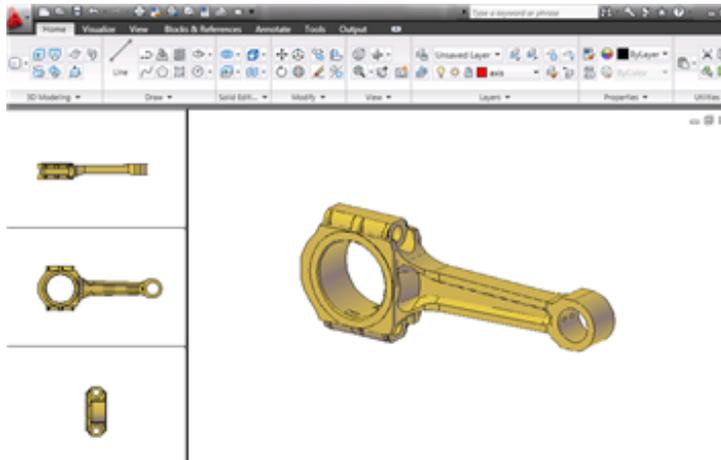# Create a 3D Environment to Draw 3D Models

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 2010

Prerequisites: Working knowledge of 2D drafting

Time to complete: 15 minutes

Objectives

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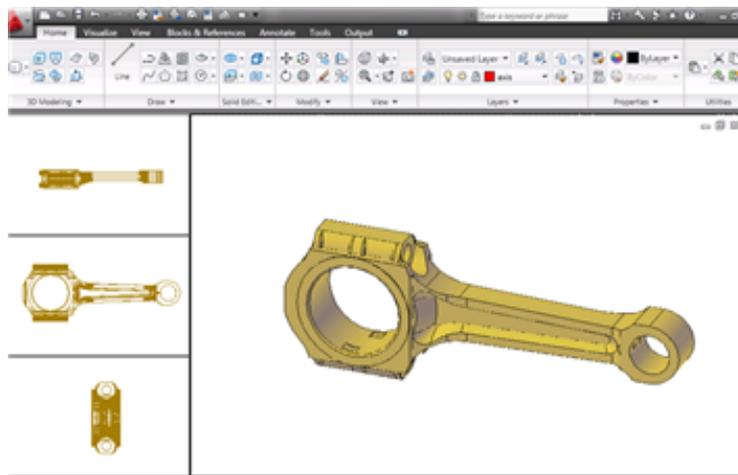- Set and define viewports

■ 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 *3D_Modeling_Environment.zip* from *http://www.autodesk.com/autocad-tutorials/.*

2 Unzip *3D_Modeling_Environment.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 and 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

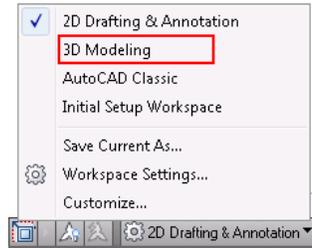**File Name:** *section_plane.dwg*

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 On the status bar, at the bottom of the drawing area, click the Workspace Switching button.

2 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.

1 Click ➤ Open.

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.
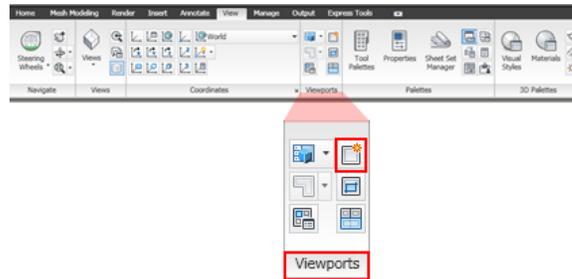
5 Under Standard Viewports, select Four: Left.

6 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.

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7 Under Preview, select the Top viewport and select 3D Wireframe from the Visual Style drop-down list. The 3D Wireframe visual style is applied to the Top viewport.

8 Repeat the step above for the Front and Right viewports.

9 Under Preview, select the SE Isometric viewport and select Conceptual from the the Visual Style drop-down list.
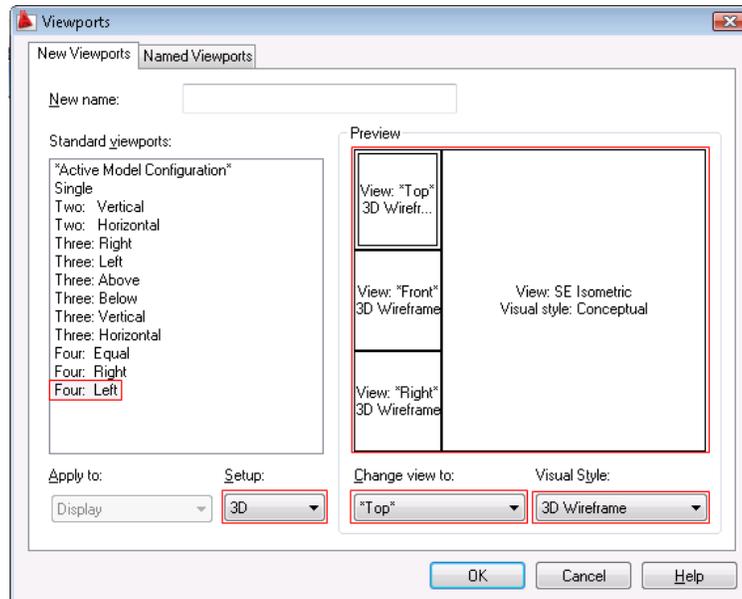
10 Click OK.

