

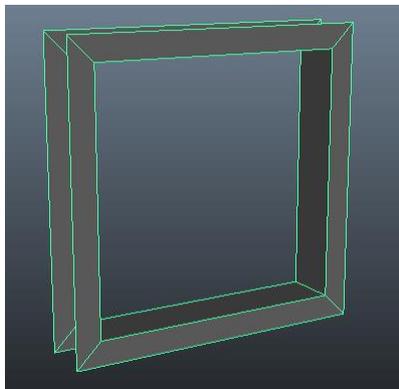
### AH | Preparing an object for a Material

#### UV Unwrapping Basics

UVs are a series of 2D points that reside within the vertex component information. In essence they provide co-ordinates that allow us to map a 2D texture onto a 3D image. UV's are always done after the Modelling process as further manipulation of an objects vertices will manipulate the UV's also.

#### Mapping UV's

There is no glossing up this section as it's probably one of the most boring and tedious parts of texturing but also pivotal to your success. If you plan on spending some time getting that perfect texture you are going to want your Model to be prepared correctly.



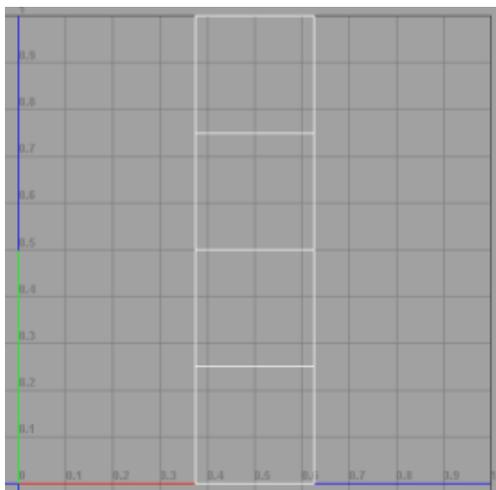
I'm going to make a very quick low polygon that I would like to be a wooden window frame.

For reference I made a polygon cube, sized it accordingly, deleted the front and back face, extruded all the side faces then deleted the faces I selected to do the extrude).

Now as this is a wooden window frame I am going to want my wood grain to flow with the shape as if the were created out of a piece of wood (seems logical).

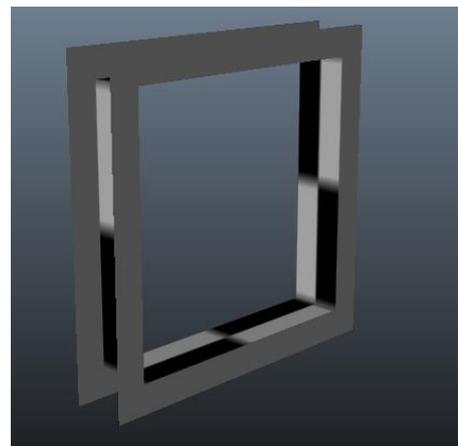
Next it's time to test the object with a chequered texture (Right click and drag down to *assign favourite material* > *Lambert* > *Colour* □ > *Checker*)

I'm sure you will agree that's not what you expected to happen. So it



needs a little work to ensure the texture is

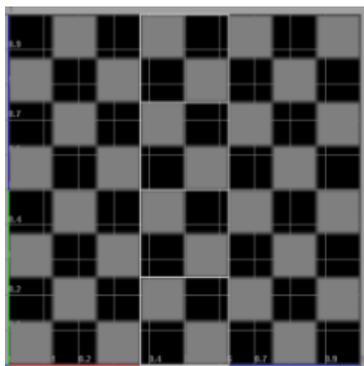
correctly spread out over your objectd.



So to find out why we need to take a look at the UV Texture Editor *Polygons (menu set)* > *Edit UV's* > *UV Texture Editor*

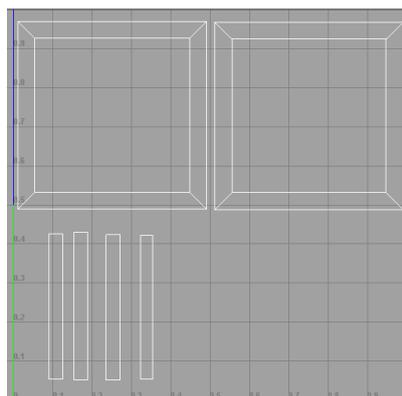
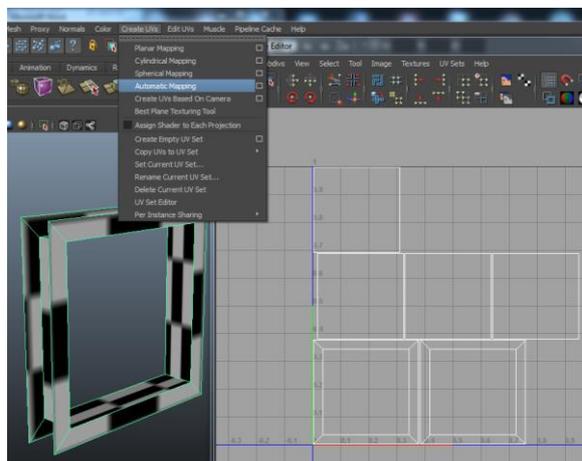


## Chapter 3: Texturing



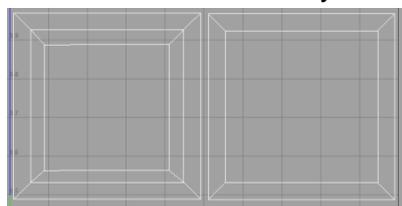
The images to the left are of the same thing only with the display image on (and dimmed) or off (to toggle these option look for a picture of a face within the UV Texture editor). From here its very obvious why the centre section is the only aspect that has a texture, because it's the only four sides we can see.

