

# Creating Basic 3D Objects

# 1

**Products:** AutoCAD 2011 for Mac or later

**Audience:** New users to 3D

**Prerequisites:** Working knowledge of 2D drafting

**Time to complete:** 15 minutes

## Download the Tutorial File

Before beginning the lessons, download the tutorial.

- Download *create\_basic\_3d\_objects\_acdmac.zip* from <http://www.autodesk.com/autocadformac-tutorials>.

## In This Tutorial

The lessons in this tutorial do not need to be completed in the presented order. In this tutorial, you learn how to do the following:

- Create 3D solid primitives: box, cylinder, cone, and torus
- Create simple 3D objects from 2D objects

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**NOTE** For more information on the topics covered in this tutorial, see the product User's Guide.

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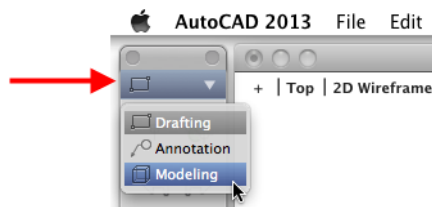
## Lesson: Create 3D Solid Primitives

In this lesson, you learn how to create 3D solid primitives from the Modeling tool set.

A 3D solid primitive is a standard 3D solid objects in the shape of a box, cone, cylinder, sphere, torus, wedge, or pyramid. You can resize primitives or combine them with other objects. To create 3D solid primitives, switch to the Modeling tool set, that contains tools to create and modify 3D solid models.

### To switch to the Modeling tool set

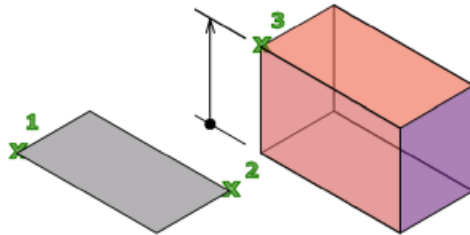
- On the Tool Sets palette, click the Tool Set button and click Modeling.  
If the Tool Sets palette is not displayed, on the menu bar, click Tools menu
  - Palettes ➤ Tool Set (or press Cmd-1).



The Modeling tool set is displayed.

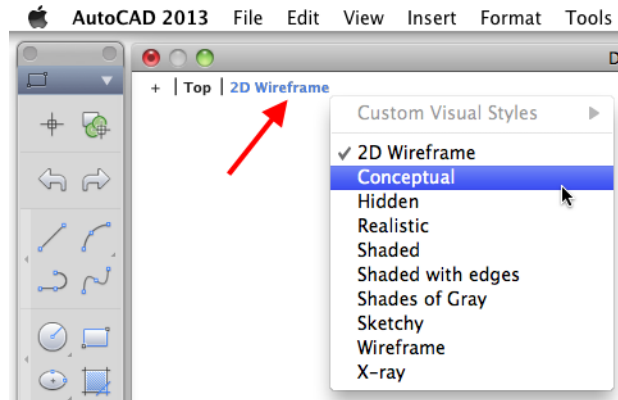
### Create a Box

Boxes can be rectangular or cubical.




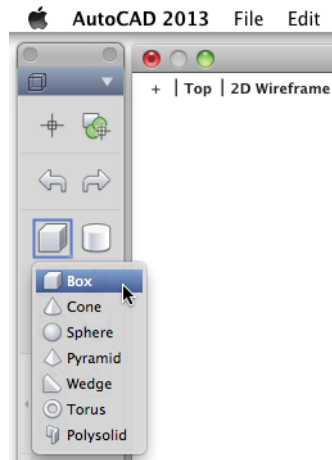
### To create a box

- 1 In the drawing area, click the Visual Styles viewport label menu and choose Conceptual.



