

# Chapter 3

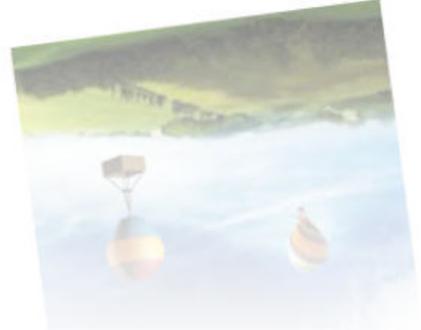
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## Creating and Modifying Primitive Objects

### Learning Objectives

**After completing this chapter, you will be able to:**

- *Create primitive objects*
- *Modify primitive objects*
- *Apply materials to different faces of an object*
- *Create omni lights and camera*
- *Add a background to the scene*



## TUTORIAL DESCRIPTION

In this tutorial, you will create a hot air balloon consisting of a balloon, basket, and ropes. You will create these components by primitive objects and apply different materials to them. In addition to this, you will add lights and a camera, and then add a background to the scene.

### Creating a Balloon

First reset the 3ds Max Design 2013 as discussed in *Chapter 1*. This sets the Autodesk 3ds Max Design to default settings. If you want to save the current scene, do so before resetting 3ds Max Design.

1. Select **Reset** from the **Application Menu**. Then, pick **Yes** in the dialog box that appears.

The data is erased and the Perspective viewport is displayed.

2. Pick the **Geometry** button from the **Create** tab of the **Command Panel**. Then, pick the **Sphere** button in the **Object Type** rollout. 
3. In the **Keyboard Entry** rollout, enter 150 in the **Radius:** spinner. In the **Parameters** rollout, enter 16 in the **Segments:** spinner. Then, pick the **Create** button in the **Keyboard Entry** rollout. By default, the object is named as Sphere001. Change its name to **Balloon** in the **Name and Color** rollout.
4. Pick the **Zoom Extents** button to zoom out the object in the Perspective viewport.
5. Pick the **Maximize Viewport Toggle** button to display all four viewports. 
6. Right-click on the **Wireframe** viewport label in the Top viewport to display the shortcut menu. Select **Shaded** from the shortcut menu to display the mesh in the Top viewport. Also, press the G key to turn on the grid, if it is not displayed.
7. Pick the **Zoom All** button and move the cursor down in any viewport to display the *Balloon* smaller than before, **Figure 3-1**. 

The **Zoom All** button zooms equally in all viewports simultaneously.

8. Activate the Front viewport and pick the **2D Snap** button from the **Snaps Toggle** flyout to turn on snaps. Right-click on the button to open the **Grid and Snap Settings** dialog box. In the **Snaps** tab, check the **Grid Points** check box and uncheck all the others.
9. Close the **Grid and Snap Settings** dialog box.
10. Pick the **Transform Gizmo Y Constraint** button from the **Axis Constraints** toolbar.

Remember the **Axis Constraints** tools do not normally work with snaps on. To overcome this problem, right-click on the **Snaps Toggle** button to display the **Grid and Snap Settings** dialog box. Pick the **Options** tab and check the **Use Axis Constraints** check box available in the **Translation** area.

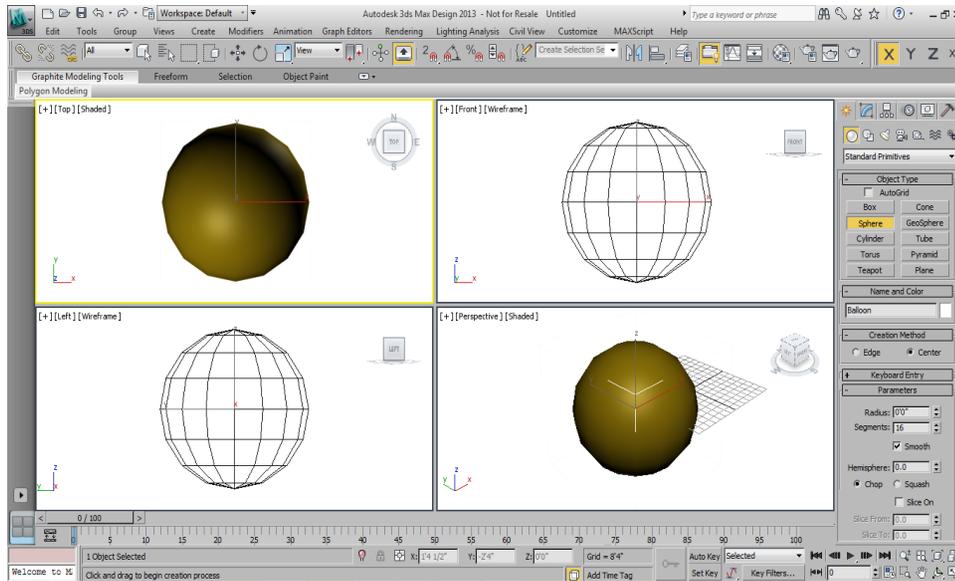


Figure 3-1 The sphere displayed in all four viewports

11. Maximize the Front viewport and zoom in, if needed, to display the subgrid. Pick the **Select and Move** button. Select the object *Balloon*, if it is not already selected. 
12. Pick the **Modify** tab in the **Command Panel**. In the **Modifier List** drop-down list, select **Edit Mesh** in the **OBJECT-SPACE MODIFIERS** section. Then, pick the **Vertex** button in the **Selection** rollout. 

You are now in the vertex sub-object mode. Selected vertices are displayed in red, and unselected vertices in blue.

13. Select the lowermost two layers of vertices by dragging a selection window around them in the Front viewport.

The selected vertices turns red.

14. In the Front viewport, drag the vertices down 40 units in the -Y direction. This is shown as 0.0, -40.0, 0.0 in the coordinate display. The shape of the sphere changes into a balloon, **Figure 3-2**.

Alternatively, you can type exact coordinate values in the **Move Transform Type-In** dialog box. To open this dialog box, right-click on the **Select and Move** button. Then, enter -40 in the **Y**: spinner in the **Offset: Screen** area.

15. Pick the **Vertex** button in the **Selection** rollout to exit the sub-object mode. Return to the four-viewport configuration.