From here we are going to select *Create UV's >Automatic Mapping* instantly you will see your texture map all over your image and something a little more familiar looking within your UV Texture Editor. You will notice some sections are more closely packed with the texture then others.

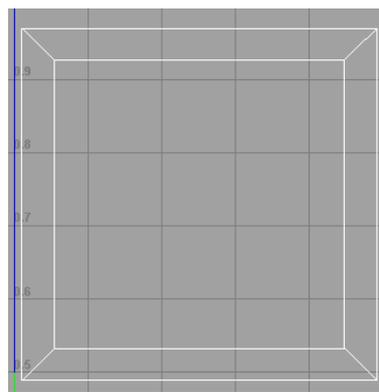


You can spend a little time cleaning things up to make them more accurate, and depending on how fundamental they will be to your shot will depend on the level of accuracy you may require.

To move the UV's you have *to right click and drag to UV*, then the same principles apply as when you are in the workspace (move, scale and rotate). You can separate or join edges and/or UV's, or snap them to one another by holding the "v" key. Don't be afraid of overlaying one area with another if you want the same bit of the texture to



be applied (i.e. both sides of an object).



Once you are generally happy with the layout you can either make a generic texture and import it or you can save an image to use as a reference in Photoshop (or equivalent) by going to *Polygons > UV snapshot*. Adjust the sliders accordingly but as a general rule textures should be square and are usually 1024 or 2048 (again dependant on the image quality you require). We will continue with wooden texture creation a little later on.

## AH | Transferring UV Attributes

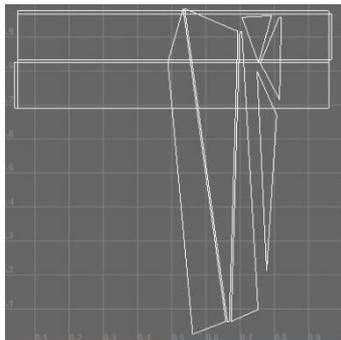
You may come across circumstances where you have to transfer the UV's of one object to an identical counterpart.



I'm just going to be using a simple wood plank in this example:

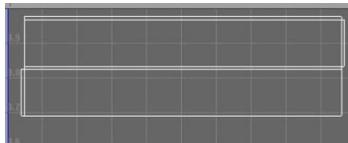


I would like to transfer the UV's of the object on the left to the UV's of the object on the right.



Select the source object (left), then shift select the target (right).

Within the polygon menu set select *Mesh > Transfer Attributes* and apply the following settings.



With both objects still selected you will see that the UVs appear like one set because they are now exactly aligned.

**Note:** Until you clear your history your geometry will inherit all changes made to the source.

### AH | Overview of Maya Materials

Understanding the fundamentals of Materials (*Window > Rendering Editors > Hypershade*) is important and should not be overlooked, therefore when you do have to create a material it will ultimately replicate what you initially envisioned.

**Diffuse:** *The spread or distribution of light across a surface*

**Specular:** *Characteristics referring to the shaders reflective capabilities*

**Lambert:** *Most Commonly used for matt surfaces such as wallpaper*

There is no specular highlight on this shader as the light is diffused across the surface of the material in every direction.

**Blinn:** *Often used for glossy/metallic surfaces such as chrome*

The surface of a Blinn diffuses specular a lot more gradually than that of a Phong. Eccentricity controls highlight size giving a more versatile surface that can be easily adapted to various materials.

**Phong:** *Often used to replicate metals, plastics and glass*

This shader has a very definitive focal point. Cosine Power (Low value big highlight) affects the “Shininess” in turn leading to a specular highlight that drops off sharply. Less complex than a Blinn as it fails to account for angular changes when looking at the specularity.

**Phong E Shader:** *Similar to above, and are used for metals, plastics and glass*

It provides the user with more control over using two attributes being Roughness and Highlight Size together to affect the “shininess” whilst maintaining a sharper appearance than Blinn.

**Ramp:** *Very often used for editing other shader attributes*

Enables transition between multiple colours on a single shader. Commonly used to edit the appearance of other shaders; enabling the adjustment of attributes such as transparency, specular highlights, incidence, incandescence, light, reflectivity and ambient occlusion.

## Chapter 3: Texturing

**Layered:** *Often used when a material is composed of multiple components*

Enables different textures types to be applied to the same piece of geometry. For the more advanced user it allows for shader stacking which can produce some very elaborate and spectacular results.

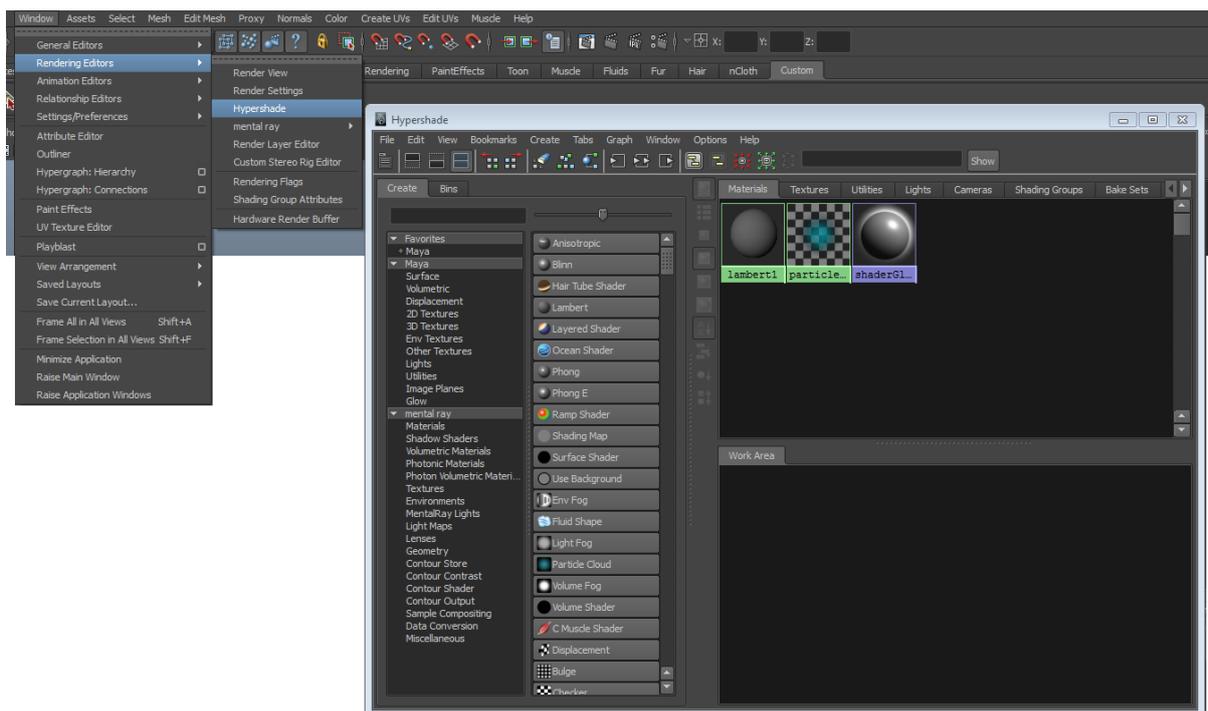
**Anisotropic Shader:** *Often used for blemished objects such as crumpled foil*