- 2 On the Tool Sets palette, click Modeling tool set ► Solids – Create tool

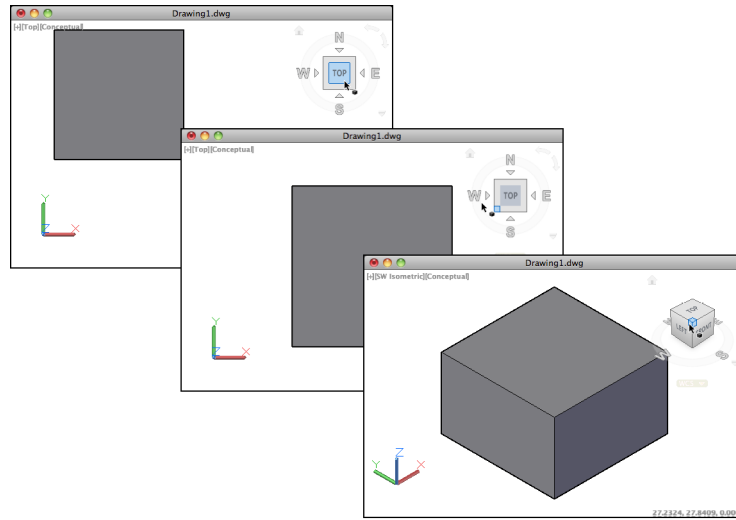
group ► Solid Primitives flyout ► Box. 



- 3 At the Specify first corner prompt, click in the drawing area to specify the box's base point.
- 4 At the Specify other corner prompt, enter @8,8 to define the opposite corner and press Enter.
- 5 At the Specify height prompt, enter 5 and press Enter.

The base of the box is always drawn on the XY plane (or work plane) of the current UCS. The height of the box is specified in the Z axis direction. You can enter both positive and negative values for the height.

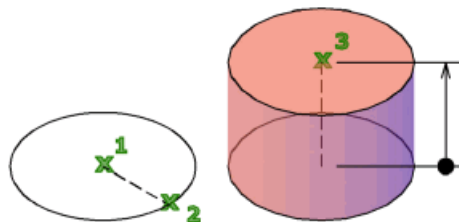
- 6 On the ViewCube tool, located in the upper-right corner of the drawing area, click Top to center the box. Then click the lower-left corner of the ViewCube tool to see an isometric view of the box.




**NOTE** For more information on the ViewCube tool, see the product User's Guide.

### Create a Cylinder

Cylinders can have a circular or elliptical base.

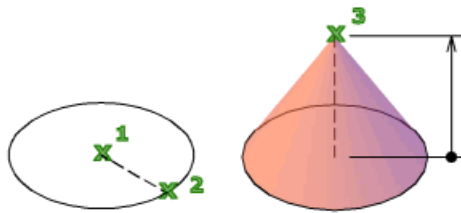


### To create a cylinder


- 1 On the Tool Sets palette, click Modeling tool set ➤ Solids – Create tool group ➤ Cylinder. 
- 2 At the Specify center point of base prompt, specify the base point in the drawing area.
- 3 At the Specify base radius prompt, enter **5** and press Enter.
- 4 At the Specify height prompt, enter **8** and press Enter.

### Create a Cone

Cones can have a circular or elliptical base, and can taper into a point or planar face (creating a cone frustum).



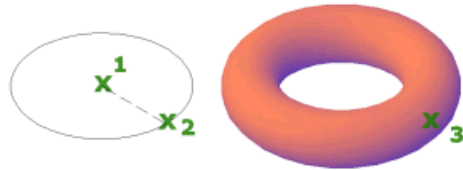
### To create a cone

- 1 On the Tool Sets palette, click Modeling tool set ➤ Solids – Create tool group ➤ Solid Primitives flyout ➤ Cone. 
- 2 At the Specify center point of base prompt, specify the base point in the drawing area.
- 3 At the Specify base radius prompt, enter **7** and press Enter.
- 4 At the Specify height prompt, enter **5** and press Enter.


### Create a Torus

Tori are doughnut-shaped primitives defined by two radii; think of it as a circle revolved around a circular path. The first radius defines the distance

from the center of the torus to the center of tube. The second radius defines the tube.



#### To create a torus

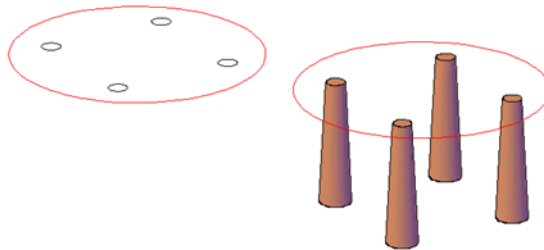
- 1 On the Tool Sets palette, click Modeling tool set ➤ Solids – Create tool group ➤ Solid Primitives flyout ➤ Torus. 
- 2 At the Specify center point prompt, specify the center point in the drawing area.
- 3 At the Specify radius prompt, enter **8** and press Enter.
- 4 At the Specify tube radius prompt, enter **3** and press Enter.

