

itDD

_Introduction to Techniques in Digital Design

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Color Texture Node

In visual arts, a **texture** is any kind of surface detail, both visual and tactile. In Maya, a **texture** is a collection of attributes that creates surface detail. Textures have a more specialized display purpose than materials. For example, you can use textures to create the appearance of a marbled pattern, bumps, or a logo image on the side of an object.

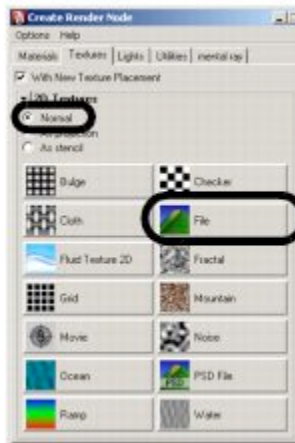
In the Maya Help, a texture is also referred to as a texture **node**. A **node** is a collection of attributes (or actions) with a common purpose. A **shader** is sometimes called a **shader node** or **material node**. To display a texture on a surface, you apply a texture node to an attribute of the surface material.

Apply a texture to a material:

1. Click the **Map** button next to the Color slider. This is a quick way of applying a texture to an attribute. This is also called mapping a texture **(A)**.



The Create Render Node window displays a list of the textures you can apply. The texture names and their icons help you to decide which texture is appropriate for the effect you want.



A File texture uses an image file that you or someone else created separately, such as a drawing from a paint program.

2. Before you create the texture, make sure Normal is selected in the options above the texture swatches.

The Normal option means Maya will stretch the texture evenly around the surface. The other settings—Projection and Stencil—are other ways you can apply a texture.

3. In the 2D Textures list, click the File button once.
4. Click the folder icon to the right of the Image Name attribute to locate your desired texture map file.
5. With the object selected, in the Attribute Editor, click the place2dTexture1 tab.



The place2dTexture1 tab is a node with attributes that control the texture's position on the surface.

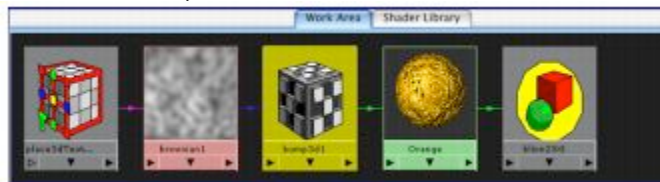
Bump Map Texture Node

A **bump map** creates the illusion that the surface has bumps or other types of surface relief. You will map the texture using the Create Bar in Hypershade.

The Create Bar is similar to the Create Render Node window you have used already. It is built into Hypershade for greater convenience.

Apply a bump map texture to a material:

1. In the Create Bar of the Hypershade, scroll down to the 3D Textures heading.
2. With the middle mouse button, drag on the 3D Texture onto the previously created material and release the mouse button.
3. From the menu that appears, choose **bump map**.
Maya connects the 3D Texture to the material's bump map attribute. This drag-and-drop method of applying a texture is essentially the same as clicking the map icon next to a material's attribute slider. Using Hypershade offers a faster, more graphical alternative to using the Attribute Editor.
4. Select *Graph > Input and Output Connections* to view the node connections for the new texture you created.



5. Double-click the bump3d1 swatch (the checkered cube) to display its attributes. This node is the link between the texture and the material. It converts visual information into the appearance of surface relief. The most important attribute in the bump3d1 node is Bump Depth, which controls the intensity of the bumps.
6. In the Hypershade panel, click the swatch to reveal its attributes. These values can also be altered to change the appearance of the texture map and, in turn, the material shader.

Material Animation

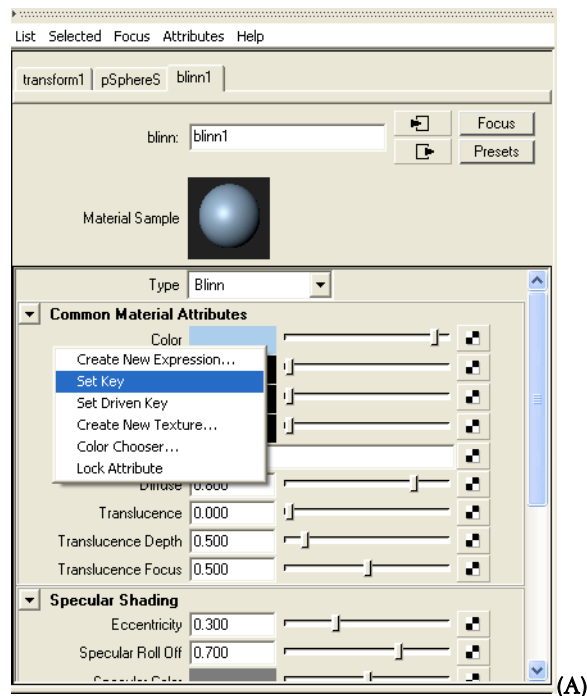
Not only can objects be animated, but also the materials applied to those objects. The different variables that make up a material (color, transparency, ambient,...) can be individually animated.

Animating a Material:

1. With the Timeline set to the appropriate time, select the material to be animated from within the **Multilister** window and open up the **Attribute Editor** for that material.
2. Position the attribute that is to be animated (color, transparency, ambient,...) in its start position.
3. With the mouse over the attribute that is to be animated, right-click and select **Set Key (A)**.

Note: This sets a key at the current frame for this attribute for the selected material. An end key needs to be set in order to complete the material animation.

4. With the material's Attribute Editor still open, position the Timeline to the appropriate end time.
5. Position the attribute that is to be animated (color, transparency, ambient,...) in its end position.
6. With the mouse over the attribute that is to be animated, right-click and select **Set Key (A)**.