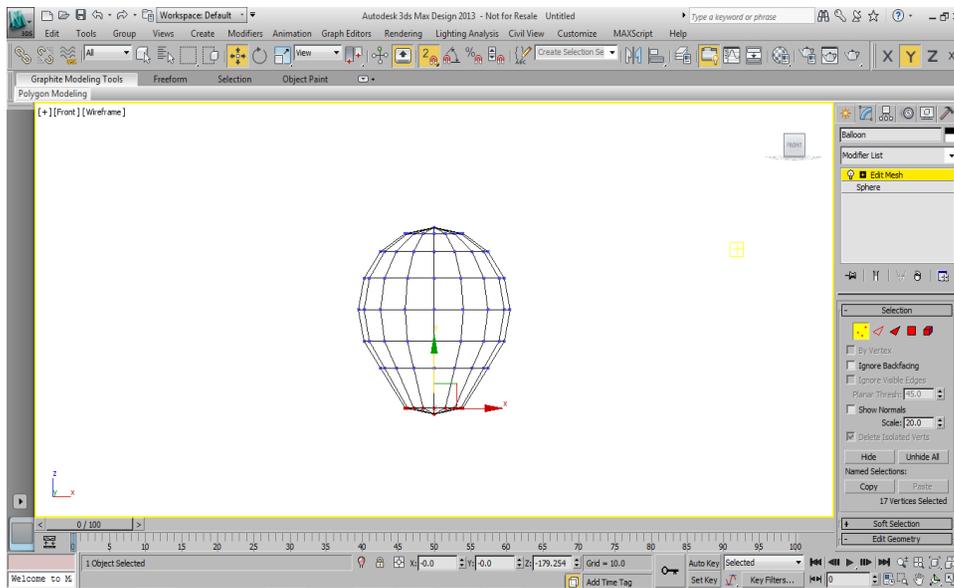


Figure 3-2 The shape of the sphere changed into a balloon

## Saving Your Work

You should save your work before proceeding further.

1. Select **Save** from the **Application Menu**.

The **Save File As** dialog box is displayed.

2. In the **Save File As** dialog box, type **Chapter03** in the **File name:** text box, select the folder of your choice, and then pick the **Save** button.

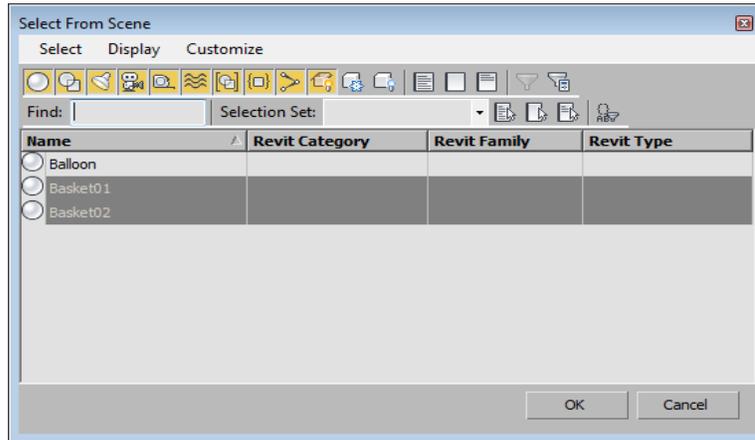
The file is saved as *Chapter03.max* in the folder you selected.

## Creating the Basket

1. Activate the Top viewport. Pick the **Create** tab and then the **Geometry** button in the **Command Panel**. Next, pick the **Box** button.
2. In the **Keyboard Entry** rollout, enter 160 in the **Length:** spinner, 160 in the **Width:** spinner, and 80 in the **Height:** spinner. Pick the **Create** button in the **Keyboard Entry** rollout. In the **Name and Color** rollout, name the object as **Basket01**.
3. Now, again enter 150 in the **Length:** spinner, 150 in the **Width:** spinner, and 100 in the **Height:** spinner in the **Keyboard Entry** rollout. Next, pick the **Create** button in the **Keyboard Entry** rollout. Then, name the object **Basket02** in the **Name and Color** rollout.

*Basket02* is created and it protrudes through the top of *Basket01*.

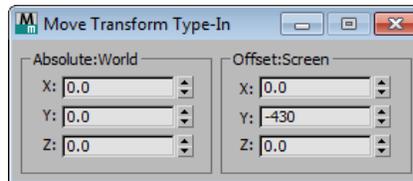
4. Pick the **Select by Name** button to display the **Select From Scene** dialog box, **Figure 3-3**. Holding down the CTRL key, pick *Basket01* so that both baskets are highlighted. Pick the **OK** button in the dialog box.



*Figure 3-3 The Select From Scene dialog box*

Both baskets are selected.

5. Pick the **Maximize Viewport Toggle** button and then activate the Front viewport by clicking in it. Next, pick the **Select and Move** button.
6. You need to move both baskets down vertically by 430 units. To do so, right-click on the **Select and Move** button to display the **Move Transform Type-In** dialog box. Then, enter  $-430$  in the **Y:** spinner in the **Offset: Screen** area and press the ENTER key, see **Figure 3-4**.



*Figure 3-4 The Move Transform Type-In dialog box*

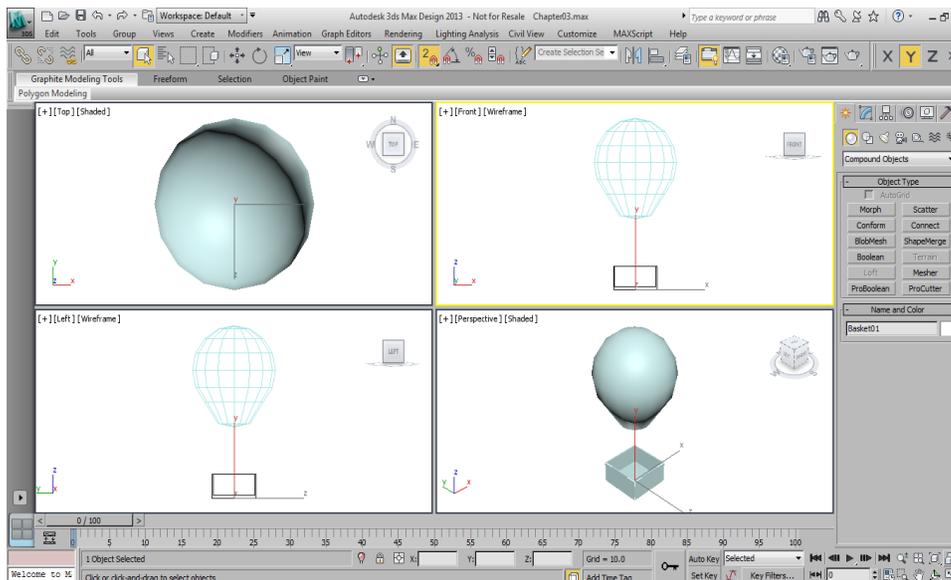
7. Close the **Move Transform Type-In** dialog box.
8. Pick the **Select by Name** button to display the **Select From Scene** dialog box. Clear *Basket01* by picking *Basket02*. Then, pick the **OK** button in the dialog box.

*Basket01* is deselected, while *Basket02* remains selected.

9. Using the **Move Transform Type-In** dialog box, move *Basket02* up 10 units in the Front viewport.
10. Pick the **Select by Name** button to display the **Select From Scene** dialog box. Next, select the object *Basket01* from the list and pick the **OK** button.
11. Make sure the **Geometry** button is picked in the **Create** tab of the **Command Panel**. Then, select **Compound Objects** from the drop-down list below the **Geometry** button.
12. In the **Object Type** rollout, pick the **Boolean** button. Make sure that the **Subtraction (A-B)** radio button is selected in the **Operation** area of the **Parameters** rollout. Pick the **Pick Operand B** button in the **Pick Boolean** rollout. Select *Basket02* as the operand B. Pick the **Select Object** button to complete the operation.

