Immersive Environments

Goals:

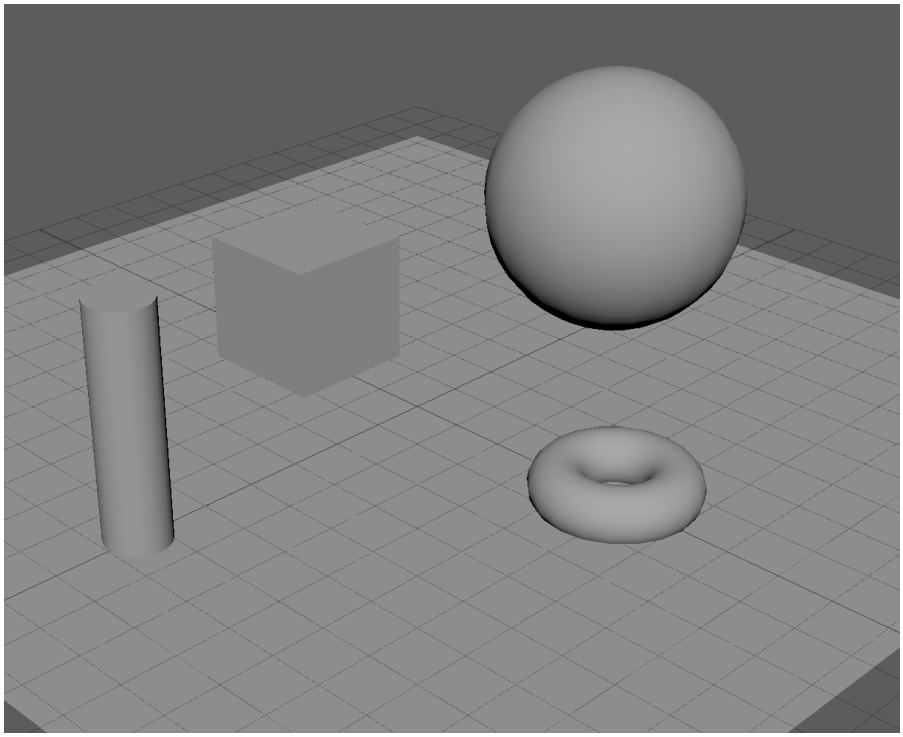
- Texturing

Load up Maya

Build Object: Primitives and Basic Texturing

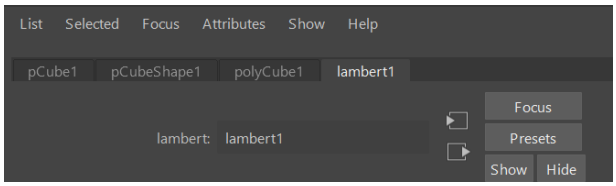
To start with, create a plane and add the following object son top of it, cube, sphere, cylinder and torus.

It should look like the following.

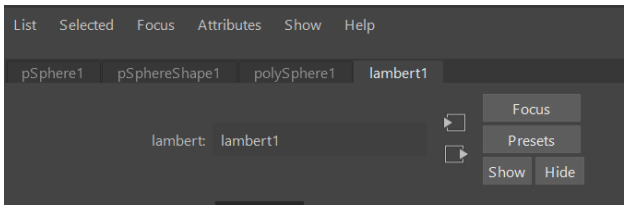


From here, click on the attribute of each primitive and notice that they are all linked to the same lambert for basic colouring.

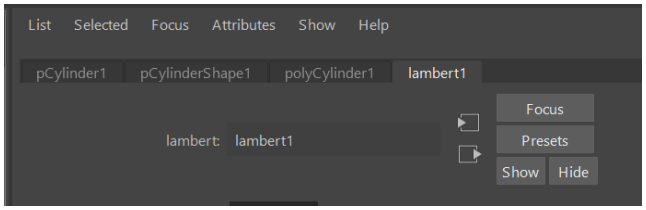
Cube:



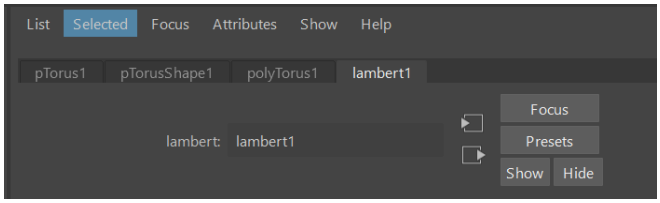
Sphere:



Cylinder:

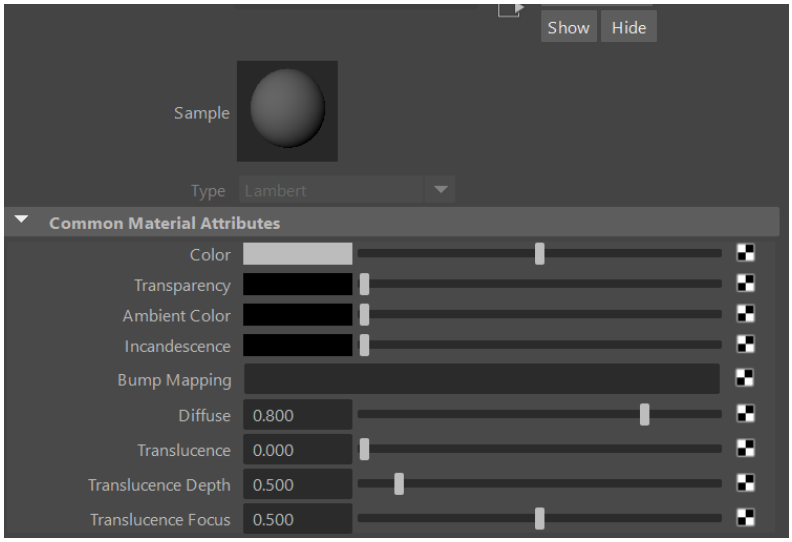


Torus:

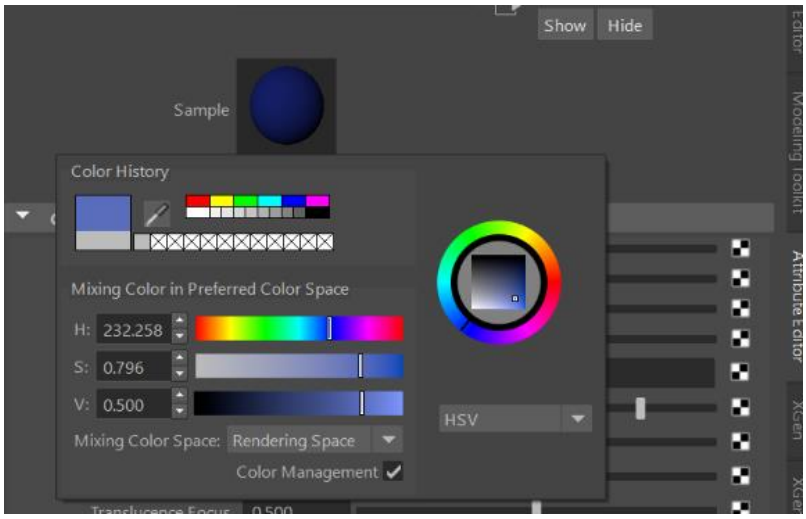


As such, if you manipulate the colours of the lambert1 then all of the primitives in the scene are going to be affected by this colour change.

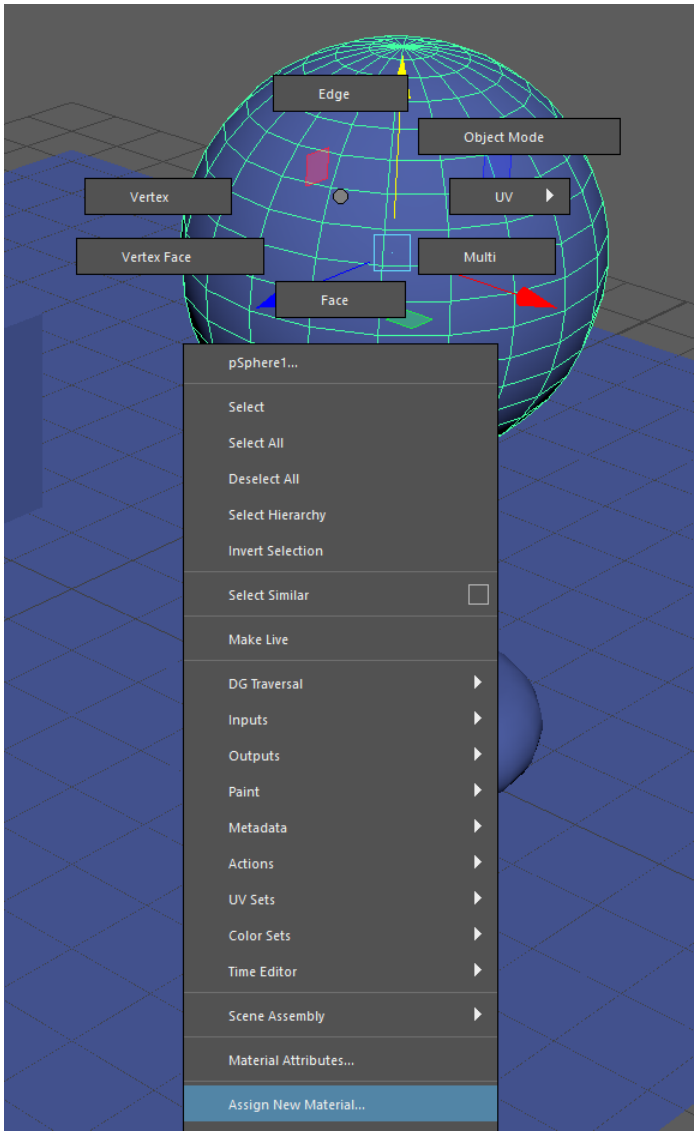
To modify the colour, we look at the common material attributes section



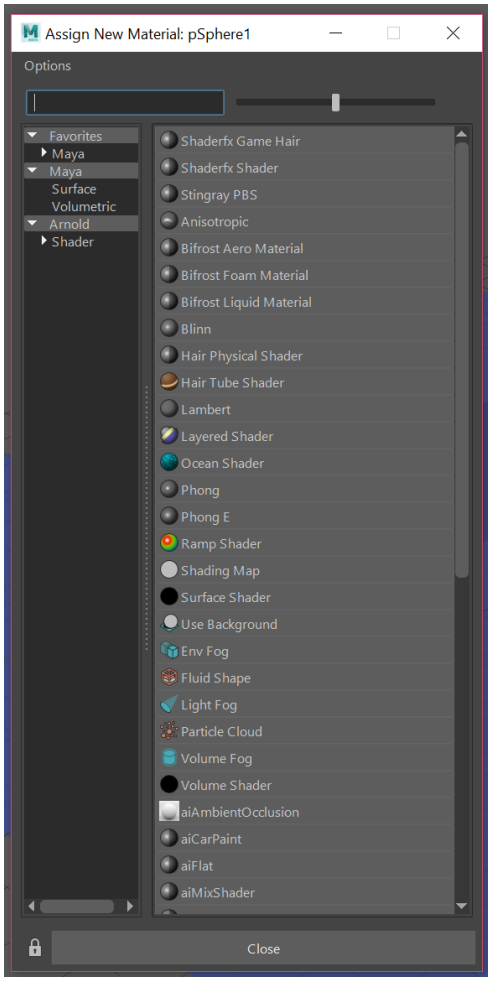
BY clicking on the actual colour, we can open a colour picker and change the colour.



The common material attributes also allow us to manipulate the colours attributes as well, such as the transparency, incandescence and translucence to name a few. So, we will play with them for a little bit, create a new material, by right clicking on the sphere and selecting assign new material

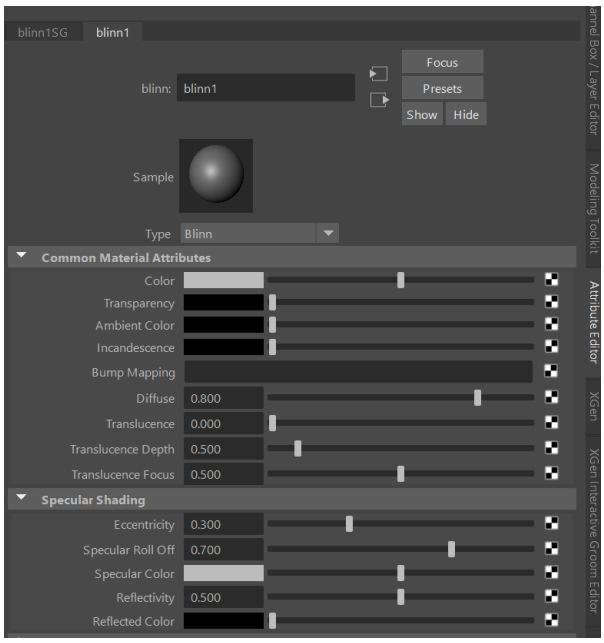


This brings up the following window



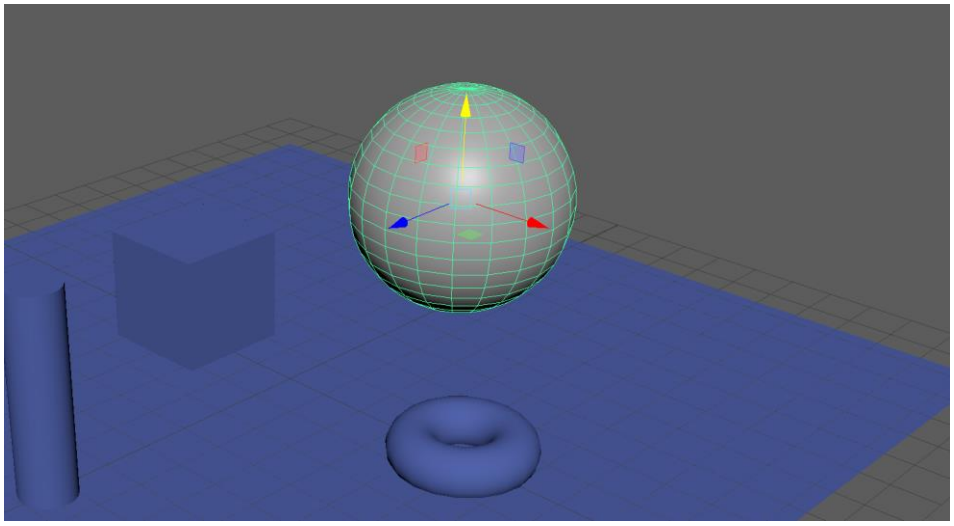
The main material types we use are Blinn, Lambert and Phong; these primarily as they are recognised by a majority of additional applications.

Select Blinn and then examine the attribute editor

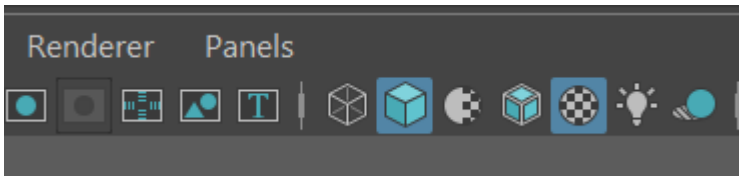


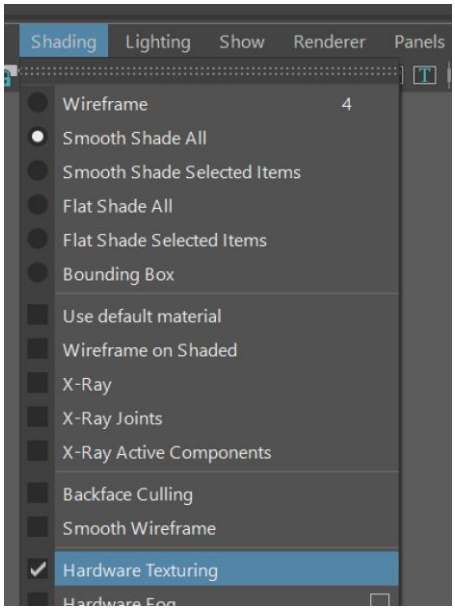
From here we have the ability to name our material, it current name is blinn1, on a fully realised scene, you will normally have a lot of materials, so getting into a decent naming structure and pattern will make modelling a lot easier.

