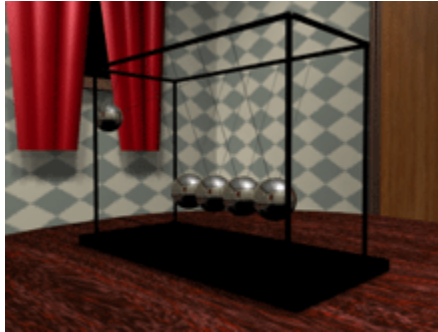


HOW TO CREATE A BALL ENV REFLECTION MAP

By S. Christov

Maya Complete
Rendering

In Maya, reflections can be achieved in one of two ways. You can either raytrace the scene or you can map the reflected color attribute using an environment shader.

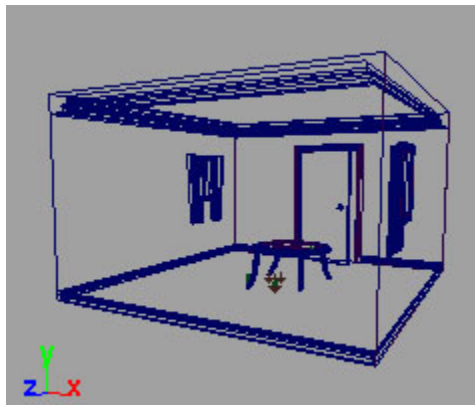


In this lesson, you will learn how to render realistic reflections without needing to raytrace every frame of the animation. Using an enviable shader, you can raytrace one image then reapplied it as a map to the shader's reflectivity.

This is an update for Maya from a previous Assistant article "*Reflection Mapping*" by L. Saunders, Assistant issue No 3, Winter 1997.

STEP ONE

For any reflections you will need to use a digital set. The set must be enclosed in that it is not 3 sided, and needs to cover the area behind the camera.



Download and **uncompress** the file:

[reflection.zip](#).

[NT ~2 megs.] or,

[reflection.tar.gz](#)

[IRIX ~2megs.]

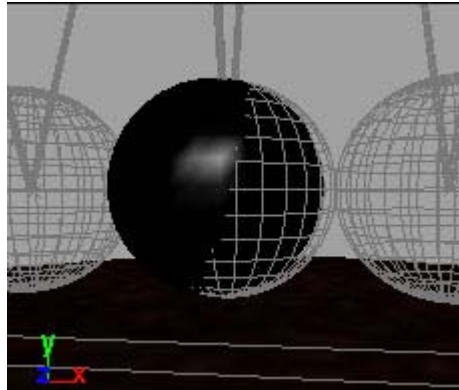
This is a simple set that will be used to demonstrate basic reflections.

You will notice that the various objects are assigned to several layers. **Select** the *ball* layer and with your right mouse button select **Template**.

STEP TWO

Create a Sphere.

Position the sphere so that it is in the same location as one of the balls for the pendulum.



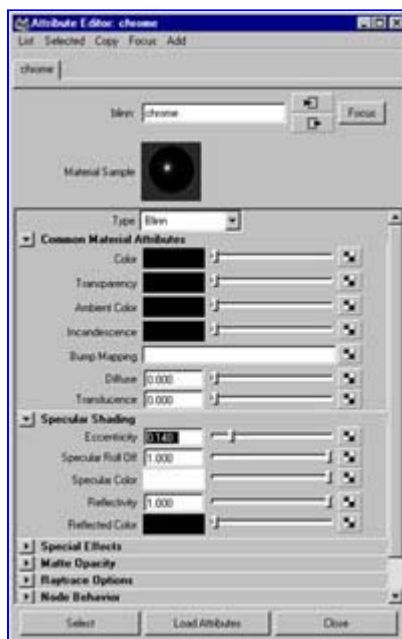
Scale the sphere to make it roughly the size of one of the balls.

STEP THREE

You now need to give this sphere a chrome-like shader.

In the Hypershade, **Create a Blinn** material. **Name it Reflector** and assign it to the sphere. Set the following values in the Attribute Editor.

