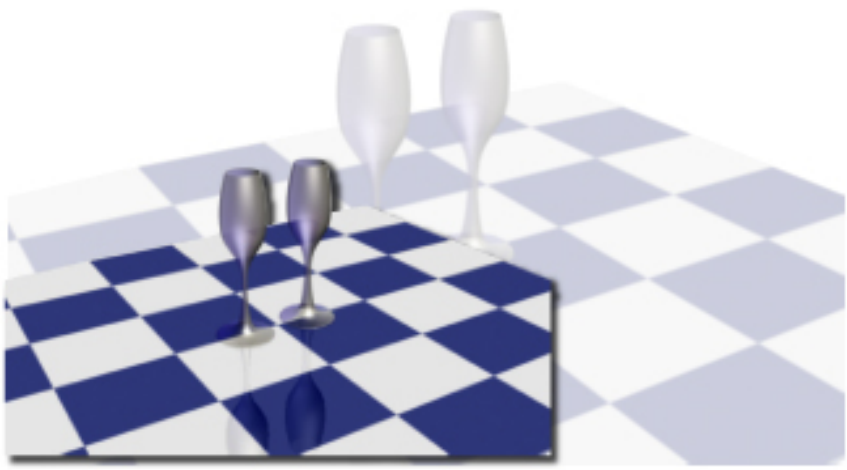
8

Materials and Maps

Learning Objectives

After completing this chapter, you will be able to:

- *Use the Material Editor tool*
- *Understand the types of materials and maps*
- *Create materials and maps*
- *Assign materials to objects*



INTRODUCTION

In this chapter, you will learn to assign various materials and maps to the objects in a scene to make it more realistic. To do so, you need to use the **Material Editor** tool from the **Main Toolbar**, which is discussed next.

MATERIAL EDITOR

Menu bar: Rendering > Material Editor > Compact/Slate Material Editor
Main Toolbar: Material Editor flyout > Compact/Slate Material Editor
Keyboard: M



In Autodesk 3ds Max, there are two types of material editors, Slate material editor and Compact material editor. You can use any of these material editors to create new materials and maps, modify the existing materials, apply these new materials and maps to the models in the scene, and create a new environment for the scene.

The Slate material editor is mostly used to design the materials of your choice. It uses nodes and wiring to graphically display the design of the materials created by you. The Compact material editor is more useful when you just need to apply the materials to the objects that have already been designed. In this chapter, you will learn about the Compact material editor.

To create a new material, press the M key; the **Slate Material Editor** dialog box will be displayed, as shown in Figure 8-1. Next, if you choose **Modes > Compact Material Editor** from the material editor menu bar; the **Material Editor** dialog box will be displayed, as shown in Figure 8-2. The title bar of the **Material Editor** dialog box displays the number and name of the current material, which gets changed depending on the material that you select. The **Material Editor** dialog box is divided into various parts, refer to Figure 8-2. These parts are discussed next.

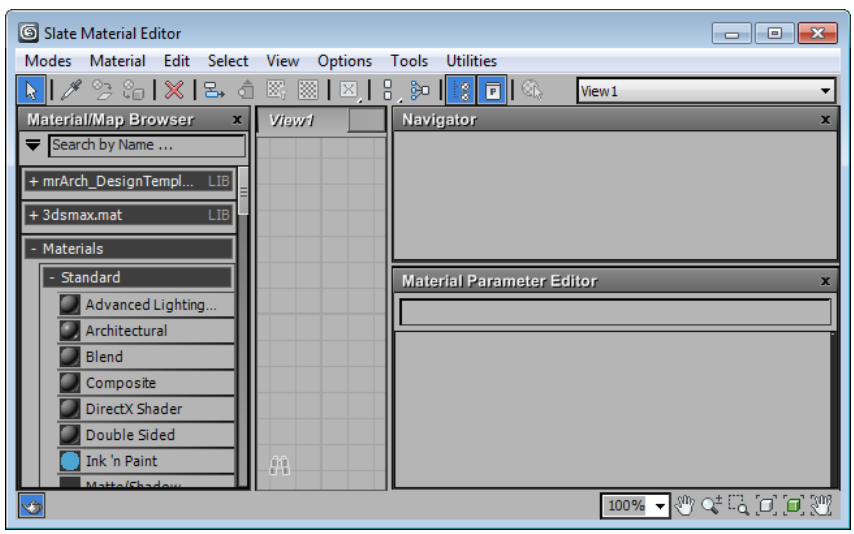


Figure 8-1 *The* ***Slate Material Editor*** *dialog box*

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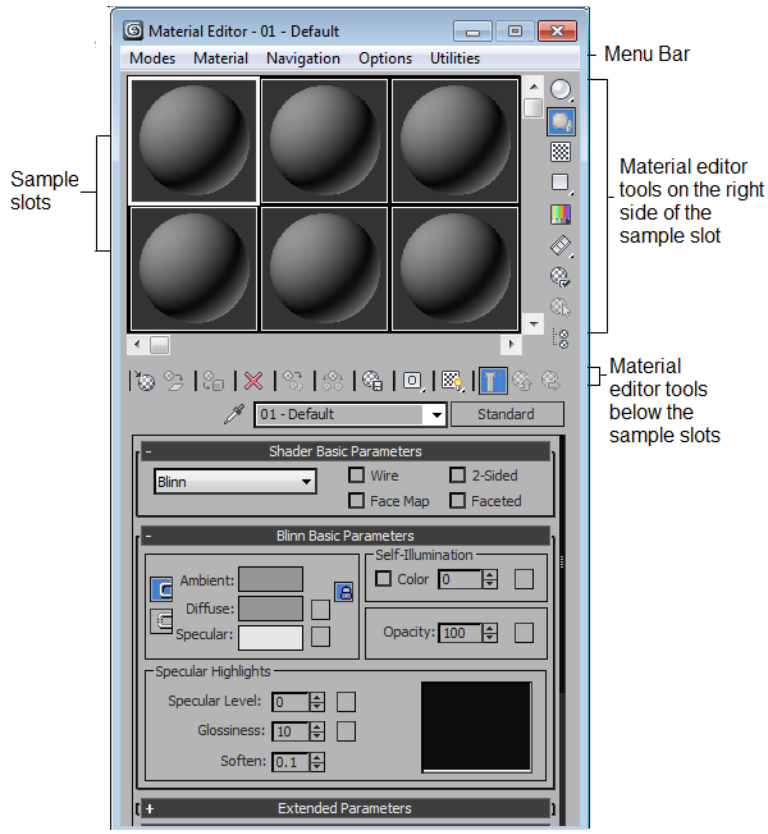

Figure 8-2 *Partial view of the* ***Material Editor*** *dialog box*



Note

When you press the M key, the material editor that you opened last in Autodesk 3ds Max will be displayed. However, if you press the M key for the first time in Autodesk 3ds Max, then the Slate material editor will be displayed.

Menu Bar

The menu bar is located at the top of the **Material Editor** dialog box. It consists of various pull-down menus such as **Material**, **Navigation**, and so on. The options in these pull-down menus are used to invoke various tools. These tools can also be invoked using the options available below as well as on the right side of the sample slots in the **Material Editor** dialog box, refer to Figure 8-2.

Sample Slots

The sample slots in the **Material Editor** dialog box are used to preview the material or the maps that you will assign to the objects in the viewport. By default, there are 24 sample slots and each sample slot represents a single material or map. You can view only six sample slots at a time. To view other sample slots, you need to scroll the scroll bar available on the right, and just below the sample slots. You can also increase the number of visible sample slots.

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To do so, select one of the sample slots; it will be surrounded by a white colored boundary and will get activated. Next, right-click on the active sample slot; a shortcut menu will be displayed, as shown in Figure 8-3. By default, the **3x2 Sample Windows** option is chosen in the shortcut menu. Next, choose the required option; the number of visible sample slots will be increased accordingly, refer to Figures 8-4 and 8-5.

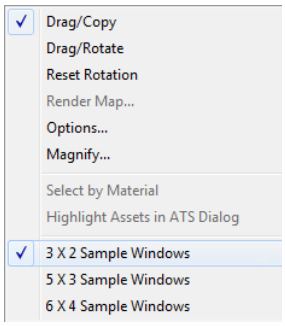

Figure 8-3 *The shortcut menu displayed*

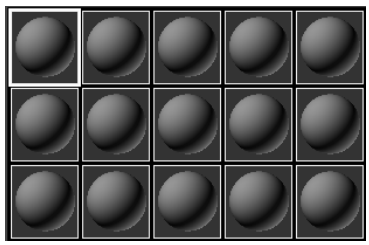

Figure 8-4 *The sample slots after choosing the* ***5x3 Sample Windows*** *option*

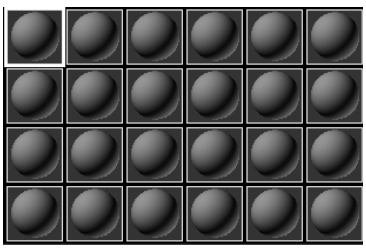

Figure 8-5 *The sample slots after choosing the* ***6x4 Sample Windows*** *option*

In the shortcut menu, the **Drag/Copy** option is also chosen by default. It is used to copy the material or the map from one sample slot to another. To do so, select the sample slot whose material or map you want to copy. Now, press and hold the left mouse button on it, drag it to another sample slot, and then release the left mouse button; the same material or the map will be copied to the other sample slot, as shown in Figures 8-6 and 8-7.

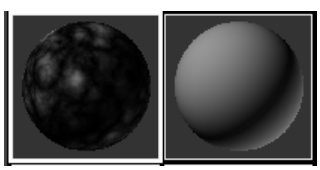

Figure 8-6 *Two sample slots in the* ***Material Editor*** *dialog box*

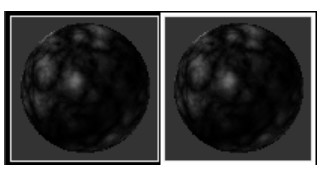

Figure 8-7 *The map/material of one sample slot copied to the other*

When you choose the **Drag/Rotate** option in the shortcut menu, the shape of the cursor is changed. Now, you can view the material map on the sample slot by rotating it. The **Reset Rotation** option in the shortcut menu is used to reset the sample slot to its default orientation. By default, the **Render Map** option in the shortcut menu is not activated. It will be activated, when you assign a map to the sample slot. This option is used to render the map in the selected sample slot by creating a bitmap or an *avi* file (if the map is animated). When you choose the **Options** option, the **Material Editor Options** dialog box is displayed. The options in this dialog box are used to modify the sample slots.

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Choose the **Magnify** option; the selected sample slot will be displayed in a separate window, as shown in Figure 8-8. Alternatively, double-click on the selected sample slot to display it in a separate window. To resize the window, move the cursor at the bottom of the window; the cursor will change to an arrow, as shown in Figure 8-8. Now, drag the cursor to resize the window.

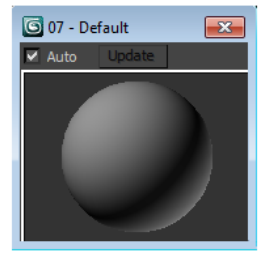

Figure 8-8 *The sample slot displayed in a separate window*

Material Editor Tools

The material editor tools are used to modify the default settings of the selected sample slot, and apply the materials or the maps to the objects. These tools are available below as well as on the right side of the sample slots in the **Material Editor** dialog box. The most commonly used tools are discussed next.

Get Material

Material Editor Menu: Material > Get Material
Material Toolbar: Get Material
Keyboard: G



The **Get Material** tool is used to get a material or a map for the selected sample slot. Materials affect the color, opacity, glossiness, and other physical properties of objects.

To get a material, select one of the sample slots to activate it. Invoke the **Get Material** tool available below the sample slots; the **Material/Map Browser** dialog box with a list of materials and maps will be displayed, as shown in Figure 8-9. You can collapse and expand this list as per your requirement. Now, double-click on one of the materials or maps from the list; the default material will be replaced by the new material or map. Also, the new material will be displayed on the sample slot in the **Sample Slots** rollout of the **Material/Map Browser** dialog box. The **Material/Map Browser** dialog box is discussed next.



Note

*The shortcut key G mentioned above will work only if the **Keyboard Shortcut Override Toggle** tool in the **Main Toolbar** is activated and the **Material Editor** dialog box is displayed.*

Material/Map Browser

The **Material/Map Browser** dialog box is used to select different types of materials and maps from the lists displayed in it. Various options in this dialog box are discussed next.

Search by Name

The **Search by Name** text box is located on the top of this dialog box. It is used to search and select the name of the materials or the maps. For example, enter the alphabet **d** in this text box; a drop-down list of all the materials and maps starting with the alphabet d will be displayed, as shown in Figure 8-10. Next, double-click on the required material or

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map; it will be displayed on the selected sample slot. Now, choose the **Clear Results** button on the right side of the text box; the drop-down list will be cleared.

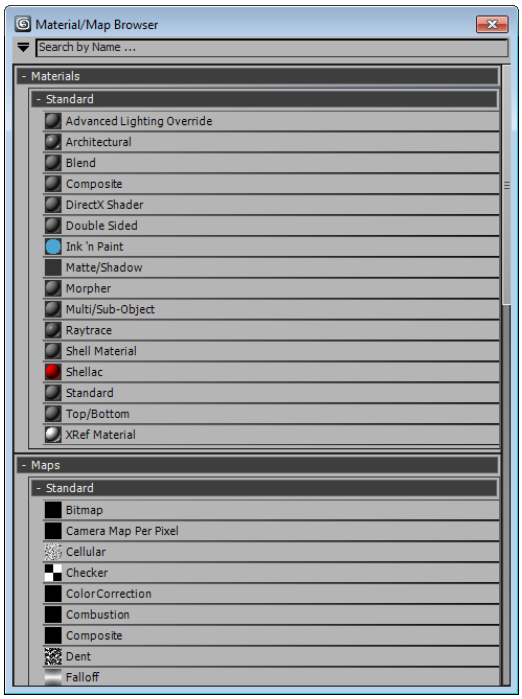

Figure 8-9 *Partial view of the rollouts in the* ***Material/Map Browser*** *dialog box*

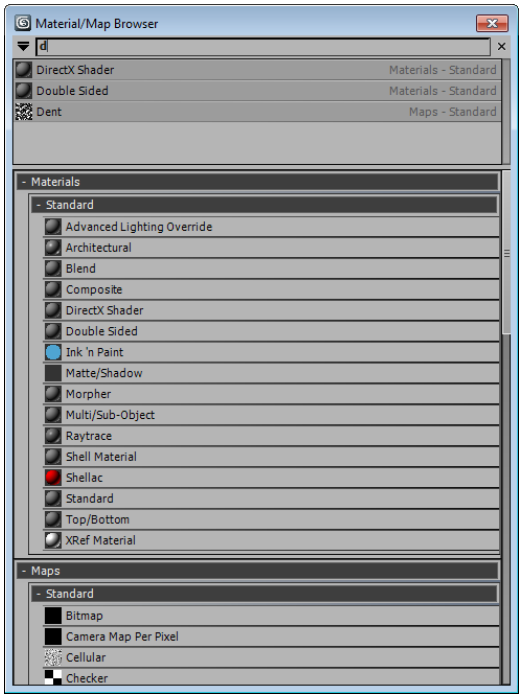

Figure 8-10 *The drop-down list displayed after entering the alphabet* ***d*** *in the text box*

Material/Map Browser Options

The **Material/Map Browser Options** button is located on the left of the **Search by Name** text box. Choose the **Material/Map Browser Options** button; a flyout with various options will be displayed, as shown in Figure 8-11. The options in the shortcut menu are used to manage the **Material/Map Browser** dialog box based on the requirement. Also, they will help to create new material library, manage Autodesk material library, and so on. These options are discussed next.

The **New Group** option is used to create a new group and add it to the **Material/Map Browser** dialog box. To do so, select the **New Group** option from the shortcut menu; the **Create New Group** dialog box will be displayed, as shown in Figure 8-12. Type a name of your choice in the text box and choose the **OK** button; a new group with the specified name will be displayed in the **Material/Map Browser** dialog box. You can expand and collapse the group based on your requirement.