*Basket02* is subtracted from *Basket01* creating a hollow basket.

13. Pick the **Maximize Viewport Toggle** button. Next, pick the **Zoom Extents All** button, **Figure 3-5**.



*Figure 3-5* *Basket01* after performing the **Boolean** operation

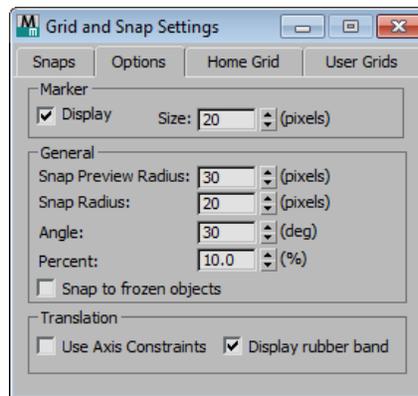
14. Save the scene.

## Creating the Ropes

1. Activate the Top viewport. Right-click on the **Shaded** label on the top-left side of the viewport. Then, select **Wireframe** from the shortcut menu.

2. Make sure the **Geometry** button is picked in the **Create** tab of the **Command Panel**. Then, select **Standard Primitives** from the drop-down list below the **Geometry** button. Pick the **Cylinder** button in the **Object Type** rollout.
3. In the **Parameters** rollout, enter 5 in the **Height Segments:** spinner. In the **Keyboard Entry** rollout, enter 4 in the **Radius:** spinner, and 150 in the **Height:** spinner. Then, pick the **Create** button. In the **Name and Color** rollout, name the object as **Rope01**.
4. Pick the **Select and Rotate** and **Transform Gizmo X Constraint** buttons. Turn the snap off. Pick the **Angle Snap Toggle** button on the **Main Toolbar** to rotate the object *Rope01* in increments. 

The **Angle Snap Toggle** button is used to rotate the object in the increments you set. By default, the rotations take place in 5-degree increments. Right-click on the **Angle Snap Toggle** button; the **Grid and Snap Settings** dialog box is displayed. Enter 30 in the **Angle:** spinner in the **General** area of the **Options** tab, **Figure 3-6**. Close the **Grid and Snap Settings** dialog box.



*Figure 3-6 The Grid and Snap Settings dialog box*

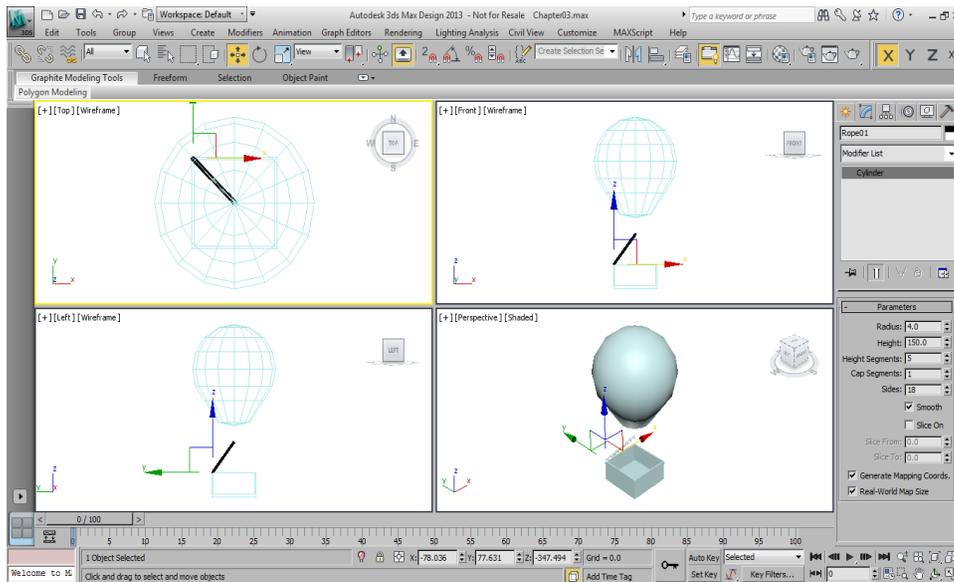
5. In the Top viewport, move the cursor over the X-axis and rotate the object *Rope01* through an angle of 30°. The rotation value is displayed in the coordinate display below the viewports.

Be careful that you do not override the axis constraint by accidentally selecting an unwanted portion of the transform gizmo. You can lock the selection before rotating it by pressing the SPACEBAR key. In this way, you can click anywhere in the viewport to transform the object.

6. Pick the **Transform Gizmo Y Constraint** button. Right-click on the **Angle Snap Toggle** button; the **Grid and Snap Settings** dialog box is displayed. Enter 35 in the **Angle:** spinner in the **General** area of the **Options** tab. Rotate *Rope01* through an angle of 35°. Turn the **Angle Snap Toggle** off.

Unlock the selection by pressing the SPACEBAR key or by picking the **Selection Lock Toggle** button, if locked.

7. Activate the Front viewport. Pick the **Select and Move** and **Transform Gizmo XY Plane Constraint** buttons. In the Front viewport, move *Rope01* so that its lower end touches the upper-left corner of the basket. In the Left viewport also, move *Rope01* such that its lower end touches the upper-left corner of the basket, **Figure 3-7**.



*Figure 3-7 The Rope01 in four viewports*

8. Notice that the top of *Rope01* does not touch the bottom of the *Balloon*. Pick the **Zoom Region** button. Then, zoom in on the bottom portion of the *Balloon* and the upper portion of the *Rope01* in the Front viewport.



If you have locked the selection, now unlock it by pressing the SPACEBAR key.

9. Make sure the *Rope01* is selected. Pick the **Modify** tab in the **Command Panel**. In the **Modifier List** drop-down list, select **Edit Mesh** in the **OBJECT-SPACE MODIFIERS** section. In the **Selection** rollout, pick the **Vertex** button to enter the sub-object mode. Then, select the upper vertices of *Rope01*.

The vertices at the top turn red.

10. Pick the **Select and Move** tool and the **Transform Gizmo Y Constraint** button. Drag the selected vertices to touch the lower point of the balloon, **Figure 3-8**.

You may need to press the SPACEBAR key to lock the selection set before moving the vertices.

11. Pick the **Vertex** button in the **Selection** rollout to exit the sub-object mode. Pick the **Zoom Extents** button.