- **Color** to **Black**
- **Diffuse** to **0.0**
- **Eccentricity** to **0.14**
- **Specular Roll off** to **1.0**
- **Specular Color** to **White**
- **Reflectivity** to **1.0**



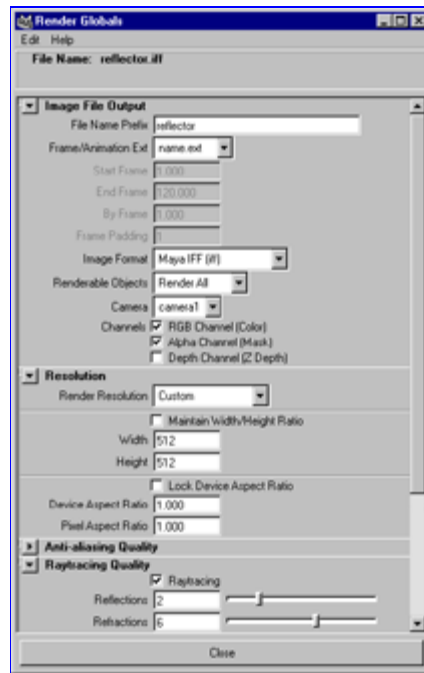
[Click to view larger version](#)

STEP FOUR

Create a new camera and toggle a panel to

look through it. It should be called *camera 2*.

In your Render Globals, set up the globals to render from your new camera. In the Resolution section change the **size** to be **512 X 512**. Turn **off Lock Device Aspect Ratio**. The reason for this is because the env sphere needs to be a square image with the chrome ball as its focus.

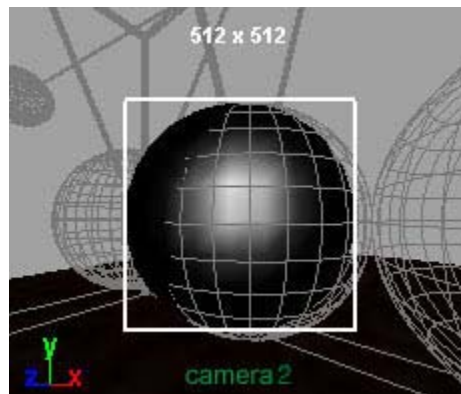


Name the output image *Reflection*, and [Click to view larger version](#) in the Raytracing section turn **Raytracing** to **On**.

Set *camera 2* as your render camera.

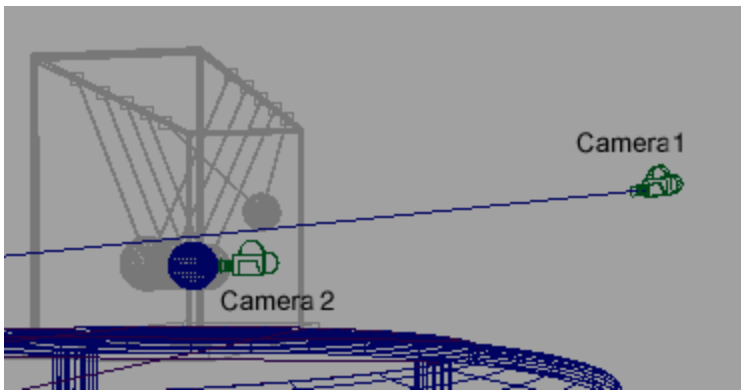
STEP FIVE

In your persp view, **Select** the **camera** and open the Attribute Editor and set a narrow **angle of view** to around **20**. This will decrease the distortion around the edges. Switch to the new camera view and select **View > Camera Settings > Resolution Gate**.



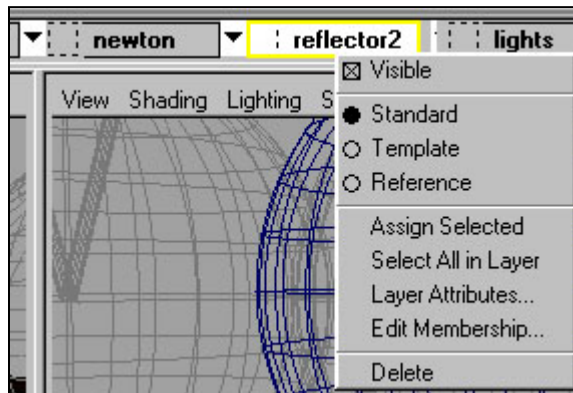
Set up a two panel view where you can see the persp and camera2. **Position** your camera in the persp window so that the ball touches all four sides of the resolution gate of camera2. It is important to keep the camera parallel to the ground so that it looks straight at the reflector. Make sure there is no **Y rotation** on the camera.