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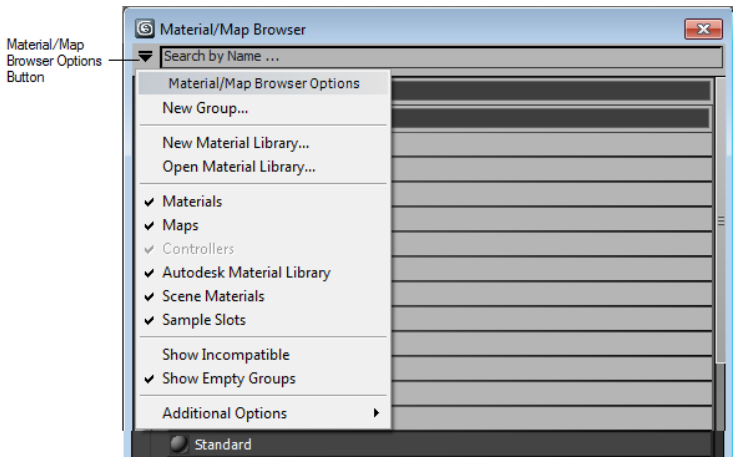

Figure 8-11 *The flyout displayed after choosing the* ***Material/Map Browser Options*** *button*

When you install Autodesk 3ds Max, the material library will automatically get installed on your system in the **.mat* format. To select the material library of your choice, choose the **Open Material Library** option from the shortcut menu; the **Import Material Library** dialog box will be displayed. Navigate to the location *Program Files\Autodesk\3ds Max 2012\materiallibraries*; the material libraries will be displayed in the **Import Material Library** dialog box, as shown in Figure 8-13. Next, select the required material and choose the **Open** button; all materials of the selected material library will be displayed in the **Material/Map Browser** dialog box in a group, as shown in Figure 8-14.

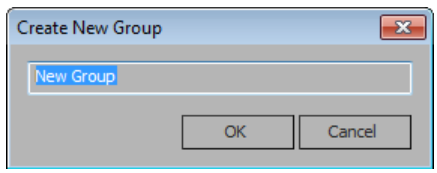

Figure 8-12 *The* ***Create New Group*** *dialog box*

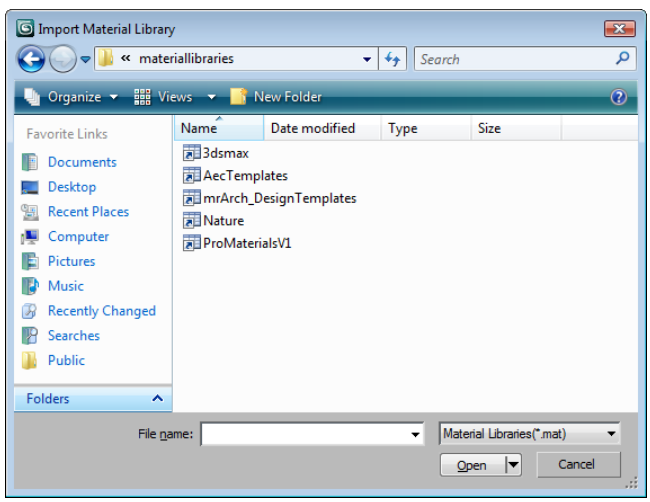

Figure 8-13 *The* ***Import Material Library*** *dialog box*

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You can also create a new library to put all materials and maps defined in the sample slots of the current file. To create a new library, choose the **New Material Library** option from the shortcut menu; the **Create New Material Library** dialog box will be displayed, as shown in Figure 8-15. Type a name in the text box and choose the **OK** button; a new library with the specified name will be displayed in the **Material/Map Browser** dialog box. You can expand and collapse it based on your requirement. Next, you can put the materials defined in the sample slots to the new library using the **Put To Library** tool in the **Material Editor** dialog box, about which you will learn later in this chapter.

When you create a new library using the **New Material Library** option, the newly created library will have a default name and location assigned to it. To modify the name and location, right-click on the title bar of the new library in the **Material/Map Browser** dialog box; a shortcut menu will be displayed, as shown in Figure 8-16. Now, choose the **Save As** option from the shortcut menu; the **Export Material Library** dialog box will be displayed. Next, navigate to the location where you want to save the new library. Also, type a new name in the **File name** text box and make sure that the **Material Libraries (*.mat)** option is selected in the **Save as type** drop-down list. Now, choose the **Save** button; the new library will be saved at the specified location. You can use the newly created library in another scene.

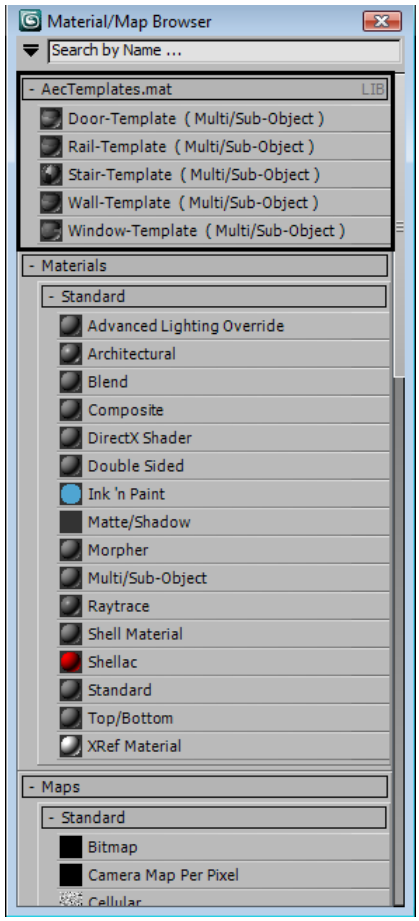

Figure 8-14 *The materials displayed in the* ***Material/Map Browser*** *dialog box*

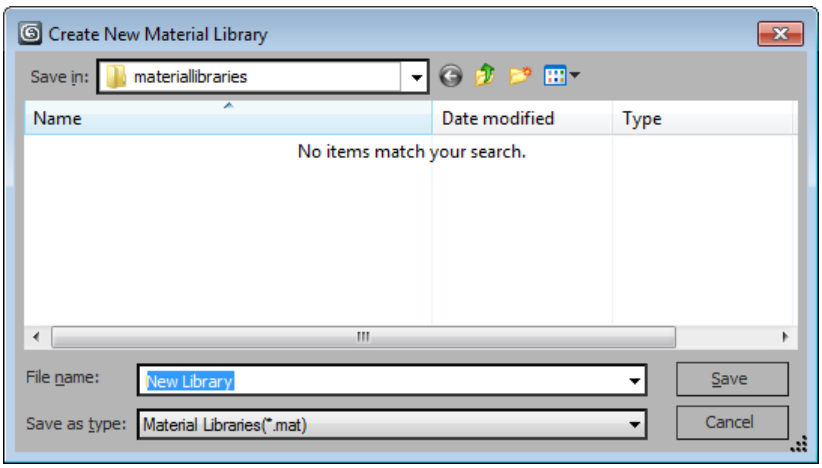

Figure 8-15 *The* ***Create New Material Library*** *dialog box*

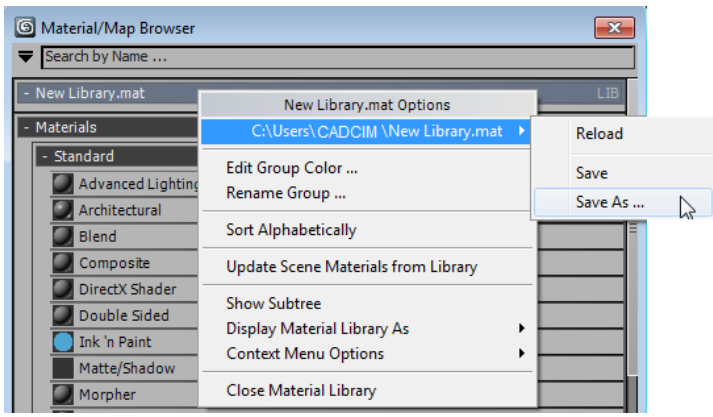

Figure 8-16 *The shortcut menu displayed*

There are various groups such as **Materials**, **Maps**, **Scene Materials**, and **Sample Slots** in the **Material/Map Browser** dialog box. You can toggle the display of these groups by choosing the respective option from the shortcut menu.

You can also reset the **Material/Map Browser** to its default appearance. To do so, choose the **Additional Options** option from the shortcut menu; a cascading menu will be displayed. Now, choose the **Reset Material/Map Browser** option; the **Reset Material/Map Browser** message box will be displayed. Choose the **Yes** button; the **Material/Map Browser** dialog box will be reset to its default appearance.

Assign Material to Selection

Material Editor Menu: Material > Assign to Selection
Toolbar: Assign Material to Selection



The **Assign Material to Selection** tool is used to assign the material or map of the active sample slot to the selected object in the viewport. When you invoke the **Assign Material to Selection** tool, the active sample slot will be surrounded by four triangular faces at corners, as shown in Figure 8-17.

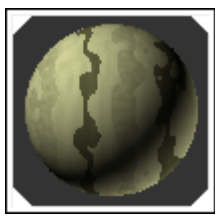

Figure 8-17 *The triangular faces in a sample slot*

To assign a material to the selected object in the viewport, select the sample slot to which you have already assigned the material or map. Next, select the object to which you need to assign the material in the viewport. You can also select more than one object to assign the same material to all of them. Then, choose the **Assign Material to Selection** button in the **Material Editor** dialog box. Alternatively, you can drag the material from the sample slot to the selected object in the viewport to assign it. Note that you need to choose the **Show Shaded Material in Viewport** tool in the **Material Editor** dialog box to view the assigned material in the viewport, if not already chosen. You will learn more about this tool later in the chapter.

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Reset Map/Mtl to Default Settings

Toolbar: Reset Map/Mtl to Default Settings



The **Reset Map/Mtl to Default Settings** tool is used to reset the values that were assigned to the map or material in the active sample slot using various rollouts displayed in the **Material Editor** dialog box.

Put to Library

Material Editor Menu: Material > Put to Library
Toolbar: Put to Library



The **Put to Library** tool is used to add the selected material to the temporary library or the library created by you. To do so, select the sample slot that has the material that you want to add to the library. If you have not created a new library then on invoking the **Put to Library** tool, the **Material Editor** message box will be displayed, as shown in Figure 8-18. In this message box, you will be prompted to specify if you want to put the entire material/map tree to the library. Choose the required option from it; the **Put to Library** dialog box will be displayed. In the **Name** text box, enter a new name of the material and choose the **OK** button; the material will be saved in the temporary library. Also, the **Temporary Library** rollout will be displayed in the **Material/Map Browser** dialog box.

If you have already created a library, then on invoking the **Put to Library** tool, the **Material Editor** message box is displayed, refer to Figure 8-18. In this message box, you will be prompted to specify if you want to put the entire material/map tree to the library. Choose the required option from it; a shortcut menu will be displayed consisting of the name of the library and the temporary library. Next, choose the library in which you want to put the material; the **Put to Library** dialog box will be displayed. In the **Name** text box, enter a new name of the material and choose the **OK** button; the material will be saved in the newly created library you specified. Also, the newly created library rollout will be displayed in the **Material/Map Browser** dialog box.

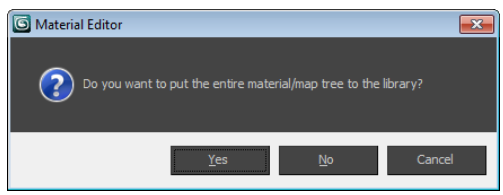

Figure 8-18 *The* ***Material Editor*** *message box*

Show Shaded Material in Viewport

Toolbar: Show Shaded Material in Viewport



The **Show Shaded Material in Viewport** tool is used to display the assigned material or map to the selected object in the viewport. To do so, select the object in the viewport and assign the material to it. Then, invoke the **Show Shaded Material in Viewport** tool; the material will be displayed in the selected object in the viewport.

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Go to Parent

Material Editor Menu: Navigation > Go to Parent
Toolbar: Go to Parent
Keyboard: Up Arrow key



The **Go to Parent** tool is used to go one level up in the current material.

Go Forward to Sibling

Material Editor Menu: Navigation > Go Forward to Sibling
Toolbar: Go Forward to Sibling
Keyboard: Right Arrow key



The **Go Forward to Sibling** tool is used to go to the next map or material at the same level in the current material. This tool is active in compound materials such as **Composite** material, **Blend** material, and so on. These materials are discussed later in the chapter.

Sample Type

Toolbar: Sample Type



The **Sample Type** flyout has three options: sphere, cylinder, and cube. These options are used to choose the geometry type to be displayed in the active sample slot. By default, the material will be displayed on a spherical sample slot. But, you can change the geometry to cylinder or cube.

Backlight

Material Editor Menu: Options > Backlight
Toolbar: Backlight
Keyboard: L



The **Backlight** tool is invoked by default. It is used to insert the backside light into the active sample slot, refer to Figures 8-19 and 8-20.

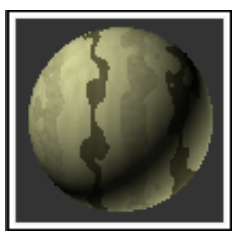

Figure 8-19 *The effect of the* ***Backlight*** *tool in the sample slot*

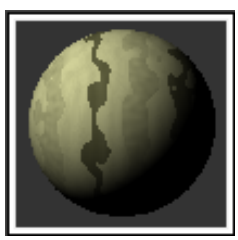

Figure 8-20 *The sample slot without the Backlight effect*

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Background

Material Editor Menu: Options > Background
Toolbar: Background
Keyboard: B



The **Background** tool is used to add a multicolored background in the active sample slot, refer to Figures 8-21 and 8-22.

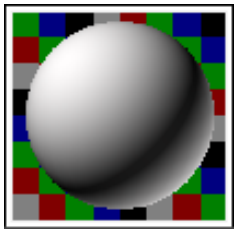

Figure 8-21 *The* ***Background*** *tool invoked in the sample slot*

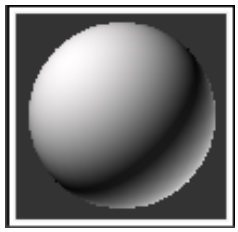

Figure 8-22 *The sample slot without invoking the* ***Background*** *tool*

Sample UV Tiling

Toolbar: Sample UV Tiling



The buttons in the **Sample UV Tiling** flyout are used to set the number of times the map will be repeated on the active sample slot. To set the tiling pattern, this flyout has four buttons, 1x1, 2x2, 3x3, and 4x4. When you set the tiling pattern, it will not affect the object in the viewport. This pattern will be displayed only in the active sample slot, refer to Figures 8-23, 8-24, and 8-25.

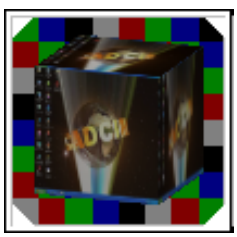

Figure 8-23 *The 1x1 sample UV tiling in a cube sample slot*

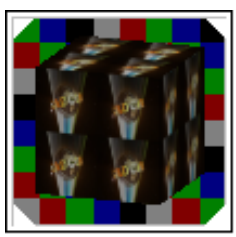

Figure 8-24 *The 2x2 sample UV tiling in a cube sample slot*

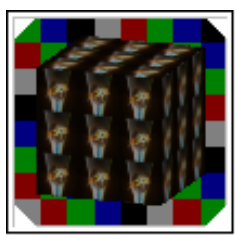

Figure 8-25 *The 3x3 sample UV tiling in a cube sample slot*

Pick Material From Object



The **Pick Material From Object** tool is used to pick the material from the object in the viewport and apply it to the active sample slot. To do so, select the sample slot to activate it and invoke the **Pick Material From Object** tool; the shape of the cursor will be changed to an eye dropper. Now, move the cursor over the object in the viewport from which you want to pick the material and click on the object; the selected sample slot will display the same material.

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You can change the name of a material of each sample slot by entering a new name in the **Material Name** text box on the right of the **Pick Material From Object** tool. The **Material Type** button on the right of the **Material Name** text box displays the name of the material that you get from the **Material/Map Browser** dialog box, refer to Figure 8-26.