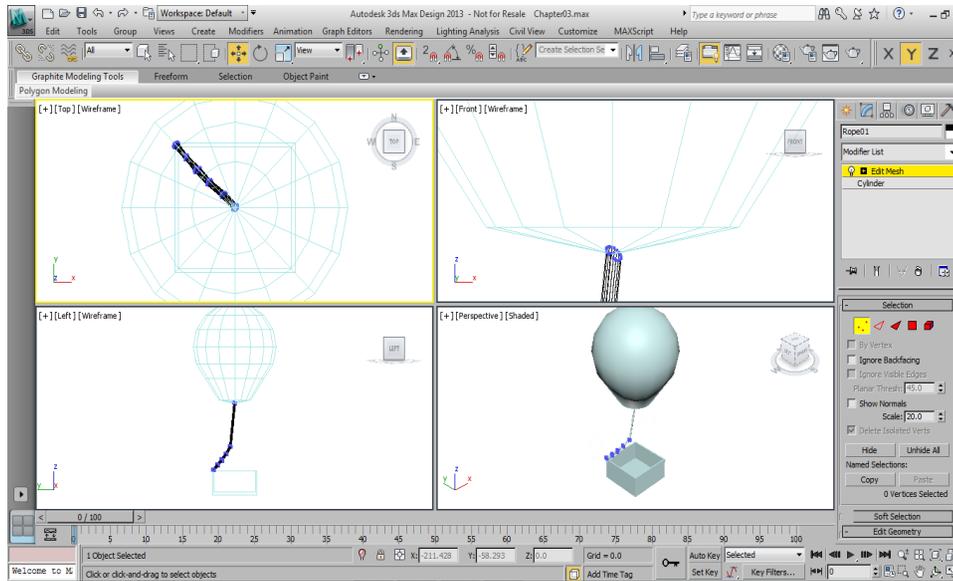


Figure 3-8 The end vertices of the Rope01 moved to meet the bottom of the balloon

12. Activate the Top viewport.



**Note**

The **Reference Coordinate System** is set to **View** by default. If you want to rotate objects about the world origin, the **Reference Coordinate System** setting may need to be changed to **World** if the viewport is not centered on the origin. After rotating the objects, you may want to set the **Reference Coordinate System** back to **View** to avoid confusion.

13. Pick the **Use Transform Coordinate Center** button from the **Use Pivot Point Center** flyout on the **Main Toolbar**. Set the **Reference Coordinate System** to **World**. Select **Array...** from the **Tools** pull-down menu; the **Array** dialog box is displayed, **Figure 3-9**.

14. Pick the **Reset All Parameters** button at the bottom of the **Array** dialog box. Enter 90 in the **Incremental Z** spinner in the **Rotate** row. In the **Type of Object** area, pick the **Copy** radio button. In the **Array Dimensions** area, pick the **1D** radio button and enter 4 in the **1D Count** spinner. Pick the **OK** button.

Ropes are placed at the four corners of the basket and extended to the bottom of the *Balloon*, **Figure 3-10**.

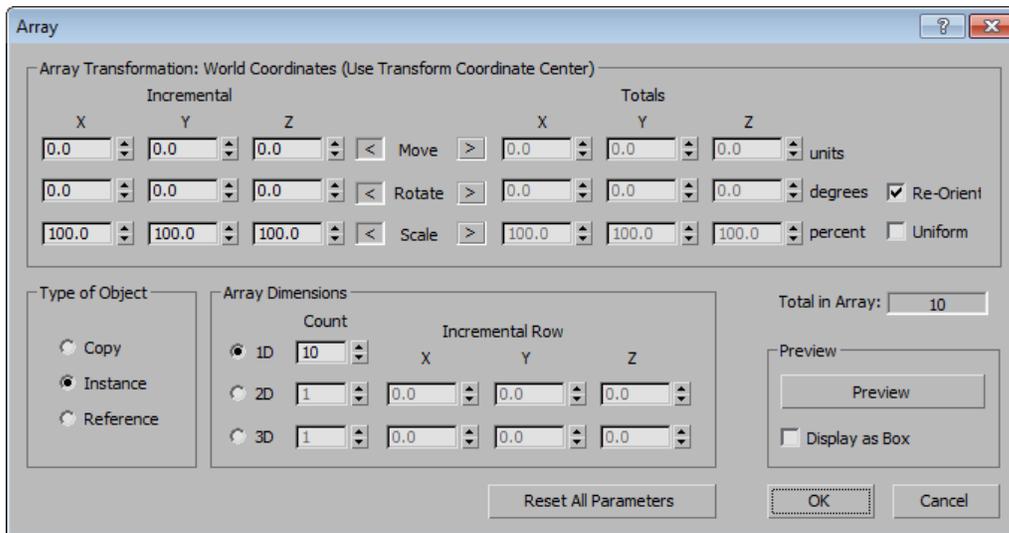


Figure 3-9 The Array dialog box

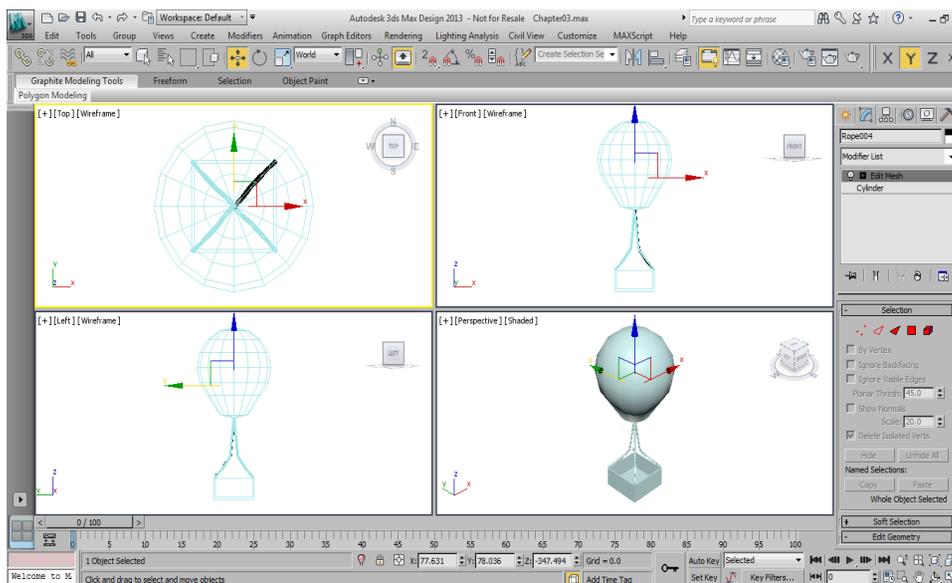


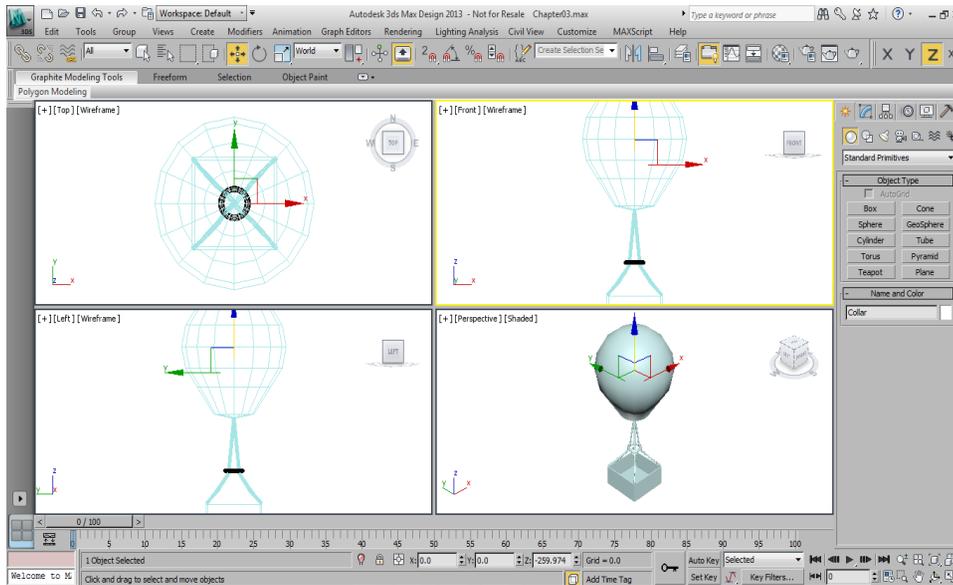
Figure 3-10 The four ropes placed at the corners of the basket