In this case, we'll change the name to yellowBall, modify the colour to yellow. At first the scene will look like the following:



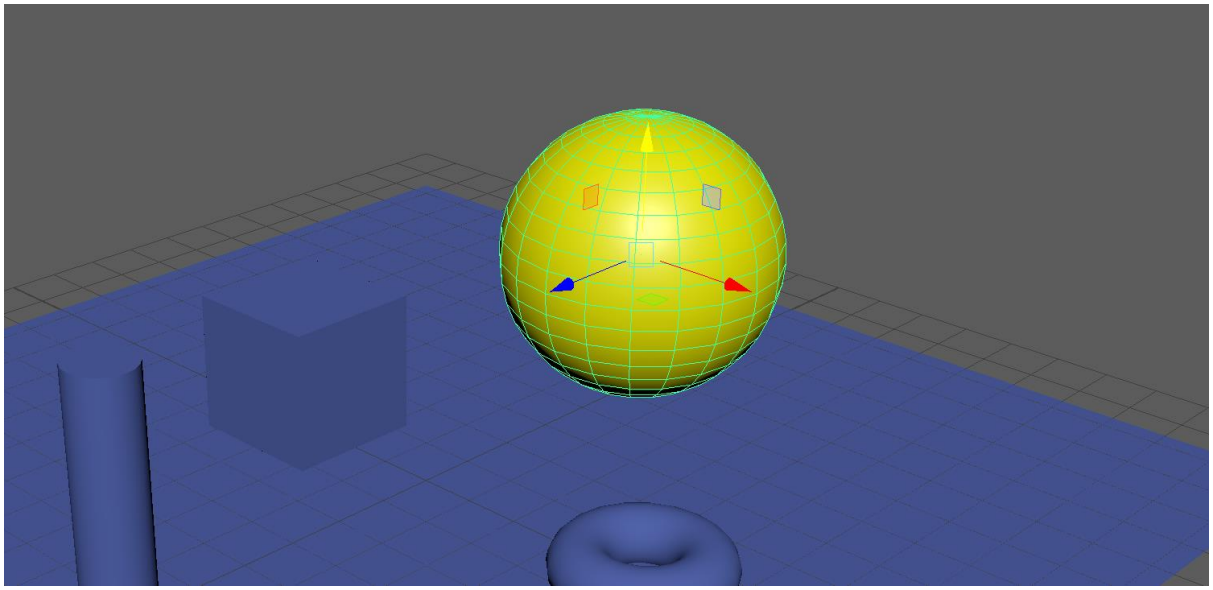
This is because we haven't turned on texturing. This can be done in two ways, you can click the checker pattern icon or go shading->hardware texturing



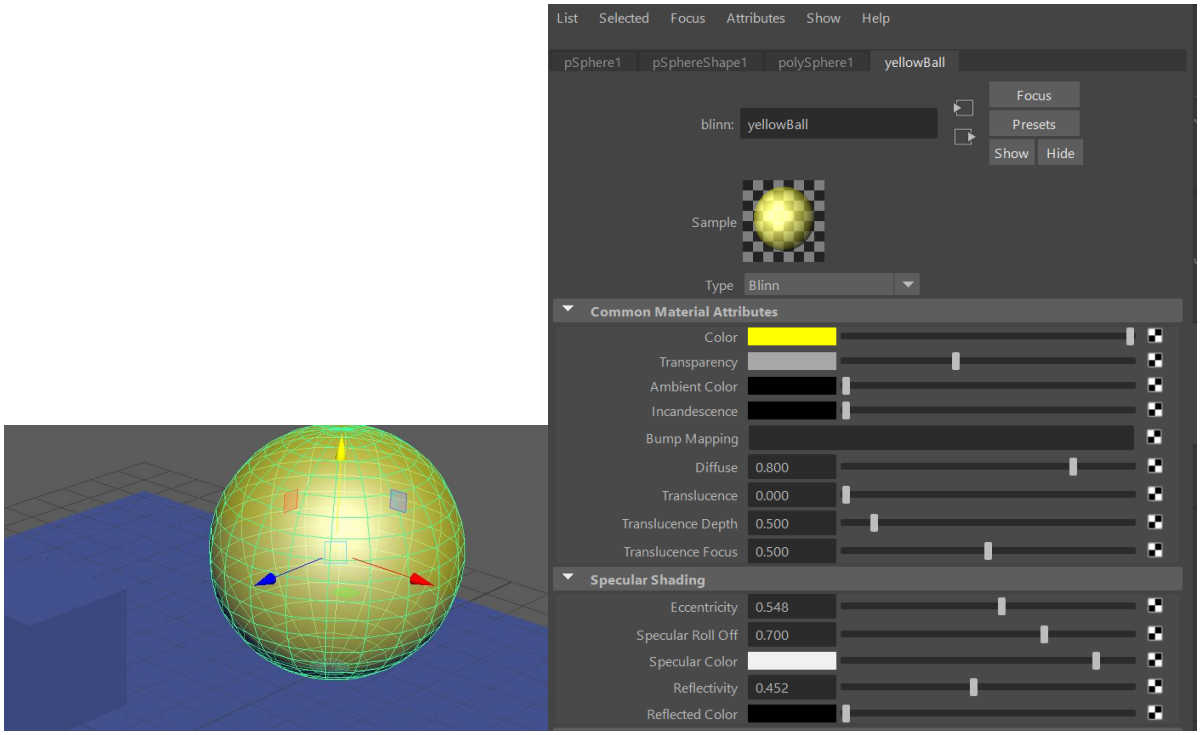


By activating texturing, you will see the colour changes and materials that get applied to primitives appear in the scene without having to render the object.

With texturing turned on, you should see the following scene.

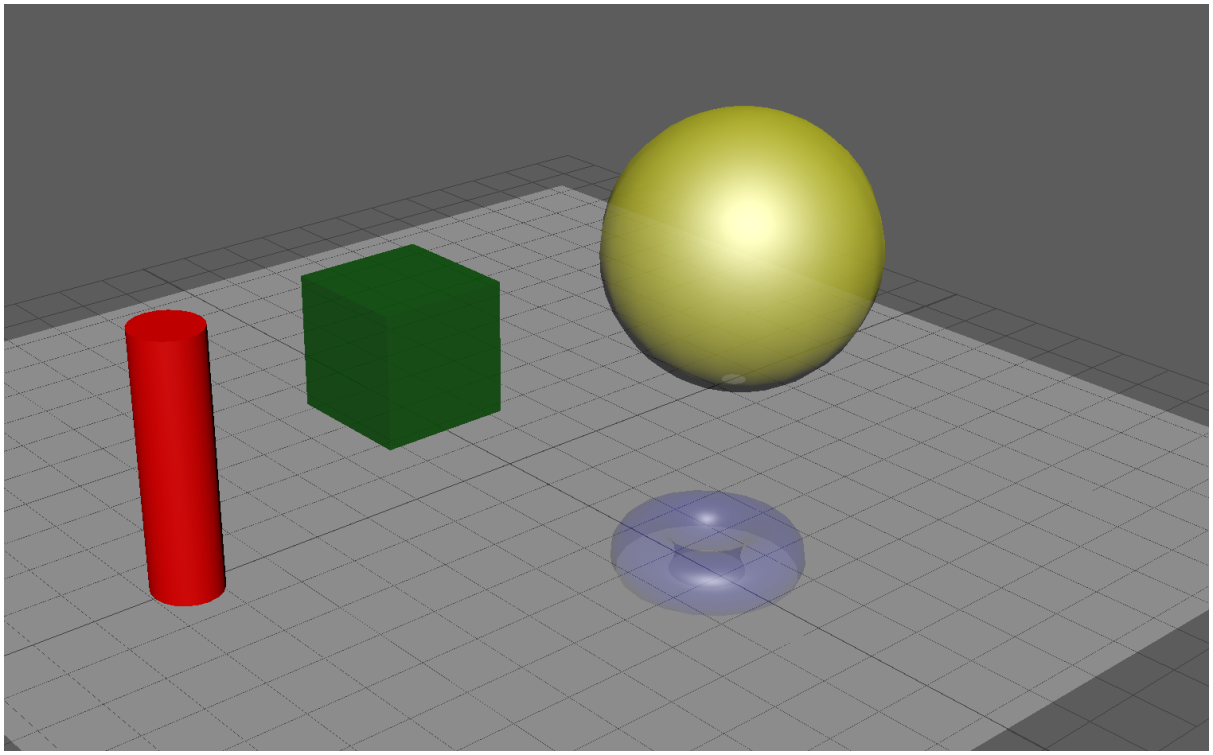


By manipulating the attributes, you can change the yellow sphere to look like the following:



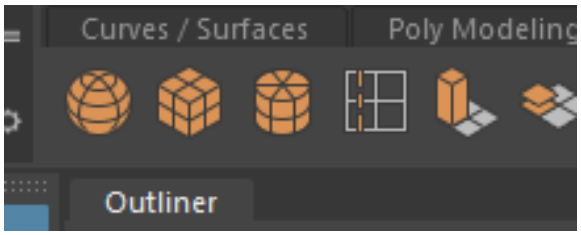
Apply the following colours to the other primitives:

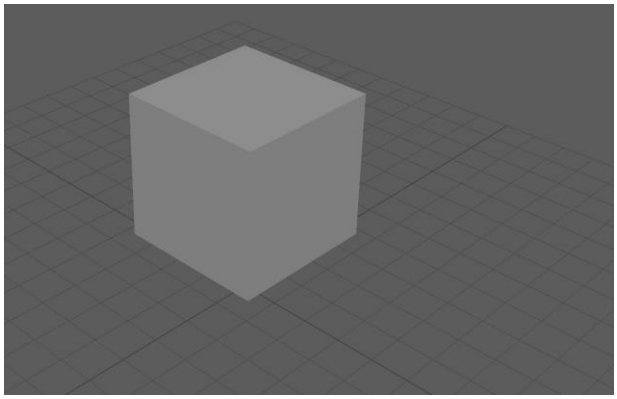
- Cube – Green, transparent
- Cylinder – Red
- Torus – Blue, transparent
- Plane – Gray



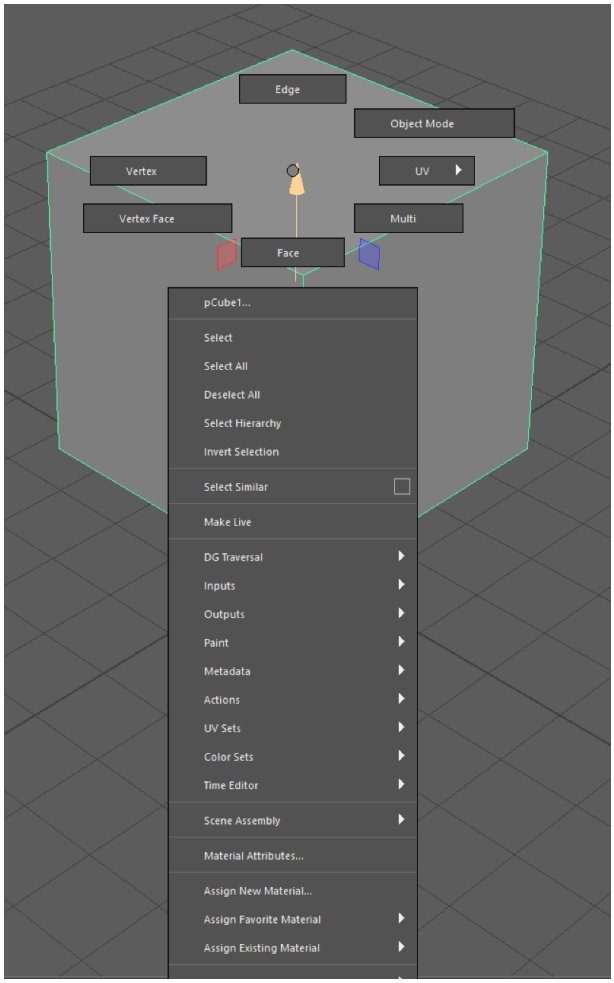
Build Object: Cube – Photoshop textures

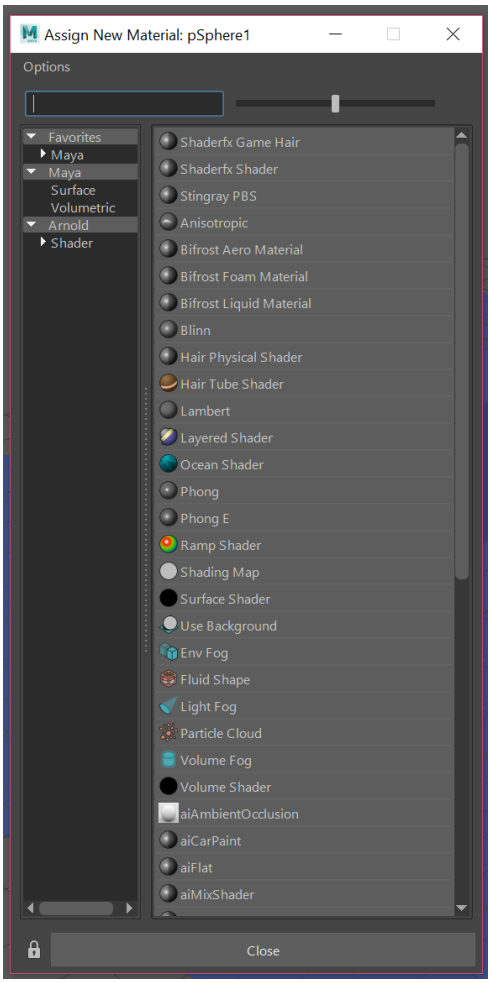
In Maya, create a simple cube and scale it up to see it easier.

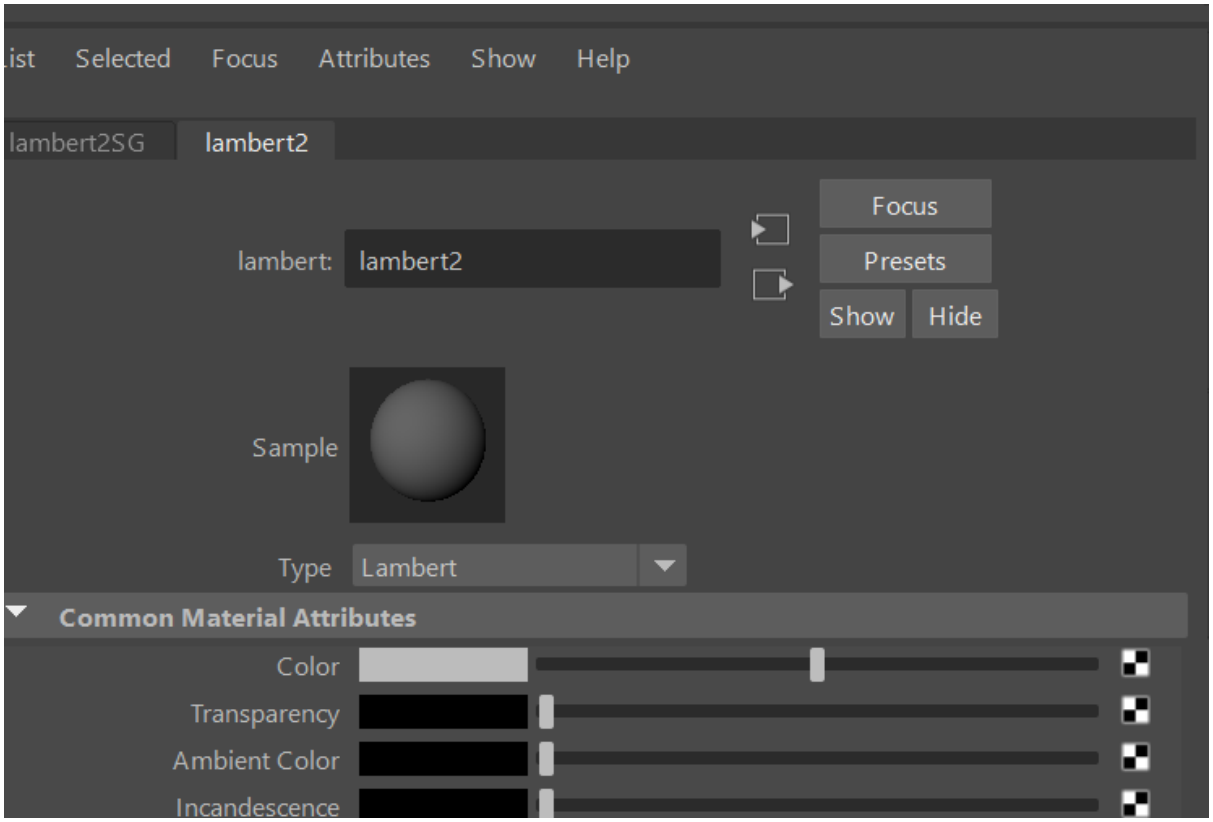




Next, assign a new material, i.e. a lambert


Edge
Object Mode
Vertex
UV
Vertex Face
Multi
Face
pCube1...
Select
Select All
Deselect All
Select Hierarchy
Invert Selection
Select Similar
Make Live
DG Traversal
Inputs
Outputs
Paint
Metadata
Actions
UV Sets
Color Sets
Time Editor
Scene Assembly
Material Attributes...
Assign New Material...
Assign Favorite Material
Assign Existing Material


Assign New Material: pSphere1
Options
Favorites
Maya
Maya
Surface
Volumetric
Arnold
Shader
Shaderfx Game Hair
Shaderfx Shader
Stingray PBS
Anisotropic
Bifrost Aero Material
Bifrost Foam Material
Bifrost Liquid Material
Blinn
Hair Physical Shader
Hair Tube Shader
Lambert
Layered Shader
Ocean Shader
Phong
Phong E
Ramp Shader
Shading Map
Surface Shader
Use Background
Env Fog
Fluid Shape
Light Fog
Particle Cloud
Volume Fog
Volume Shader
aiAmbientOcclusion
aiCarPaint
aiFlat
aiMixShader
Close


ist
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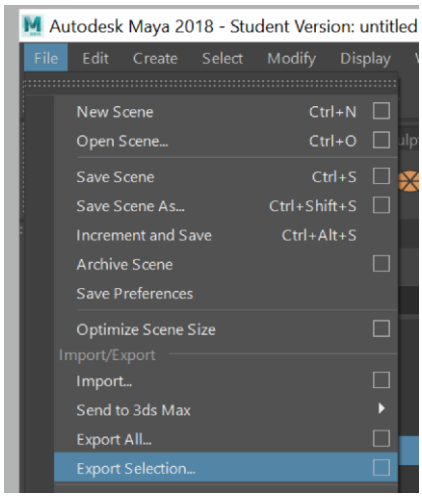
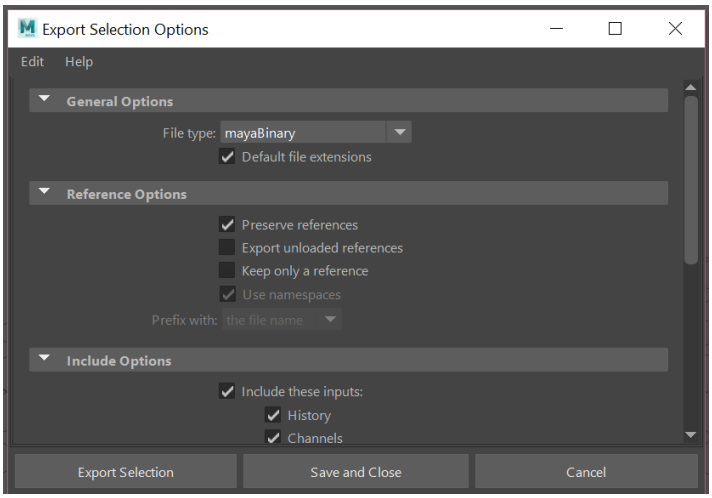
Lambert
Common Material Attributes
Color
Transparency
Ambient Color
Incandescence

