Create a 3D Environment to Draw **3D Models**



This tutorial outlines the procedures for creating a 3D environment, which you can use to create 3D models. With these procedures, you can navigate 3D models in different views.

Audience: Users new to 3D modeling in AutoCAD 2011

Prerequisites: Working knowledge of 2D drafting

Time to complete: 15 minutes

Objectives

- Set the current workspace to 3D Modeling
- Set and define viewports
- Navigate a 3D model

Tutorial Files

All necessary files for this tutorial are located at *http://www.autodesk.com/autocad-tutorials*.

Recommended: Before starting the tutorials

- 1 Download the create_3Denvironment.zip from http://www.autodesk.com/autocad-tutorials.
- 2 Unzip create_3Denvironment.zip to C:\My Documents\Tutorials.

Lesson 1: Change to a 3D Modeling Work Environment



In this lesson, you learn how to do the following:

- Change the workspace from 2D Drafting & Annotation to 3D Modeling
- Set and define model space and layout viewports where you can work with one viewport and reference different views in other viewports to create a 3D model
- Set the annotation scale for layout viewports

File Name: section_plane.dwg

Display the 3D Modeling workspace

To set up the 3D modeling environment, switch to the 3D Modeling workspace where the palettes and ribbon tabs are customized to create and modify 3D models.

1 The status bar is located at the bottom of the window. The workspaces icon on the status bar is shown below.

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NOTE If you do not see this icon, right-click in an empty area on the status bar and click Workspaces. If you still do not see this icon, you may need to maximize the AutoCAD window.

- 2 Click the down arrow to display the menu of predefined workspaces.
- **3** On the Workspace menu, click 3D Modeling.



NOTE For more information about switching workspaces, see the *AutoCAD User's Guide* or refer to AutoCAD 2009 tutorial: *Switching Workspaces in AutoCAD 2009*.

The 3D Modeling workspace is displayed. The Workspaces icon in the status bar indicates that you are now in the 3D Modeling workspace. In this workspace, you can access the various commands and tools needed for creating 3D drawings.

Set and define model space viewports

You can create model space viewports and change the viewports to display different views. Model space viewports display your model with different views, visual styles, and zoom levels. With this viewport configuration, you can view and create a 3D model in one viewport and reference other viewports for different views of the model.



- 2 In the Select File dialog box, browse to C:\My Documents\Tutorials and select section_plane.dwg.
- 3 Click Open.
- **4** On the ribbon, click View tab ➤ Viewports panel ➤ New.



- 5 In the Viewports dialog box, specify a new name.
- 6 In the Standard Viewports list, select Four: Left.
- 7 In the Setup drop-down list, select 3D.

The four viewports are divided into Top, Front, Right, and SE Isometric orthographic projection views respectively.

NOTE With an orthographic view, the parallel lines in a model continue to be parallel, even when projected in 3D space.

- **8** Under Preview, select the Top viewport and select Wireframe from the Visual Style drop-down list. The Wireframe visual style is applied to the Top viewport.
- **9** Repeat step 7 to apply the same visual style to the Front and Right viewports.
- **10** Under Preview, select the SE Isometric viewport and ensure that the visual style is set to Conceptual.

Viewports New Viewports Named Viewports		
New name:	- Preview]
Standard viewports: "Active Model Configuration" Single Two: Vertical Two: Horizontal Three: Right	View: *Top* Wireframe	
Three: Left Three: Above Three: Below Three: Vertical Three: Horizontal Four: Equal	View: *Front* Wireframe	View: SE Isometric Visual style: Conceptual
Four Left	View: *Right* Wireframe	
Apply to: <u>S</u> etup:	Change view to:	Visual S <u>t</u> yle:
Display 🗸 🚽	SE Isometric	✓ Conceptual ✓
		OK Cancel <u>H</u> elp

11 Click OK.

The 3D model is displayed in different views.



Set and define layout viewports

With layout viewports, you can create viewports that show different views of a 3D model and use different visual styles for each viewport. You can also freeze unwanted layers to hide objects such as dimensions in specified viewports. When plotting or publishing, you can use layout viewports to set the layout of your output.



