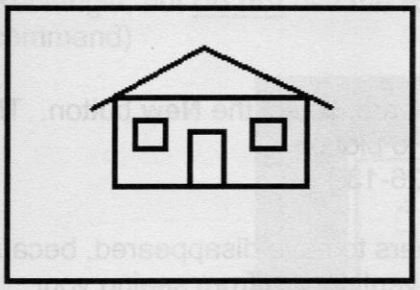
When you select a Layout tab, Model Space will seem to have disappeared, and a blank sheet of paper is displayed on the screen. This sheet of paper is basically in front of the Model Space. (Refer to the illustration on the next page)

To see the drawing in Model Space, while still in Paper Space, you must cut a hole in this sheet. This hole is called a **"Viewport"**. *(Refer to "Viewports" page 26-6.)*

MODEL and LAYOUT tabs….continued

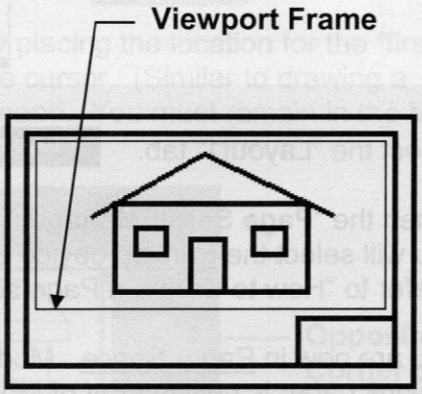
Try to think of this as a picture frame (paper space) in front of a photograph (model space).





This is what you see when you select the Model tab.

You see only model space.



This is what you see when you select the Layout1 tab with a viewport.

You see through the Viewport to Model Space.

Now hold this thought…….more explanation coming on the next few pages.

VIEWPORTS

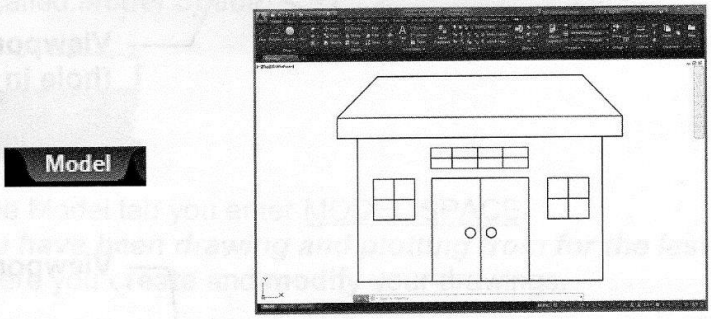
Note: This is just the concept to get you thinking. The actual step-by-step instructions will follow in the exercises.

Viewports are only used in Paper Space (Layout tab).
Viewports are holes cut into the sheet of paper displayed on the screen in Paper Space.
Viewports frames are objects. They can be moved, stretched, scaled, copied and erased. You can have multiple Viewports, and their size and shape can vary.

Note: It is considered good drawing management to create a layer for the Viewport "frames" to reside on. This will allow you to control them separately; such as setting the viewport layer to "No plot" so it will not be plotted out.

HOW TO CREATE A VIEWPORT

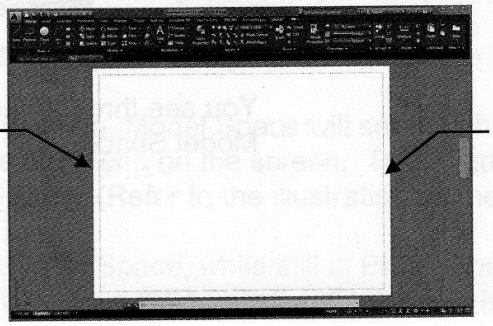
1. First, create a drawing in Model Space (Model tab) and save it.



2. Select the "Layout1" tab. 

   When the "**Page Setup Manager**" dialog box appears, select the **New** button. Then you will select the Printing device and paper size to plot on.
   (Refer to "How to Create a Page setup" on page 26-13.)

3. You are now in Paper Space. Model Space appears to have disappeared, because a blank paper is now in front of Model Space, preventing you from seeing your drawing. You designated the size of this sheet in the "page setup" mentioned in #2 above. (The Border, title block and notes will be drawn on this paper.)



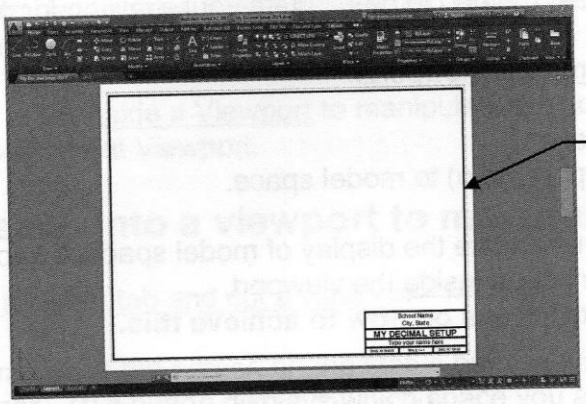
You designated the size of this sheet in the Page setup

The dashed line represents the printing limits for the printer that you selected in the Page setup.