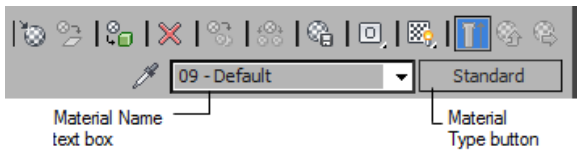

Figure 8-26 *The* ***Material Name*** *text box and the* ***Material Type*** *button*

MATERIALS

In this section, you will learn to create materials and assign them to the objects to make them more realistic using the **Material Editor** tool. The materials assigned to the objects give the best results with lights, about which you will learn in the later chapters. In Autodesk 3ds Max, you can create and assign various materials to the objects using the **Material Editor** tool from the **Main Toolbar**, which are discussed next.

TYPES OF MATERIALS

In Autodesk 3ds Max, invoke the **Material Editor** tool to select a material; the **Material Editor** dialog box will be displayed. Now, choose the **Material Type** button on the right side of the **Material Name** text box, refer to Figure 8-26; the **Material/Map Browser** dialog box will be displayed. Next, expand the **Materials > Standard** rollouts, if they are not already expanded; a list of 16 types of materials will be displayed. In this list, there are some materials that can combine other materials in them. These are known as Compound materials. These are **Blend**, **Composite**, **Double-Sided**, **Morpher**, **Multi/Sub-Object**, **Shellac**, and **Top/Bottom**. Select the material that you require from the list and choose the **OK** button; the name of the selected material will be displayed on the **Material Type** button in the **Material Editor** dialog box. Also, the rollouts related to that material will be displayed in the **Material Editor** dialog box. You can modify the material using the parameters available in these rollouts. The most commonly used materials are discussed next.



Note

You can also get the default materials using the ***Get Material*** *tool in the* ***Material Editor*** *dialog box as discussed earlier in this chapter.*

Standard Material

By default, the **Standard** material is selected in the **Material Editor** dialog box. Various rollouts are also displayed below the **Material Type** button to create new materials or modify the properties of the current materials. The most commonly used rollouts are discussed next.

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Shader Basic Parameters Rollout

The options in this rollout are used to specify the shading types and other properties for the material, refer to Figure 8-27. Select the **Wire** check box in this rollout to render the material as wireframe, as shown in Figure 8-28. Select the **2-Sided** check box to apply the material to both sides of the selected faces at rendering. Select the **Face Map** check box to apply the maps or images to each face of the object, as shown in Figure 8-29. Select the **Faceted** check box to create a faceted object, as shown in Figure 8-30. In this case, each face of the surface will be rendered as flat face.

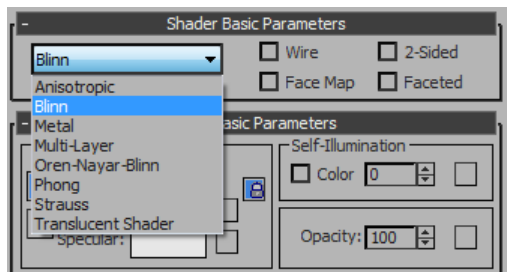

Figure 8-27 *The* ***Shader Basic Parameters*** *rollout with eight shaders displayed in the drop-down list*

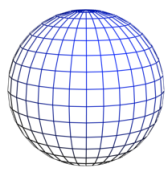

Figure 8-28 *The sphere with the* ***Wire*** *check box selected*



Figure 8-29 *The sphere with the* ***Face Map*** *check box selected*



Figure 8-30 *The sphere with the* ***Faceted*** *check box selected*



Note

1. To view the effect of the selection of the ***Face Map*** *or* ***Faceted*** *check box on an object, you need to assign an image or a map to the object. You will learn more about assigning an image or a map to the object later in this chapter.*

2. You can see the effect of the selection of the ***Faceted*** *check box only in rendering.*

There are eight types of shaders in the drop-down list located on the top of this rollout, refer to Figure 8-26. These shaders provide different effects to the material at rendering. Various shaders and their rollouts are discussed next.

Anisotropic Shader

The **Anisotropic** shader is used to create elliptical highlights, as shown in Figure 8-31. This shader is suitable for creating glasses, brushed metals, grass, and so on. To assign this shader to the material, you need to select the **Anisotropic** option from the drop-down list in the **Shader Basic Parameters** rollout. On doing so, the **Anisotropic Basic Parameters** rollout will be displayed below the **Shader Basic Parameters** rollout, as shown in Figure 8-32. This rollout is discussed next.

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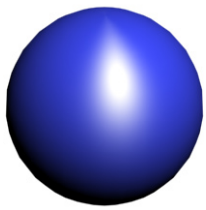

*Figure 8-31 The sphere with **Anisotropic** shader*

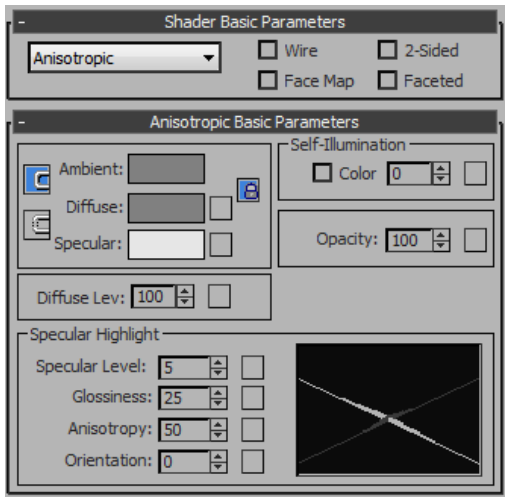

*Figure 8-32 The **Anisotropic Basic Parameters** rollout*

Note

*To view the effects of shaders, you need to set the parameters in the **Basic Parameters** rollout of the corresponding shader.*

Anisotropic Basic Parameters Rollout

The options in the **Anisotropic Basic Parameters** rollout are used to set the colors, transparency, shininess, and so on of the material.

The **Ambient**, **Diffuse**, and **Specular** color swatches are used to set the colors of the material. The **Ambient** color swatch is used to specify the color of an object in shadow. It is usually the darkest component of the material. The **Diffuse** color swatch is used to specify the color of an object in direct light. It is the main color of the material. The **Specular** color swatch is used to specify the color of the highlight or the shiny part of the material, refer to Figure 8-33.

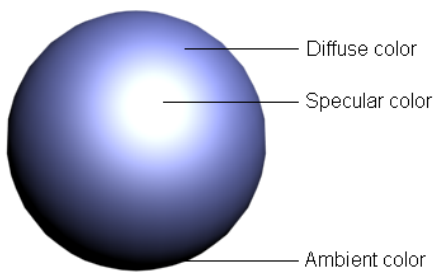

Figure 8-33 The ambient, diffuse, and specular colors in a sphere

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To set the color of the material, select one of the color swatches; the **Color Selector** dialog box will be displayed along with the name of the color swatch that you have selected. Select a color and choose the **OK** button; the selected color will be displayed in the color swatch and the active sample slot.

Self-Illumination Area

The **Self-Illumination** area is used to replace the shadow on the surface of the material with the color used in the **Diffuse** color swatch. It creates an illusion of light being generated from the material. The value of the spinner in the **Self-Illumination** area specifies the percentage of shadow replaced with the color. To set the illumination of the object, select the **Color** check box in this area; the spinner on its right will be replaced by a color swatch. You can change the intensity as well as the color for the self-illumination using the color swatch. Choose the color swatch in the **Self-Illumination** area; the **Color Selector: Self Illum Color** dialog box will be displayed. As you increase the value in the **Value** spinner, the intensity of the material also increases, refer to Figures 8-34 and 8-35.

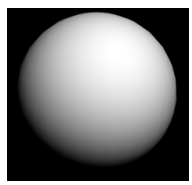

Figure 8-34 *A sphere without self-illumination*

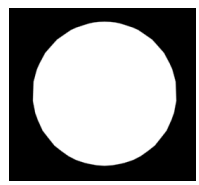

Figure 8-35 *A sphere with self-illumination*

The value in the **Opacity** spinner is used to control the transparency of the material. By default, the value in the spinner is 100, which makes a material opaque. As you decrease the value, the transparency will increase, refer to Figure 8-36.



Figure 8-36 *A teapot within a transparent box*

The value in the **Diffuse Lev** spinner is used to control the brightness of the diffuse color in the material, refer to Figures 8-37 and 8-38. By default, the value in this spinner is 100.

Specular Highlight Area

The options in the **Specular Highlight** area are used to set the shape, appearance, strength, and orientation of the specular highlight or the shiny part of the material.

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Figure 8-37 *The torus knot with the default value in the* ***Diffuse Lev*** *spinner*



Figure 8-38 *The torus knot with the value* ***150*** *in the* ***Diffuse Lev*** *spinner*

The value in the **Specular Level** spinner is used to set the brightness or intensity of the specular highlight of the material. By default, the value in this spinner is 0. As you increase the value in the spinner, the brightness of the specular highlight will also increase, refer to Figures 8-39 and 8-40.



Figure 8-39 *The sphere with the value* ***0*** *in the* ***Specular Level*** *spinner*



Figure 8-40 *The sphere with the value* ***66*** *in the* ***Specular Level*** *spinner*

The value in the **Glossiness** spinner is used to set the size of the specular highlight of the material. By default, its value is 10. However, if you increase the value in the **Glossiness** spinner, the size of the specular highlight will decrease, refer to Figures 8-41 and 8-42.

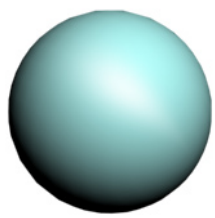

Figure 8-41 *The sphere with less value in the* ***Glossiness*** *spinner*

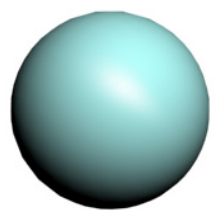

Figure 8-42 *The sphere with more value in the* ***Glossiness*** *spinner*

The value in the **Anisotropy** spinner is used to set the shape of the specular highlight of the material. By default, its value is 50 and it ranges from 0 to 100. As you increase the value in the **Anisotropy** spinner, the shape of the specular highlight will reduce, refer to Figures 8-43 and 8-44.

The value in the **Orientation** spinner is used to change the orientation of the specular highlight of the material in degrees. By default, its value is 0. By changing the value in

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the **Orientation** spinner, you can change the orientation of the specular highlight of the material, as shown in Figures 8-45 and 8-46.



Figure 8-43 *The teapot with less value in the* ***Anisotropy*** *spinner*



Figure 8-44 *The teapot with more value in the* ***Anisotropy*** *spinner*



Figure 8-45 *The teapot with the value 0 in the* ***Orientation*** *spinner*



Figure 8-46 *The teapot with the value 45 in the* ***Orientation*** *spinner*



Note

In the ***Specular Highlight*** *area, there is a graph on the right side that displays the graphical representation of the changes in all spinners.*

Blinn Shader

The **Blinn** shader is used to create round and soft highlights, as shown in Figure 8-47. To assign this shader to the material, you need to select the **Blinn** option from the drop-down list available in the **Shader Basic Parameters** rollout; the **Blinn Basic Parameters** rollout will be displayed below the **Shader Basic Parameters** rollout. This rollout is discussed next.

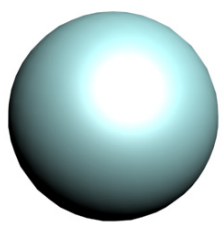

Figure 8-47 *The sphere with the* ***Blinn*** *shader*

Blinn Basic Parameters Rollout

The **Ambient**, **Diffuse**, and **Specular** color swatches, the **Self-Illumination** area, and the **Opacity** spinner are the same as those discussed in the **Anisotropic Basic Parameters** rollout.

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In the **Specular Highlights** area, the **Specular Level** and **Glossiness** spinners are the same as those discussed in the **Anisotropic Shader**. The value in the **Soften** spinner is used to soften the effect of the specular highlight. By default, its value is 0.1.

Metal Shader

The **Metal** shader is used to give a metallic effect to objects, as shown in Figure 8-48. To assign this shader to the material, you need to select the **Metal** shader from the drop-down list available in the **Shader Basic Parameters** rollout; the **Metal Basic Parameters** rollout will be displayed below the **Shader Basic Parameters** rollout. This rollout is discussed next.



Figure 8-48 *The teapot with the* ***Metal*** *shader*

Metal Basic Parameters Rollout

The options in this rollout are the same as discussed in the **Anisotropic Basic Parameters** rollout.

Multi-Layer Shader

The **Multi-Layer** shader is similar to the **Anisotropic** shader with the only difference that the **Multi-Layer** shader has two specular highlight controls. To assign this shader to the material, you need to select the **Multi-Layer** shader from the drop-down list available in the **Shader Basic Parameters** rollout; the **Multi-Layer Basic Parameters** rollout will be displayed. This rollout is discussed next.

Multi-Layer Basic Parameters Rollout

In the **Multi-Layer Basic Parameters** rollout, the **Ambient** and **Diffuse** color swatches are the same as those discussed in the **Anisotropic Basic Parameters** rollout. Also, the **Self-Illumination** area, the **Opacity** spinner, and the **Diffuse Level** spinner are the same as those discussed in the **Anisotropic Basic Parameters** rollout.

The **Roughness** spinner is used to set the transition from diffuse color to the ambient color. By default, its value is 0 and it ranges from 0 to 100. When you increase the value in the **Roughness** spinner, the material becomes less shiny, refer to Figures 8-49 and 8-50.

In the **Multi-Layer Basic Parameters** rollout, there are two specular highlight areas, **First Specular Layer** and **Second Specular Layer**. You can use both highlights independently to produce complex and blend shadings in the material. The options in the **First Specular Layer** and the **Second Specular Layer** areas are the same. However, you can use different settings to produce the blend shadings in the material, as shown in Figure 8-51. These options are discussed next.

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Figure 8-49 *The teapot with less value in the* ***Roughness*** *spinner*



Figure 8-50 *The teapot with more value in the* ***Roughness*** *spinner*



Figure 8-51 *The teapot with the* ***Multi-Layer*** *shader*

Choose the **Color** color swatch to change the specular color of the first and the second highlights in the respective areas. The **Level** spinner is used to set the brightness or the intensity of the specular highlight of the material. By default, its value is 0. As you increase the value in the spinner, the brightness of the specular highlight will also increase. The **Glossiness**, **Anisotropy**, and **Orientation** options are the same as those discussed in the **Anisotropic** shader.

Oren-Nayar-Blinn Shader

The **Oren-Nayar-Blinn** shader is a variant of the **Blinn** shader and is used to create dull or matte highlights, as shown in Figure 8-52. This shader can be used for rubber, clay, clothes, and so on. To assign this shader to the material, you need to select the **Oren-Nayar-Blinn** shader from the drop-down list available in the **Shader Basic Parameters** rollout; the **Oren-Nayar-Blinn Basic Parameters** rollout will be displayed. This rollout is discussed next.



Figure 8-52 *The teapot with the* ***Oren-Nayer-Blinn*** *shader*

Oren-Nayar-Blinn Basic Parameters Rollout

The **Ambient**, **Diffuse**, and **Specular** color swatches, the **Self-Illumination** area, and the **Opacity** spinner are the same as discussed in the **Anisotropic Basic Parameters** rollout. In the **Advanced Diffuse** area, the **Diffuse Level** and **Roughness** spinners are the same as discussed in the **Multi-Layer** shader.

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In the **Specular Highlights** area, the **Specular Level**, **Glossiness**, and **Soften** spinners are the same as discussed in the **Blinn** shader.

Phong Shader

The **Phong** shader is very similar to the **Blinn** shader. The only difference is that the highlights produced by the **Phong** shader are stronger than those produced by the **Blinn** shader, as shown in Figure 8-53. To assign this shader to the material, select the **Phong** shader from the drop-down list available in the **Shader Basic Parameters** rollout; the **Phong Basic Parameters** rollout will be displayed. This rollout is discussed next.

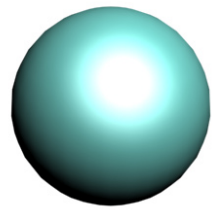

Figure 8-53 *The sphere with the* ***Phong*** *shader*

Phong Basic Parameters Rollout

The **Ambient**, **Diffuse**, and **Specular** color swatches, the **Self-Illumination** area, and the **Opacity** spinner are the same as described in the **Anisotropic Basic Parameters** rollout. In the **Specular Highlights** area, the **Specular Level**, **Glossiness**, and **Soften** spinners are the same as those discussed in the **Blinn** shader.