Used for materials where light reflectivity differs according to direction as it will reflect asymmetrically.

## AH | Hypershade

### Ways to Access the Hypershade Menu

- *Window > Rendering Editors > Hypershade*
- *Inside a Panel select Panels > Panel > Hypershade*
- *Hotbox: LMB click underneath all other options and drag left*



Maya's Hypershade provides you with the ability to quickly create, edit and delete render nodes. If you're thinking "What is a render node?" then the simple answer is that they are iconized characteristics of elements within Maya, such as Materials, Textures, Lights, Utilities, and Cameras. Below you will see the default Hypershade menu and what there functions are.

## Chapter 3: Texturing

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### Hypershade Tabs & Nodes (Left Column)

The tabs and structure are organized so you can easily access the specific node you require. One of the few ways to create nodes is directly within the Hypershade, to do this you firstly click on any heading node under the “create” section then click the appropriate node (right hand column) to add it to the work area.

### Hypershade Menu

As within most aspects of Maya you can create customised tabs and choose a layout of your choice. Many of the menu options are self-explanatory but we will be covering the more ambiguous ones later in this section.

### Hypershade Work Area

As you might imagine the “Work Area” tab is where you can create relationships, or edit attributes and characteristics of multiple nodes at any one given time. Although designed for building shaders, rigging techniques also use this area.

### Navigation and Controls within the Hypershade

You can navigate and access features within the Hypershade menu the same way in which you do within your scene.

<u>Hot Key</u>	<u>Action</u>
Alt + LMB	Tumble / Rotate
Alt + MMB	Track / Pan
Alt + RMB	Dolly / Zoom
A	Frame all Nodes
F	Frame an individual node
Ctrl + A	Attribute Editor

### How to Work on a Texture Node

MMB click and drag from the top window to bottom (Workspace).

### Clearing the Workspace

Navigate to the icon bar and click on the clear graph Button which resembles an eraser tool this will (like eraser tool), the nodes will not be deleted just removed from the workspace area.

### Renaming a Node

On the node, right click and drag down to rename.

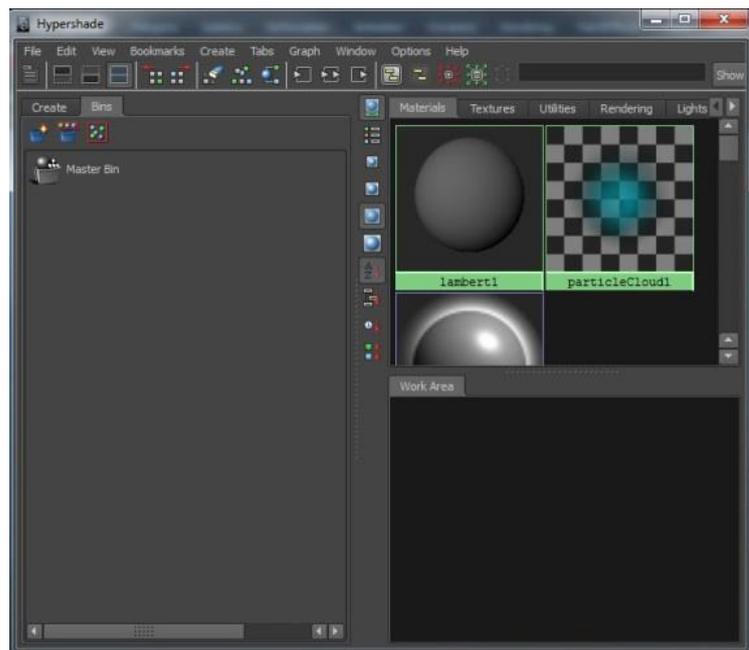
## Chapter 3: Texturing

### Grouping

Like within the main scene you can create layers to help organise your scene, the same principle applies to the textures only instead of layers they use bins.

Within the Bins Tab you can create an empty bin, create a bin from selected or select all unsorted items.

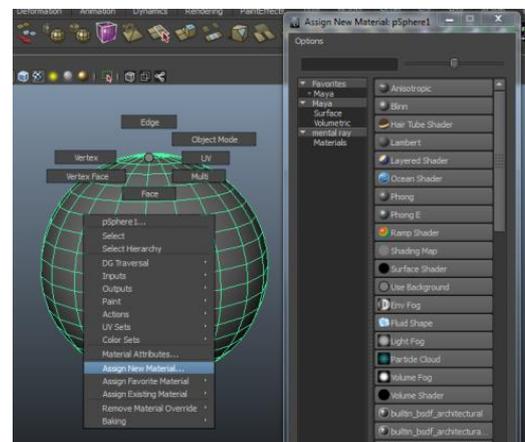
Removing a node from the bin is just as easy. Select the node, right click on the bin and select *remove selected node*.