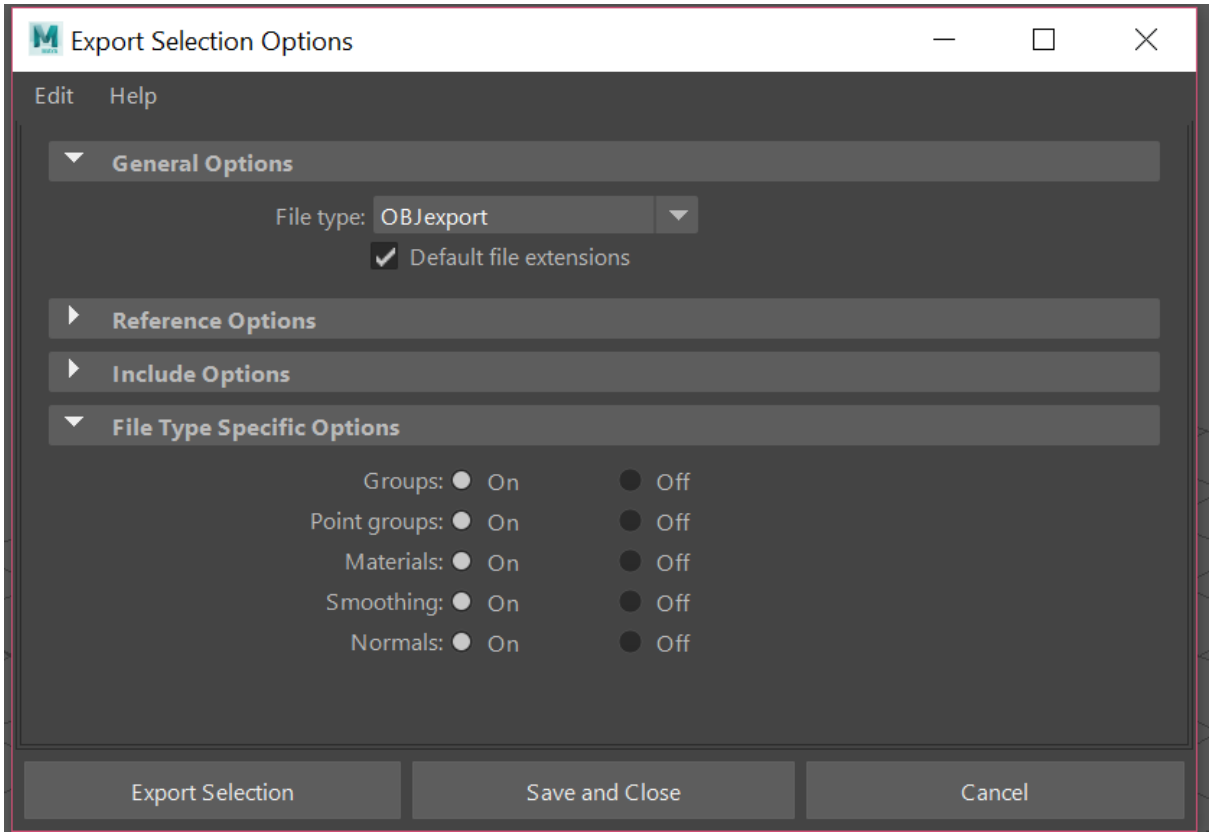
From here, we will export the lambert as an object, so we can load it up into photoshop and then manipulate it as needed.

To export, go to file Export Selection, but click on the box next to the words, so we can check the settings.



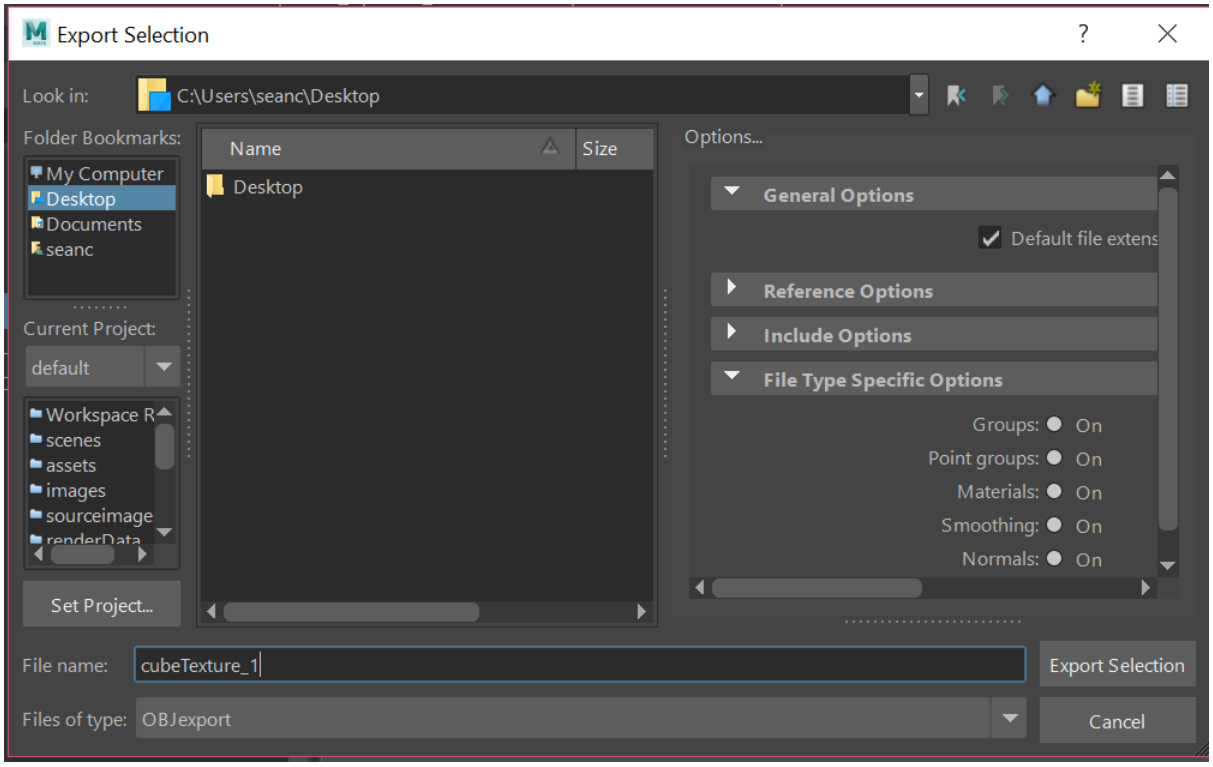


Notice in the default window, the file type is mayaBinary which is not the file type we want, so we need to swap the file type over to OBJExport



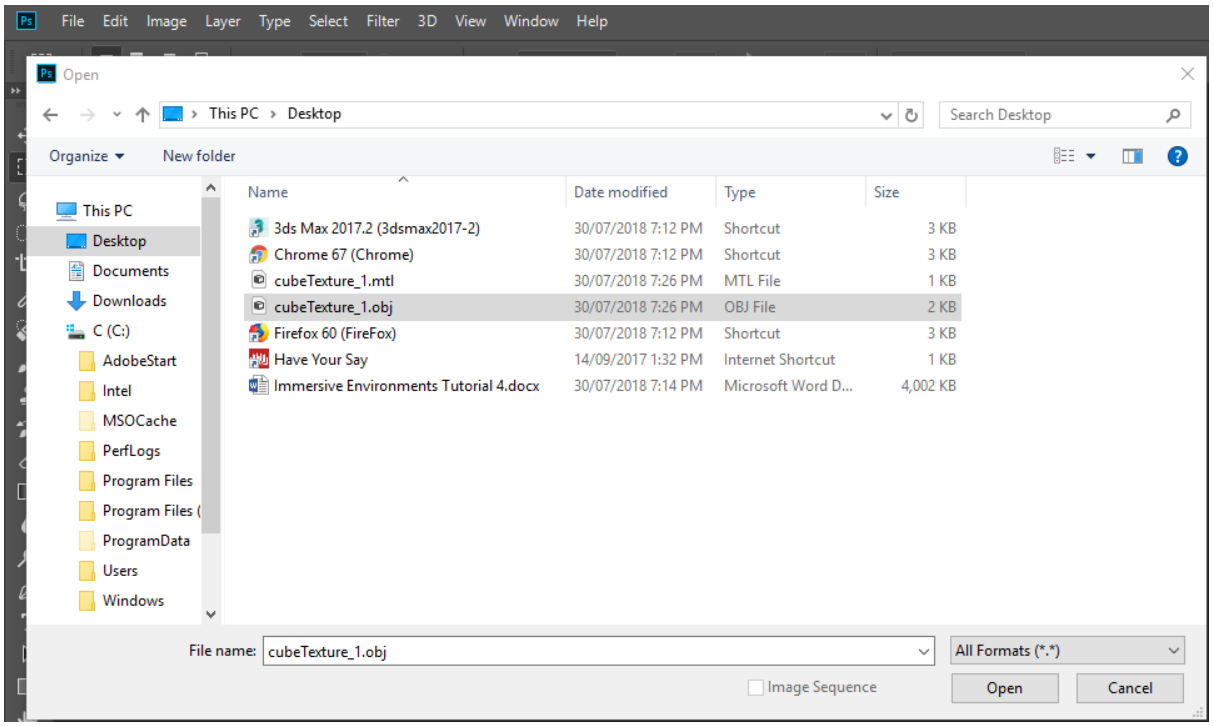
From here, click on Export selection.

Save the file to your desktop for ease of locating. Give it a name you will recognise.

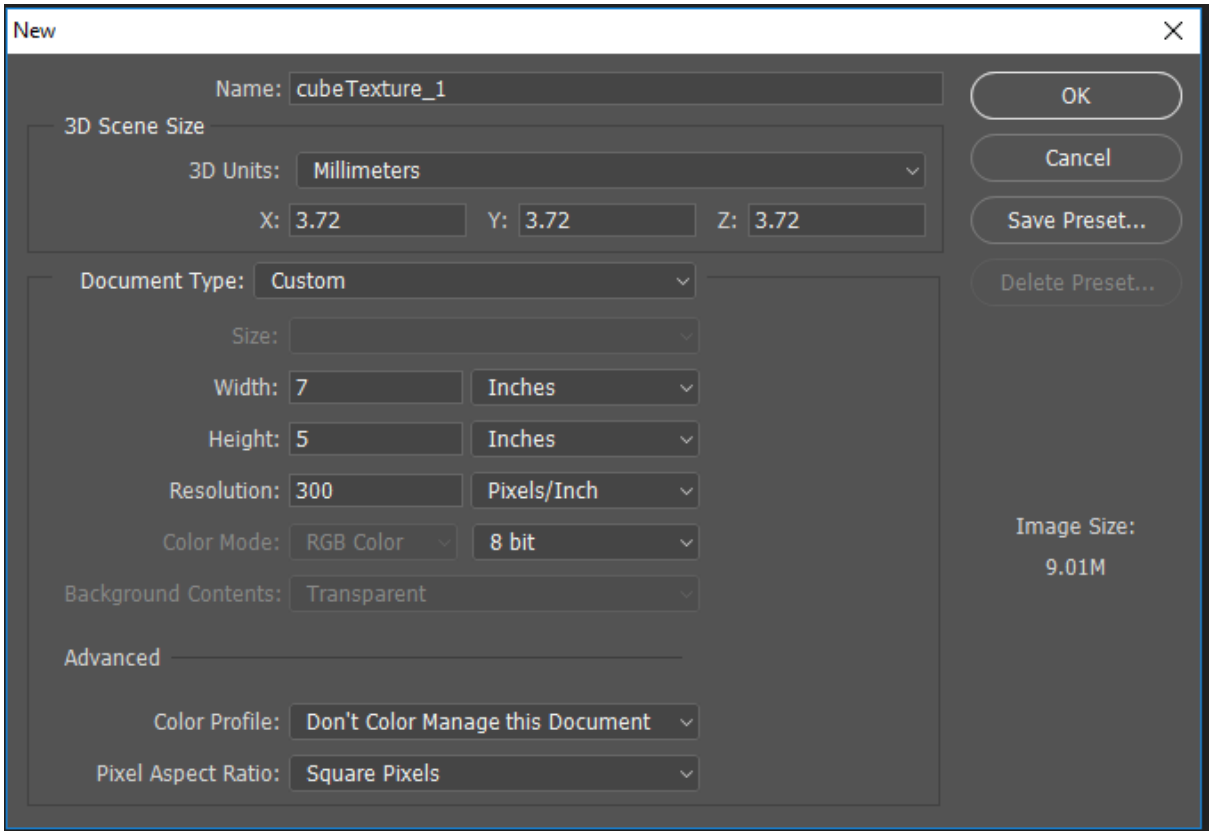


Then we go to photoshop.

From photoshop go to file-> open, locate the obj file and click on open

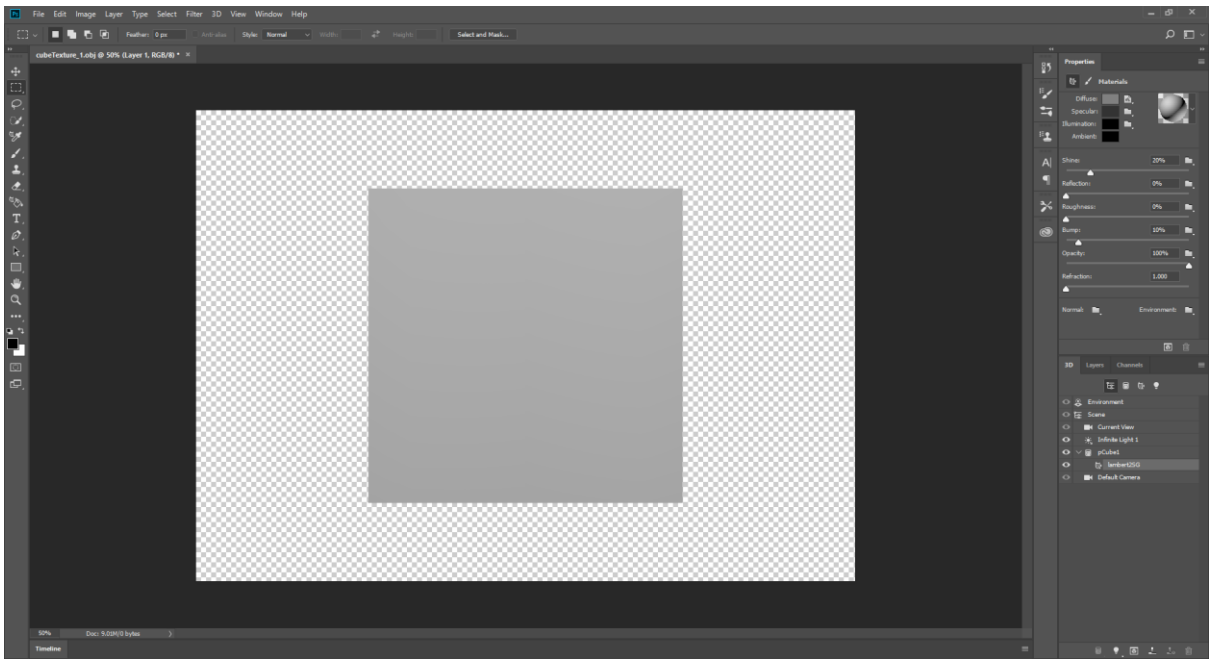


This leads to the following window:

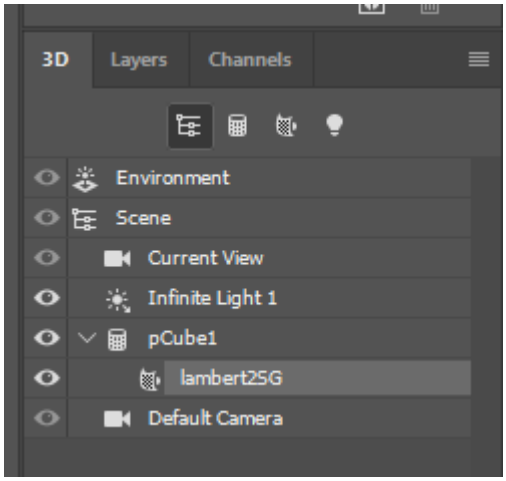


Just click yes and proceed to the 3D environment that photoshop has.

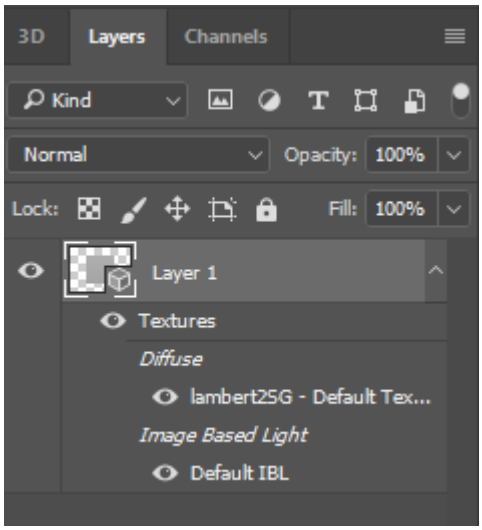
This should give you the following screen



From here, it doesn't look like much, but our primary concern is the menu system in the bottom right, if you examine the tabs on offer, there is 3D, Layers and Channel.

