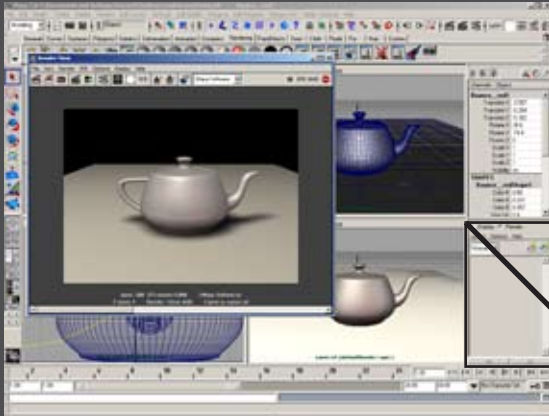


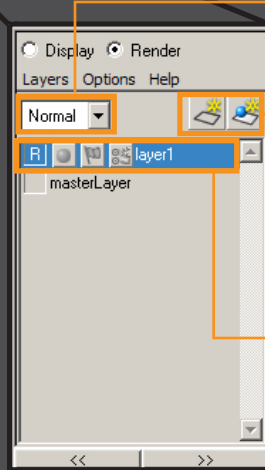
# Rendering in Layers | A quick overview



Maya's render layer system the primary use is to render out separate passes for compositing. These passes will usually be some combination of beauty, specular, diffuse, shadow, reflection, occlusion, depth. Let's get started on location and standard option overview shown below. Render layers can be found in the channel box, where display layers is located. Simply select the radio button "Render" and here we create our layers and set our options. Any extra information you would like not covered here simply seek the Maya help docs.

## Presets

Right clicking on a layer will bring up some options like adding, or removing, a selected object from the layer, etcetera. With any process in 3D there are multiple ways of accomplishing the same goal. For the purposes of this info sheet the simple method will suffice. To specify the type of render pass we would like this layer to be simply **Right Click** on the layer **Find Presets** and select the **Type of Pass** you would like to have. These are standard layer passes and each option is explained below. These explanations have been taken from the Maya help file, with some added notes by the author



"Blending Mode" : Per layer attribute that allows the renderer to composite multiple layers during a render based on method selected. Much like photoshop's layering, the idea is the same. To see a composite of multiple layers select Options->Render All Layers->Option Dialog

"Create new Layer" : 1st buttons creates an empty layer. 2nd button creates a new layer and assigns selected objects to the new layer.

"A Layer with per layer overrides"

1st box: "R" specifies whether the layer is renderable.

2nd btn: Material override

3rd btn: Render Stats such as visibility or pass options like specular, shadow, etc. Clicking the FLAG button also allows users to specify, among other things, the type of render pass to be performed. However unlike a preset which can change material, render settings, etc, needed for a specific type of pass like occlusion, the only render pass options are the standards like Beauty, Color, Shadow, Diffuse, Specular, everything else like the type of renderer needed are left to the user to specify. See Render Pass Breakdown below.

4th btn: Render settings for this layer, if no options are overridden then global render settings are used.

Then the name of the layer. Double click to change. Right click to bring up more options.

"Luminance Depth" : A grayscale render based upon the depth (distance) from the camera. This produces an antialiased grayscale image for use in determining depth priority in a compositing application.

"Geometry Matte" : A color version (black and white) of geometry's alpha or silhouette. Also known as a Mask. The Geometry Matte does not respect transparency information, as can be seen in this example (the car's windows are transparent). Only use if needed use the alpha from a color (diffuse + specular), diffuse, or beauty pass.

"Occlusion" : Uses the mental ray renderer to produce an open sky-type render. Other names for this type of pass are Fake GI or Dirt shader. This pass works well with a white background..

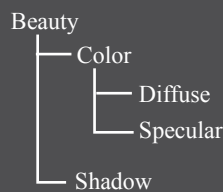
"Diffuse" : Only diffuse shading is performed (that is, no shadow or specular information). The diffuse pass contains the diffuse and ambient information and is modulated by color, transparency, and Diffuse Coeff (diffuse coefficient).

"Specular" : Only specular shading is performed. No mask or alpha channel is produced for the Specular Pass; therefore, additive compositing of a specular pass is recommended. In shake or photoshop use screen.

"Shadow" : Produces only the shadow component of the image in the alpha channel. No color information is produced.

*The Selected layer will render into the image viewer. In order to render and save every layer pass you will need to batch render the scene.*

## Render Pass Breakdown



A Beauty Pass basically is a full render of the scene

A Color Pass renders the Diffuse and Specular, with no shadow.