Strauss Shader

The **Strauss** shader is used to create the metallic and non-metallic surfaces, as shown in Figure 8-54. To assign this shader to the material, you need to select the **Strauss** shader from the drop-down list; the **Strauss Basic Parameters** rollout will be displayed. This rollout is discussed next.



Figure 8-54 *The teapot with the* ***Strauss*** *shader*

Strauss Basic Parameters Rollout

The **Strauss** shader does not have the **Ambient**, **Diffuse**, and **Specular** color swatches. Choose the **Color** swatch to change the color of the material. The value in the **Glossiness** spinner is used to set the size and the intensity of the specular highlight of the material. The value in the **Metalness** spinner is used to set the metallic effect in the material. The value in the **Opacity** spinner is used to set the transparency of the material.

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Translucent Shader

The **Translucent** shader is used to create translucent materials. In such materials, the light gets scattered as it passes through them, as shown in Figure 8-55. It is very similar to the **Blinn** shader. Additionally, it defines the translucency of the material. To assign this shader to the material, you need to select the **Translucent Shader** from the drop-down list in the **Shader Basic Parameters** rollout; the **Translucent Basic Parameters** rollout will be displayed. This rollout is discussed next.



Figure 8-55 *The sphere with* ***Translucent*** *shader*

Translucent Basic Parameters Rollout

Most of the options in this rollout are the same as discussed earlier. Select the **Backside specular** check box in this rollout to get the specular highlight on both sides of the material.



Note

Select the ***Backside specular*** *check box in the* ***Specular Highlights*** *area in the* ***Translucent Basic Parameters*** *rollout to create materials such as plastic or smooth glass. Clear the* ***Backside specular*** *check box to create the frosted or rough material.*

In the **Translucency** area, the **Translucent Clr** swatch is used to define the color of the light that will be scattered inside the material. The **Filter Color** swatch is used to define the color of the light that will be transmitted by the material.

Architectural Material

The **Architectural** material is used to provide a highly realistic view of an object when rendered with photometric lights and radiosity, about which you will learn in the later chapters. To apply the **Architectural** material, choose the **Material Type** button on the right side of the **Material Name** text box; the **Material/Map Browser** dialog box will be displayed. Choose the **Architectural** material from the **Material/Map Browser** dialog box; the **Architectural** label will be displayed on the **Material Type** button. Also, various rollouts such as **Physical Qualities**, **Special Effects**, and so on will be displayed below the **Architectural** button. You can use these rollouts to create new materials and modify the physical properties of those materials. The most commonly used rollouts are discussed next.

Templates Rollout

The drop-down list in the **Templates** rollout consists of a number of preset materials such as **Water**, **Glass-Clear**, **Metal**, **Paper,** and so on, as shown in Figure 8-56. On selecting one of the preset materials from the drop-down list, you will get a template in the selected sample slot for the type of material you have selected. After selecting the material, you can set the parameters in other rollouts to get a realistic view of the material, as shown in Figure 8-57.

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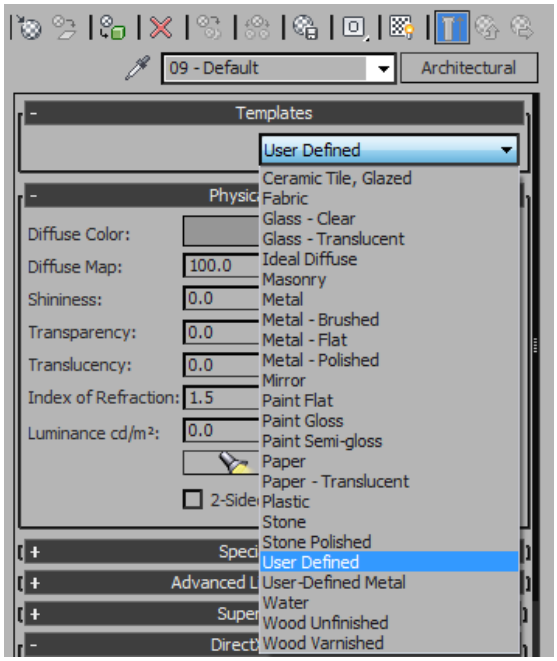

Figure 8-56 *The preset materials in the drop-down list in the* ***Templates*** *rollouts*



Figure 8-57 *The teapot with the* ***Architectural*** *material applied*

Physical Qualities Rollout

The **Diffuse Color** swatch is used to specify the color of an object in direct light. It is the main color of the material. Choose the **Diffuse Color** swatch to define the color of the material. The **Diffuse Map** option is used to assign a map or an image to the material. To do so, choose the **Diffuse Map** button labeled as **None** on the right side of the **Diffuse Map** spinner; the **Material/Map Browser** dialog box will be displayed. Select one of the maps from the **Maps > Standard** rollouts and double-click on it to assign it. The basic parameters rollouts of the selected map will be displayed. Set the parameters as per your requirement and then choose the **Go To Parent** button to go back to the previous level; the **None** label will be replaced by the name of the selected map. The spinner on the right side of the **Diffuse Map** option is used to set the amount of visibility of the map in the material in percentage. By default, its value is 100. On decreasing the value in this spinner, the visibility of the map in the material will be decreased. By default, the check box located in between the spinner and the button is selected, which is used to view the map in the material.

The **Set color to texture average** button will be available next to the **Diffuse Color** color swatch, only if you assign a diffuse map to the material using the **Diffuse Map** button. The **Set color to texture average** button is used to set the diffuse color according to the map that you have assigned to the material using the **Diffuse Map** button.

The **Shininess**, **Transparency**, and **Translucency** options in the **Physical Qualities** rollout are used to define the shininess, transparency, and the translucency of the material. Also, you can assign a map or an image to these options as you did for the **Diffuse Map** option. The

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Index of Refraction spinner is used to set the amount of refraction of the light transmitted by the material. The **Luminance cd/m²** spinner is used to give the glow effect to the material. The luminance is measured in candelas per meter square. The **Set luminance from light** button uses the scene light to obtain the materials luminance. Select the **2-Sided** check box to assign the material on both sides of the selected faces.



Note

*The **Architectural** material gives a realistic result only with photometric lights.*

Raytrace Material

A raytrace material creates highly refractive and reflective surfaces. When this material is assigned to an object in the scene, the materials/maps of other objects in the scene get reflected on it, as shown in Figure 8-58. It is an advance material and is used to provide realistic raytraced images. It also creates raytraced reflections and refractions, and takes a longer time to render. On selecting the **Raytrace** material, various rollouts will also be displayed below the **Material Type** button to create new materials and modify the properties of those materials. The **Raytrace Basic Parameters** rollout is most commonly used and is discussed next.

Raytrace Basic Parameters Rollout

The basic parameters in this rollout are similar to those used in the **Standard** material but the color swatches in this rollout act differently, refer to Figure 8-59. These color controls are discussed next.



Figure 8-58 *The teapot with the **Raytrace** material*

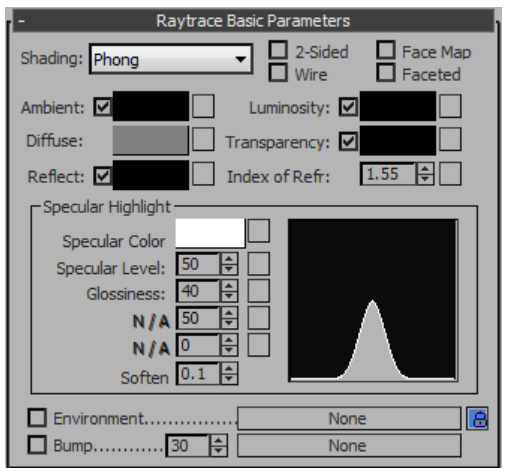

Figure 8-59 *The **Raytrace Basic Parameters** rollout*

By default, the check box on the left side of the **Ambient** color swatch is selected, which is used to specify the amount of absorption of the ambient light by the material. By default, the black color is selected in this color swatch and it specifies the maximum absorption of the ambient light by the material. On setting a lighter color in the **Ambient** color swatch, the ambient light will be reflected. If you clear the check box, the color swatch will be replaced by a spinner. The value in the spinner specifies the grayscale value.

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The **Diffuse** color swatch specifies the color of the object without the specular highlight. The **Reflect** color swatch is used to specify the specular reflection color. By default, the color in this color swatch is black and the object does not reflect. If you change the color to white, then the object will reflect everything and will be visible. If you clear the check box, the color swatch will be replaced by a spinner. If you set the value in the **Reflect** spinner to 100, then the diffuse color will not be visible on the object. The value in the spinner specifies the grayscale value. If you select this check box again, the spinner will be replaced by the **Fresnel** option. This option adds the fresnel effect to the reflecting object resulting in a bit of extra reflection in the reflecting object.

The **Luminosity** color swatch is very similar to the **Self-Illumination** area in the **Standard** material. By default, the check box on the right side of the **Luminosity** option is selected. If you clear the check box, the **Luminosity** label will be replaced by **Self-Illum** and the color swatch will be replaced by a spinner. The value in the spinner specifies the grayscale value.

The **Transparency** color swatch is used to define the transparency of the object. By default, the check box on the right side of the **Transparency** option is selected. If you clear this check box, the **Transparency** color swatch is replaced by a spinner. The value in the spinner also defines the transparency of the object.

Blend Material

The **Blend** material is a compound material and is used to mix two different materials, as shown in Figure 8-60. You can assign this mixed or blend material as a single material. When you select the **Blend** material from the **Material/Map Browser** dialog box; the **Replace Material** dialog box will be displayed, as shown in Figure 8-61. Select the **Discard old material?** radio button to remove the current material of the selected sample slot. Select the **Keep old material as sub-material?** radio button to keep the material of the selected sample slot as a sub-material in the **Blend** material. Choose the **OK** button; the **Blend** material will be displayed in the **Material Type** button with a number of rollouts. The most commonly used rollout is discussed next.

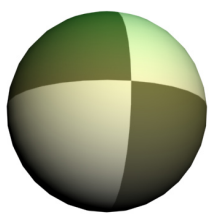

Figure 8-60 *The sphere with the* ***Blend*** *material applied*

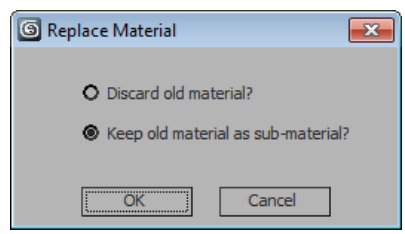

Figure 8-61 *The* ***Replace Material*** *dialog box*

Blend Basic Parameters Rollout

On the top of this rollout, there are two buttons, **Material 1** and **Material 2**, as shown in Figure 8-62. These buttons are labeled with the name of the default materials and are used to select two different materials to blend. By default, the **Standard** material is displayed as the sub-material. Choose these buttons to assign desired materials. Next, invoke the **Go To Parent** tool to go back to the **Blend** material.

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The **Mask** button is used to insert an image or a map as a mask. The amount of blending of the two materials depends on the mask image. The lighter area of the mask image will show more of **Material 1** and the darker area of the mask image will show more of **Material 2**.

By default, the check boxes on the right side of the **Material 1**, **Material 2**, and **Mask** buttons are selected, which specify that the concerned material or the mask will be displayed on the object. If you clear any of the check boxes, the corresponding material or mask will not be displayed.

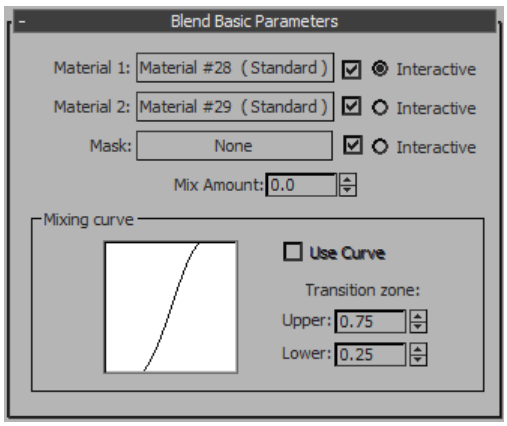

***Figure 8-62** The **Blend Basic Parameters** rollout*

Select the two **Interactive** radio buttons on the right side of the check boxes to specify the materials that will be displayed on the object in the shaded viewports. The value in the **Mix Amount** spinner is used to set the blending amount of the materials in percentage. When you insert a map using the **Mask** button; the **Mix Amount** spinner will become inactive.

The **Mixing Curve** area is used to define the transition between two colors being blended. It affects the transition only when the mask map is applied to the **Mask** button. Select the **Use Curve** check box to apply the curve settings to the blending. This check box will be available only if you have assigned the mask map. In the **Transition zone** group, the values in the **Upper** and **Lower** spinners set the transition of the materials. The values in these spinners vary from 0 to 1.0.



Note

The amount of blend can be animated over time.

Composite Material

The **Composite** material is similar to the **Blend** material and is used to mix ten different materials. You can assign this mixed material as a single material. To do so, choose the **Material Type** button; the **Material/Map Browser** dialog box will be displayed. Select the **Composite** material and choose the **OK** button; the **Replace Material** dialog box will be displayed. Select the **Discard old material?** radio button to remove the material of the selected sample slot. Else, select the **Keep old material as sub-material?** radio button to retain the material of the selected sample slot as a sub-material in the **Composite** material. Choose the **OK** button; the

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Composite material will be displayed in the **Material Type** button with a number of rollouts. The most commonly used rollout is discussed next.

Composite Basic Parameters Rollout

On the top of this rollout, there is the **Base Material** button which is labeled with the name of the material on it, refer to Figure 8-63. It is used to define the base material of the object. By default, the **Standard** material is displayed on it. Choose this button and set the parameters for the base material as per your requirement. Then invoke the **Go to Parent** tool to go back to the parent level.

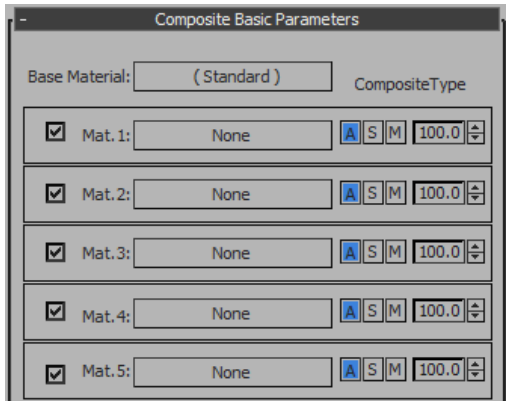

***Figure 8-63** The **Composite Basic Parameters** rollout*

There are nine buttons below the **Base Material** button, from **Mat.1** to **Mat.9**, labeled with **None**. These are used to composite nine materials. Choose these buttons one by one to assign different materials; the **None** labels will be replaced by the names of the materials that will be assigned to them. The check boxes on the left side of these buttons are selected to display the corresponding materials in the objects. If you do not want to display any of the materials, then clear the respective check boxes.

The **A**, **S**, and **M** buttons are used to specify the composition of the materials. Choose the **A** button to use the additive color to compose the materials. It specifies that the color of the base material will be added to the color of the composed material. Choose the **S** button to use the subtractive color to compose. It specifies that the color of the composed material will be subtracted from the color of the base material. Choose the **M** button to blend the materials as discussed in the Blend Material section with the only difference that the option for masking is not available in this case. For each material, the spinner on the right of the **A**, **S**, and **M** buttons determines the amount of mixing of the respective material with the **Base Material**. When the **A** and **S** buttons are active, the value in the spinner ranges from 0 to 200. Whereas, when the **M** button is active, the value in the spinner ranges from 0 to 100.

Double Sided Material

The **Double Sided** material is used to assign two different materials to the front and back faces of an object, refer to Figures 8-64 and 8-65. To do so, choose the **Double Sided** material

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from the **Material/Map Browser** dialog box; the **Double Sided** material will be displayed in the **Material Type** button with a number of rollouts. The **Double Sided Basic Parameters** rollout is discussed next.