## Lesson: Create Simple 3D Objects from 2D Objects

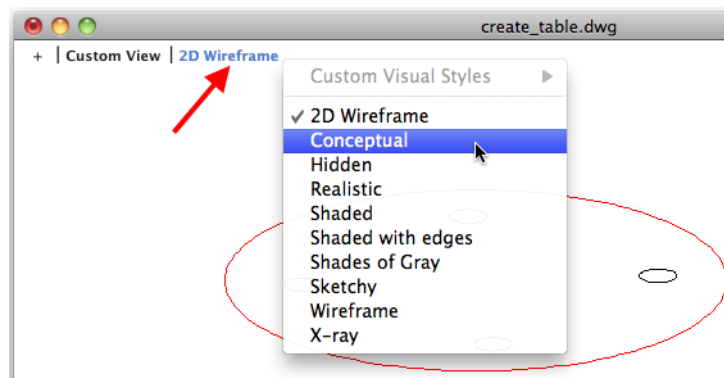
In this lesson, you create simple 3D objects from 2D objects.

You can create simple and complex objects by combining and modifying basic 3D shapes. You can also extrude 2D objects to create solids and surfaces by adding height. A surface is a type of 3D object that has no thickness.

## To draw a table stand with simple 3D solid primitives



- 1 On the menu bar, click File menu ► Open.
- 2 In the Open dialog box, browse to and select *create\_table.dwg*. Click Open.
- 3 On the viewport label menus, click the Visual Styles menu and click Conceptual.

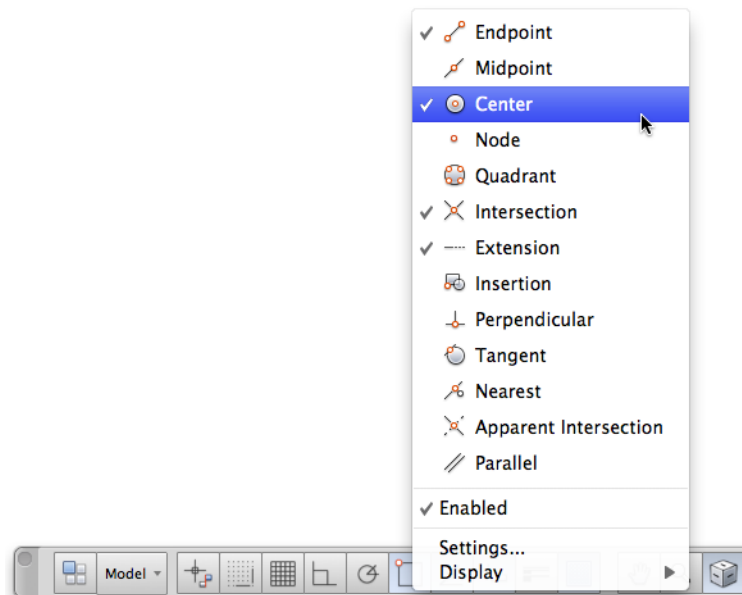



**TIP** If you have trouble selecting objects, change the current visual style to 3D Wireframe.

- 4 On the status bar, click the Object Snap button to enable Object Snap mode. Right-click the Object Snap button.

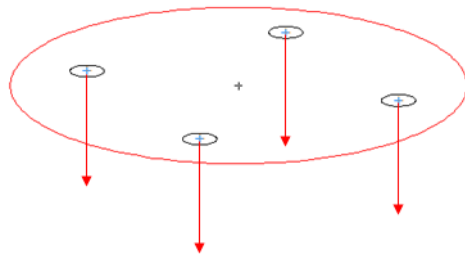


- 5 On the shortcut menu, click Center. The Center option should now have a check mark next to it to indicate the object snap is enabled.



- 6 On the Tool Sets palette, click Modeling tool set ► Solids – Create tool group ► Solid Primitives flyout ► Cone. 