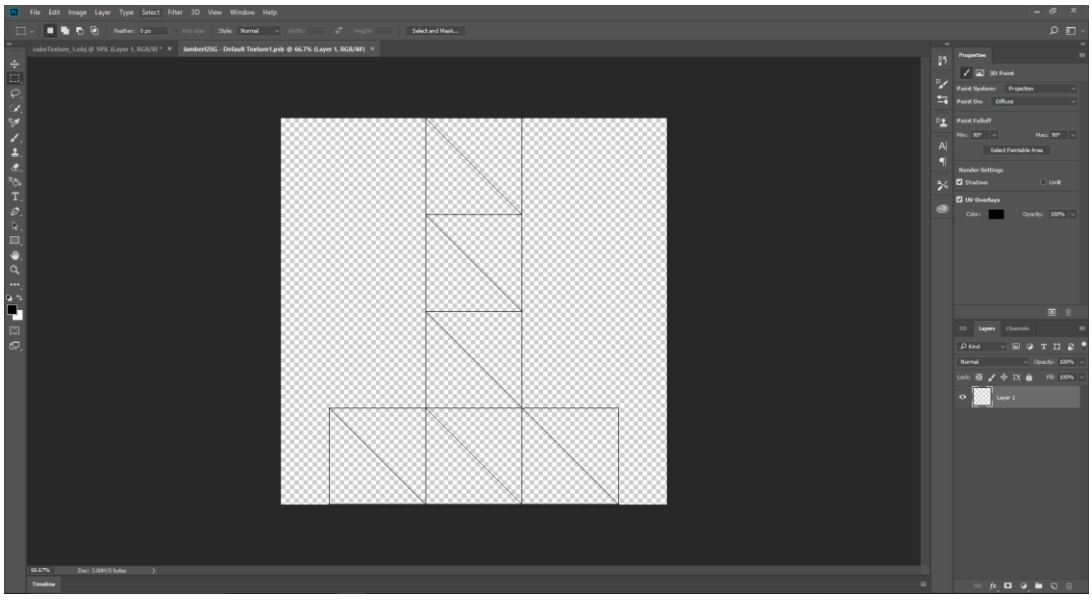


Select Layers, you will see the following



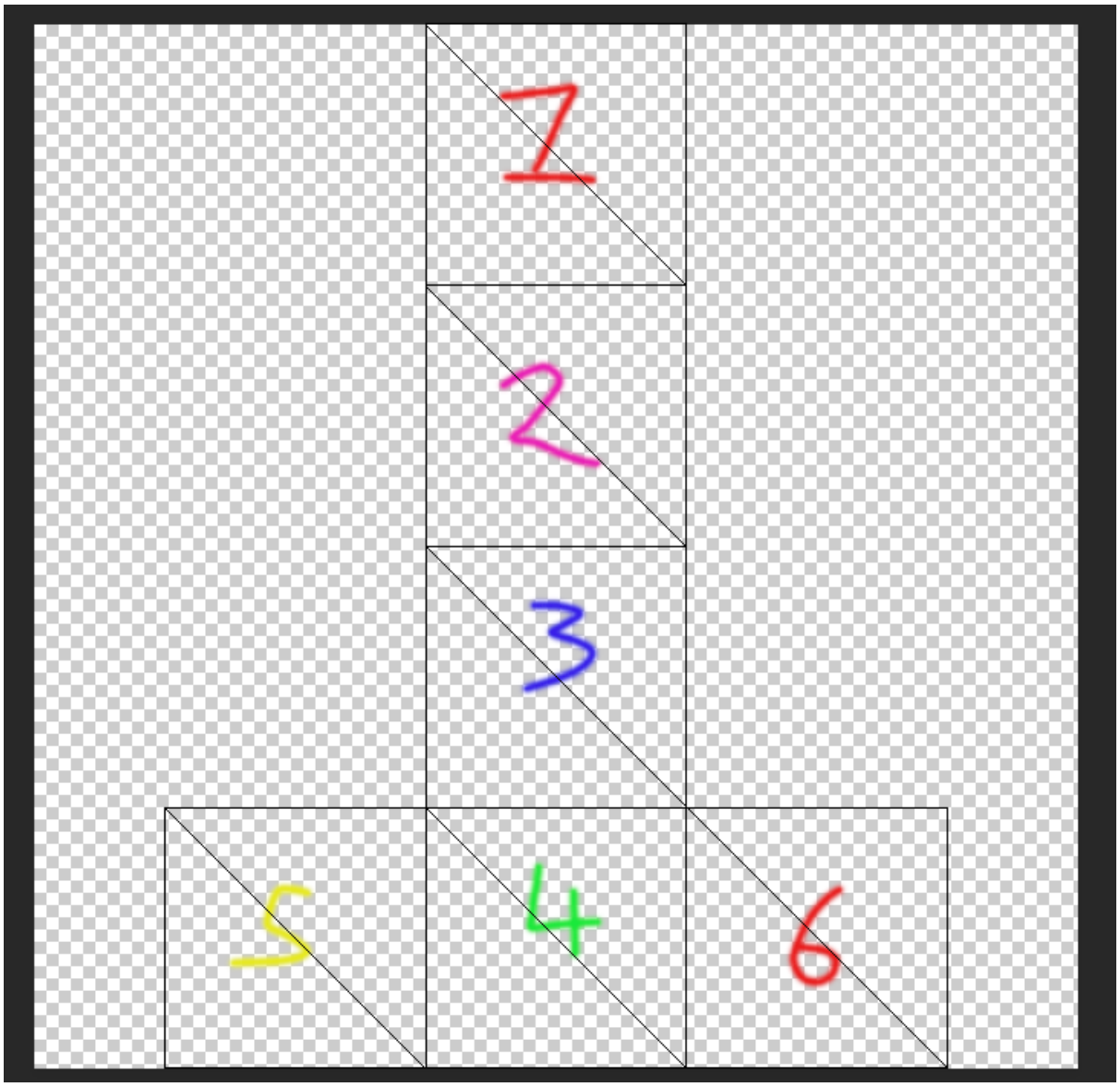
Notice the name that has been given to the lambert we applied to the cube, from here, double click the lambert2SG- Default Texture.

This will open up a brand new tab in photoshop, you should see the following:



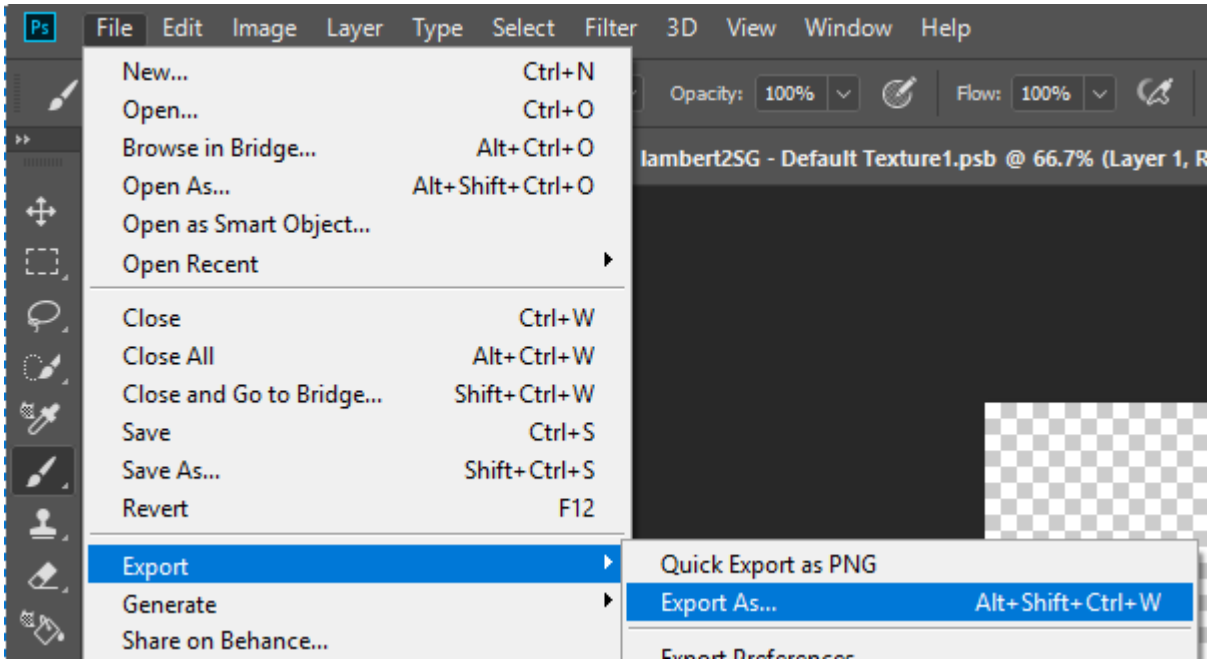
This new screen, has broken down the cube into the 6 boxes that make up the side, from here, you can colour and import images onto each of these sides. Grab a normal brush, then apply a mark to each of the cubes sides in a different colour.

In this case, I just placed the numbers 1-6 on the faces.

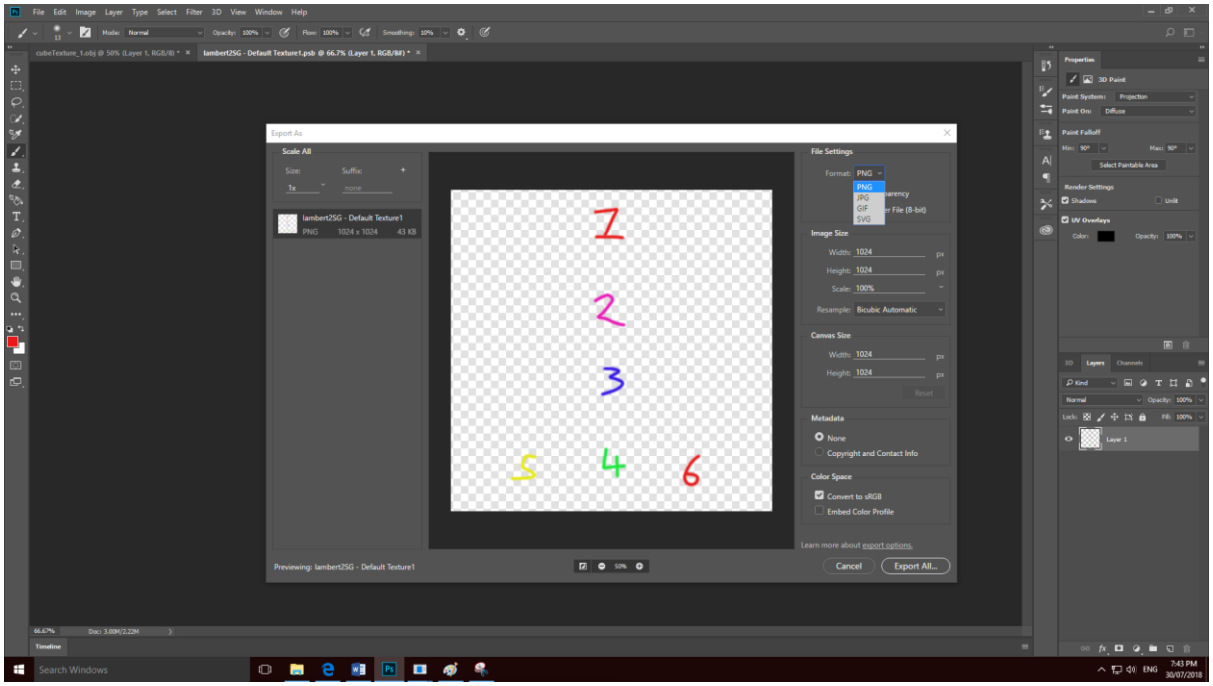


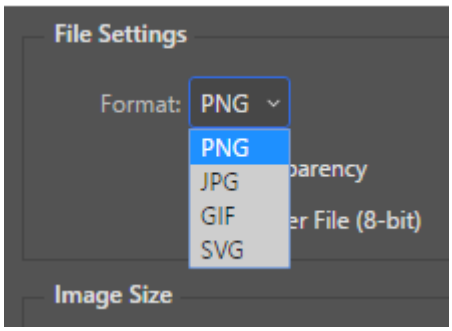
From here, there are a multitude of ways to get the image out for our model. In this case, what we will do is export the image.

Go file->export->Export as

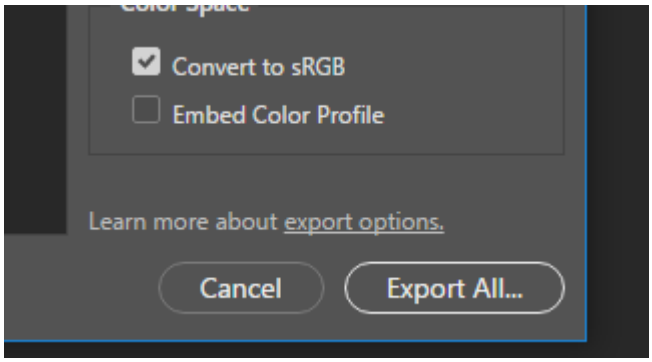


There are a few different formats that are presented with the next window, in this case we will stick with png for the transparency.

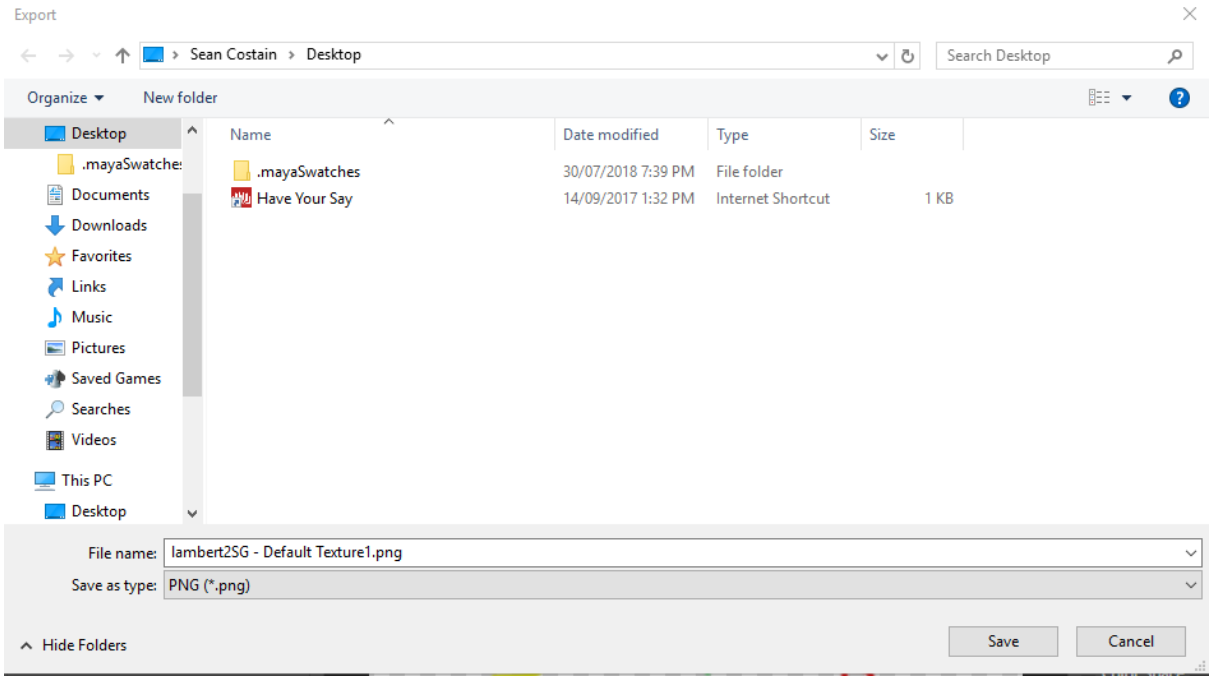




From here, click on the export all button

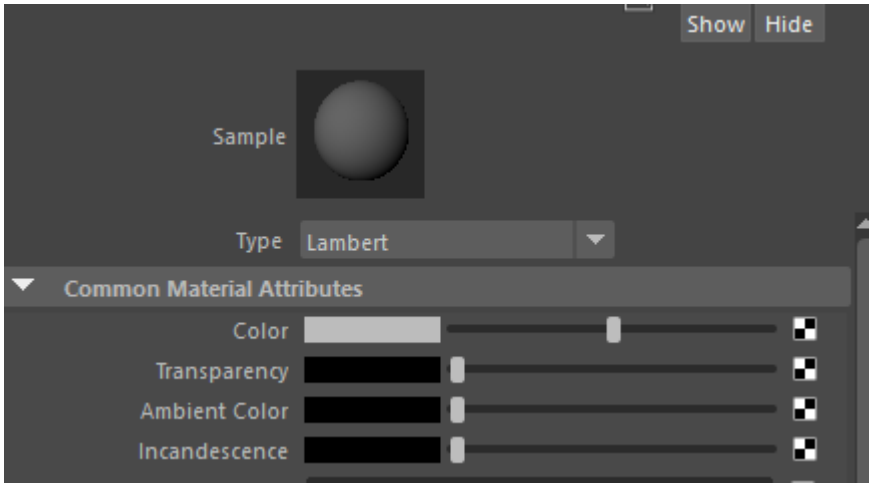


Save the file to a location you will recall, in this case I went with desktop.

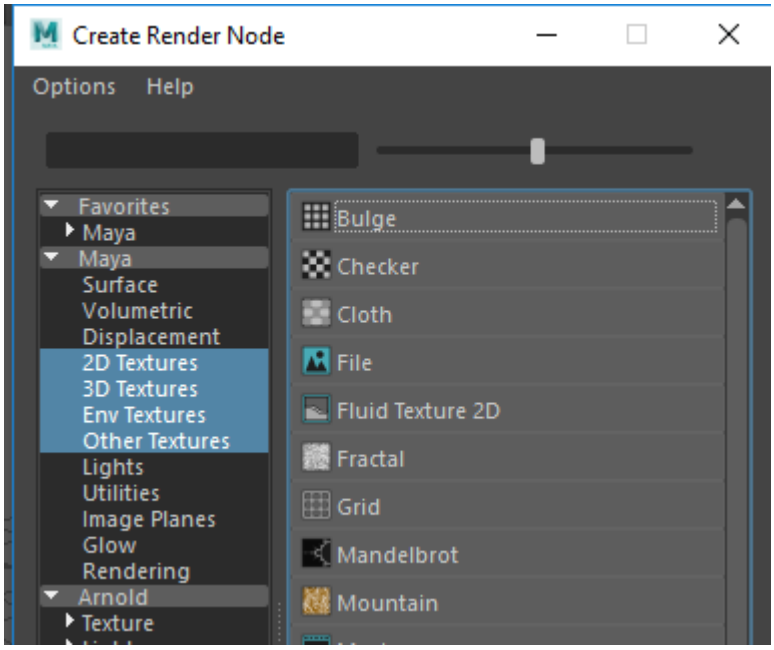


Save and then once that is done, jump back into Maya.