Figure 8-64 *The object with the* ***Standard*** *material*



Figure 8-65 *The object with the* ***Double Sided*** *material*

Double Sided Basic Parameters Rollout

The **Translucency** spinner at the top of this rollout specifies the amount of blending of **Facing Material** and **Back Material**, refer to Figure 8-66. The value in this spinner varies from 0 to 100.0. If you set the value **100** in the **Translucency** spinner; the back material will completely cover the face material. Choose the **Facing Material** and **Back Material** buttons to select the material for the front and back sides of the object, respectively.

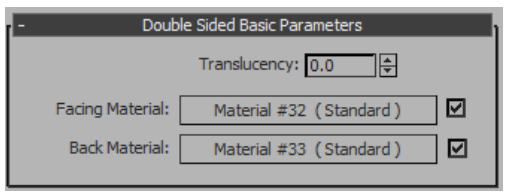

Figure 8-66 *The* ***Double Sided Basic Parameters*** *Rollout*



Note

If the double sided material is not displayed correctly in the viewport, then you need to change the settings as follows:

Choose ***Customize > Preferences*** *from the menu bar; the* ***Preference Settings*** *dialog box will be displayed. In this dialog box, choose the* ***Viewports*** *tab. Next, choose* ***Configure Driver*** *from the* ***Display Drivers*** *area; the* ***Configure Direct3D*** *dialog box will be displayed. In this dialog box, clear the* ***Use Cached D3DXMeshes*** *check box. Now, restart 3dsMax to view the double sided material correctly in the viewport.*

Multi/Sub-Object Material

The **Multi/Sub-Object** material is used to assign different materials to an object at the sub-object level, as shown in Figure 8-67. To do so, select the object to which the **Multi/Sub-Object** material is to be assigned. Convert the object to editable poly. Now, select the **Polygon** sub-object level and select the group of polygons in the viewport, refer to Figure 8-68. Next, expand the **Polygon Material IDs** rollout and enter the value **1** in the **Set ID** spinner and press ENTER. Then, invert the selection and enter the value **2** in the **Set ID** spinner and press ENTER,

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refer to Figure 8-69. Note that you can assign any number of IDs to an object depending on the number of materials to be assigned to it. Once you set IDs to different parts of the object, choose the **Multi/Sub-Object** material from the **Material/Map Browser** dialog box; the **Replace Material** message box will be displayed. Select the **Discard old material?** radio button from it and choose the **OK** button; the **Multi/Sub-object** material will be displayed in the **Material Type** button. Also, the **Multi/Sub-Object Basic Parameters** rollout will be displayed, refer to Figure 8-70. This rollout is discussed next.



Figure 8-67 *The object with the* ***Multi/Sub-Object*** *material*

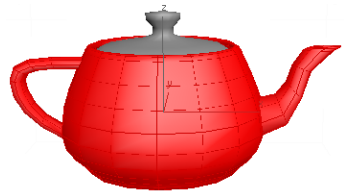

Figure 8-68 *The object with group of polygons selected*

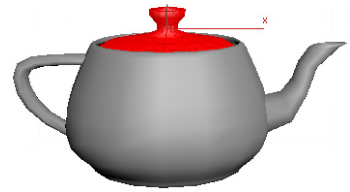

Figure 8-69 *The object with remaining polygons selected*

Multi/Sub-Object Basic Parameters Rollout

Choose the **Set Number** button in this rollout; the **Set Number of Materials** dialog box will be displayed. Enter **2** in the **Number of Materials** spinner and choose the **OK** button; the **Multi/Sub-Object Basic Parameters** rollout will display two entries instead of ten entries. Note that the value entered in the **Number of Materials** spinner should be equal to the number of IDs created for the object which in turn is equal to the entries in this rollout. Now, choose the **None** button for each of the IDs to assign the required sub-material. Also, you can enter the name of the sub-material in the **Name** text box. Next, assign the material to the object to see the effect of the **Multi-Sub-Object** material.

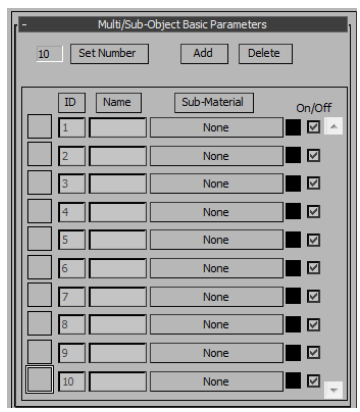

Figure 8-70 *The* ***Multi/Sub-Object Basic Parameters*** *Rollout*



Note

If you want to change only the color of the sub-material without assigning any map to it, then the color swatch next to it will be inactive. It will be activated only when you assign ***Standard*** *Material to it.*

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Top/Bottom Material

The **Top/Bottom** material is used to assign two different materials on the top and bottom portions of the object, as shown in Figure 8-71. To do so, choose the **Top/Bottom** material from the **Material/Map Browser** dialog box; the **Top/Bottom** material will be displayed in the **Material Type** button with a number of rollouts. The **Top/Bottom Basic Parameters** rollout is discussed next.

Top/Bottom Basic Parameters Rollout

Choose the **Top Material** and **Bottom Material** buttons to select the material for the top and bottom portions of the object, respectively, refer to Figure 8-72. Choose the **Swap** button to exchange the material of the **Top Material** and **Bottom Material** buttons.



Figure 8-71 *The object with the* ***Top/Bottom*** *material applied*

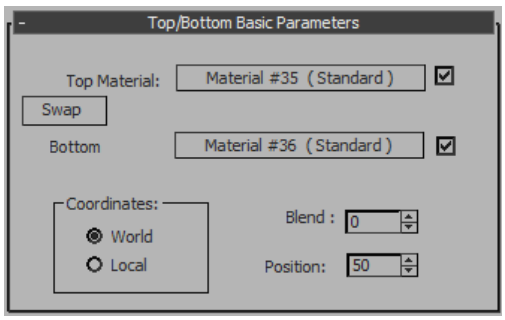

Figure 8-72 *The* ***Top/Bottom Basic Parameters*** *rollout*

The **Coordinates** area is used to set the boundary between the top and bottom of the object. By default, the **World** radio button is selected and the faces will point up or down according to the world coordinates of the scene. In this case, if you transform the object, then the boundary remains constant at its place. If you select the **Local** radio button, then the faces will point up or down according to the local coordinates of the object. In this case, if you transform the object, the material will also get transformed. The value in the **Blend** spinner is used to blend the edges of the top and bottom materials. The value in the **Position** spinner is used to specify the position of the top and bottom materials on the object. By default, the value in both the spinners ranges from 0 to 100.0.

MAPS



In Autodesk 3ds Max, maps are the default images assigned to a material. These are used to create texture for the objects to make them appear more realistic. In this section, you will learn about assigning the maps to the objects. When maps are applied to the objects, the objects demonstrate best effects on applying lights.

To assign a map to the material, press the M key; the **Slate Material Editor** dialog box will be displayed. Next, choose **Modes > Compact Material Editor** from the material editor menu bar; the **Material Editor** dialog box will be displayed. Select one of the sample slots in the **Material Editor** dialog box to activate it. Now, in the basic parameters rollout of the selected material, choose the small square buttons on the right of the parameters available, refer to

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Figure 8-73; the **Material/Map Browser** dialog box will be displayed with a list of default maps available in Autodesk 3ds Max. Next, select the required map from the **Maps > Standard** rollouts and choose the **OK** button; the name of the selected map will be displayed on the **Material Type** button and the rollouts related to that map will also be displayed. Set the parameters for the map in various rollouts displayed. Next, choose the **Go to Parent** button to go back to the previous level; the small square button will be labeled as **M**. Also, when you move the cursor over the **M** button, it will display the name of the map that you assigned to it.

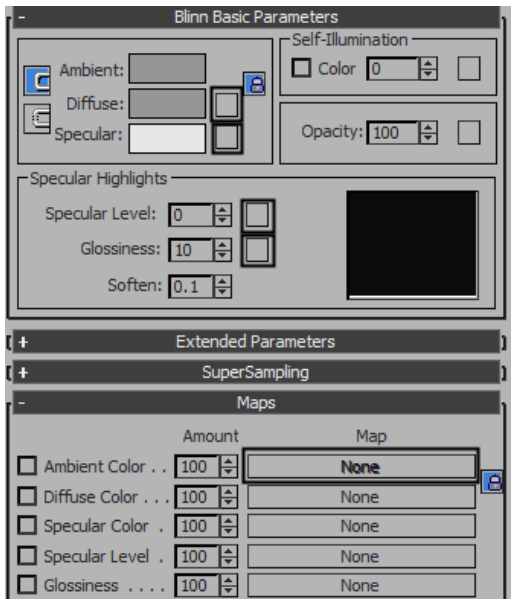

Figure 8-73 *The square buttons highlighted for inserting maps*

Various types of maps available in the **Material/Map Browser** dialog box are discussed next.

Note

*You can also assign maps using different options such as **Ambient Color**, **Diffuse Color**, **Specular Color**, and so on in a material using the **Maps** rollout in the **Material Editor** dialog box. To do so, you need to choose the buttons on the right side of these options that are labeled as **None**, refer to Figure 8-73.*

Types of Maps

In Autodesk 3ds Max, you can categorize the maps as the bitmaps and procedural maps. The bitmaps are 2D images and they get pixelised when you zoom in on them. The procedural maps are **Noise**, **Tiles**, **Marble**, **Gradient**, and so on and they do not get pixelised when you zoom in on them. There are various maps that can be categorized into 2D maps, 3D maps, Compositors, Color Mods, and Others. These maps are discussed next.

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2D Maps

The 2D maps are two-dimensional images that can be assigned to geometric objects and are used to create an environment for the scene. The most commonly used two-dimensional maps such as **Bitmap**, **Checker**, **Combustion**, **Gradient**, **Gradient Ramp**, **Swirl**, and **Tiles** discussed next.

Bitmap

The bitmaps are the simplest 2D images. To apply this map on an object, select the **Bitmap** map in the **Material/Map Browser** dialog box; the **Select Bitmap Image File** dialog box will be displayed. In this dialog box, select the image that you want to insert and choose the **Open** button; the image will be displayed in the selected sample slot. Also, various rollouts to modify the image map will be displayed in the **Material Editor** dialog box. Now, when you assign the material to the object in the viewport, the object will be displayed with the assigned bitmap, as shown in Figure 8-74. You can select all the still or animated files that Autodesk 3ds Max supports.

Checker

The **Checker** map is a combination of two colors, as shown in Figure 8-75. You can change the colors or replace the colors with the images using the **Checker Parameters** rollout in the **Material Editor** dialog box.

Gradient

The **Gradient** map is used to create a ramp of three colors, as shown in Figure 8-76. You can modify or replace colors with images using the **Gradient Parameters** rollout of the **Material Editor** dialog box.

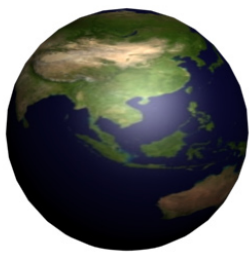

Figure 8-74 *A sphere with the* ***Bitmap*** *map applied*



Figure 8-75 *A sphere with the* ***Checker*** *map applied*

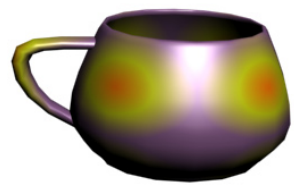

Figure 8-76 *An object with the* ***Gradient*** *map applied*

Gradient Ramp

The **Gradient Ramp** map is an advanced map of the **Gradient** map and is shown in Figure 8-77. It is used to create the ramp using different colors and maps at advance level. You can get the best effect using the **Gradient Ramp Parameters** rollout in the **Material Editor** dialog box.

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Swirl

The **Swirl** map is a procedural map and is used to produce whirl effect in materials, as shown in Figure 8-78. You can modify the colors or replace the colors with the images using the **Swirl Parameters** rollout in the **Material Editor** dialog box.

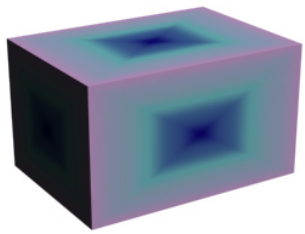

Figure 8-77 *A box with the* ***Gradient Ramp*** *map applied*

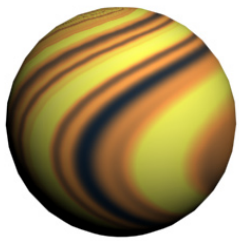

Figure 8-78 *A sphere with the* ***Swirl*** *map applied*

Tiles

The **Tiles** map is a procedural map and is used to create bricks or tiles effect using different colors and maps, as shown in Figure 8-79. You can get the best effect of this map using the different rollouts displayed in the **Material Editor** dialog box.

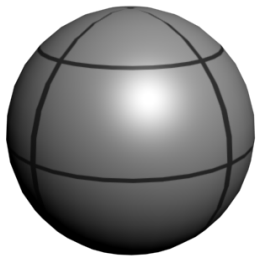

Figure 8-79 *A sphere with the* ***Tiles*** *map applied*

Substance Map and Map Output Selector Map

The **Substance** map is a collection of 2D textures. To use a texture from the **Substance** map, choose any of the desired map buttons from the **Material Editor** dialog box and select the **Map Output Selector** map from the **Maps** rollout in the **Material/Map Browser** dialog box. On doing so, the **Map Output Selector** map will be displayed in the **Material Type** button. Also, the **Parameters** rollout will be displayed, as shown in Figure 8-80. Next, choose the **None** button on the right of the **Source Map** parameter from the **Parameters** rollout and then select **Substance** from the **Material/Map Browser** dialog box; various rollouts such as **Global Substance Settings**, **Substance Package Browser**, **Coordinates**, and so on will be displayed in the **Material Editor** dialog box as shown in Figure 8-81.

Now, choose the **Load Substance** button from the **Substance Package Browser** rollout; the **Browse from Substances** dialog box will be displayed. In this dialog box, select the desired texture and choose the **Open** button; the **Load Substance** button will be replaced by the texture you have selected. Also rollout for the respective texture parameters will be added at the bottom in the **Material Editor** dialog box. In this rollout, you can change different parameters to get the desired result. You can choose the **Get Substance From Marketplace** button to buy textures online. Next, choose the **Go to Parent** button and select the desired channel name from the **Channel Name** drop-down list.

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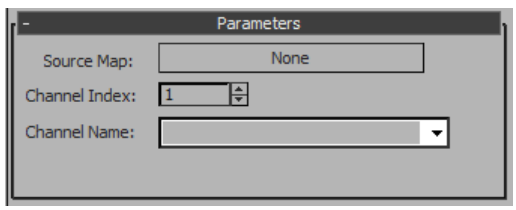

*Figure 8-80 The **Parameters** rollout of the **Map Output Selector** map*

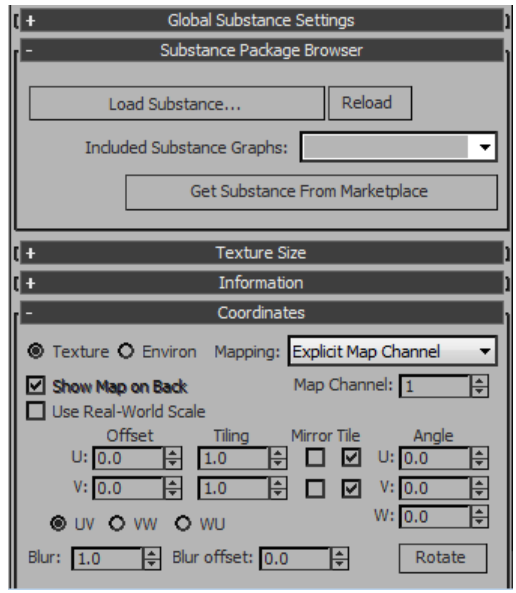

*Figure 8-81 The rollouts displayed on selecting the **Substance** map*

3D Maps

The 3D Maps are three-dimensional images that can be assigned to geometric objects. These are also known as procedural maps. The most commonly used three-dimensional maps such as **Cellular**, **Falloff**, **Noise**, and so on are discussed next.

Dent

The **Dent** map is used to produce material with 3D bumps on its surface. It is basically used as the **Bump** map using the **Maps** rollout, refer to Figure 8-82. You can modify the effect of this map at advanced level using the **Dent Parameters** rollout in the **Material Editor** dialog box.