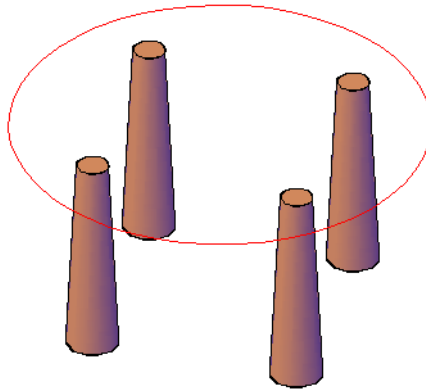
- 7 At the Specify center point of base prompt, move the cursor over one of the small circles. An AutoSnap marker appears at the center of the circle. Click when the marker is displayed to snap to the center of the circle.



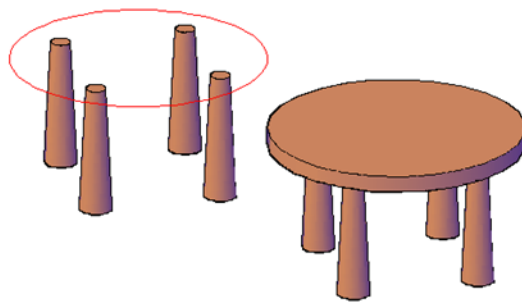
- 8 At the Specify base radius prompt, enter **0.3** and press Enter.  
 9 At the Specify height prompt, enter **T** for top radius and press Enter.  
 10 At the Specify top radius prompt, enter **0.5** and press Enter.




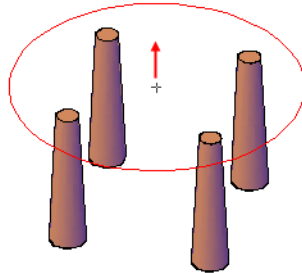
- 11 At the `Specify height` prompt, move the cursor below the table surface. Enter **4** for the height and press Enter.
- 12 Repeat the process on the other small circles in the drawing to create four table legs.



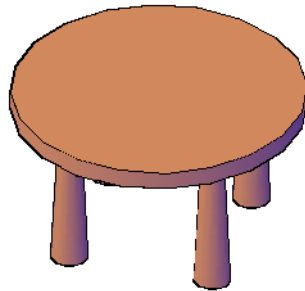
**To draw a tabletop with a simple 3D solid primitive**



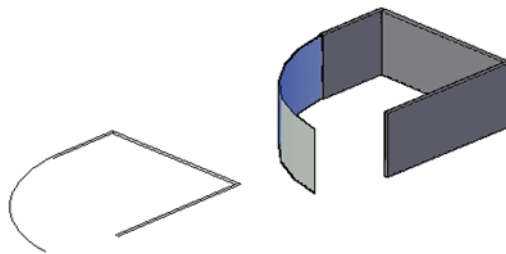
- 1 In the same drawing file, on the Tool Sets palette, click Modeling tool set ➤ Solids – Create tool group ➤ Cylinder. 
- 2 At the `Specify center point of base` prompt, select the center point of the large circle.



- 3 At the `Specify base radius` prompt, enter **4** and press Enter.
- 4 At the `Specify height` prompt, enter **0.5** and press Enter.



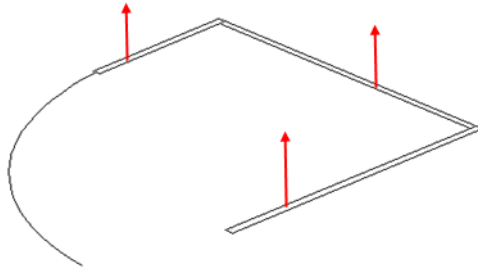
#### To extrude an object to create walls



- 1 On the menu bar, click File menu ► Open.
- 2 In the Open dialog box, browse to and select *create\_wall.dwg*. Click Open.

- 3 On the Tool Sets palette, click Modeling tool set ➤ Solids – Create tool group ➤ Extrude. 

- 4 At the Select objects to extrude prompt, select the three rectangles and press Enter.



- 5 At the Specify height of extrusion prompt, move the cursor above the rectangles. Enter **96** and press Enter.

**NOTE** By default, a 3D solid object (wall) is created because you have extruded a closed object (rectangle). When you extrude an open object, a 3D surface is created.

- 6 Repeat the extrude process on the arc (an open object) displayed in the drawing to create a 3D surface.