Batch Render the image.



STEP SIX

In your scene it is a good idea to put the camera and the chrome ball in its own layer so that you can hide



them and come back to them later if you need to.

Make sure your layer bar is shown by selecting **Options > Layer Bar**.

Create a new layer. Name it *reflector*. **Select** the camera and the chrome ball. In the layer bar move your mouse over the reflection layer, click with your right mouse button, and select **Assign Selected**. Again with your right mouse button, select **Visible**.

This will hide the camera and chrome ball so that it does not clutter your scene.

STEP SEVEN

In the Hypershade window, select the *reflector* shader you made and select **Edit -> Duplicate -> Shading Network**. **Rename** the material to *reflection_color*. In the

Attribute editor, click on the **Map** button beside **Reflected Color**. In the Environments Section, select **envBall**. In the Attribute Editor window, Click beside **Image**, and select **File** in the Create Node Window. In the Attribute Editor for the **File**, click on the folder beside image name and **Select** the image *reflection.iff*. By default, this image will be located in the images folder in your project directory.



NOTE: Many times reflections are not perfect, to achieve a blurred effect, import the file into a paint program to add some blur. For the final animation, the file was blurred slightly.

STEP EIGHT

At this point you should see the material node updated in the Hypershade. Notice that the color is not changed but enhanced when you add the effect of reflections.

Untemplate the *Newton* layer by selecting it and using the right mouse button to click on **Standard**.



Assign the new material to the *balls* layer.

STEP NINE

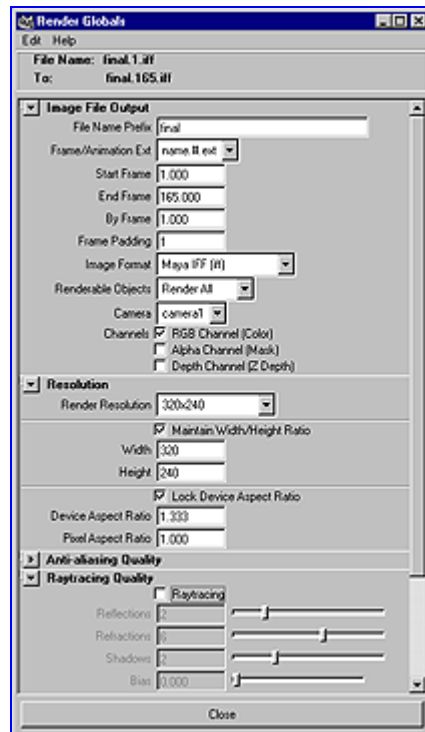
In the Render Globals, turn **Raytracing** to **Off**.

Rename the final

render.

Set your **Frame/Animation Ext.** to start at **frame 1** and end at **frame 165**. Pick the **camera1** as your renderable camera.

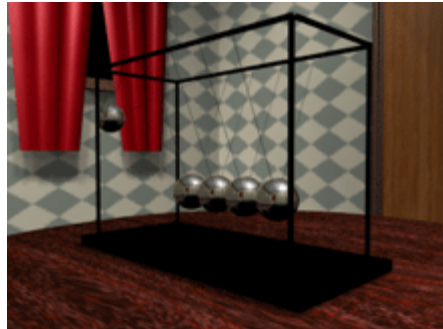
You are now ready to **render** the scene.



CONCLUSION

[Final Animation](#) [MPEG 800k]

By using the ball method to create a reflection map you can save on total render time when rendering multiple frames for an animation. While this may not work in all cases, it does offer an alternative to raytracing a scene.



You could also use different resolutions for your ball image depending on the size of the object and the distance from the camera, but generally you'll want to keep the resolution at either **256 x 256** or **1024 x 1024**. In the final animation the shading samples have been increased to 4 instead of 1. This helps to reduce some flickering that was encountered when the final animation was rendered.

Take a look at the following [examples](#) for rendering an animation of 165 frames on a Pentium III with 512 megs ram.

- Scene using reflection mapping. Time: **1 hour 28 minutes.**
- Scene using selective raytracing only on the balls in the pendulum. Time: **3 hours 19 minutes.**

One thing to keep in mind is that reflections are used to enhance realism and most times you only need to see general contrast and shapes to produce the effect of a true reflection as more often than not the viewer is concentrating on the animation rather than reflections.