A Shadow Pass renders only the shadow which is found in the alpha channel

So say for instance you wanted to render out an object's shadow separately, but you don't want a separate diffuse and specular. You would then set up two layers. Select the first layer and specify shadow, select the second and specify color.

To help facilitate quick usage of Render Layers I suggest setting all render settings before adding any new render layers. Additionally, I would also group all objects, lights, cameras currently in your scene and take out remove items form the layer if they are not required for the specific pass/layer. Another tip is to set the Image File Outputs name prefix to %s/%l which is basically the scene name with the folder of the layer name, keeps things organized when batch rendering.

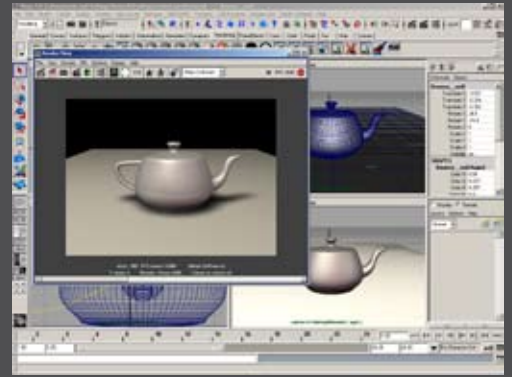
Now lets set up a common rendering situation where a single object needs multiple passes for compositing.

## Rendering in Layers | Quick Workflow

1. Build a standard scene with an object, floor, camera, some lights, and a reflective/specular material. Anything will do. The idea is that I want to composite this teapot onto a table in a match to live situation, thus I want control over all my render components i.e. Diffuse, Specular, Shadow, etc..
2. Select all items in your scene including the render cam, lights, and objects then group them. Name the group something like "Scene".
3. Set your rendering global's under the common tab set File Name Prefix to %s/%l then set all other relevant options. Select your renderer be it Maya, or Mental Ray, adjust settings to your needs. Remember to turn on ray tracing if you are using reflection or ray traced shadows. Test render and make sure the look is close to final. If not final make any major changes before proceeding. *(Any changes made later will be reflected in any layers created as long as the property being changed doesn't turn orange, which means a layer specific override)*
4. Select the floor, open attribute editor, under the shape node tab drop down "Render Stats" uncheck "Primary Visibility". *Since we plan to only composite the teapot and do not require the floor expect to reflect and catch the teapots shadow we will need to remove the floor object from the alpha channel before creating our render layers. This way we will only have to make one layer override*
5. Open outliner select the "Scene" group. Then in the channel box switch from Display to Render.
6. With the scene group selected press the "Create New Layers and Assign Selected Object" button  3 times
7. Double click "layer 1" rename to "Diffuse". Right click same layer then select "Present" -> "Diffuse".
8. Double click "layer 2" rename to "Specular". Specify the specular preset. Set the blending mode to "Screen" (the little drop down box below "layers")
9. Double click "layer 3" rename to "Shadow". Specify the shadow preset. Set the blending mode to "Multiply". Now our only layer override. Select the floor and bring up the attribute editor. Under "Render Stats" check "Primary Visibility" it should turn orange signaling a User Specified Layer Specific override.
10. Under "Options" menu select and check "Render all Layers". Make sure all four layers are renderable except the Master Layer.
11. Click Render. Maya will now build a composite rendering of all the render layers into the render view. If you would like to only render the selected pass then uncheck "Render all Layers" found under the options menu.

If you would like to see your floor in the render, for testing purposes of course, select the diffuse render layer, then select the floor object, open up attribute editor, and turn on primary visibility. Now the floor will render and you can continue to work. Remember to turn off the floor when batch rendering the scene for compositing the teapot.

This same workflow applies to creation of any layer type such as Occlusion and Luminance.



When you are ready to do a full blown render...simply batch render. Since we specified our naming conventions at the go all passes will be put in the appropriate folders in your project directory.

Any change you make throughout the scene from now on will reflect in all the render layers. Such changes could include object locations, light intensities, camera settings, etc. However, sometimes you may want to override lets say the intensity of a light in a specific layer, or the renderer the layer uses. Simple right-click on the attributes name and select "Create Layer Override" and any change you make to this attribute will only affect the current render layer you are working on. Right click to remove it

Also, remember any new item, camera, light introduced, will only show up in the currently selected render layer and the master layer. It will have to be added to all appropriate layers. Since we have a "Scene" group simply moving the object into the group will add the new item to all render layers. Setting up a workflow this way helps.

Remember there is allot to Maya's Render Layer system. Refer to the help docs for more information; there is a lot in there. This beginners workflow is the easiest way of getting your scene ready for pass rendering. In fact if you're crazy like me set up a mel script to do this for you. I have one.... best of luck.