15. Set the **Reference Coordinate System** back to **View** and change **Use Transform Coordinate Center** button to **Use Pivot Point Center** button in the flyout on the **Main Toolbar**. Rename the three newly created ropes as **Rope02**, **Rope03**, and **Rope04**.
16. Save the scene.

## Creating the Collar

Next, you will create a collar and place it at the “kink” in the ropes.

1. With the Top viewport active, pick the **Geometry** button in the **Create** tab of the **Command Panel**. Then, pick the **Torus** button in the **Object Type** rollout.
2. In the **Keyboard Entry** rollout, enter 25 in the **Major Radius:** spinner and 5 in the **Minor Radius:** spinner. Pick the **Create** button. In the **Name and Color** rollout, name the object as **Collar**.
3. Pick the **Transform Gizmo Y Constraint** and **Select and Move** buttons. In the Front viewport, move the *Collar* down so that the “kinks” in the ropes are inside the torus, **Figure 3-11**. Zoom as needed.



*Figure 3-11 Alignment of the Collar with the ropes*

4. Pick the **Zoom Extents All** button.
5. Save the scene.

## Assigning Materials to the Balloon

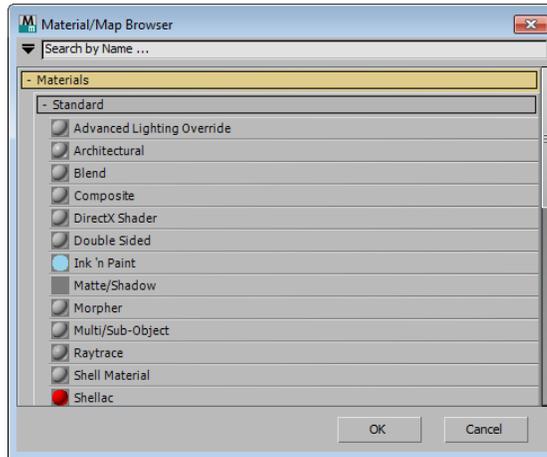
You will assign different materials to different portions of the balloon. This can be accomplished by using the multi/sub-object type of material.

1. Select **Material Editor** option from the **Rendering** pull-down menu. Then, select the **Compact Material Editor...** option from the cascading menu.

The **Material Editor** is displayed.

2. Select the first material sample slot. Then, pick the **Arch & Design** button.

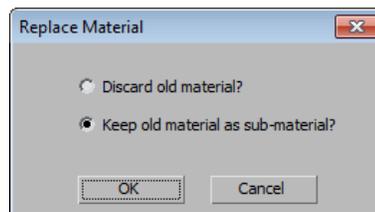
The **Material/Map Browser** dialog box is displayed, **Figure 3-12**.



*Figure 3-12 The Material/Map Browser dialog box*

3. Expand the **Materials** title bar. Next, expand the **Standard** title bar. A list of standard materials is displayed. Select **Multi/Sub-Object** from the list of material types and then pick the **OK** button.

The **Replace Material** dialog box is displayed, **Figure 3-13**.



*Figure 3-13 The Replace Material dialog box*

4. Pick the **Discard old material?** radio button and then pick the **OK** button.

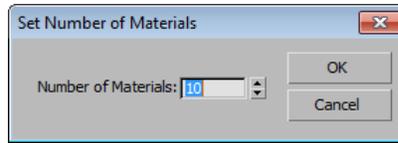
The **Arch & Design** button is labeled as **Multi/Sub-Object** in the **Material Editor** with ten materials listed.

5. Select the drop-down list where the name of the material appears. Now, rename it as **Balloon Material** and then press the ENTER key.

The material you are creating is named as *Balloon Material*.

6. In the **Multi/Sub-Object Basic Parameters** rollout, pick the **Set Number** button.

The **Set Number of Materials** dialog box is displayed, **Figure 3-14**.

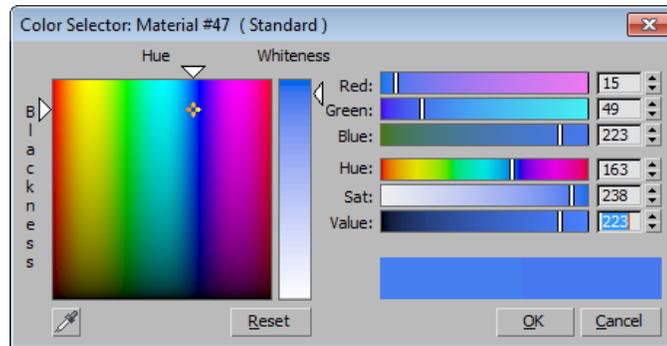


**Figure 3-14** The *Set Number of Materials* dialog box

7. Enter 3 in the **Number of Materials:** spinner and pick the **OK** button.

The material now has three submaterials instead of ten.

8. Pick the button labeled as **None** placed on the right of the first material to display the **Material/Map Browser** dialog box.
9. Expand the **Materials** title bar. Next, expand the **Standard** title bar; a list of standard materials is displayed. Select **Standard** from the list of material types and then pick the **OK** button.
10. Pick the **Go to Parent** button. Next, pick the color swatch to the right of the first material to display the **Color Selector** dialog box. Select the blue color and drag the arrow to set the intensity of your choice, **Figure 3-15**.



**Figure 3-15** Setting the color of the material to blue using the *Color Selector* dialog box

Then, pick the **OK** button in the **Color Selector** dialog box.

The first material is changed to blue color.

11. Similarly, make the second material red and the third material yellow.
12. Select the object *Balloon* in the Front viewport. With the slot containing *Balloon Material* as current, pick the **Assign Material to Selection** button in the **Material Editor**.

The *Balloon Material* is assigned to the object *Balloon*.

13. With the object *Balloon* still selected, pick the **Modify** tab in the **Command Panel**. From the **Modifier List** drop-down list, select **Mesh Select** in the **Selection Modifiers** section. In the **Mesh Select Parameters** rollout, pick the **Face** button. 
14. In the Front viewport, select the bottom three rows of faces on the *Balloon* by dragging a selection window around them.
15. In the **Modifier List** drop-down list, select **Material** in the **OBJECT-SPACE MODIFIERS** section.