### AH | Assigning a Material to an Object

There are a few ways to assign a texture to an object so which ever method you use will have the same effect.

- Open the *Hypershade* > Click on the Material > *MMB* drag from the texture/shader node onto your object
- Right Click on your object, scroll down to assign a texture, either choose a created texture from the list or create a new one.
- Select your object(s), open the Hypershade, right click on the texture/shader node and select *assign material to selected*.

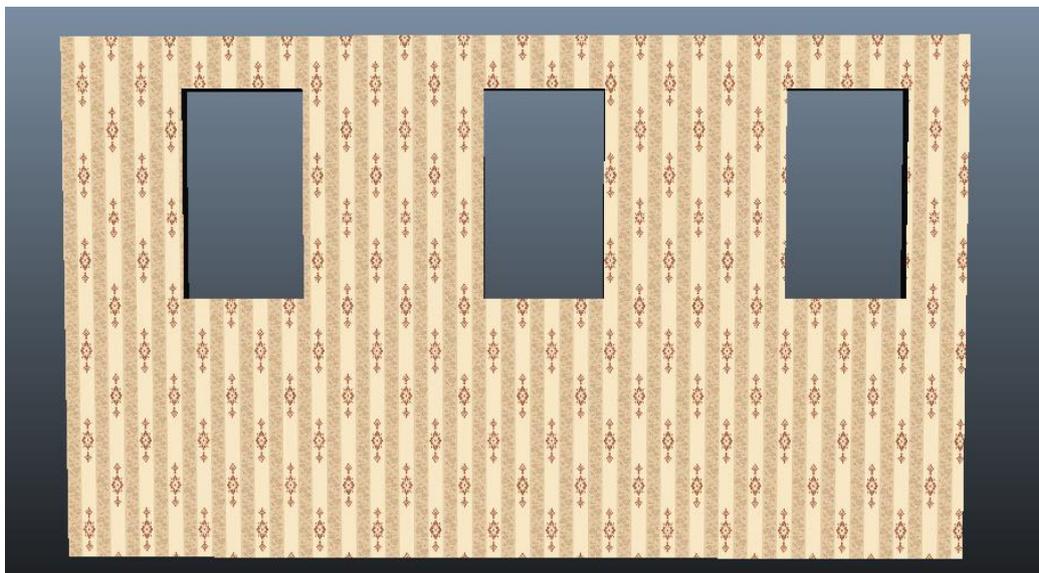


If you haven't already got a texture assigned to your object, follow one of the above methods.

### AH | Adding custom features to your Material

#### Adding a custom image to a Material

- Select *lambert* (or suitable alternative) > *(Name it)* > *Colour* □ > *File*
- *Select image*



#### Normal, Bump or Displacement Maps?

A question that arises frequently as well as making regular appearances on forums; are the differences between each of these maps and how/when to use each of them.

*Bump Maps* and *Normal Maps* do have their similarities in so far that neither of them affects geometry in a physical form however they do hold a vastly different amount of information and are used for a very different purpose. A *Bump Map* holds only single axis (height) information and will be used primarily to “shade” the surface and create the subtle feeling of depth. A *Normal Map* has the ability to hold information on all 3-axis allowing it to retain detail from higher mesh models to be latter recreated on lower geometric representations. *Displacement Maps* have a similar makeup to that of a *Bump Map* displaying a white to black colour range from 0-255 nevertheless their rendered results vary considerably. They do by all accounts rely heavily on near perfect UV's as they affect the geometric position of vertices over the objects surface in relation to their value.

## Chapter 3: Texturing

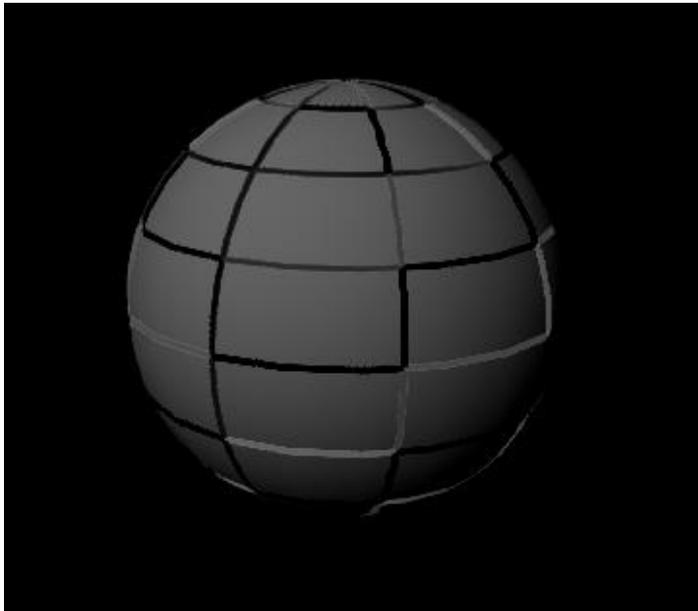
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### Mipmapping

In this process (designed primarily for bitmaps) Maya stores a colour value for sequentially decreasing image sizes i.e. 1024 x 1024, 512 x 512, 256 x 256 and so on all the way down to 1 x 1. Therefore during the rendering process the renderer determines the most appropriate mipmap for the relevant pixel, thus if the pixel is in the background a low resolution mipmap is used and vice versa. Maya can also use an average of two mipmaps for a more accurate representation of a pixel. Mipmapping is designed to reduce the rendering load as it will not have to filter through large image sizes to determine a specific pixels colour.