Continued on the next page...

VIEWPORTS….continued

4. Draw a border, title block and notes in Paper Space (Layout)



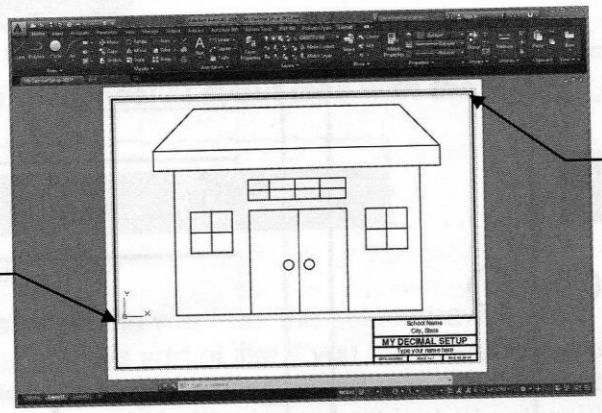
Now you will want to see the drawing that is in Model Space.

5. Select layer "**Viewport**" (You want the viewport frame to be on layer viewport)

6. Select the Viewport command using one of the following:

Ribbon = Layout tab / Layout Viewports panel /
or
Keyboard = MV <enter>

7. Draw a rectangular shaped Viewport "frame" by placing the location for the "first corner" and then the "opposite corner" using the cursor. (Similar to drawing a Rectangle, but **do not** use the Rectangle command. You must remain in the MV command)



You should now be able to look through the Paper Space sheet to Model Space and see your drawing because you just cut a rectangular shaped hole in the sheet.

Note: Now you may go back to Model Space or return to Paper Space, simply by selecting the tabs, model or layout.
(Make sure your grids are ON in Model Space and OFF in Paper Space. Otherwise you will have double grids)

WHY LAYOUTS ARE USEFUL

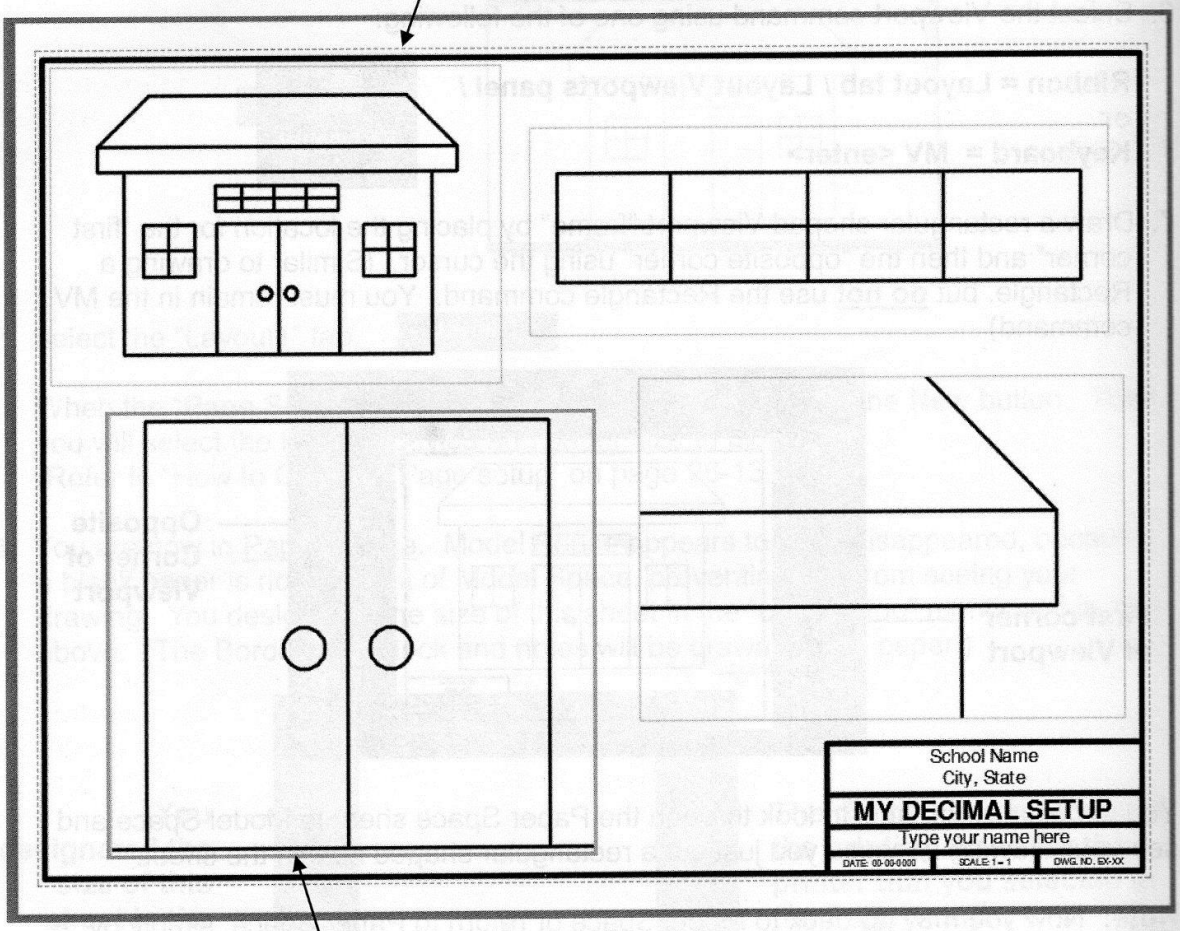
I know you are probably wondering why you should bother with Layouts.
A Layout (Paper Space) is a great method to manipulate your drawing for plotting.