Cellular

The **Cellular** map is a 3D procedural map. It is used to produce materials such as sand, pebbled surfaces, and so on, as shown in Figure 8-83. You can modify the effect of this map at advanced level using the **Cellular Parameters** rollout in the **Material Editor** dialog box.

Noise

The **Noise** map is used to create disturbance on the surface of an object by combining two colors or materials in different ways, as shown in Figure 8-84. You can modify the effect of this map at advanced level using the **Noise Parameters** rollout in the **Material Editor** dialog box.

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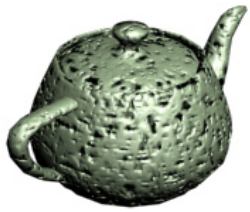

Figure 8-82 *A teapot with the* ***Dent*** *map applied*



Figure 8-83 *An object with the* ***Cellular*** *map*

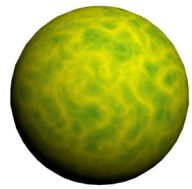

Figure 8-84 *A sphere with the* ***Noise*** *map*

Smoke

The **Smoke** map is used to produce the texture such as smoke from the fire, cloudy effect, or the beam of lights on the surface of an object, as shown in Figure 8-85. You can modify the effect of this map at advanced level using the **Smoke Parameters** rollout of the **Material Editor** dialog box.

Speckle

The **Speckle** map is used to produce the texture of the patterned surfaces such as granite and so on, as shown in Figure 8-86. You can modify the effect of this map at advanced level using the **Speckle Parameters** rollout in the **Material Editor** dialog box.

Splat

The **Splat** map is used to produce texture such as splattered paint on the surface of an object, as shown in Figure 8-87. You can modify the effect of this map at advanced level using the **Splat Parameters** rollout of the **Material Editor** dialog box.



Figure 8-85 *A sphere with the* ***Smoke*** *map applied*

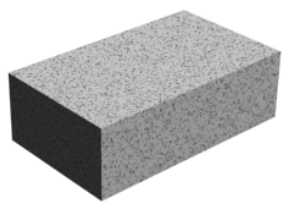

Figure 8-86 *A box with the* ***Speckle*** *map applied*

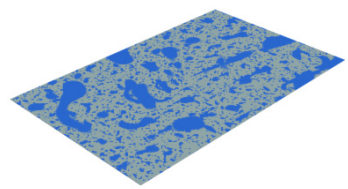

Figure 8-87 *A box with the* ***Splat*** *map applied*

Stucco

The **Stucco** map is used to produce the texture such as plaster or cement on the surface of an object, as shown in Figure 8-88. You need to assign a **Bump** map using the **Maps** rollout to get its best effect. You can modify the effect of this map at advanced level using the **Stucco Parameters** rollout in the **Material Editor** dialog box.

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Waves

The **Waves** map is used to create wavy surface, as shown in Figure 8-89. You can modify the effect of this map at advanced level using the **Waves Parameters** rollout in the **Material Editor** dialog box.

Wood

The **Wood** map is used to create the 3D wood texture on the surface of the object, refer to Figure 8-90. You can modify the effect of this map at advanced level using the **Wood Parameters** rollout in the **Material Editor** dialog box.

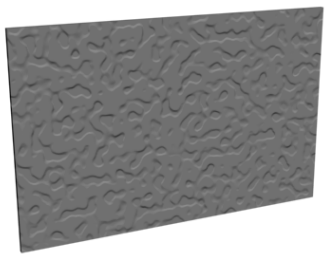

Figure 8-88 *A wall with the **Stucco** map applied*

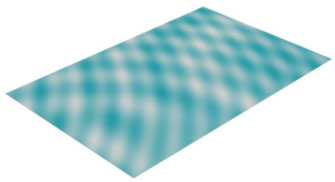

Figure 8-89 *A plane with the **Waves** map applied*

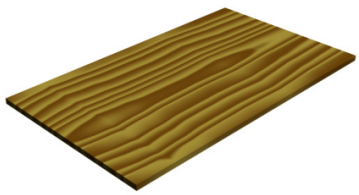

Figure 8-90 *A box with the **Wood** map applied*

Compositors Maps

The **Compositors** maps are used to combine the colors or the maps together. Various maps in this category are: **Composite**, **Mask**, **Mix**, and **RGB Multiply**.

Color Mods Maps

The **Color Mods** maps are used to modify or change the color of pixels in a material. Various maps in this category are: **Output**, **RGB Tint**, and **Vertex Color**.

Other Maps

There are some other types of maps such as **Raytrace**, **Flat Mirror**, and so on, which are used in a different way. These maps are discussed next.

Flat Mirror

The **Flat Mirror** map is used to create a material that generates reflection of other objects in the scene when assigned to the flat surfaces. You can get the best effect of this map using the **Flat Mirror Parameters** rollout in the **Material Editor** dialog box.

Raytrace

The **Raytrace** map is used to create the raytraced reflections and refractions on the surface of the objects. You can get the best effect of this map using the **Raytrace Parameters** rollout in the **Material Editor** dialog box.

Reflect/Refract

The **Reflect/Refract** map is used to produce the reflection and the refraction based on the objects in the scene. You can modify the effects using the **Reflect/Refract Parameters** rollout in the **Material Editor** dialog box.

Once you assign any of the above maps on the square button in the **Material Editor** dialog box; **M** will be displayed on it. If you right-click on this button; a shortcut menu will be displayed, as shown in Figure 8-91. Using the options in the shortcut menu, you can cut or copy the map and paste it at the desired place. You can also clear the unwanted map using the **Clear** option.

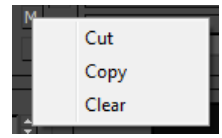

Figure 8-91 *The shortcut menu displayed on right-clicking on the* ***M*** *button*

Tutorial 1

In this tutorial, you will assign material to two cocktail glasses that were created in Tutorial 1 of Chapter 7, refer to Figure 8-92. **(Expected time: 15 min)**

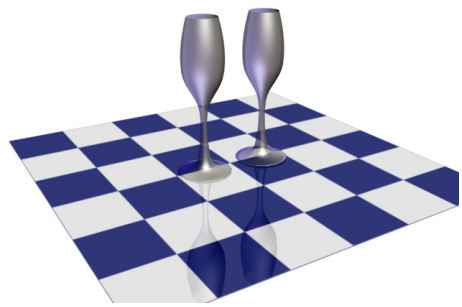

Figure 8-92 *Model for Tutorial 1*

The following steps are required to complete this tutorial:

a. Set the project folder.
b. Download and open the file.
c. Create the floor.
d. Create material for the floor.
e. Create material for the cocktail glasses.
f. Render the scene for the final output.
g. Save the file.

Setting the Project Folder

1. Set the project folder with the name *c08_tut1* in the *3dsmax* folder as discussed in earlier chapters.

Downloading and Opening the File

1. Download the *c08_3dsmax_2012_tut.zip* file from *http://www.cadcim.com*. The path of the file is as follows:

Textbooks > Animation and Visual Effects > 3ds Max > Autodesk 3ds Max 2012: A Comprehensive Guide

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Extract the contents of the zipped file and save them in the *\Documents* folder.

2. Choose **Open** from the **Application menu**; the **Open File** dialog box is displayed. In this dialog box, browse to the location *\Documents\c08_3dsmax_2012_tut* and select the *c08_tut1_start.max* file in it. Choose the **Open** button to open the file, refer to Figure 8-93.

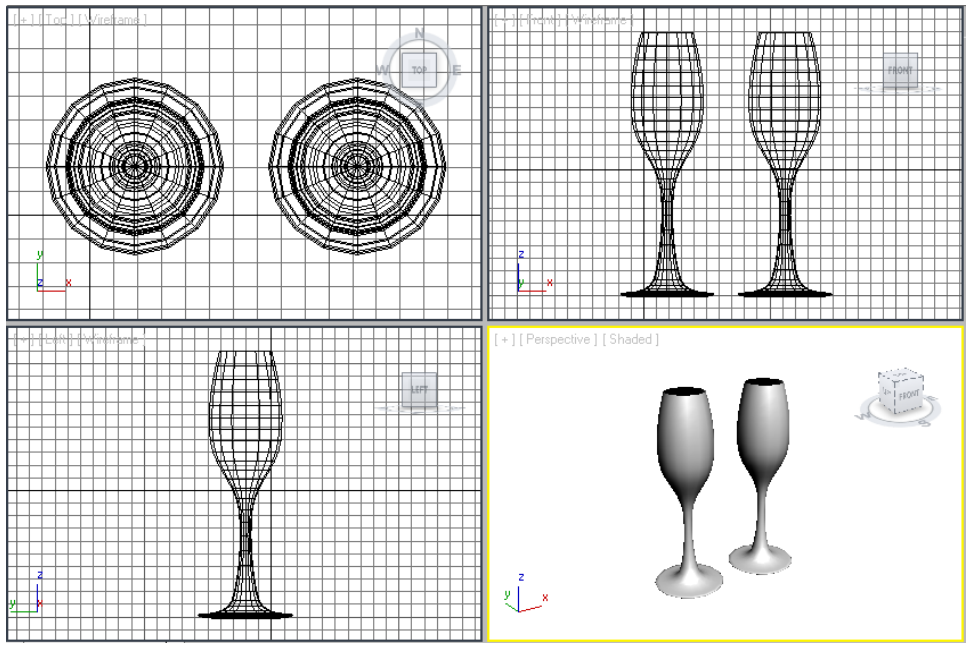

Figure 8-93 *The file with the cocktail glasses displayed*

Note

Instead of following steps 1 and 2, you can directly open the file that you created in Tutorial 1 of Chapter 7 and then follow step 3 given below to save it.

3. Now, choose **Save As** from the **Application menu**; the **Save File As** dialog box is displayed. Browse to the location *\Documents\3dsmax\c08_tut1\scenes*. Save the file with the name *c08tut1.max* at this location.

4. Browse to the *c08_3dsmax_2012_tut* folder and copy the *CHROMBLU.jpg* file from this folder to the location *\Documents\3dsmax\c08_tut1\sceneassets\images*.

Creating the Floor

1. Activate the Top viewport and choose **Create > Geometry** in the **Command Panel**; the **Standard Primitives** option is displayed in the drop-down list below the **Geometry** button. Invoke the **Box** tool from the **Object Type** rollout and create a box in the Top viewport.

2. Name the box as *floor*.

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3. In the **Parameters** rollout, set the length and width parameters of the box according to your scene. Set the value in the **Height** spinner to **1.0**.

4. Align the *floor* with the cocktail glasses using the **Select and Move** tool, as shown in Figure 8-94. Invoke the **Zoom Extents All** tool.

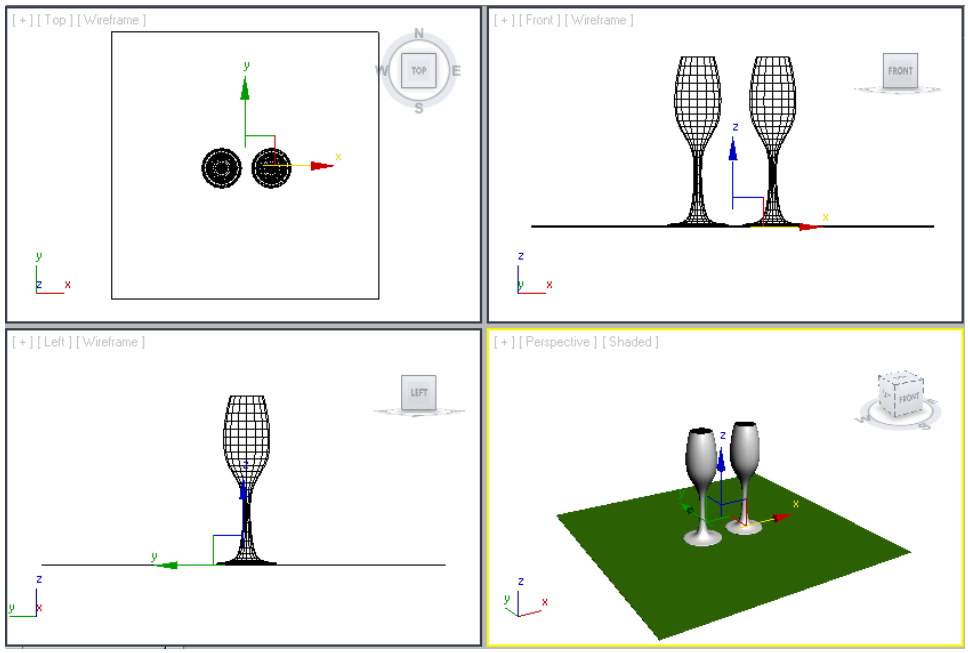

Figure 8-94 *Alignment of floor in all viewports*

Next, you need to create materials for objects in the scene.

Creating Material for the Floor

1. Select the *floor* in any viewport. Then, choose **Rendering > Material Editor > Compact Material Editor** from the menu bar; the **Material Editor** dialog box is displayed.

2. In the **Material Editor** dialog box, select the second sample slot to which no material is assigned; the selected sample slot is surrounded by a white square. In the **Material Name** drop-down list, enter **floor** and press the ENTER key.

   Next, you need to use the **Standard** material for the *floor*.

3. By default, the **Standard** material is selected in the **Material Type** button.

   Next, you need to set parameters for the **Standard** material.

4. In the **Shader Basic Parameters** rollout, make sure that the **Blinn** shader is selected in the drop-down list.

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5. In the **Blinn Basic Parameters** rollout, choose the small square button on the right of the **Diffuse** color swatch, as shown in Figure 8-95; the **Material/Map Browser** dialog box is displayed.

6. Expand the **Maps > Standard** rollouts and select the **Checker** map from the list displayed in the **Material/Map Browser** dialog box. Choose the **OK** button; the **Checker** map is displayed in the selected sample slot, as shown in Figure 8-96. Also, the **Coordinates**, **Noise**, and **Checker Parameters** rollouts are displayed in the **Material Editor** dialog box, as shown in Figure 8-97.

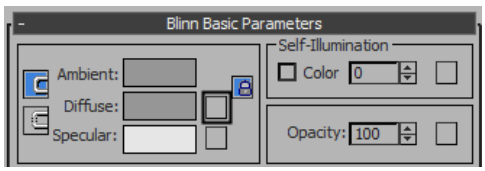

Figure 8-95 *The highlighted square button to be chosen*

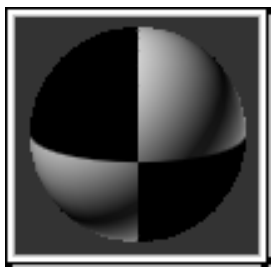

Figure 8-96 *The **Checker** map in the sample slot*

7. In the **Coordinates** rollout, set the value **3** in the **U Tiling** and **V Tiling** spinners to apply the **Checker** map thrice on the X and Y-axes. Note that the map is displayed in the selected sample slot, as shown in Figure 8-98. Use the default values for other options.

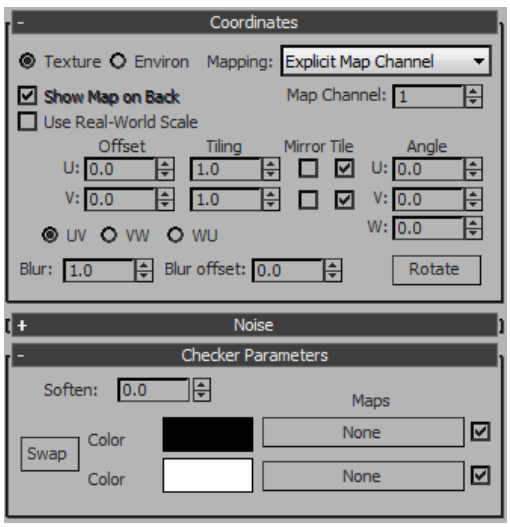

Figure 8-97 *The rollouts displayed on selecting the **Checker** map*



Figure 8-98 *The **Checker** map with 3x3 tiling*

8. In the **Checker Parameters** rollout, select the black color swatch; the **Color Selector: Color1** dialog box is displayed. Set the values as given below:

Red: **0** Green: **12** Blue: **104**

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Now, choose the **OK** button to close this dialog box.