### Assigning a Bump Map

- Select your existing material (i.e. lambert1) > *Bump Mapping* □ > *File*
- *Select image* (Bump Map)



**Note:** *This image has been assigned a black and white chequered texture into the bump. Creating the feeling of depth that additional geometry wasn't required to make.*

## Chapter 3: Texturing

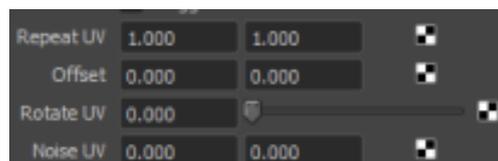
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### Repeating Textures

As the title suggests you can make a small material repeat over a larger area. For this to be effective it is advisable you use a seamless square texture, or learn how to create one yourself on page 118.

Once you have your image file ready, create a Polygon Plane and stretch it out over your grid

- *Press 6 to go into shaded mode (this way you can see the changes)*
- *Select your existing Material*
  - *Object > Material (i.e. Lambert1)*
  - *Window > Rendering Editors > Hypershade > Lambert1*
- Press the arrow going into the box either next to the material name or next to the colour (this will take you to your texture file)
- Press the same arrow again next to the material name or on the tabs you will see a *place2dTexture* Tab
- Repeat UV's
  - 1x1 are the default settings
  - 2x2 = 4 instances of your image
  - 3x3 = 9 instance
  - and so on...
- Rotate Frame – If the image if it has come in a different way that what you have set up for your UV's use this setting to correct the rotation.



## Chapter 3: Texturing

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Repeat UV	<input type="text" value="4.000"/>	<input type="text" value="4.000"/>	<input type="checkbox"/>
Offset	<input type="text" value="0.000"/>	<input type="text" value="0.000"/>	<input type="checkbox"/>
Rotate UV	<input type="text" value="0.000"/>	<input type="range" value="0.000"/>	<input type="checkbox"/>
Noise UV	<input type="text" value="0.000"/>	<input type="text" value="0.000"/>	<input type="checkbox"/>

### AH | Texture Examples

*Mia\_material\_x* is probably one of the most versatile textures within Maya and because of this we find ourselves using it a large proportion of the time as it's easy to create anything from wood, metal or glass within a few simple steps.

We will take you through a couple of them but will leave the remainder for you to play around with.

#### Wooden Floor

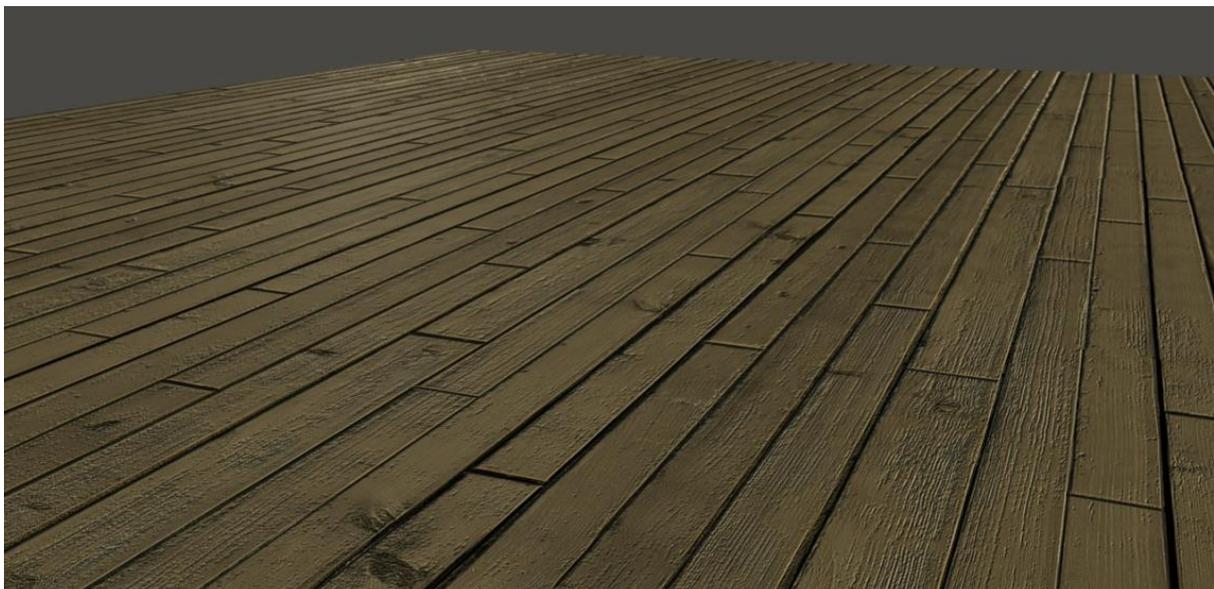
- *Create a floor plane > RMB Click and Drag down to > Assign New Material*
- *Select Mia\_material\_x > (Name it...WoodenFloor) > Select Colour □ > File*
- *Select wooden floor image (you had already prepared)*
- *Drop Reflectivity down to around > 0.1- 0.2*
- *Glossiness > 0.2 – 0.3*

#### Bump

- *Attribute Editor > Bump > Standard Bump □*
- *Import file*
- *Bump depth = 0.15*

More definition (points further away from the camera)

- *File attributes*
  - *Filter Type > Mipmap*
  - *Mental ray > Advanced Elliptical filtering*





## Chapter 3: Texturing

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### Glass Window

We are going to create a very simple glasslike texture that we can apply to our window geometry.