Notice the drawing below with multiple viewports.

Each viewport is a hole in the paper.
You can see through each viewport (hole) to model space.

Using Zoom and Pan you can manipulate the display of model space in each viewport.
To manipulate the display you must be inside the viewport.
Refer to the next page for instructions on how to achieve this.

Note: the dashed line indicates the maximum printing area for the printer and paper selected. Any object outside of this area will not print.



Active viewport indicated by heavier viewport frame.

HOW TO REACH INTO A VIEWPORT

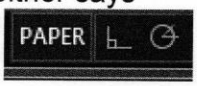
Here are the rules:

1. You have to be in Paper Space (layout tab) and at least one viewport must have been created.

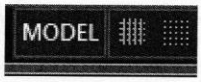
2. You have to be inside a Viewport to manipulate the scale or position of the drawing that you see in that Viewport.

How to reach into a viewport to manipulate the display.

First, select a layout tab and cut a viewport

At the bottom right of the screen on the status bar there is a button that either says Model or Paper. This button displays which space you are in currently. 

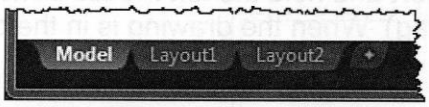
When the button is PAPER you are working on the Paper sheet that is in front of Model Space. (Refer to the illustration on page 26 - 5)
You may cut a viewport, draw border, title block and place notes.

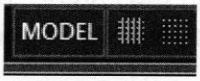
If you want to reach into a viewport to manipulate the display, double click inside of the viewport frame. Only one viewport can be activated at one time. The active viewport is indicated by a heavier viewport frame. (Refer to the illustration on the previous page. The viewport displaying the doors is active).
Also, the Paper button changed to Model. 

While you are inside a viewport you may manipulate the scale and position of the drawing displayed. To return to the Paper surface click on the word Model and it will change to Paper 

You may now work on the paper surface.

Note: Do not confuse the Model / Layout tabs with the MODEL / PAPER button .





Here is the difference.

The **Model / Layout tabs** shuffle you from the actual drawing area (model space) to the Layout area (paper space). It is sort of like if you had 2 stacked pieces of paper and when you select the Model tab the drawing would come to the front and you could not see the layout. When you select the Layout tab a blank sheet would come to the front and you would not see model space……unless you have a viewport cut.

The **MODEL / PAPER button** allows you to work in model space or paper space without leaving the layout tab. No flipping of sheets. You are either on the paper surface or in the viewport reaching through to model space.

Don't worry it will get easier. This is the concept….but it will get more clear when you have completed the exercises in this lesson.

PAN

After you zoom in and out or adjust the scale of a viewport the drawing within the viewport frame may not be positioned as you would like it. This is where **PAN** comes in handy. **PAN** will allow you to move the drawing around, within the viewport, without affecting the size or scale.

Note: *Do not use the MOVE command. You do not want to actually move the original drawing. You only want to slide the viewport image, of the original drawing, around within the viewport.*

How to use the PAN command.

1. Select a layout tab (paper space)
2. Unlock the viewport if it is locked. (Refer to page 26-12)
3. Click inside a viewport.
4. Select the **PAN** command using one of the following:

   Ribbon = View tab / Navigate panel / 

   (Refer to pages 1-11 & 4-8)
   or
   Keyboard = P <enter>
   or
   Navigation Bar =  **(turned off on page 1-23)**

   (Consider adding the PAN tool to the Quick Access tool bar. See page 1-10)

5. Place the cursor inside the viewport and hold the left mouse button down while moving the cursor. (Click and drag) When the drawing is in the desired location release the mouse button.
6. Press the **Esc** key or press **<enter>** to end the **PAN** command.
7. Lock the viewport.
   (Refer to page 26-12)

Refer to the Example on the next page.