9. Make sure that the white color is selected in the other color swatch, refer to Figure 8-97.

10. Invoke the **Go to Parent** tool to go back to the **Standard** material.

Next, you need to assign the **Raytrace** map to the material to give it a realistic effect.



Note

After assigning the map, the small square button on the right of the ***Diffuse*** *color swatch is labeled as* ***M****.*

11. Expand the **Maps** rollout; a list of maps is displayed, as shown in Figure 8-99.

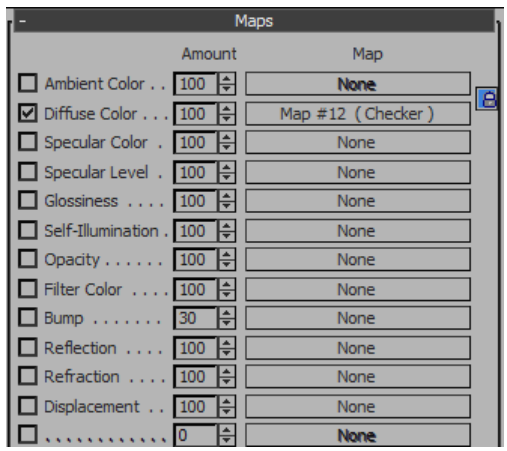

Figure 8-99 *The* ***Maps*** *rollout*

12. In this rollout, select the **Reflection** check box to make it active. Choose the **Reflection** map button on the right of the spinner that is labeled as **None**; the **Material/Map Browser** dialog box is displayed. Select the **Raytrace** map from the **Maps > Standard** rollouts and choose the **OK** button; the **Raytrace** map with various rollouts is displayed in the **Material Editor** dialog box. Use the default values for the **Raytrace** map.

13. Invoke the **Go to Parent** tool. Expand the **Maps** rollout and set the value **20** in the **Reflection** spinner.

Now, you need to assign the **floor** material to the *floor*.

14. Make sure that the *floor* is selected in the viewport and the **floor** material is selected in the **Material Editor** dialog box.

15. Next, invoke the **Assign Material to Selection** tool from the **Material Editor** dialog box; the **floor** material is assigned to the *floor* in the viewport.

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16. Now, invoke the **Show Shaded Material in Viewport** tool to display the **floor** material on the object in the viewport, as shown in Figure 8-100.

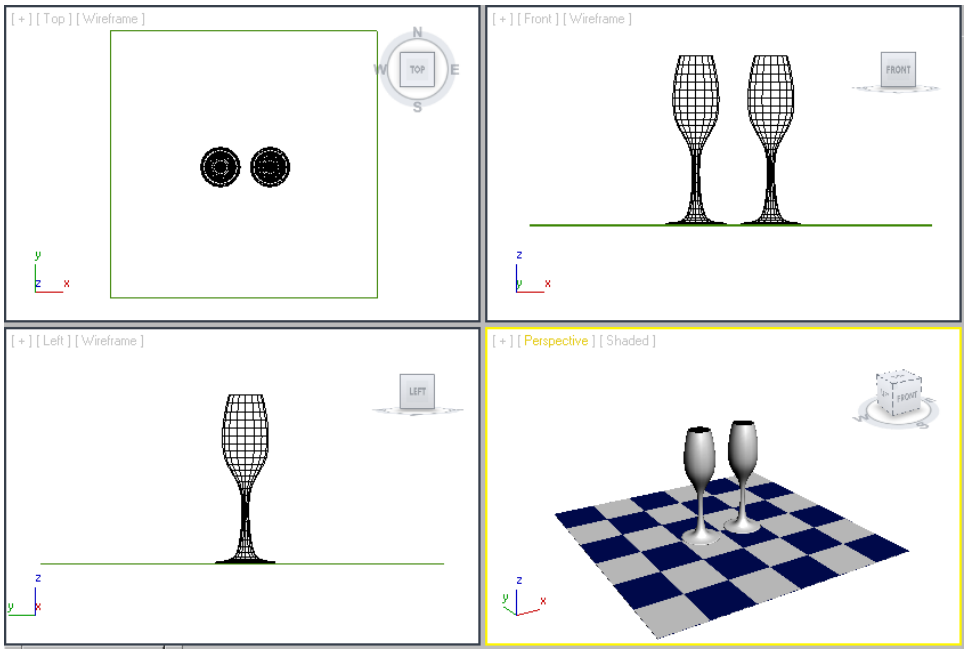

Figure 8-100 *The **floor** material displayed on the floor*

Creating Material for the Cocktail Glasses

The material has already been assigned to the cocktail glasses in Tutorial 1 of Chapter 7. But, in this section, you will assign another material to it.

1. Select the cocktail glasses in the viewport and then select another sample slot in the **Material Editor** dialog box. In the **Material Name** drop-down list, enter **glass** and press ENTER.

2. Use the **Standard** material for the cocktail glasses. By default, it is selected in the **Material Type** button.

   Next, you need to set parameters for the **Standard** material.

3. In the **Shader Basic Parameters** rollout, select the **Phong** shader; the **Phong Basic Parameters** rollout is displayed. Select the **2-Sided** check box.

4. In the **Phong Basic Parameters** rollout, choose the small square button on the right of the **Diffuse** color swatch; the **Material/Map Browser** dialog box is displayed.

5. Select the **Bitmap** map from the list displayed in the **Material/Map Browser** dialog box and double-click on it; the **Select Bitmap Image File** dialog box is displayed.

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As the project folder is already set, the path *\Documents\3dsmax\c08_tut1\sceneassets\images* is displayed in **Look in** text box of this dialog box.

6. Select the file *CHROMBLU.jpg* from it and choose the **Open** button; the image is displayed in the selected sample slot, as shown in Figure 8-101.

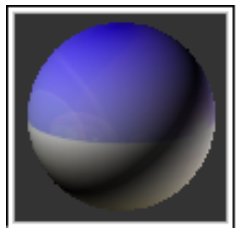

Figure 8-101 *The sample slot after assigning the* ***Bitmap*** *map*

7. Next, invoke the **Go to Parent** tool from the **Material Editor** dialog box to go back to the **Standard** material.

8. In the **Specular Highlights** area of the **Material Editor**, set the values as given below:

Specular Level: **96** Glossiness: **18** Soften: **0.1**

9. In the **Opacity** spinner, set the value **30** to make the object transparent.

Next, you need to assign the same image (*CHROMBLU.jpg*) to the **Opacity** map that you have assigned to the **Diffuse** map to get a realistic effect.

10. Move the cursor over the **Diffuse** map button that is labeled as **M**. Press and hold the left mouse button and then drag it to the **Opacity** map button on the right of the **Opacity** spinner. Next, release the left mouse button; the **Copy (Instance) Map** dialog box is displayed.

11. In this dialog box, select the **Copy** radio button and choose the **OK** button; the same image is assigned to the **Opacity** map. Also, the square button is labeled as **M**.



Note

You can also insert the ***Diffuse*** *and* ***Opacity*** *maps using the* ***Maps*** *rollout.*

Next, you need to apply the **glass** material to the cocktail glasses.

12. Make sure that the cocktail glasses are selected in the viewport. In the **Material Editor** dialog box, make sure that the **glass** material is selected.

13. Next, invoke the **Assign Material to Selection** tool; the **glass** material is assigned to the cocktail glasses in the viewport.

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14. Now, invoke the **Show Shaded Material in Viewport** tool to display the **glass** material on the object in the viewport, as shown in Figure 8-102. Close the **Material Editor** dialog box.

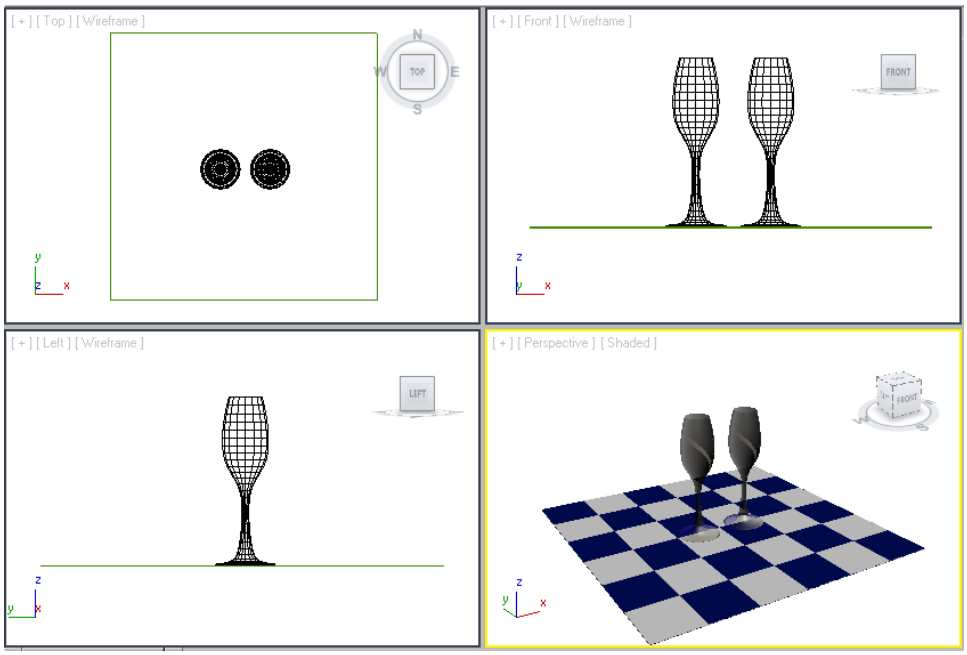

Figure 8-102 *The* ***glass*** *material displayed on the cocktail glasses*

Rendering the Scene for the Final Output

1. Activate the Perspective viewport. Render the view using the **Render Production** tool in the **Main Toolbar**; the final output of the scene is displayed, as shown in Figure 8-103.

   You can view the final rendered image of this model by downloading the file *c08_3dsmax_2012_render.zip* from *http://www.cadcim.com*.

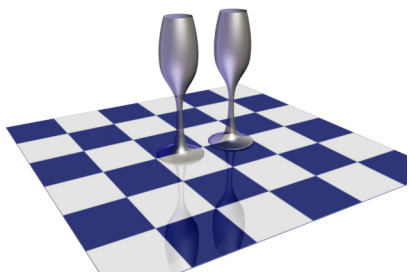

Figure 8-103 *The final output of the scene*

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Saving the File

1. Save the file with the name *c08tut1.max* as discussed in earlier chapters. The location of this file is given below:

   \Documents\3dsmax\c08_tut1\scenes

Tutorial 2

In this tutorial, you will assign a brass material to a flower pot, as shown in Figure 8-104.

(Expected time: 15 min)



Figure 8-104 *Model for Tutorial 2*

The following steps are required to complete this tutorial:

a. Set the project folder.
b. Download and open the file.
c. Create brass material for the flower pot.
d. Render the scene for the final output.
e. Save the file.

Setting the Project Folder

1. Set the project folder with the name *c08_tut2* in the *3dsmax* folder as discussed in earlier chapters.

Downloading and Opening the File

1. Before you start the tutorial, download the *c08_3dsmax_2012_tut.zip* file from *http://www.cadcim.com*. The path of the file is as follows:

   Textbooks > Animation and Visual Effects > 3ds Max > Autodesk 3ds Max 2012: A Comprehensive Guide

   Extract the contents of the zipped file and save them in the *\Documents* folder.

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2. Choose **Open** from the **Application menu**; the **Open File** dialog box is displayed. In this dialog box, browse to the location *\Documents\c08_3dsmax_2012_tut* and select the *c08_tut2_start.max* file in it. Choose the **Open** button to open the file, refer to Figure 8-105.

Note

Instead of following steps 1 and 2, you can directly open the file that you created in Exercise 3 of Chapter 7 and follow step 3 given below to save it.

3. Now, choose **Save As** from the **Application menu**; the **Save File As** dialog box is displayed. Browse to the location *\Documents\3dsmax\c08_tut2\scenes*. Save the file with the name *c08tut2.max* at this location.

4. Browse to the *c08_3dsmax_2012_tut* folder and copy the *Lakerem2.jpg* file from this folder to the location *\Documents\3dsmax\c08_tut2\sceneassets\images*.

5. Delete two flowerpots from the scene; a single flowerpot remains in the viewport, as shown in Figure 8-105.

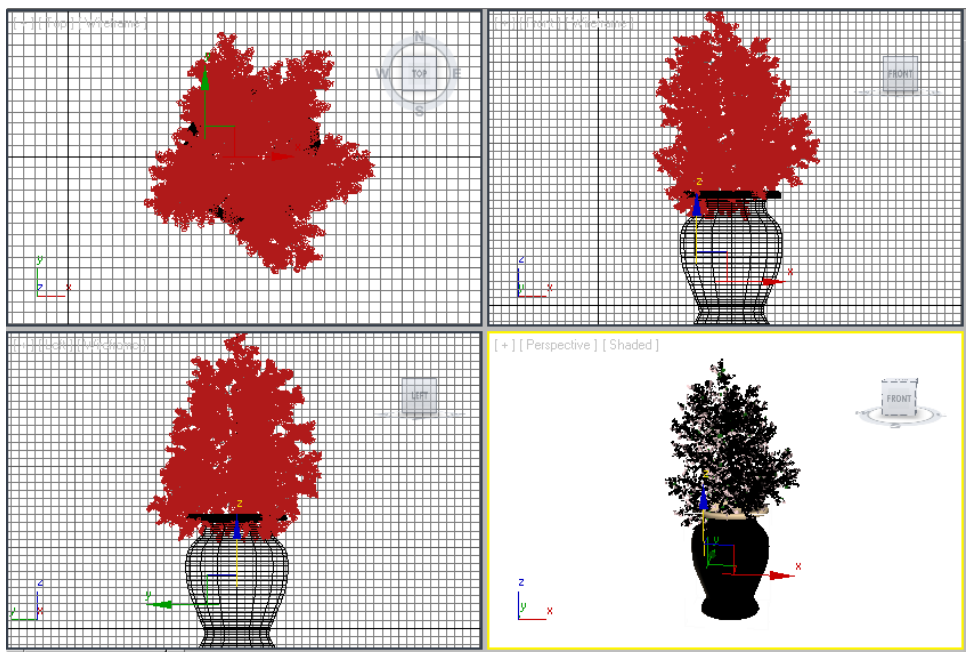

Figure 8-105 *The flower pot with a plant in all viewports*

Creating Brass Material for the Flower Pot

1. Select the *flower pot* in any viewport and invoke the **Compact Material Editor** tool from the **Main Toolbar**; the **Material Editor** dialog box is displayed.

2. Select one of the sample slots in the **Material Editor** dialog box. In the **Material Name** drop-down list of this dialog box, enter **brass** and then press the ENTER key.

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3. By default, the **Standard** material is selected in the **Material Type** button and you need to use the same for creating the **brass** material.

   Next, you need to set parameters for the **Standard** material.

4. In the **Shader Basic Parameters** rollout, select the **Metal** shader option from the drop-down list; the **Metal Basic Parameters** rollout is displayed. Select the **2-Sided** check box.

5. In the **Metal Basic Parameters** rollout, use the **Diffuse** color swatch to change the color of the material; the **Color Selector** dialog box is displayed. Set the values as given below:

   Red: **253** Green: **159** Blue: **37**

   Now, choose the **OK** button to close this dialog box.

6. In the **Specular Highlights** area, set the values as given below:

   Specular Level: **80** Glossiness: **75**

   Next, you need to assign the **Reflection** map from the **Maps** rollout to get a realistic effect.

7. Expand the **Maps** rollout in the **Material Editor** dialog box; a list of maps is displayed.

8. Select the **Reflection** check box to make it active. Choose the **Reflection** map button that is labeled as **None** on the right of the **Reflection** spinner; the **Material/Map Browser** dialog box is displayed. Select the **Bitmap** map from the **Maps > Standard** rollouts and choose the **OK** button; the **Select Bitmap Image File** dialog box is displayed.

9. As the project folder is already set, the path *\Documents\3dsmax\c08_tut2\sceneassets\images* is displayed in the **Look in** text box of this dialog box. Select the file *Lakerem2.jpg* from it and choose the **Open** button; the image is displayed in the selected sample slot, as shown in Figure 8-106.