A material modifier is applied to the selected faces.

16. In the **Parameters** rollout for the material modifier, enter **1** in the **Material ID:** spinner, if it is not already specified.

The material, with a material ID of 1, is assigned to the bottom of the *Balloon*. This is the first (blue) submaterial.

17. Apply another **Mesh Select** modifier to the object *Balloon*. In the **Mesh Select Parameters** rollout, pick the **Face** button.
18. Select the middle two rows of faces on the *Balloon* by dragging a window around them. Then, apply a **Material** modifier to the selected faces.
19. In the **Parameters** rollout for the material modifier, enter 3 in the **Material ID:** spinner.

The material with a material ID of 3 is assigned to the middle of the *Balloon*. This is the third (yellow) submaterial.

20. Apply the third **Mesh Select** modifier to the object *Balloon*. In the face sub-object mode, select the remaining rows of faces on the *Balloon* by dragging a window around them.
21. Apply a **Material** modifier to the selected faces.
22. In the **Parameters** rollout, enter 2 in the **Material ID:** spinner.

The material with a material ID of 2 is assigned to the top of the *Balloon*. This is the second (red) submaterial.

23. Save the scene.

## Adjusting the Material

1. In the **Material Editor**, select the *Ballon Material*. Then, pick the first submaterial button with ID:1

The parameters for the blue material appear.

2. Select the drop-down list where the name of the submaterial appears. Now, rename it as submaterial **Blue**.
3. In the **Shader Basic Parameters** rollout, select **Phong** from the drop-down list.
4. In the **Specular Highlights** area of the **Phong Basic Parameters** rollout, enter 50 in the **Specular Level:** spinner and enter 20 in the **Glossiness:** spinner.
5. In the **Material Name** drop-down list, where submaterial Blue currently appears, select *Balloon* Material to return to the parent material or you can pick the **Go to Parent** button.
6. Select **Phong** from the drop-down list of the **Shader Basic Parameters** rollout and then using the same process, rename the second submaterial as submaterial **Red**. Enter 50 in the **Specular Level:** spinner and enter 20 in the **Glossiness:** spinner.
7. Select **Phong** from the drop-down list of the **Shader Basic Parameters** rollout and then rename the third submaterial as submaterial **Yellow**. Enter 50 in the **Specular Level:** spinner and enter 20 in the **Glossiness:** spinner.
8. At the *Yellow* submaterial level, check the **Color** check box in the **Self Illumination** area in the **Phong Basic Parameters** rollout.

The spinner is replaced by a color swatch.

9. Pick the color swatch to display the **Color Selector: Self-Illum Color** dialog box. Change the color to dark red.

The **Self-Illumination** color will help give the illusion of a gas burner inside the *Balloon*.

10. Return to the parent material level. Close the **Material Editor**.
11. Activate the Perspective viewport. Pick the **Render Production** button on the **Main Toolbar**.

A still image of the *Balloon* is rendered.

12. Save the scene.

## Assigning Material to Ropes

1. Pick the **Select by Name** button to display the **Select From Scene** dialog box. Using the CTRL key, select *Rope01*, *Rope02*, *Rope03*, and *Rope04* from the list. Then, pick the **OK** button to exit the dialog box, and select the objects.
2. Open the **Compact Material Editor** from the flyout on the **Main Toolbar** and pick the second sample slot.



3. Pick the **Get Material** button to display the **Material/Map Browser** dialog box. 
4. Pick the **Material/Map Browser Options** button from the **Material/Map Browser**.
5. Select the **Open Material Library...** option from the **Material/Map Browser Options** drop-down list.

The **Import Material Library** dialog box is displayed.

6. Select the *3dsmax.mat* file from **Programs Files > Autodesk > 3ds Max Design 2013 > materiallibraries** and then pick the **Open** button.

The different materials available in the *3dsmax.mat* library are displayed.

7. Double-click on the material **Fabric\_Tan\_Carpet(Standard)** to load it into the **Material Editor**. Then, in the **Material Editor**, pick the **Assign Material to Selection** button. Close the **Material/Map Browser** and minimize the **Material Editor**.

The **Material Editor** is now at the bottom of the screen as minimized window. Note that minimized windows can be restored by double-clicking on their title bar.

8. With the ropes selected, pick the **Modify** tab in the **Command Panel**. In the **Modifier List** drop-down list, select **UVW Map** in the **OBJECT-SPACE MODIFIERS** section.

A **UVW Map** modifier is applied to all ropes.

9. In the **Mapping** area of the **Parameters** rollout, uncheck the **Real-World Map Size** check box and pick the **Planar** radio button. In the **Alignment** area, pick the **Y** radio button and pick the **Fit** button.
10. With the Perspective viewport active, pick the **Render Production** button on the **Main Toolbar** to render the scene.

## Assigning Material to Collar

1. Pick the **Select by Name** button to display the **Select From Scene** dialog box. Select the object *Collar* in the list, pick the **OK** button to exit the dialog box, and then select the object.
2. Restore the **Material Editor** dialog box. Then, pick the third sample slot to make it active. Pick the **Get Material** button to display the **Material/Map Browser**.
3. Double-click on the material **Fabric\_Blue\_Carpet(Standard)** to load it into the **Material Editor**. Then, in the **Material Editor**, pick the **Assign Material to Selection** button. Minimize the **Material Editor** and close the **Material/Map Browser**.
4. With the *Collar* selected, pick the **Modify** tab in the **Command Panel**. In the **Modifier List** drop-down list, select **UVW Map** in the **OBJECT-SPACE MODIFIERS** section.

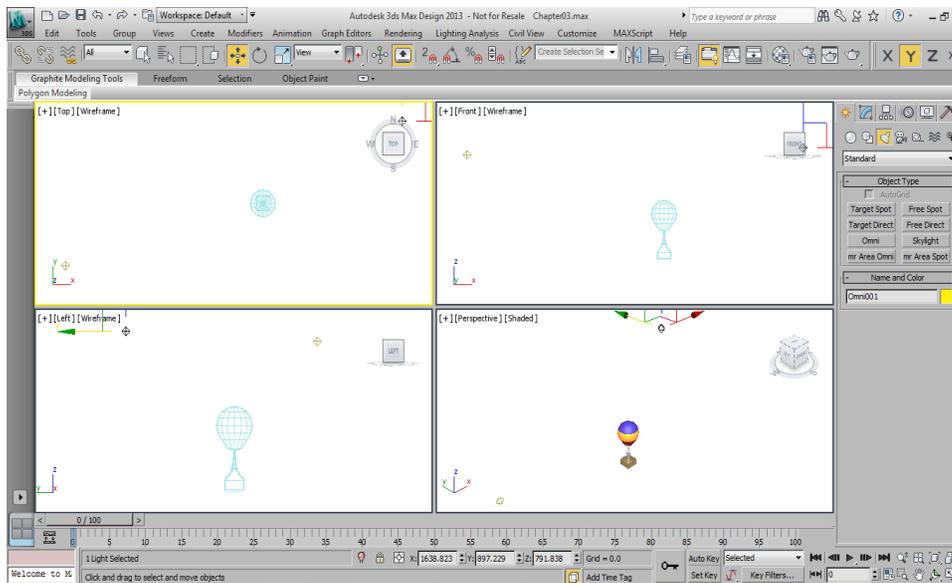
5. In the **Mapping Area** of the **Parameters** rollout, uncheck the **Real-World Map Size** check box and pick the **Cylindrical** radio button. Enter the value 60 in the **Length:**, **Width:**, and **Height:** spinners and the value 0.3 in the **U Tile:**, **V Tile:**, and **W Tile:** spinners.