In the same *section_plane.dwg*, do the following:

- 1 On the status bar, click Quick View Layouts to preview the model space and layout in the current drawing.
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2 Click on the Layout preview image to switch to the layout in the drawing area.



3 On the ribbon, click View tab \blacktriangleright Viewports panel \blacktriangleright New.



- **4** In the Viewports dialog box, under Standard Viewports, select Two: Vertical.
- **5** In the Setup drop-down list, select 3D.
- **6** Under Preview, select the left viewport.
- **7** Specify the following:
 - Change View To: **SE Isometric**
 - Visual Style: Wireframe
- **8** Under Preview, select the right viewport.
- **9** Repeat step 7 to specify the view and visual style.

Viewports New Viewports Named Viewports Current name: Two: Vertical		
Standard viewports:	Preview	
"Active Model Configuration" Single Two: Vertical Two: Horizontal Three: Right Three: Above Three: Above Three: Below Three: Vertical Three: Horizontal Four: Equal	View: SE Isometric Visual style: Wireframe	View: SE Isometric Visual style: Conceptual
Viewport Spacing: Setup:	Change view to:	Visual Style:
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	OK	Cancel <u>H</u> elp

- **10** Click OK.
- **11** In the drawing window, specify a point in the upper-left corner of the defined paper area and a point in the lower-right corner to create the viewports.

The printable area is highlighted.

- **12** Double-click the viewport on the left to enter model space. The layout tab is still active. However, the changes you make within the viewport affects the objects on the Model tab (model space).
- **13** At the Command prompt, enter layer.
- **14** In the Layer Properties Manager, select Start layer and click VP Freeze icon to freeze the layer.



TIP Hold down Ctrl to select more than one layer. Hold down Shift to select a sequence of layers.

When you freeze a layer, the objects in that layer are not displayed in the selected viewport.

Set the viewport scale

Viewport scale is a setting that is saved with layout viewports. When you display 3D objects in a layout viewport, they are scaled based on the current viewport scale setting and are automatically displayed at the correct size.

- 1 Select a viewport.
- 2 On the right side of the drawing or application status bar, click the down arrow next to the displayed viewport scale.
- **3** Select a scale from the list.



Summary: In this lesson, you learned how to:

- Change the current workspace from 2D Drafting & Annotation to 3D Modeling.
- Set and define model space and layout viewports.
- Set the viewport scale for layout viewports.

Lesson 2: Navigate Different Views of 3D Models

In this lesson, you navigate different views of a 3D solid model.

File Name: section_plane.dwg

Navigate different views of a 3D model with Free Orbit

To create 3D models, you need to navigate different views to ensure that the models are displayed from different viewports.

- 1 In the same *section_plane.dwg*, select the section plane.
- 2 On the ribbon, click View tab ➤ Navigate panel ➤ Orbit flyout drop-down list ➤ Free Orbit.



- **3** Use one of the following methods to orbit around objects in the 3D model:
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- To rotate along the XY plane, click in the viewport and drag the cursor left or right.
- To rotate along the Z axis, click in the drawing and drag the cursor up or down.

TIP To return to the original view, right-click in the drawing window and click Preset Views ➤ SE Isometric.

Change the projection mode for a view

You can change the projection mode from orthographic (parallel) to perspective. In parallel views, parallel lines are displayed as parallel, even when they are projected into 3D space. In perspective views, the lines appear to grow closer together as they are projected into 3D space. The following illustration shows the same model viewed from the same viewing direction, but with different view projections.



In the above illustration, left is parallel and right is perspective view projection.

To change from parallel to perspective projection do the following:

- 1 Start the Free Orbit tool and right-click.
- 2 Click Perspective.

NOTE You can also right-click the ViewCube to change the view projection mode to perspective or parallel. For more information on ViewCube, see the *AutoCAD User's Guide* or refer to AutoCAD 2009 tutorial: *Navigating a Model with ViewCube*.

Summary: In this lesson, you learned how to navigate different views of a 3D model and change view projection modes.

Congratulations! You have configured a 3D working environment.

For more information, see the AutoCAD User's Guide.