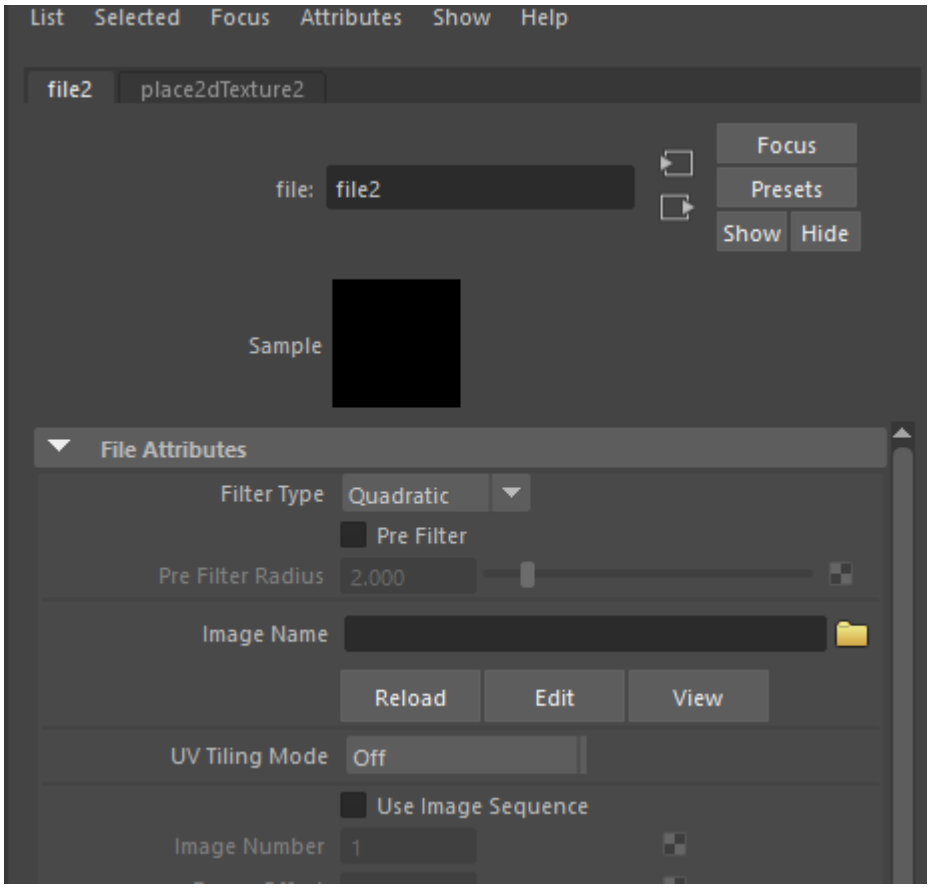
Ensure that you get to the lambert section of the cube.



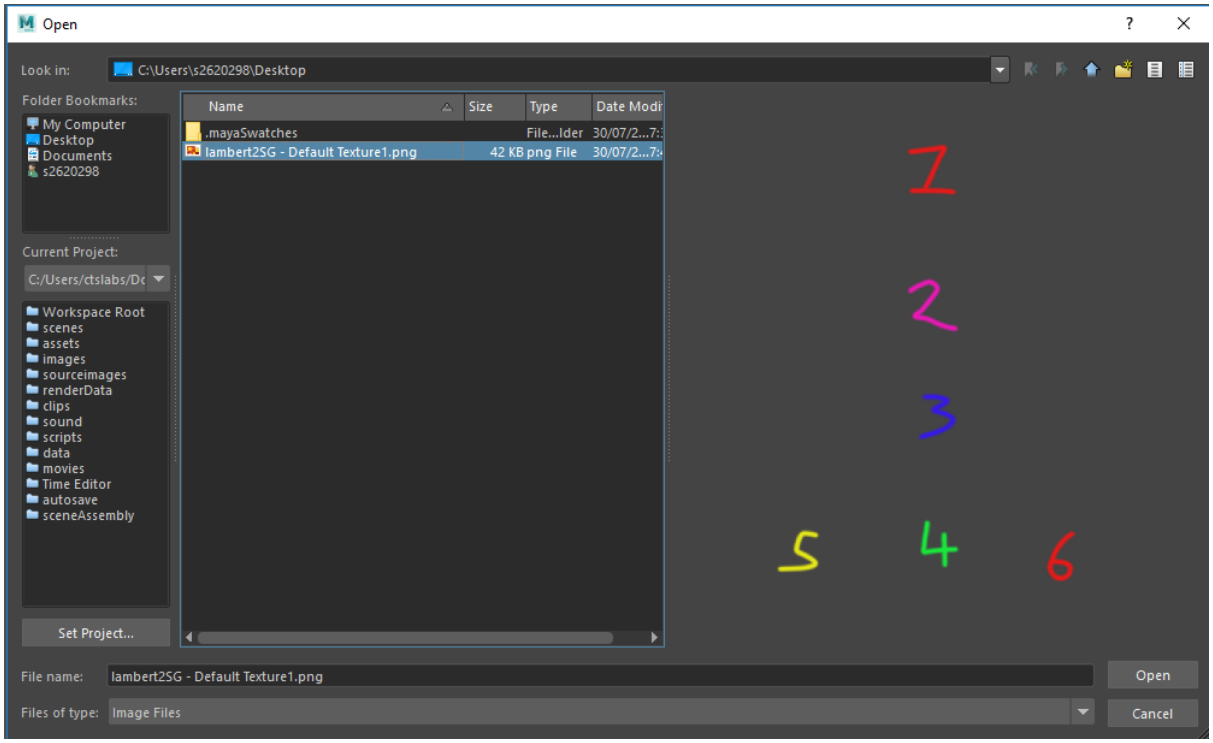
Next to the colour is a checker box, click on that. The following window will appear.



Select File, then look at the attribute area again.

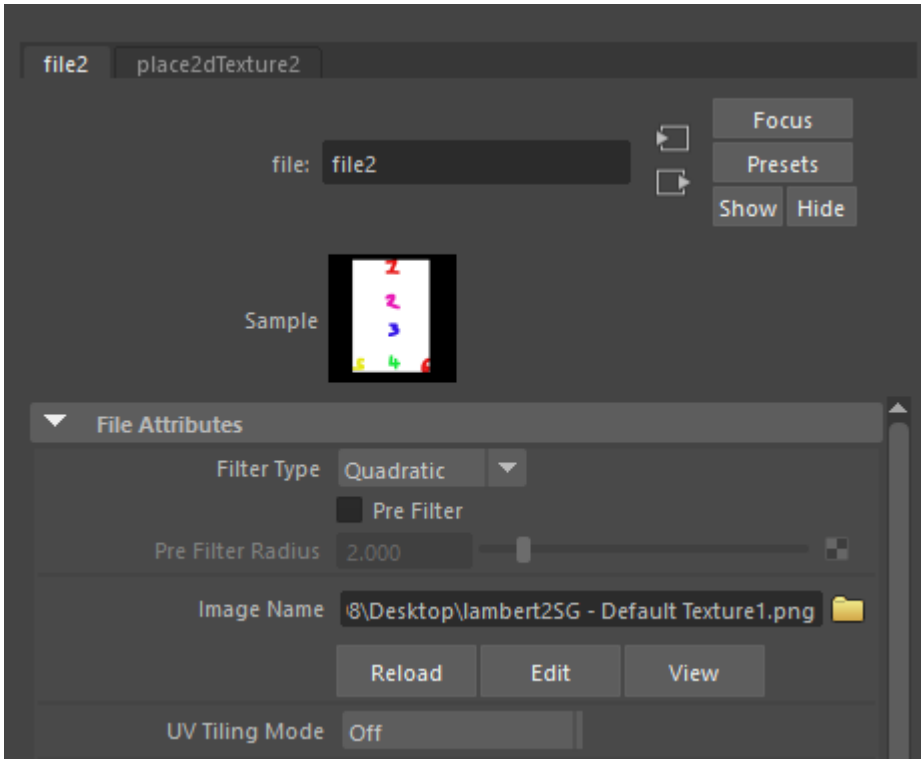


From here, select the yellow folder icon and then browse to the location you save the png file.

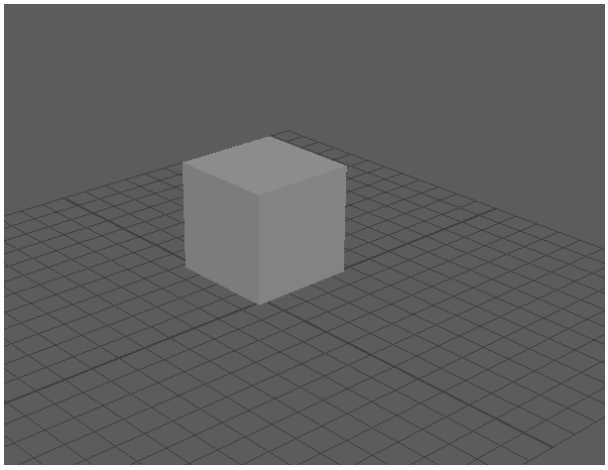


Click on open. Notice that the image is just the numbers, this is because the majority of the image was transparent.

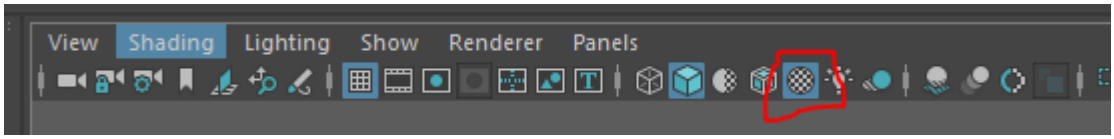
The attribute area will look like the following:



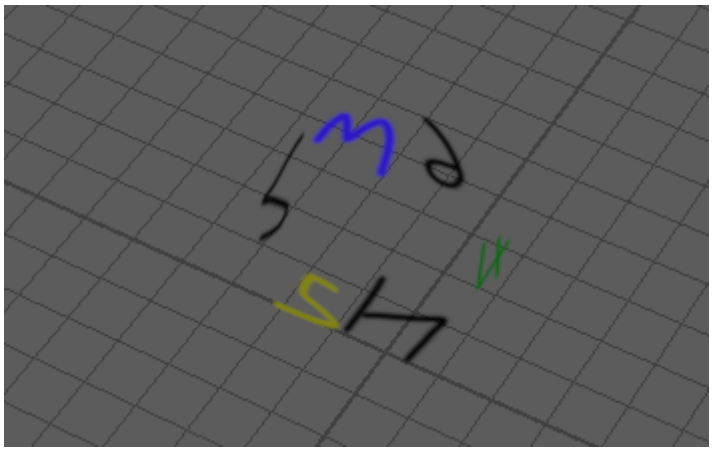
The panel will look like this for the moment:



So, to see the texture being applied, click on the checker box in the panel menu system.



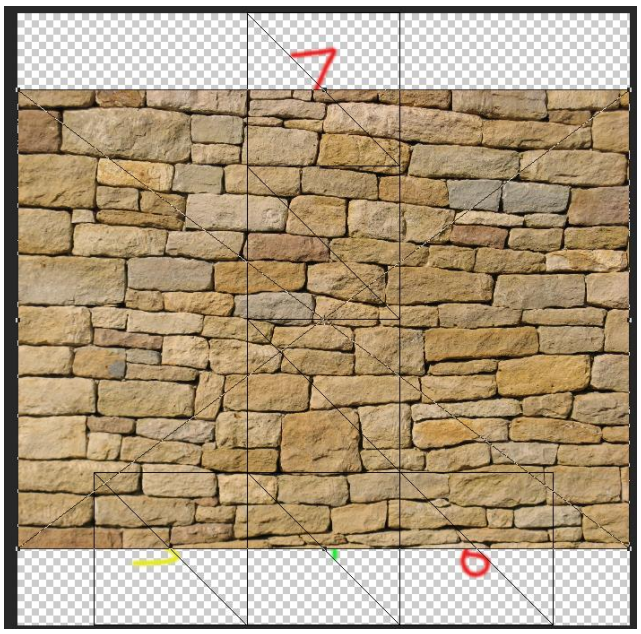
This will then allow you to see the texture on the model.



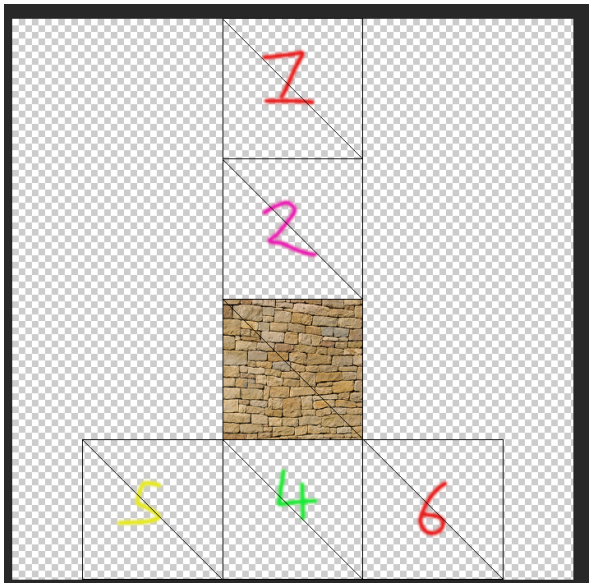
From here, if you rotate around the object, you can see through what the model looks like with only numbers in the location.

To make it seem a bit more useful, cut and save the following image to your desktop.

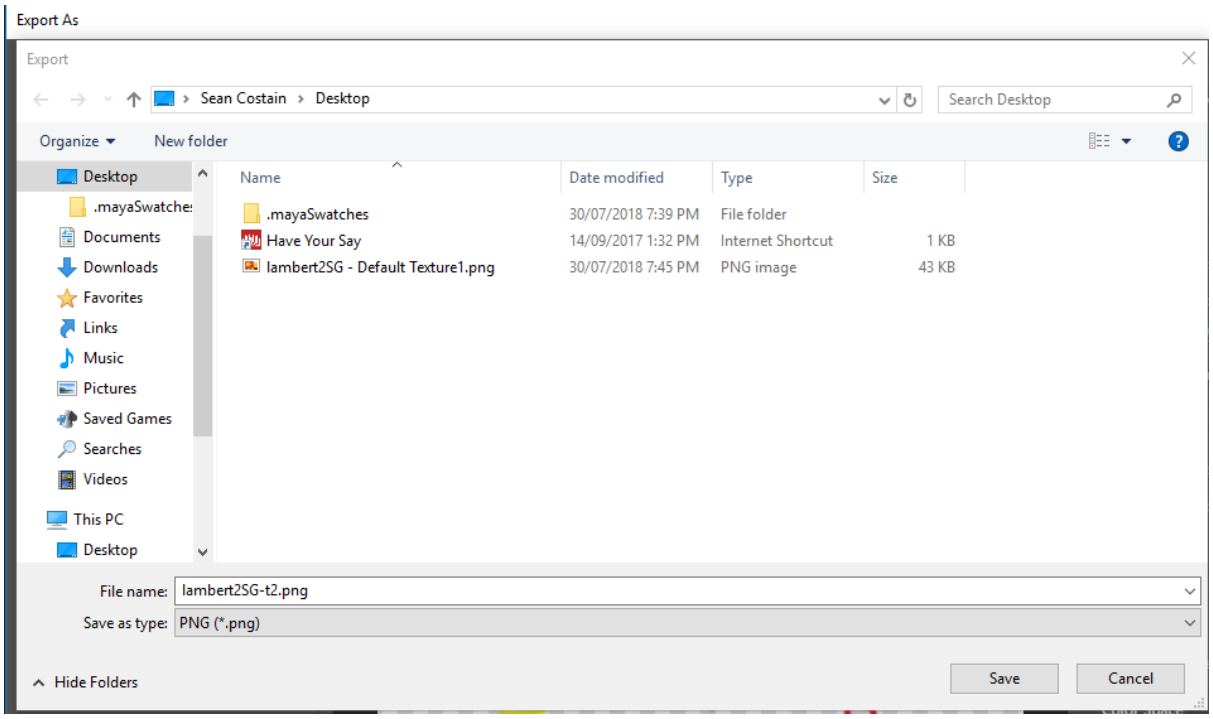
Now jump back into photoshop, from here drag the image into our layer.



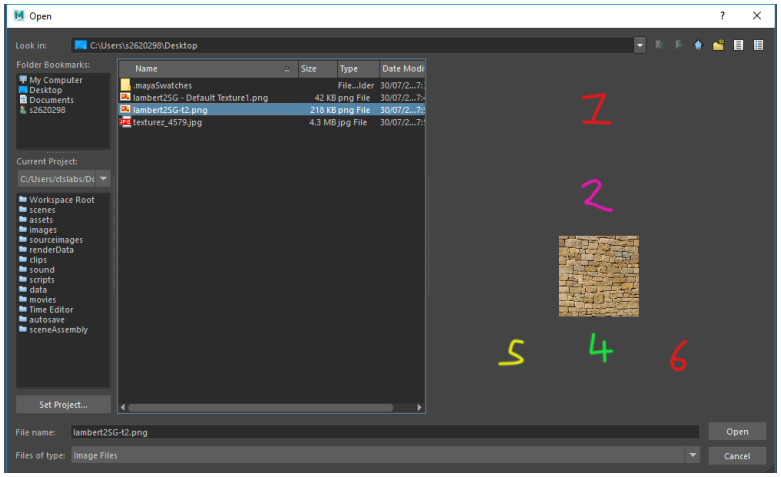
As you can see the image is too large for the cube faces that we have, so, to fix this, we use the normal transform tool in photoshop, scale the image down to fit a cube face.