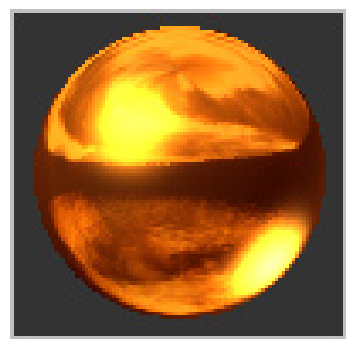

Figure 8-106 *The brass material displayed in the sample slot*

10. Invoke the **Go to Parent** tool from the **Material Editor** dialog box. In the **Maps** rollout, set the value **50** in the **Reflection** spinner.

    Next, you need to apply the **brass** material to the *flower pot*.

11. Make sure that the *flower pot* is selected in the viewport and the **brass** material is selected in the **Material Editor** dialog box.

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12. Next, invoke the **Assign Material to Selection** tool; the **brass** material is assigned to the *flower pot*.

13. Now, invoke the **Show Shaded Material in Viewport** tool; the **brass** material is displayed on the *flower pot* in the Perspective viewport, as shown in Figure 8-107.

Rendering the Scene for the Final Output

1. Activate the Perspective viewport. Render the scene using the **Render Production** tool in the **Main Toolbar**; the final output is displayed, as shown in Figure 8-108.

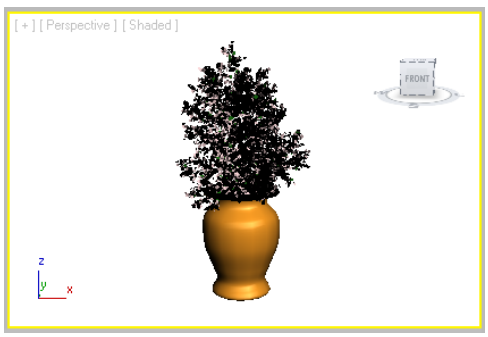

Figure 8-107 *The* ***brass*** *material displayed in the flower pot*



Figure 8-108 *The final output at rendering*

You can view the final rendered image of this model by downloading the file *c08_3dsmax_2012_render.zip* from *http://www.cadcim.com*.

Saving the File

1. Save the file with the name *c08tut2.max* as discussed in earlier chapters. The location of this file is given below:

\Documents\3dsmax\c08_tut2\scenes

Tutorial 3

In this tutorial, you will assign a map to the LCD computer, as shown in Figure 8-109, which you created in Tutorial 2 of Chapter 6. **(Expected time: 15 min)**

The following steps are required to complete this tutorial:

a. Set the project folder.
b. Download and open the file.
c. Assign the map to the LCD screen.
d. Render the scene for the final output.
e. Save the file.

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Figure 8-109 *Model for Tutorial 3*

Setting the Project Folder

1. Set the project folder with the name *c08_tut3* in the *3dsmax* folder as discussed in earlier chapters.

Downloading and Opening the file

1. Before you start the tutorial, download the *c08_3dsmax_2012_tut.zip* file from *http://www.cadcim.com*. The path of the file is as follows:

   Textbooks > Animation and Visual Effects > 3ds Max > Autodesk 3ds Max 2012: A Comprehensive Guide

   Extract the contents of the zipped file and save them in the *\Documents* folder.

2. Choose **Open** from the **Application menu**; the **Open File** dialog box is displayed. In this dialog box, browse to the location *\Documents\c08_3dsmax_2012_tut* and select the *c08_tut3_start.max* file in it. Choose the **Open** button to open the file, refer to Figure 8-110.



Note

Instead of following steps 1 and 2, you can directly open the file that you created in Tutorial 2 of Chapter 6 and follow step 3 given below to save it.

3. Now, choose **Save As** from the **Application menu**; the **Save File As** dialog box is displayed. Browse to the location *\Documents\3dsmax\c08_tut3\scenes*. Save the file with the name *c08tut3.max* at this location.

Assigning the Map to the LCD Screen

First, you need to create an image similar to the desktop of the computer for the screen.

1. To do so, display the image on your computer screen and press the Prt Scr key. Now, open a new file in the **Microsoft Paint** software. Press the CTRL+V keys to paste the image in

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the file. Then, save the file with the name *desktop_screen* in the *jpg* format to the location *\Documents\3dsmax\c08_tut3\sceneassets\images*.

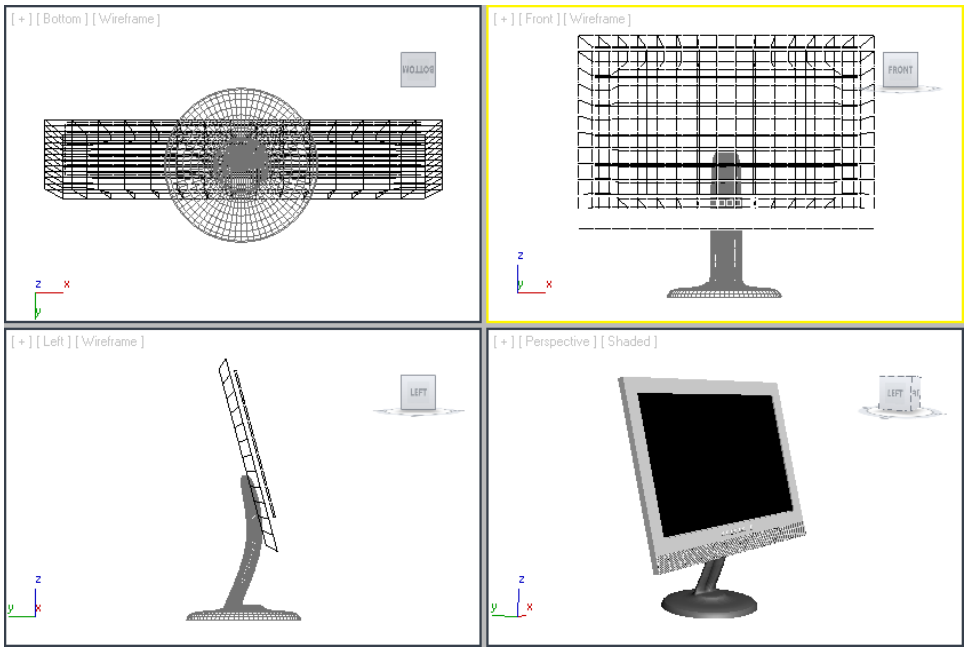

Figure 8-110 *The LCD computer in all viewports*

2. Select the *screen* of the LCD computer in any viewport and then invoke the **Compact Material Editor** tool from the **Main Toolbar**; the **Material Editor** dialog box is displayed.

3. Select one of the sample slots from the **Material Editor** dialog box. In the **Material Name** drop-down list, enter **screen** and press the ENTER key.

4. By default, the **Standard** material is selected in the **Material Type** button. You will use the same material for assigning the map.

   Next, you need to assign the *desktop_screen.jpg* image to the **Diffuse** map button.

5. Make sure that the **Blinn** shader is selected in the **Shader Basic Parameters** rollout.

6. In the **Blinn Basic Parameters** rollout, choose the **Diffuse** map button; the **Material/Map Browser** dialog box is displayed. Select the **Bitmap** map from the **Maps > Standard** rollouts and choose the **OK** button; the **Select Bitmap Image File** dialog box is displayed. As the project folder is already set, the path *\Documents\3dsmax\c08_tut3\sceneassets\images* is displayed in the **Look in** text box of this dialog box. Select the file *desktop_screen.jpg* and then choose the **Open** button; the image is displayed in the selected sample slot.

7. Invoke the **Go to Parent** tool.

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8. In the **Specular Highlights** area, set the values as given below:

   Specular Level: **40** Glossiness: **16** Soften: **0.1**

   Next, you need to apply the map to the *screen*.

9. Make sure that the *screen* is selected in the viewport and the **screen** material is selected in the **Material Editor** dialog box.

10. Invoke the **Assign Material to Selection** tool; the **screen** material is assigned to the *screen* of the LCD computer in the viewport.

11. Now, invoke the **Show Shaded Material in Viewport** tool; the **screen** material is displayed on the *screen* in the Perspective viewport, as shown in Figure 8-111.

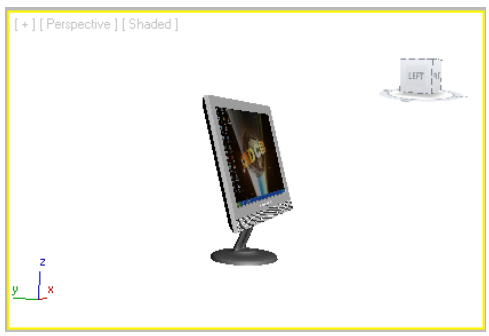

Figure 8-111 *The* ***screen*** *material assigned to the screen of the computer*

You can also assign other materials or maps to different parts of the computer to give it a realistic look.

Rendering the Scene for the Final Output

1. Activate the Perspective viewport. Render the scene using the **Render Production** tool in the **Main Toolbar**; the final output is displayed, as shown in Figures 8-112 and 8-113.

   You can view the final rendered image of this model by downloading the file *c08_3dsmax_2012_render.zip* from *http://www.cadcim.com*.

Saving the File

1. Save the file with the name *c08tut3.max* as discussed in earlier chapters. The location of this file is given below:

   \Documents\3dsmax\c08_tut3\scenes

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Figure 8-112 *The final output at rendering (view 1)*



Figure 8-113 *The final output at rendering (view 2)*

Self-Evaluation Test

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

1. Which of the following key combination is used to invoke the **Slate Material Editor** dialog box?

(a) ALT+M (b) CTRL+M
(c) M (d) ALT+CTRL+M

2. Which of the following tools in the **Material Editor** dialog box is used to pick material from an object in the viewport to apply it to the active sample slot?

(a) **Assign Material to Selection** (b) **Get Material**
(c) **Pick Material From Object** (d) All of these

3. Which of the following materials is known as the **Compound** material?

(a) **Blend** (b) **Composite**
(c) **Double-Sided** (d) All of these

4. Which of the following materials has the **Templates** rollout to insert preset materials to the objects?

(a) **Standard** (b) **Architectural**
(c) **Raytrace** (d) **Composite**

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5. Which of the following shaders in the **Standard** material is used to create elliptical highlights?

   (a) **Anisotropic** (b) **Blinn**
   (c) **Metal** (d) **Phong**

6. The _____ color swatch in the **Basic Parameters** rollout of shaders is used to specify the color of the objects in direct light.

7. The _____ shader in the **Standard** material is used to create dull or matte highlights.

8. The _____ material is used to provide highly realistic raytraced images.

9. The **Material Editor** tool is used to create new materials and maps for objects to make them look more realistic. (T/F)

10. The **Get Material** tool is used to select materials or maps for the selected sample slot. (T/F)

11. The **Phong** shader is very similar to the **Oren-Nayar-Blinn** shader. (T/F)

Review Questions

Answer the following questions:

1. Which of the following maps in the **Material/Map Browser** dialog box is a 2D map?

   (a) **Checker** (b) **Bitmap**
   (c) **Cellular** (d) **Wood**

2. Which of the following maps is used to select default images from the file to make the objects realistic?

   (a) **Checker** (b) **Dent**
   (c) **Bitmap** (d) All of these

3. Which of the following maps is used to produce textures such as plaster and cement?

   (a) **Stucco** (b) **Speckle**
   (c) **Splat** (d) **Smoke**

4. The **Compositor** maps are used to modify or change the color of pixels in a material. (T/F)

5. You can insert maps in different materials using the **Maps** rollout. (T/F)

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6. The **Flat Mirror** map is used to generate reflections and refractions based on the objects in the scene. (T/F)

7. The **Anisotropic** shader in the **Standard** material has two specular highlight controls. (T/F)

8. The _____ spinner in the **Basic Parameters** rollout of the **Standard** material is used to control the transparency of material.

9. The _____ material is used to create the preset materials such as **Glass**, **Water**, **Paper**, and so on.

10. The **Ambient** color swatch in the _____ material is used to specify the amount of absorption of the ambient light by the material.

Exercises

Exercise 1

Start Autodesk 3ds Max 2012 and then perform the following operations:

Create an object in the viewport and invoke the **Compact Material Editor** tool; the **Material Editor** dialog box will be displayed. Then, try the following operations:

1. By default, the **Standard** material is selected. In the **Shader Basic Parameters** rollout, select the **Anisotropic** shader from the drop-down list. Modify the parameters of the **Anisotropic Basic Parameters** rollout and assign a material to the object in the viewport using the **Assign Material to Selection** tool. Then, render the Perspective viewport to notice the effects. Use different shaders in the drop-down list to notice the difference in the shaders.

2. Invoke the **Get Material** tool; the **Material/Map Browser** dialog box is displayed. Select the **Architectural** material from the material list in the dialog box. In the **Templates** rollout, select various preset materials from the drop-down list. Set the parameters for the selected materials using the **Physical Qualities** rollout. Then, assign a material to the object in the viewport using the **Assign Material to Selection** tool. Render the Perspective viewport to notice the effects in the output. Select different materials from the list displayed in the **Material/Map Browser** dialog box and assign them to the objects to view various realistic effects in the objects.

3. In the **Standard** material, select any shader from the drop-down list in the **Shader Basic Parameters** rollout. In the **Basic Parameters** rollout, select the **Diffuse** map button on the right of the **Diffuse** color swatch; the **Material/Map Browser** dialog box will be displayed. Select different maps from the maps list in the **Material/Map Browser** dialog box and

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assign the maps to the objects in the viewports. Next, render the Perspective viewport to notice the effects in the final output.

4. In the **Standard** material, set the value below 100 in the **Opacity** spinner. Modify other parameters in the **Basic Parameters** rollout and assign the material to the objects in the viewport. Next, render the Perspective viewport to notice the effect of opacity in the final output.

5. Try to assign different maps and materials to all objects created in the previous chapters to make them more realistic.

Exercise 2

Create the model shown in Figure 8-114 using the **Line** tool and the **Lathe** modifier. To create the steel material, you need to use the **Oren-Nayar-Blinn** shader in the **Standard** material and the **Reflection** map in the **Maps** rollout. You can view the final rendered image of this model by downloading it from *http://www.cadcim.com*. **(Expected time: 15 min)**

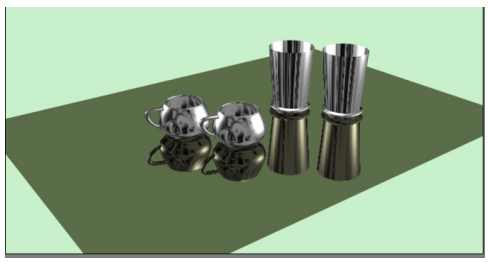

Figure 8-114 *Model for Exercise 2*

Exercise 3

Download the file *c08_3dsmax_2012_exer.zip* from *http://www.cadcim.com*. Extract the contents of the zipped file and open *c08_exer3_start* from it. Next, assign different maps and materials to give it a realistic view, as shown in Figure 8-115. **(Expected time: 15 min)**

You can view the final rendered image of this scene by downloading it from the following website: *http://www.cadcim.com*.

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Figure 8-115 *Scene for Exercise 3*

Exercise 4

Create an object in the viewport, as shown in Figure 8-116. Then, create a copper material using the **Phong** shader in the **Standard** material and assign this material to the object. You can view the final rendered image of this model by downloading it from *http://www.cadcim.com*.

(Expected time: 15 min)

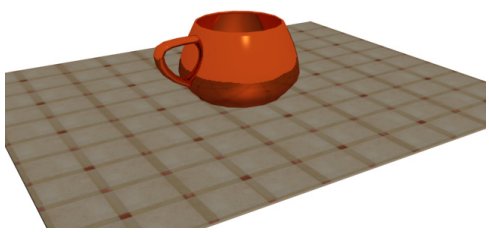

Figure 8-116 *Model for Exercise 4*

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Answers to Self-Evaluation Test

1. c, **2.** c, **3.** d, **4.** b, **5.** a, **6. Diffuse**, **7. Oren-Nayar-Blinn**, **8. Raytrace**, **9.** T, **10.** T, **11.** F