The 3D model is displayed in different views.
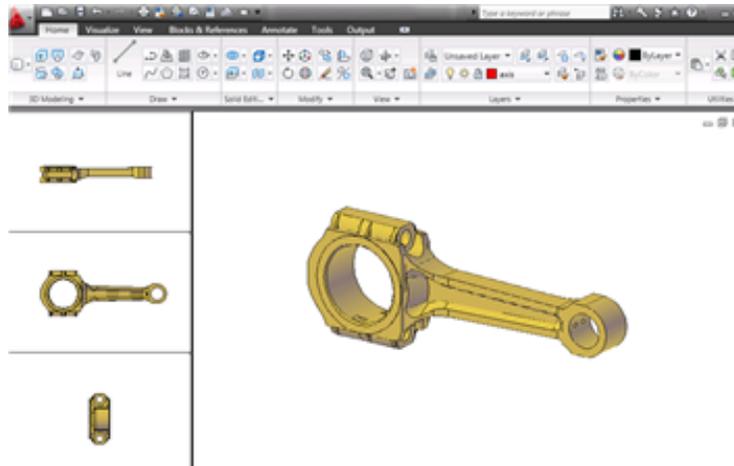
Set and define layout viewports

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.
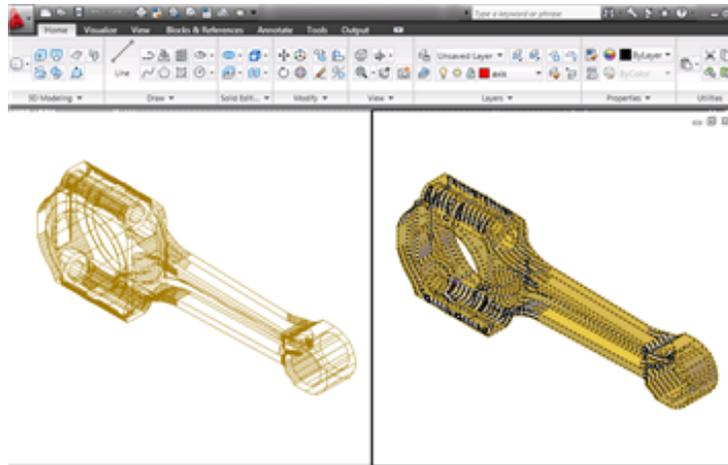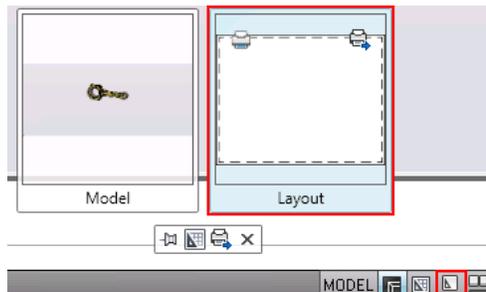

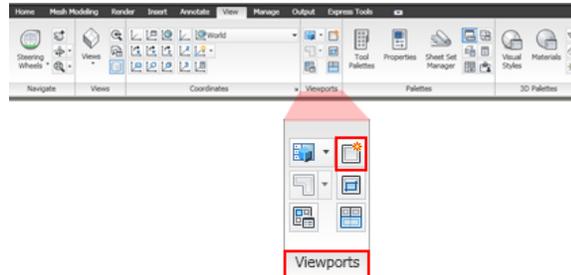➤ In the same *section_plane.dwg*, do the following:

1 On the status bar, click Quick View Layouts to preview the model space and layout in the current drawing.


2 Click on the Layout preview image to switch to the layout in the drawing area.

**3** On the ribbon, click View tab ➤ Viewports panel ➤ 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 In the Change View To drop-down list, select SE Isometric.