- *Windows > Hypershade > Create > Mental Ray Materials > Mia\_material\_x*
- Add file texture colour (window)
- Reflectivity = 0.3
- Index of refraction = 0.8
- Refraction Colour > add in same texture file as above

Or

- *Windows > Hypershade > Create > Mental Ray Materials > Mia\_material\_x*
- *Presets\* > GlassThin > Replave*
- Add file texture to *Diffuse Colour*



**Note:** *Useful to link to the same file rather than creating multiple instances of the same texture.*

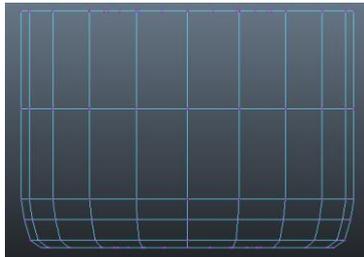
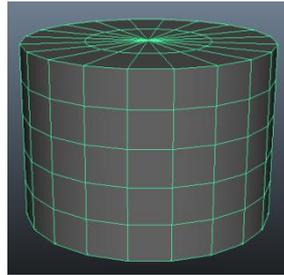
- One quick way to “dirty up” the window would be to
  - Transparency > Chequered box > Noise/fractal/file(custom)

## Chapter 3: Texturing

### Glass - Whisky Tumbler (and contents)

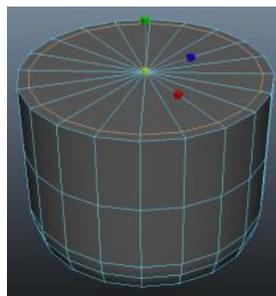
Create > Polygon > Polygon Cylinder

- Subdivisions Axis 20
- Subdivisions Height 5
- Caps 2

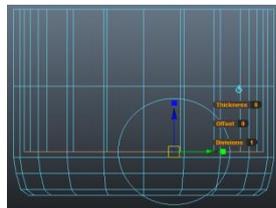
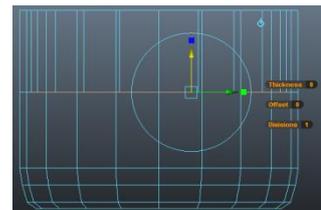


There are 4 rows of vertices in the middle of the tumbler. Switch to side view and out of those 4 select the bottom 3 rows of vertices and scale them in the Y Axis. Drop them to the bottom of the so they are close to the base and gradually scale them inward creating the curve at the bottom.

Select the remaining row of Vertices and move them down to a height where you would like the glass to appear filled, (and tweak the glass height if required).

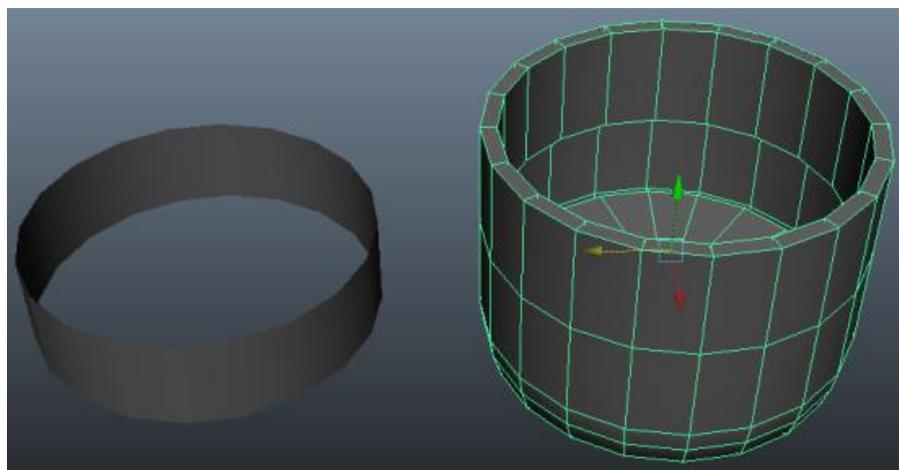


Switch to *top view* (or *perspective*) and select the top inner edge (*RMB* > *Edge* > *Double click one edge to select continuous edges*) and scale them outward towards creating the glass thickness. Then select all the centre faces and *Edit Mesh* > *Extrude* switch to side view, hold down the “v”



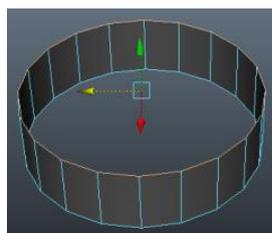
key and snap the extrude to the row of vertices that determines the fill level, press “g” to repeat the extrude and bring the vertices down towards the bottom of the glass leaving a thick base.

Switch to perspective view and select the faces below the fill line but

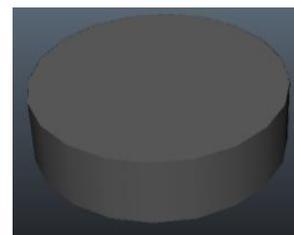


not the base (you should have one row of faces selected at this point). *Mesh* > *Extract* will separate the geometry from the Tumbler, then move the geometry to one side.

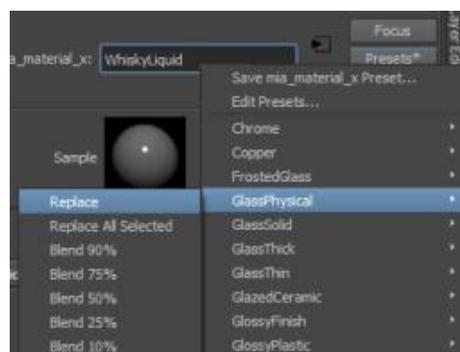
## Chapter 3: Texturing



Select the upper rim of edges *Mesh > Fill hole* then *Edit > Delete by Type > History*. Assign a *mia\_material\_x* and rename it to *WhiskyLiquid* (or similar), select the *Presets\** button and select *GlassPhysical > Replace*.