## Assigning Material to Basket

1. Pick the **Select by Name** button to display the **Select From Scene** dialog box. Select the object *Basket01* in the list, pick the **OK** button to exit the dialog box, and then select the object.
2. Restore the **Material Editor**. Select the fourth sample slot in the **Material Editor** to make it active. Then, pick the **Get Material** button to display the **Material/Map Browser**.
3. Double-click on the material **Wood-Cedfence(Standard)** to load it into the **Material Editor**. Then, in the **Material Editor**, pick the **Assign Material to Selection** button. Close both the **Material/Map Browser** and the **Material Editor**.
4. With the basket selected, pick the **Modify** tab in the **Command Panel**. In the **Modifier List** drop-down list, select **UVW Map** in the **OBJECT-SPACE MODIFIERS** area.
5. In the **Mapping** area of the **Parameters** rollout, uncheck the **Real-World Map Size** check box and select the **Box** radio button. Enter 160.16 in the **Length:**, **Width:**, and **Height:** spinners.
6. Render the Perspective viewport. Close the render window after examining the image.
7. Save the scene.

## Adding Lights and Cameras

1. Pick the **Zoom All** button. Zoom so that the objects are displayed at about one-fourth of their original size. 
2. Pick the **Lights** button in the **Create** tab of the **Command Panel**. Change **Photometric** lights to **Standard** lights from the drop-down list. Then, pick the **Omni** button in the **Object Type** rollout. In the Front viewport, place two omni lights; one in the upper-right corner and the other in the upper-left corner of the viewport. Pick the **Zoom Extents All** button. 
3. Pick the **Select and Move** and **Transform Gizmo Y Constraint** buttons. In the Top viewport, move the omni lights to the bottom-left and top-right corners, **Figure 3-16**.
4. Select the omni light in the lower-left corner of the Top viewport and pick the **Modify** tab in the **Command Panel**. In the **Shadows** area of the **General Parameters** rollout, uncheck the **On** check box. In the **Intensity/Color/Attenuation** rollout, enter 0.4 in the **Multiplier:** spinner.

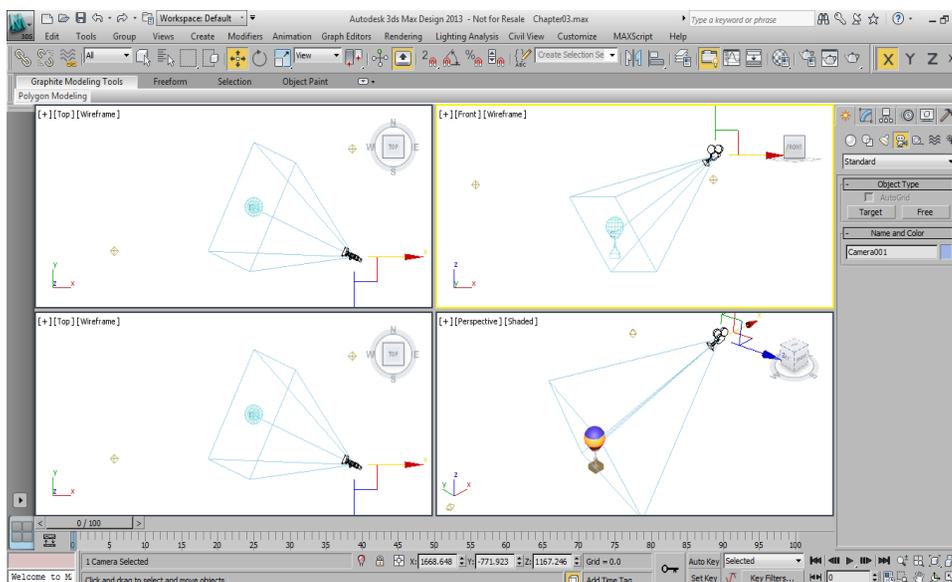


*Figure 3-16 The Omni001 and Omni002 lights in the scene*

5. Select the omni light in the upper-right corner of the Top viewport. In the **Intensity/Color/Attenuation** rollout, enter 0.8 in the **Multiplier:** spinner. In the **Shadow Parameters** rollout, enter 0.7 in the **Dens.:** spinner.

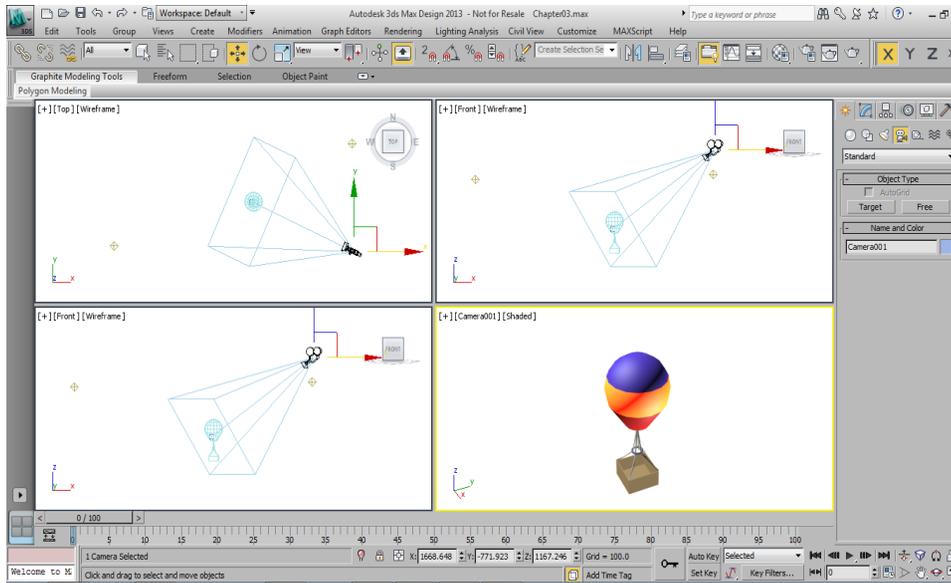
This lightens the shadows cast by the omni light.

6. Pick the **Create** tab in the **Command Panel** and then pick the **Cameras** button. Then, pick the **Target** button in the **Object Type** rollout. Place the camera in the Top viewport and position it, as shown in **Figure 3-17**.