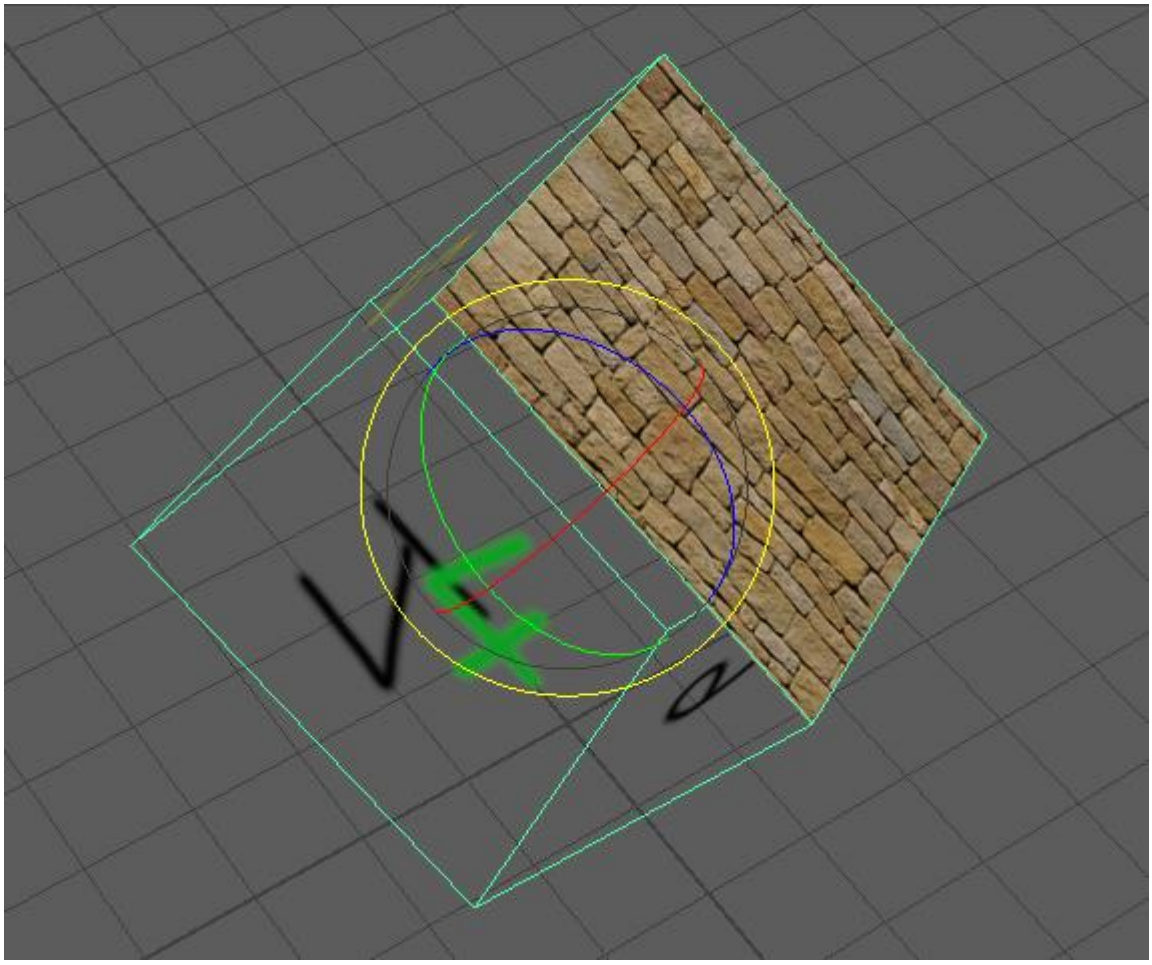
Next re-export the image out to the desktop.



Once that is done, go back into maya and then swap the image file on the cube.



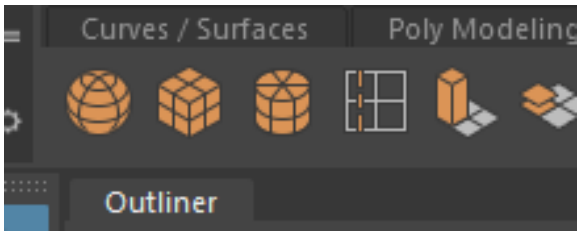
Once you have done this, you should be able to rotate the cube and see the new texture applied.

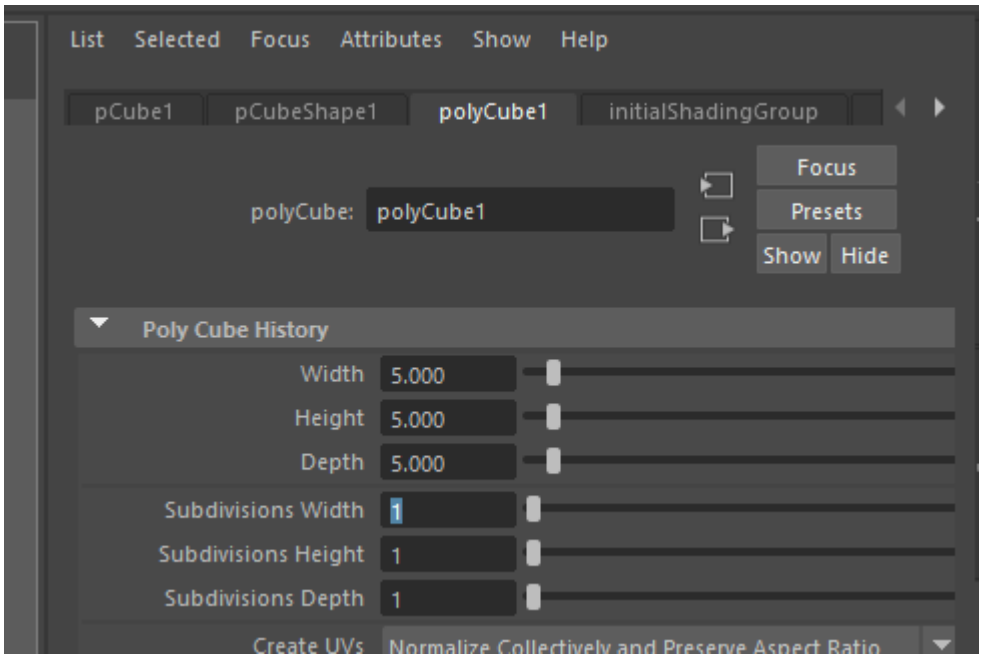


Build Object: Wooden box – UV Mapping

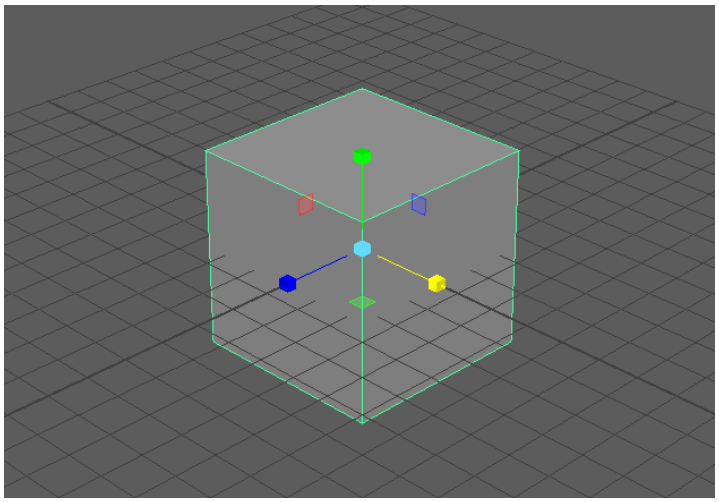
Aim: Create a cube and texture it with an external image.

In Maya, create a simple cube and scale it up to see it easier.

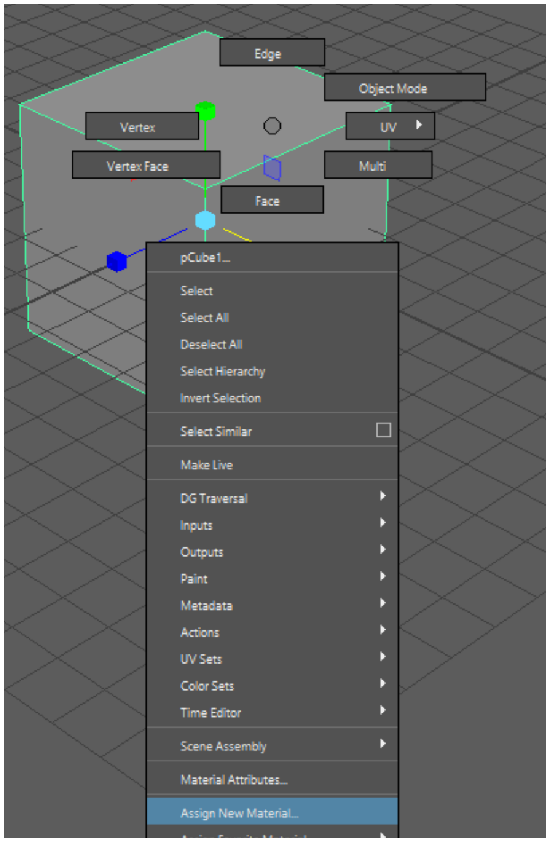




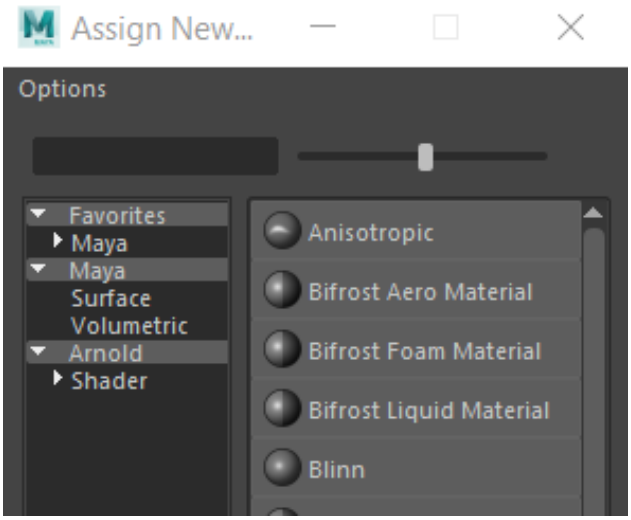
You should see the following



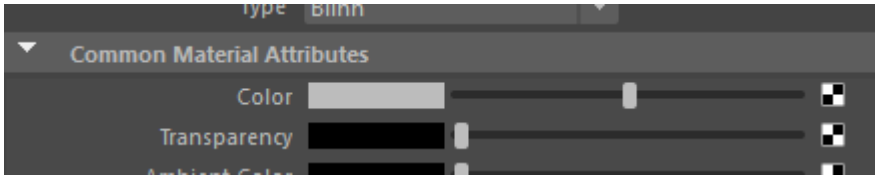
We've covered normal materials being assigned but a quick refresher. Right click on the cube and select assign new material



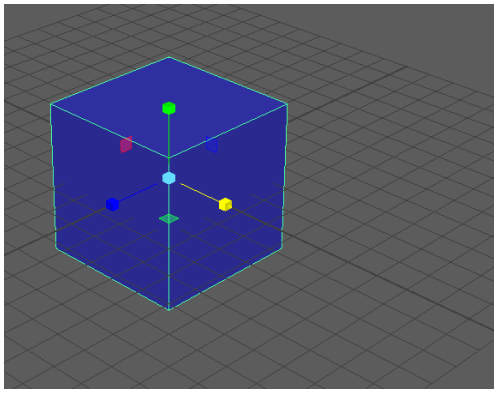
Select Blinn



And then from the attribute editor we can change the colour



This can produce the following results.



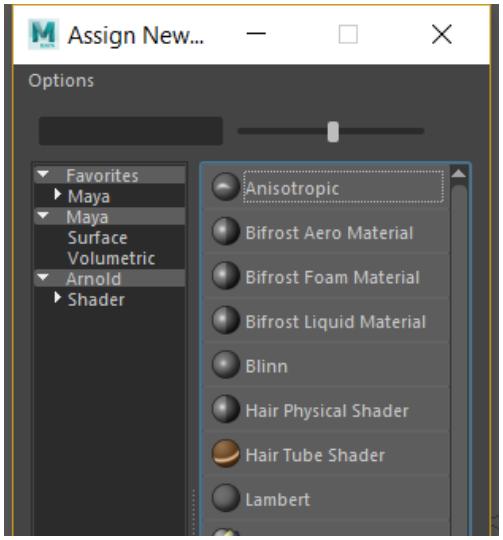
Which is great when you are quickly putting an element together, the problem is that in most 3D generated elements, the requirement is not a single colour box, but a more detailed element.

Details can be created in two ways, complex modelling or complex textures. In most cases, it is the correct application of both.

Now we have a blue box, let's add a wooden texture to it.

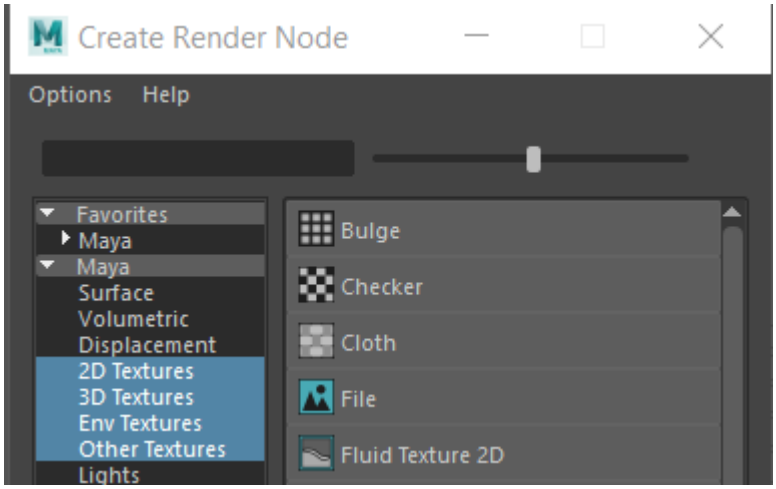
This image was located here: https://www.hongkiat.com/blog/28-high-resolution-wood-textures-for-designers/

Now to apply the image to the blue cube that we have; we will create a new material to assign to it, from the right click, assign new material and look for a lambert. Once this has been done, we can click on the checker box next to the colour attribute.

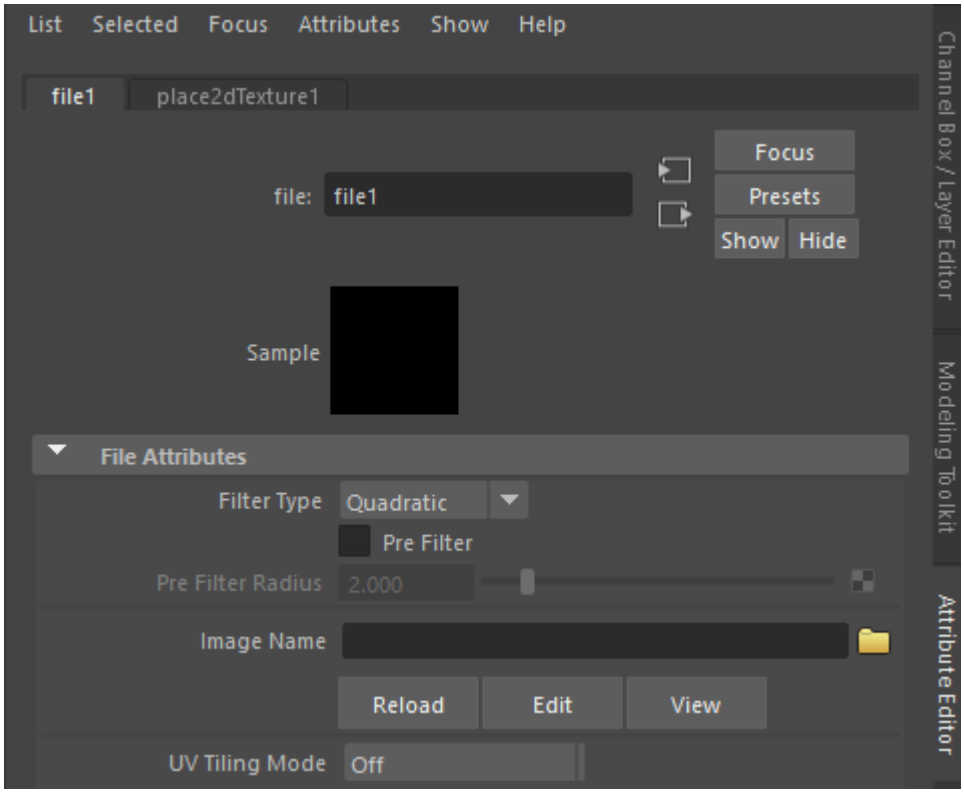


From here select file

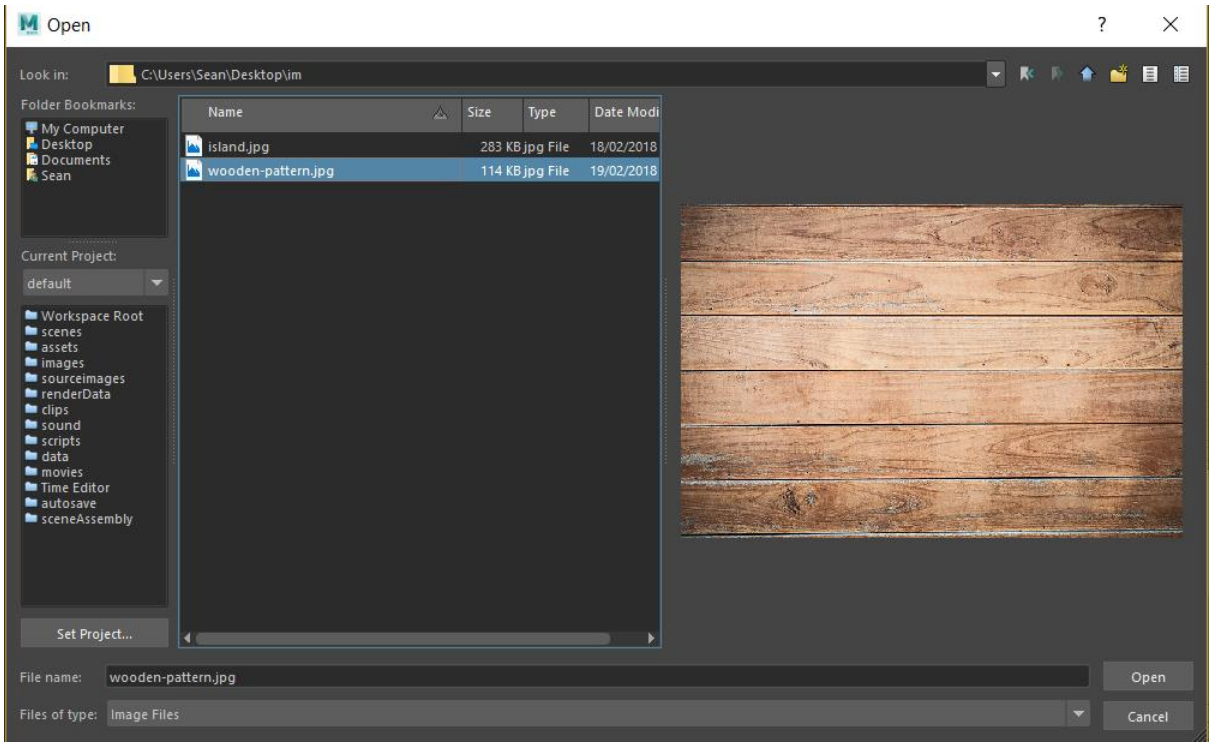
The checker box will open up the create Render Node window.