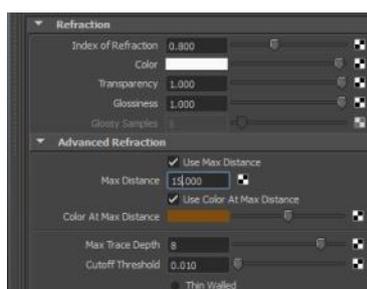


**Note:** If the mental ray materials are not available in the Hypershade menu we need to make sure the *mayatomr.mll* plugin is loaded in the Plug-in Manager (*Window > Settings/Preferences > Plug-in manager*)



- *Refraction > Index of Refraction 0.8 -1*
- *Advanced Refraction > Max Distance 15.0*
- *Advanced Refraction > Colour at Max Distance*

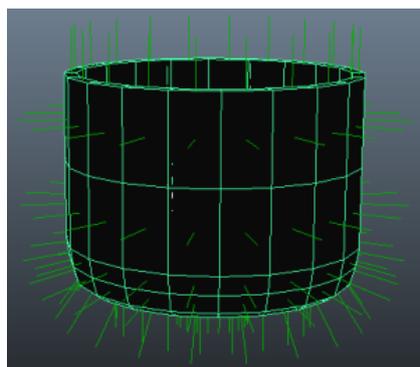
Chose liquid colour



Put your liquid geometry back in place (zero out your translation attributes) then select the top face you created earlier by filling the hole. *Mesh > Extract* to separate the top face from your geometry and assign a *mia\_material\_x* and name it *WhiskySurface*. Select the *Presets\** button and select *GlassPhysical > Replace*.

- *Refraction > Index of Refraction 1.33 - 1.36*
- *Advanced Refraction > Max Distance 15.0*
- *Advanced Refraction > Colour at Max Distance* Chose liquid colour. This works best with an exact match so if you just take the HSV values from your *WhiskyLiquid* texture this will be fine.

Lastly, if you select your tumbler assign a *mia\_material\_x* and name it *GlassTumbler*. Select the *Presets\** button and select *GlassThick > Replace*.



**Note:** We need to ensure all normals (*Display > Polygons > Face Normals*) are facing outward to ensure the effects are calculated correctly. If not go to the *Normals > Reverse* option to flip them around.

## Chapter 3: Texturing

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We will not be delving into the render and lighting in too much detail, but in order for you to render this effect you need a light and some improvements from the base render settings. We will be using two of Mayas pre-sets.



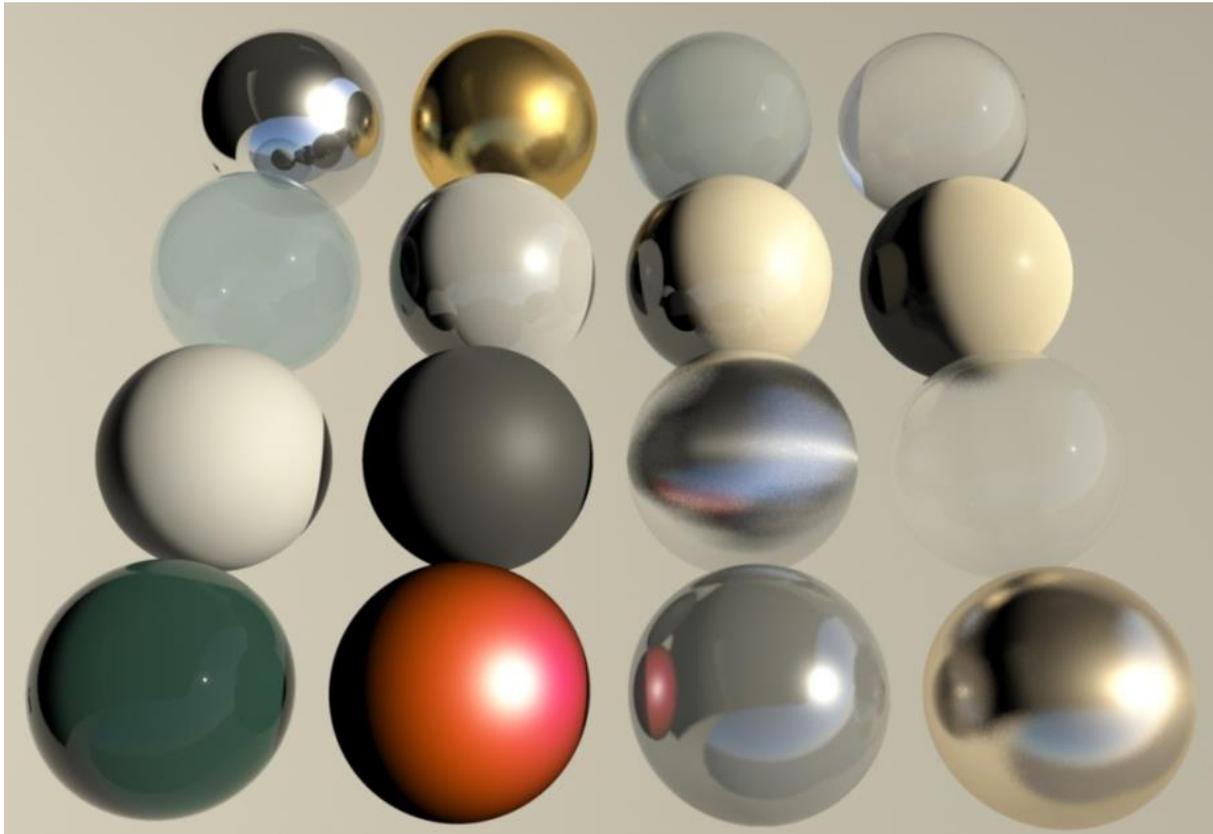
- **Light:** *Physical sun and sky*  
(*Render Settings > Indirect Lighting > Environment > Physical Sun and Sky > Create*)
- **Render settings:** *Quality > Quality Presets > Production*

**Note:** *You can tweak the Max Distance settings in your liquid material to lighten and darken the appearance.*

Here is another example of the above technique within a finished scene.



### AH | Mental Ray Presets



(Top left to bottom right) Chrome, Copper, Frosted Glass, Glass Solid, Glass Thin, Ceramic, Glossy Plastic, Matte Plastic, Pearl, Rubber, Stained Metal, Translucent Plastic Film, Water, Car Paint Shader, Glass/Pearl (Preset Blend), Copper/Stained Metal (Preset Blend).