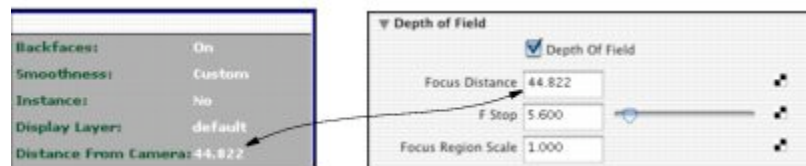
Depth of Field

In photography, the range of distances within which objects will be sharply focused (objects outside of this range appear blurred, or out of focus). In Maya, all objects are sharply focused by default, no matter how near or far they are from the camera. However, Maya does selectively focus on objects to simulate **Depth of Field**.

Depth of Field needs to be activated with the camera attribute editor in order to take effect **(A)**. The **Depth of Field** of an image depends upon the distance from the camera to the object in focus. You can view the calculated distance of the camera from the object and apply that value to the Focus Distance for the camera to achieve Depth of Field effects in the Camera's Attribute Editor.

Determining Focus Distance:

1. Select the object in the view.
2. Make sure Object Details is turned on in the **Heads Up Display** menu (*Display > Heads Up Display > Object Details*). Notice the Distance to Camera value.
3. Use the **Distance to Camera** value as the **Focus Distance (B)** value in the **Depth of Field** section for the current **Camera**.
4. If you select multiple objects, Maya uses the center of their bounding box to calculate the distance from the camera.



fStop (C) Determines Depth of Field:

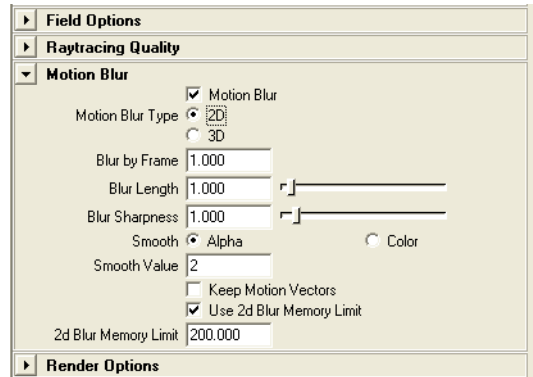
Depth of Field is the region of sharp focus in a photograph. **Depth of Field** is determined by the camera's aperture setting. At wide aperture settings (for example, at **fStop** $f/2$, the **Depth of Field** is shallow, and more of the foreground and background (that brackets the area in sharp focus) is out of focus. At narrow aperture settings (for example, at **fStop** $f/22$, the depth of field is deep, and more of the foreground and background is in focus.

Motion Blur

Motion Blur is the simulation of the blurring that occurs when a fast-moving surface is captured by a camera. Maya can compute real-world blur either accurately (**3D Motion Blur**, an expensive operation), or approximately (**2D Motion Blur**, a cheaper operation acceptable in some situations). Maya uses the relationship between the Shutter Angle and Motion Blur attributes to determine how much blur is applied to an object. The options for Motion Blur are located within the **Render Globals (Settings)** window:

1. **2D Motion Blur** is a post-process; Maya blurs each object in the image after rendering the entire image based on the object's motion vector (its speed and direction).
2. **3D Motion Blur** is similar to real-world motion blur, but takes longer to render than **2D Motion Blur**. The default setting is 3D.

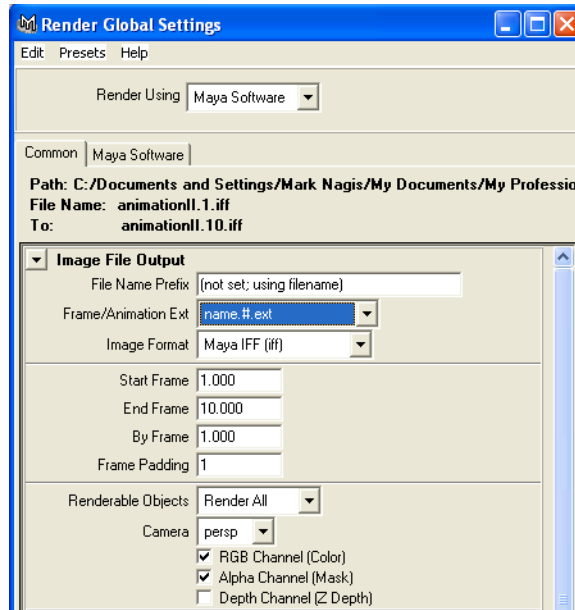
- Blur by Frame** is the amount moving objects are blurred. The higher the value the more **Motion Blur** is applied to objects.



Outputting an Animation

Variables within the Render Settings window need to be altered in order to send an animation rather than a still image:

- Frame/AnimationExt** should be set to *name.#.ext*, where *name* is the file name, *#* is the frame number, and *.ext* is the file extension.
- Image format** can be left as Maya IFF, TIFF or JPG, which will render out a series of individual files that need to be composited together, or an .AVI or MOV which will render out one single AVI/Quicktime file, respectively. The advantage of rendering out a series of images over one single file is that if your computer is to fail and you were rendering out to a single file you would be left with nothing, but if you were to render out a series of images you would at least have a handful of images rendered.
- Start Frame** is the first frame of your animation, the point at which you would like the rendering to start.
- End Frame** is the last frame of your animation, the point at which you would like the animation to end.
- By Frame** value determines the interval of frames rendered. If the **By Frame** value is set to 2, then Maya will render every other frame. If the **By Frame** value is set to 4, then Maya will render every fourth frame.



Sending an Animation to Render:

1. With the **Render Pull Down Menu** selected click *Render > Batch Render* in the **Main Menu**