*Figure 3-17 The camera in the Top viewport*

7. Activate the Perspective viewport and then press the C key to make it the Camera viewport. Also, turn the grid off by pressing the G key.
8. Pick the **Select and Move** button and move the camera to get the desired view in the Camera viewport. In the Camera viewport, you can use the **Field-of-View** button and other camera viewport controls to move the camera view closer and get a better view, **Figure 3-18**. The **Zoom Region** button is replaced by the **Field-of-view** button when the Camera viewport is active.



*Figure 3-18 The Camera viewport after using the Field-of-View button*

9. Render the Camera viewport. Then, save the scene.

## Setting the Background

To set the background image, you need to download the *c03\_maxdesign\_2013\_tut.zip* from [www.cadcim.com](http://www.cadcim.com). The path of the file is as follows:

*Textbooks > Animation and Visual Effects > 3ds Max Design > Autodesk 3ds Max Design 2013: A Tutorial Approach*

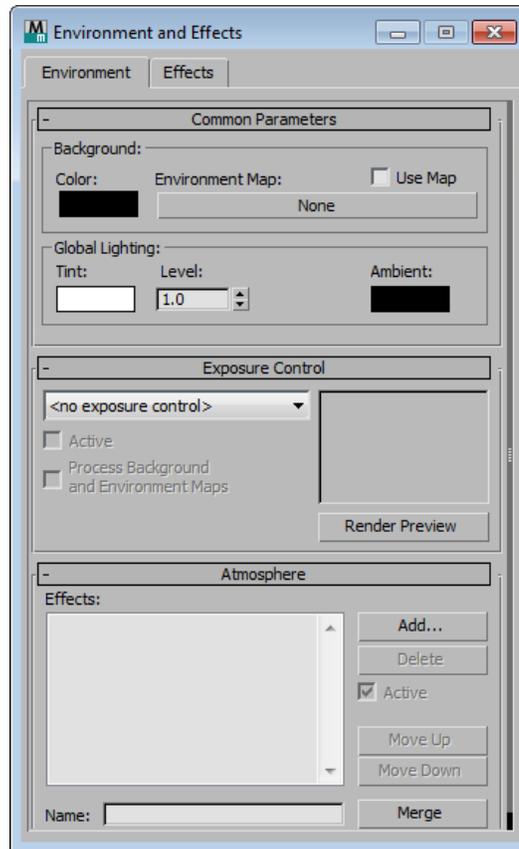
1. Select **Environment...** from the **Rendering** pull-down menu.

The **Environment and Effects** dialog box is displayed, **Figure 3-19**.

2. Pick the **None** button in the **Background:** area of the **Common Parameters** rollout.

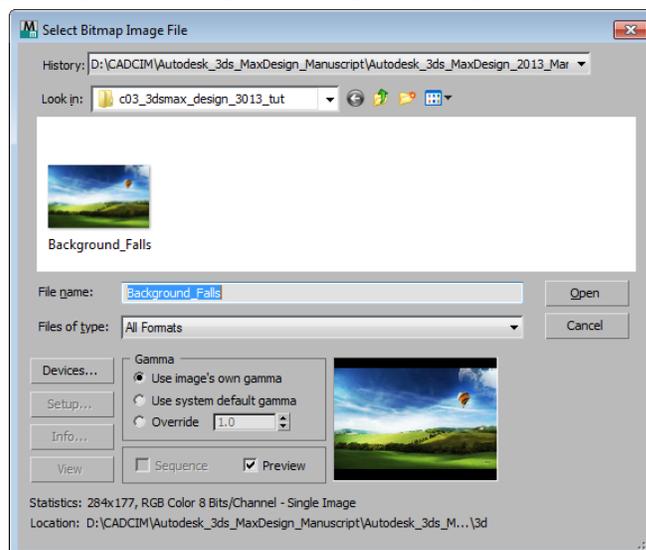
The **Material/Map Browser** is displayed.

3. Double-click on the **Maps** material type and select the **Bitmap** option from it, if it is not expanded already. Now, pick the **OK** button.



*Figure 3-19 The Environment and Effects dialog box*

The Select Bitmap Image File dialog box is displayed, **Figure 3-20**.



*Figure 3-20 The Select Bitmap Image File dialog box*

4. Select **Background\_Falls.jpg** that you have downloaded from the CAD/CIM website and pick the **OK** button.

The **Background\_Falls.jpg** replaces the **None** label in the **Environment and Effects** dialog box.

5. Make sure the **Use Map** check box is checked. Then, exit the **Environment and Effects** dialog box.
6. In the **Material Editor**, pick the **Environ** radio button from the **Coordinates** area and make sure **Screen** is displayed in the **Mapping:** drop-down list in the **Coordinates** rollout. Also, make sure 0.0 is entered in the **Blur offset:** spinner.
7. Close the **Material Editor** dialog box. Then, render the Camera viewport and save the scene.

The rendered view of the balloon with the *background\_falls* scene is displayed, **Figure 3-21**.



*Figure 3-21* The final rendered scene

## Self-Evaluation Test

Answer the following questions and then compare them to those given at the end of this chapter:

1. To display objects in shaded mode in a viewport, select \_\_\_\_\_ from the shortcut menu displayed by right-clicking on the viewport label.
2. The \_\_\_\_\_ dialog box is displayed when you pick the **Select by Name** button.
3. You can use the \_\_\_\_\_ tool to zoom in on a small portion of an object by enclosing it in a selection window.
4. Pick the \_\_\_\_\_ button to get the full-screen view of the active viewport only.
5. Select **Clone** from the \_\_\_\_\_ pull-down menu to display the **Clone Options** dialog box.
6. You can assign different material IDs to different portions of an object using the \_\_\_\_\_ modifier.
7. Select **Environment...** in the \_\_\_\_\_ pull-down menu to display the **Environment and Effects** dialog box.
8. You can use the **Render Production** button to render the active viewport. (T/F)
9. You can use the **Field-of-View** button to adjust the extent of the scene that is visible in a viewport. (T/F)

## Review Questions

Answer the following questions:

1. The \_\_\_\_\_ button is used to zoom an object equally in all viewports.
2. The \_\_\_\_\_ key is used to activate the camera viewport.
3. Select **Array** from the \_\_\_\_\_ pull-down menu to display the **Array** dialog box.
4. The SPACEBAR key is used to lock the selection. (T/F)
5. The **Axis Constraints** tools do not normally work with snaps on. (T/F)
6. The **Snaps Toggle** button is used to rotate the object in the increments you set. (T/F)
7. Which of the following buttons is used to invoke the **Material/Map Browser** dialog box?
  - (a) **Go To Parent**
  - (b) **Get Material**
  - (c) **Assign Material to Selection**
  - (d) **Show Shaded Material in Viewport**



## **Answers**

The following are the answers of Self-Evaluation Test:

1. **Shaded**;
2. **Select From Scene**;
3. **Zoom Region**;
4. **Maximize Viewport Toggle**;
5. **Edit**;
6. **Material**;
7. **Rendering**;
8. T;
9. T