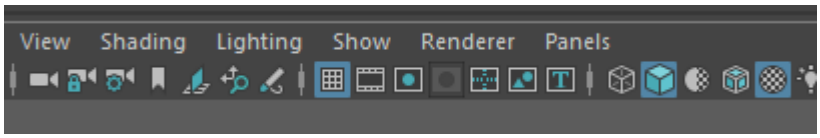
This changes the attribute editor to the following



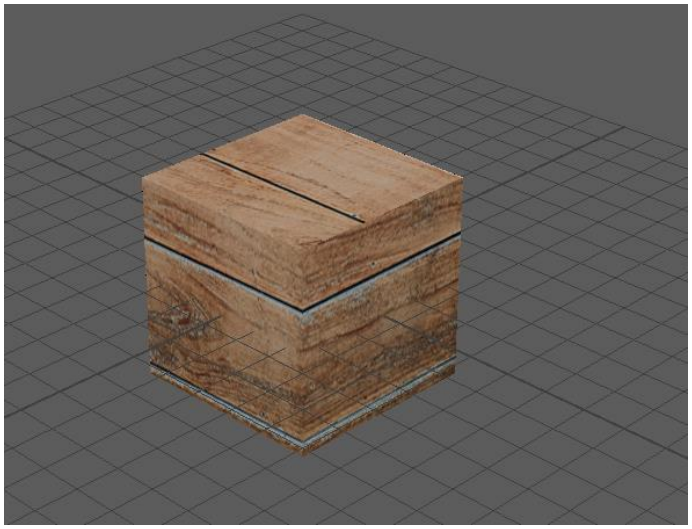
To access the file, we need to click on the folder icon, then browse to the image



Once you have loaded the image, the scene doesn't change. We need to push the checker box in the view menu.

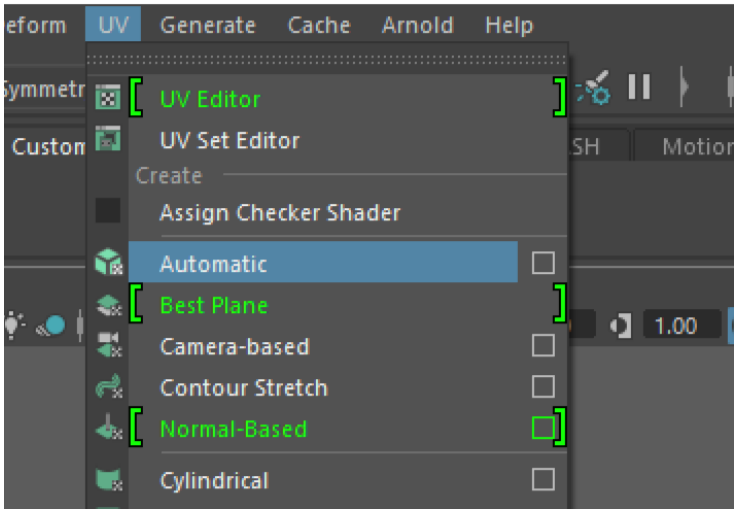


This then shows our cube covered with the texture.

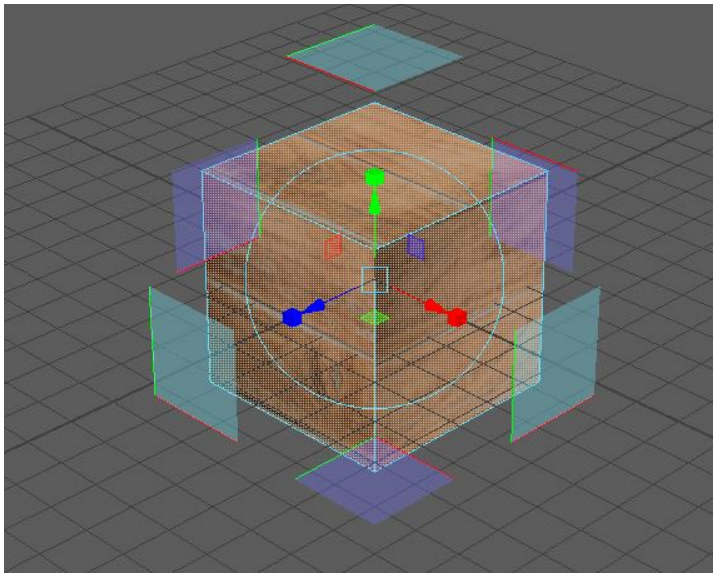


As expected, the texture doesn't sit properly on the object, as such we will now have to manipulate the texture to make it fit better.

To start with the modification, go to object mode, select object. With the object selected go to the menu system, from there we will set the uv to automatic and then see what needs to be fixed.

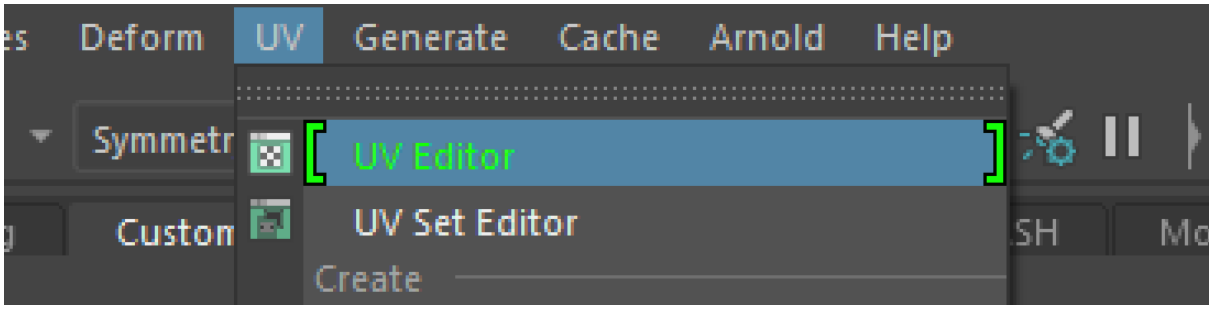


This pops up in the scene

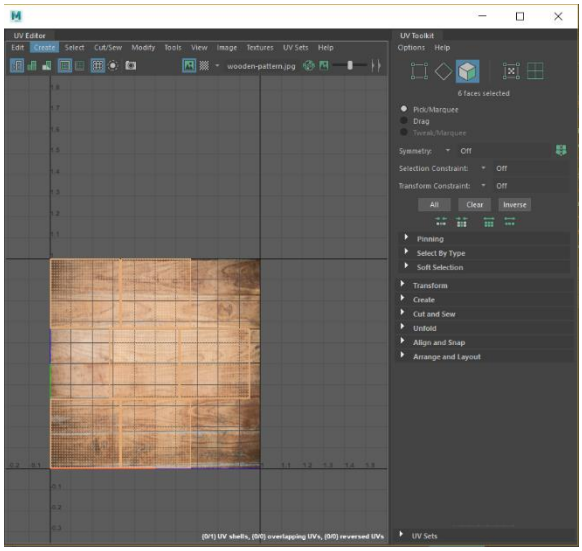


This is the new way that Maya lays out the UV mapping, each extrapolated side is representative of what is going to occur on that side of the cube. Now, the plane is to create top, font, bottom and back having the same pattern with the sides looking a little different.

Once this is done, we need to go in to the uv editor. Go to the menu and UV->UV Editor

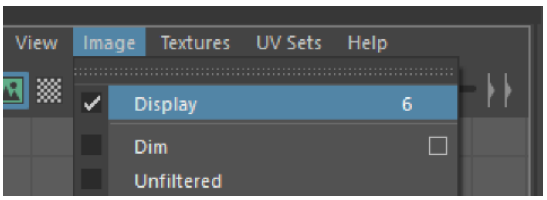


This opens up the UV Editor

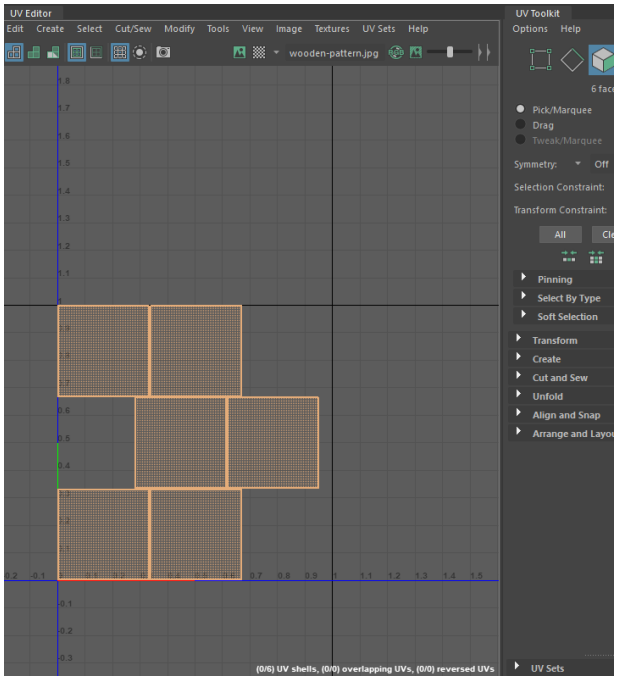


Even though it's a little hard to see, the cube has been flattened out. To make things easier to work with, the first thing we will do is turn the image off, so we can focus on the cube shape itself.

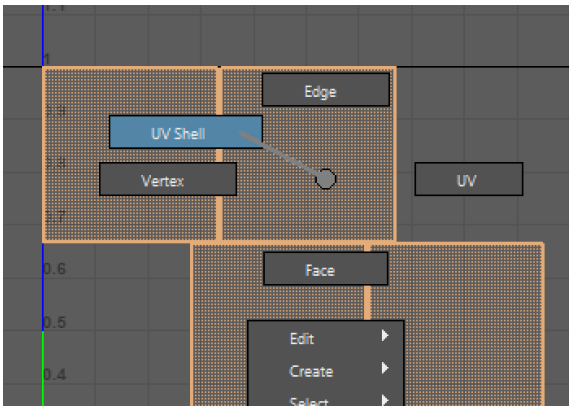
This is done in the image-> Display menu section



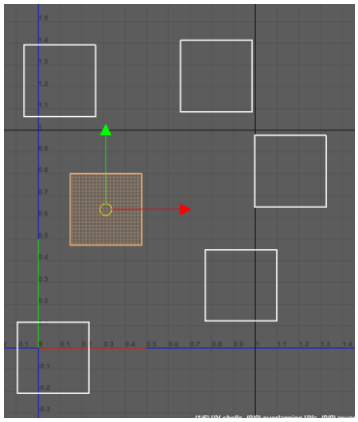
With the image turned off you can easily see the six sides of the cube.



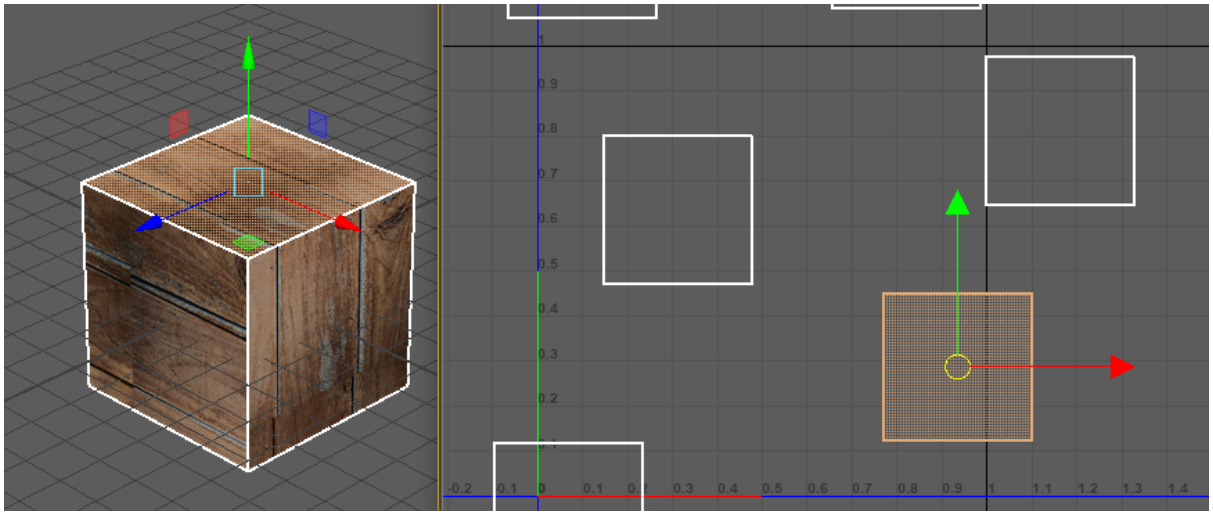
From here we will use the right click -> UV Shell function and move to separate the pieces for ease of location.



Space out the squares. Using the move tool (W)

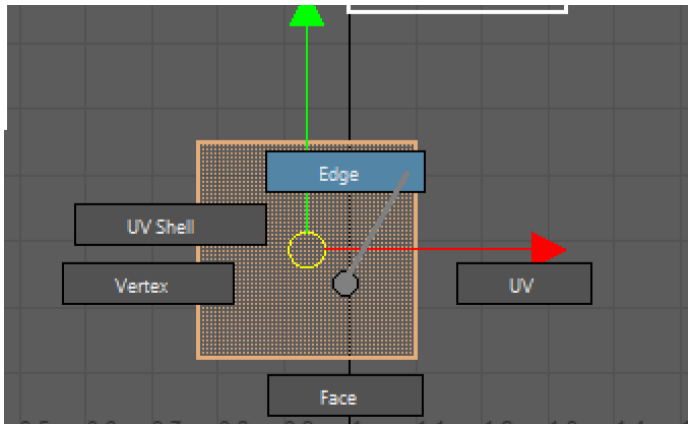


Next select the top square

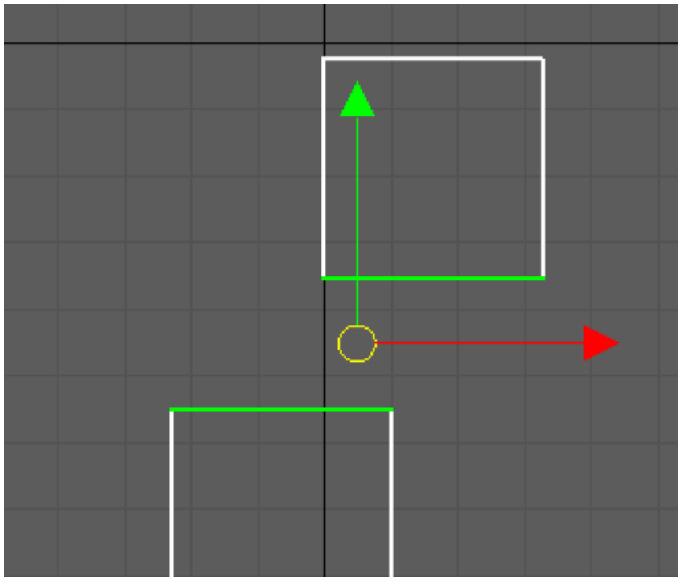


You can see it's positioning by matching the uv shell with the actual object, once you have located the top, we will start sewing the edges together to form a consistent texture on the object.