8 Repeat the process to change the view of the right viewport to SE Isometric.

9 Under Preview, select the left viewport.

10 In the Visual Style drop-down list, select 3D Wireframe.

11 Repeat the process to change the visual style of the right viewport to Conceptual.
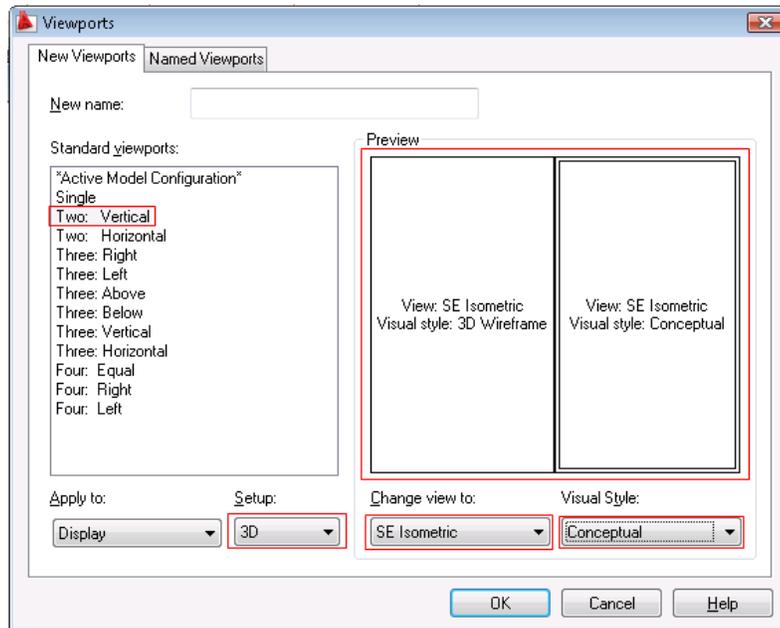
12 Click OK.

13 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.

> **NOTE** The printable area is highlighted with the dashed lines.

14 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).

15 At command line, enter **layer**.

16 In the Layer Properties Manager, click the icon in the Freeze column of the Start layer.
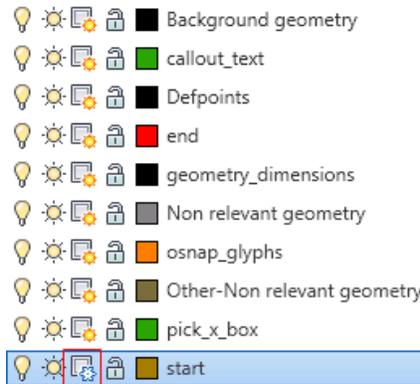

TIP Hold down Ctrl to select more than one layer. Hold down Shift to select a sequence of layers.

The objects in the frozen 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.
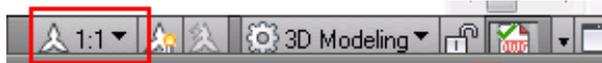
Summary: In this lesson, you learned how to:

■   Change the current workspace from 2D Drafting and 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.
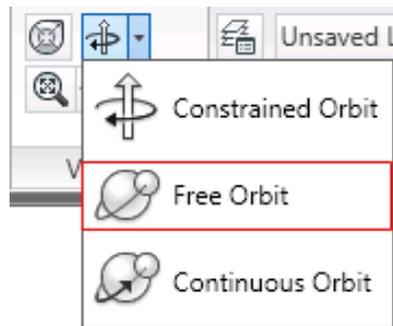
3 Use one of the following methods to orbit around objects in the 3D model:
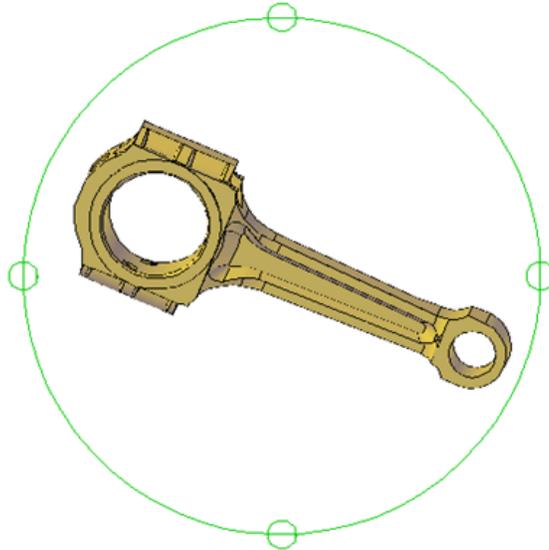
- To rotate along the XY plane, click in the viewport and drag the cursor left or right

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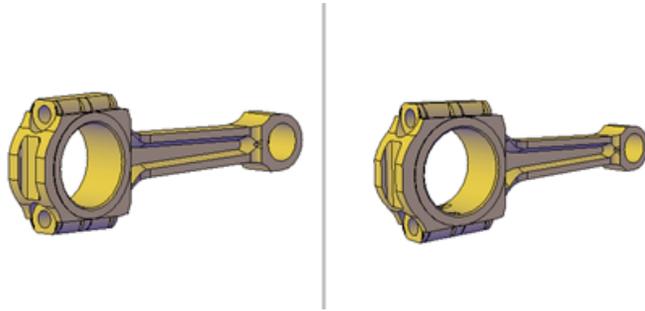
In the above illustration, left is parallel and right is perspective view projection

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.*