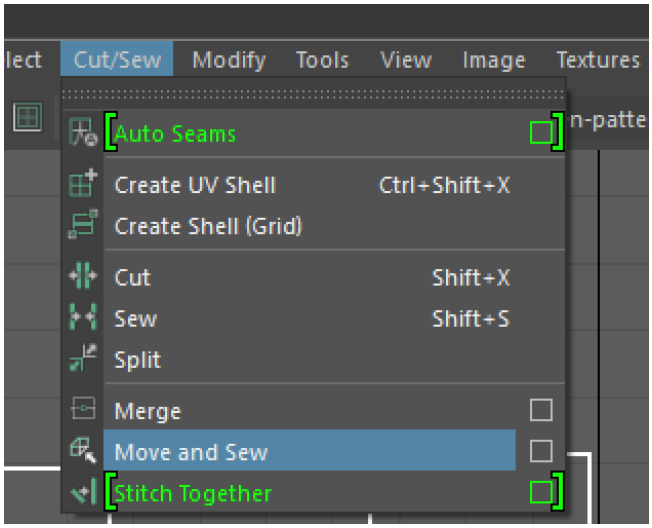
To do this, right click on the shell and select edge



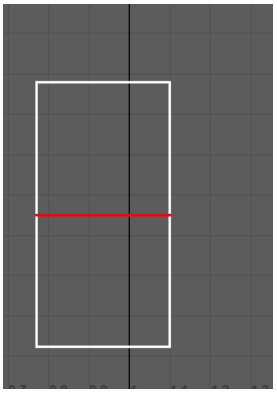
From here select an edge



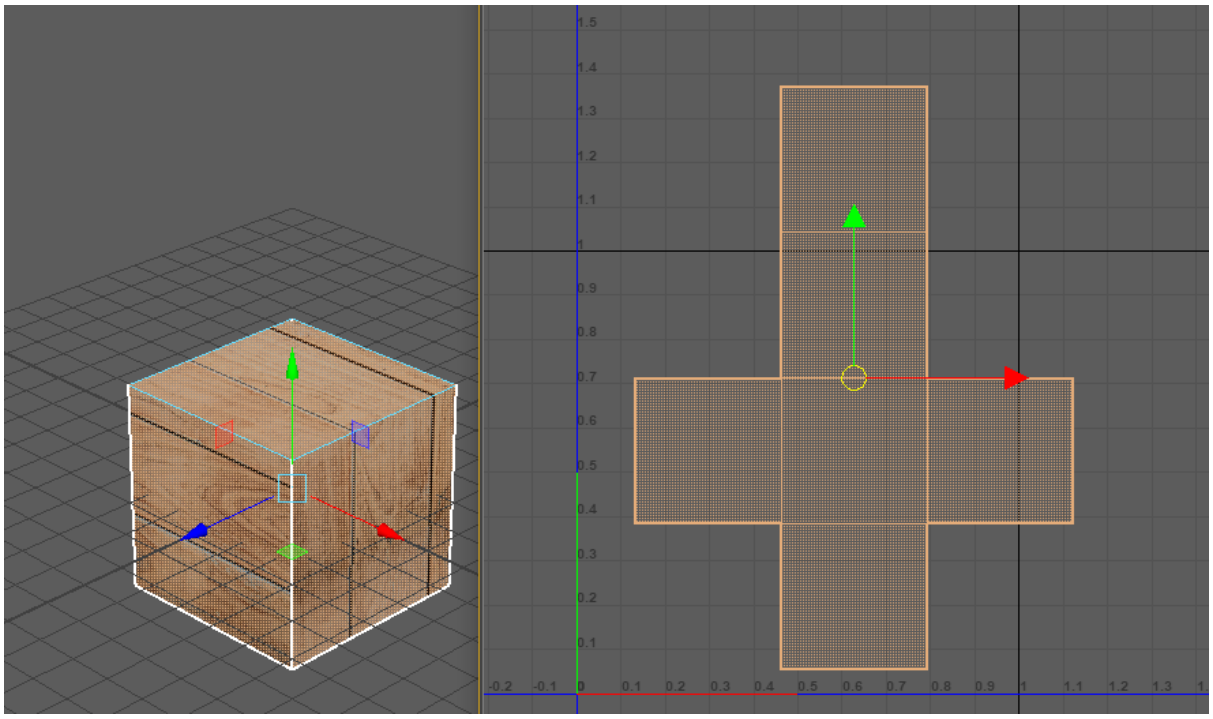
Notice how it has selected an additional edge and turned green, this is the edge that matches on the actual object. From here, we can sew the edges together. This is done through the menu system cut/sew-> move and sew



This snaps and merges the edges together. The advantage to this is that it will make the texture work together.

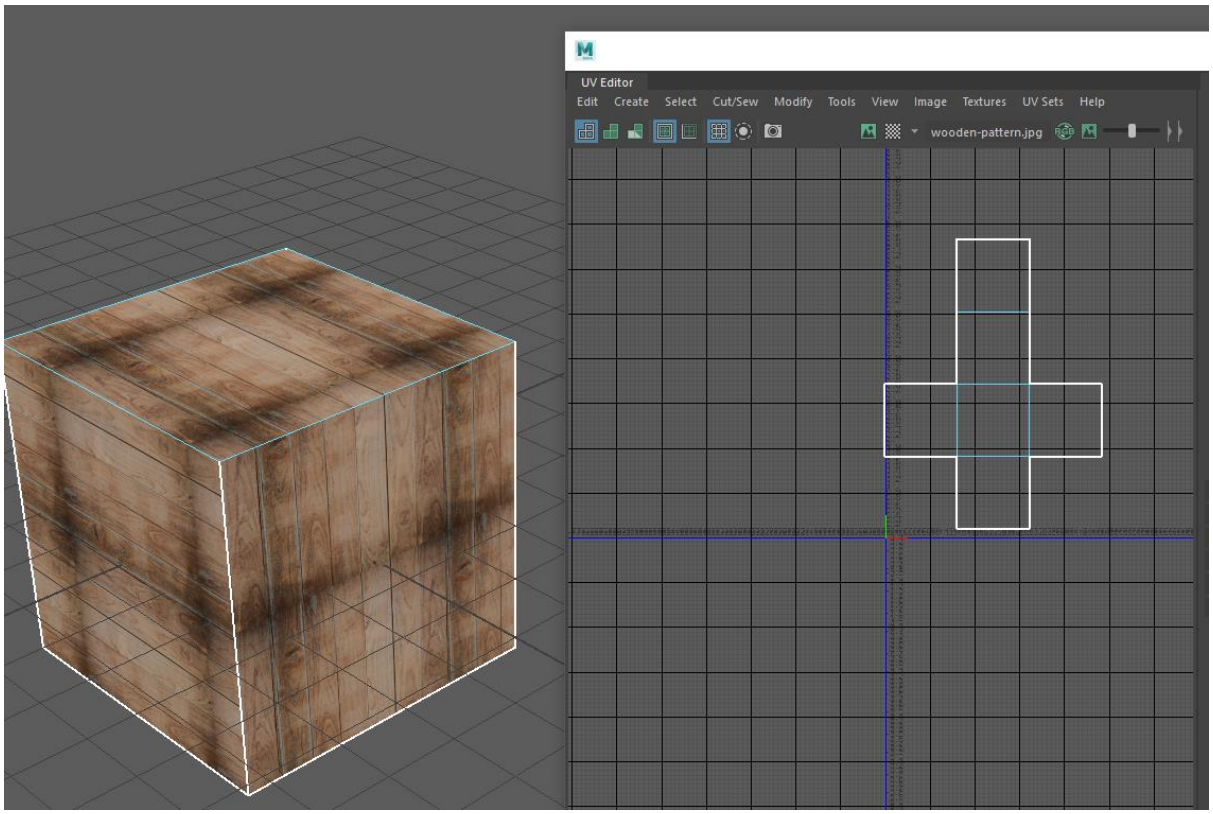


Repeat this process for all of the sides.



Once this is done, you should have a consistent set of markings from the texture all the way around the object. In this case I can make more planks appear in the box by scaling the uv shell.

So, select the uv shell, go to the standard scale tool (R) and then shrink to make more planks.

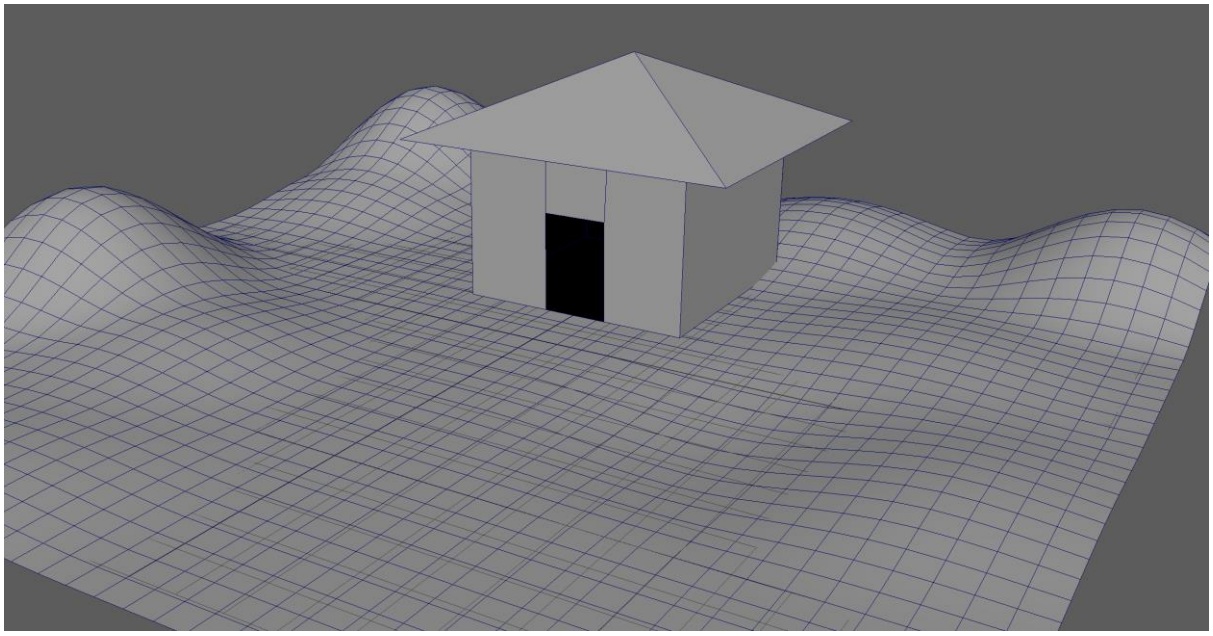


So, we have gone from 3 planks to 11, which makes the object look better. This technique can be done on any object.

Build Object: False Geometry

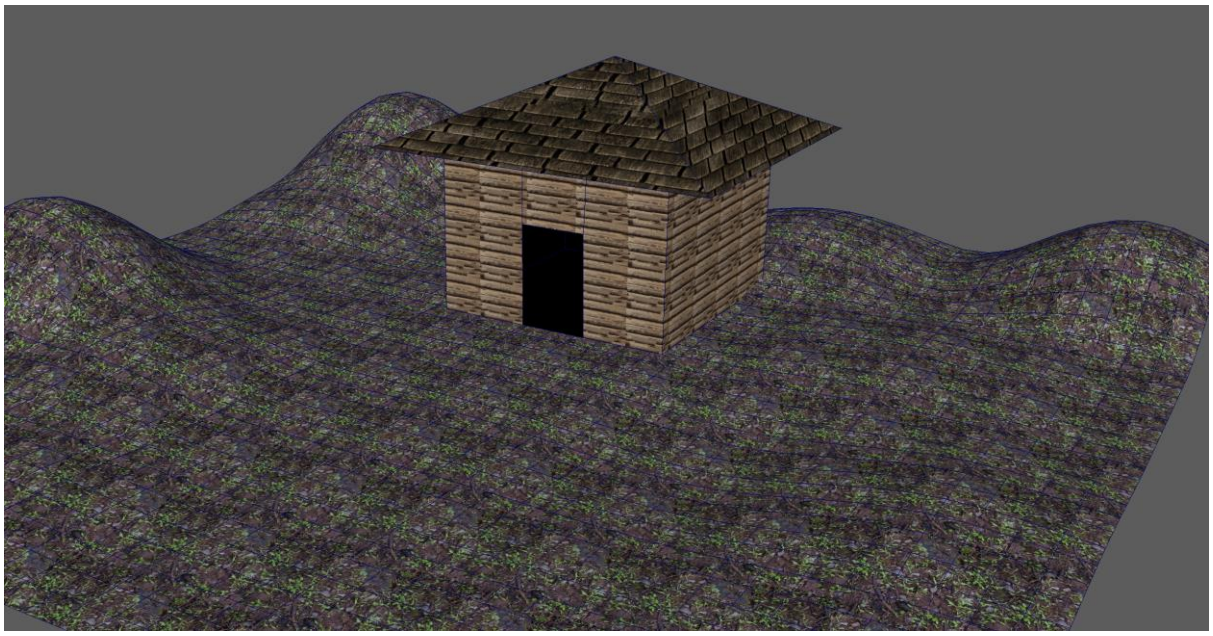
To start looking at false geometry, you need to construct a small world to then add in elements that will allow for false geometry. False geometry is where we can use the minimum amount of faces to generate a complex looking object. This is normally achieved by applying textures on simple primitives.

Build the following elements:



This is just a plane with some vertex moved, and a couple of cubes that have been shaped. Using the techniques you have learned through this add in some textures to give it a little bit of life.

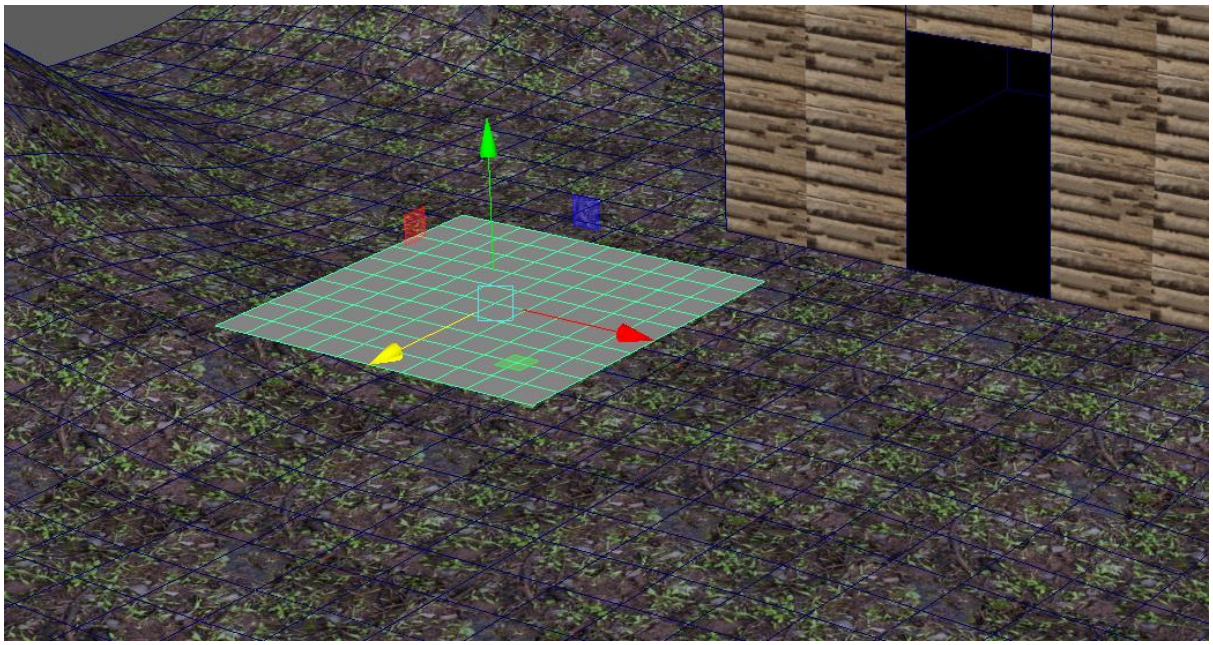
Such as:



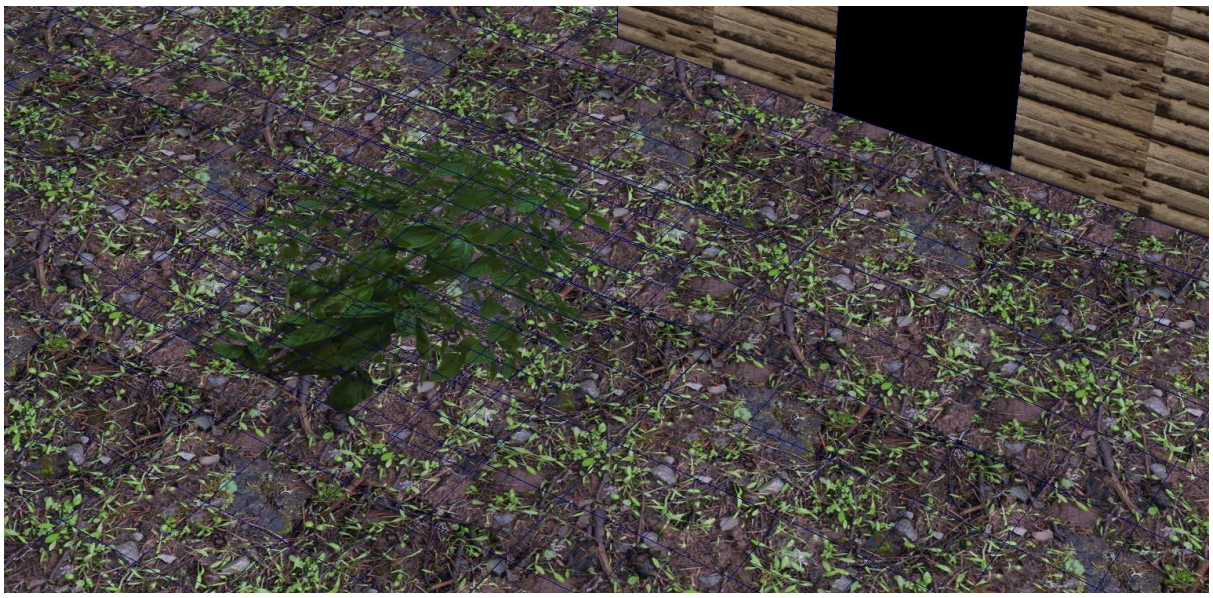
These textures are:

This allows for a very simple environment, to add false geometry, do the following:

Create a plane.



From here, add a tree or bush texture. Same as we have done earlier with textures.



Once the texture is applied, rotate the plane to position, then duplicate as required.

When you move the camera around, you can end up with an image like the following:

Each of the plants that you see, is a single plane, so the face count is very small. This is false geometry, the plants look complex, but in all honestly the computing price is very small, based off the faces we have used.