### AH | Image Optimisation

Maya has its own proprietary image format that it likes to use, the \*.iff format. Converting your files to this format will actually allow Maya to work more efficiently, thus speeding up render times. There are two main ways to convert images to .iff's, Fcheck can save images out as .iff's or you can download a plug-in for Photoshop from high-end 3D.

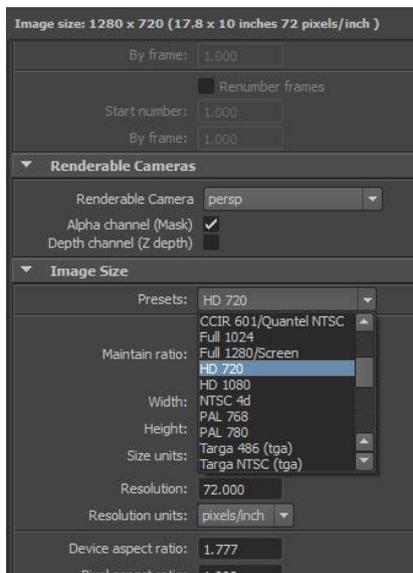
Another useful way of speeding up Maya's rendering is to set the texture filtering to 'off' or 'mip-map'. The texture filter is essentially a blur applied to smooth textures, but in large image files and heavy scenes in general this can substantially increase render times and memory load. Obviously there is a trade off in quality, but you will have to find what works best for your project.

## Chapter 3: Texturing

### PC | Subsurface Scatter Skin Material

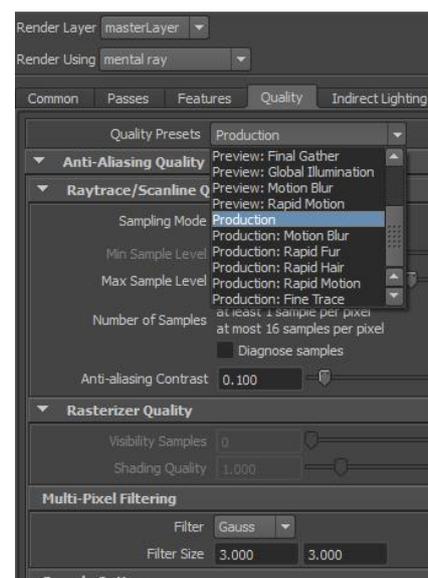
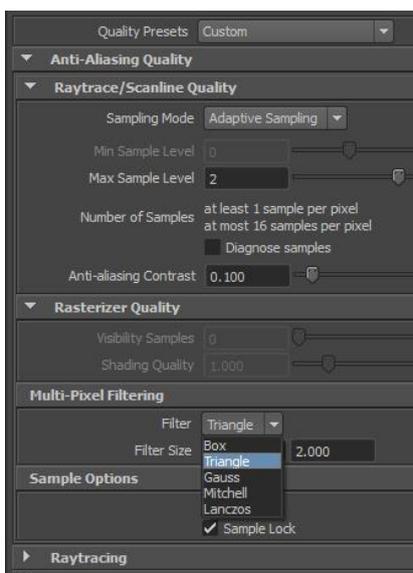
Amongst the Mental Ray materials that are built into Maya are a few subsurface scatter nodes. The one we will be using today is the *misss\_fast\_skin\_maya* shader, which has a few extra options than the *misss\_fast\_simple\_maya* shader to give us a really nice skin shader, really quickly.

Open a new scene and let's set up our rendering settings. First change the resolution so something more appropriate such as *HD720*, and then make sure we are using mental ray as our renderer.



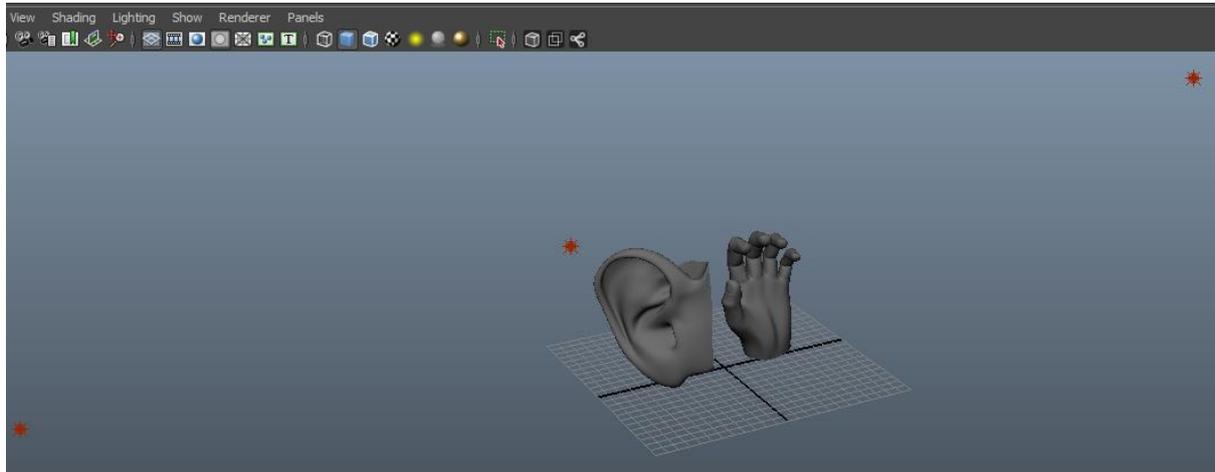
**Note:** If the mental ray option is not available in the drop down menu we need to make sure the *mayatomr.mll* plugin is loaded in the Plug-in Manager (Window > Settings/Preferences > Plug-in manager).

In the *Quality* Tab we can use the preset *Production* to give us a good start on our settings, and for now we will just change the filter to *Triangle* to give us sharper edges and speed up rendering.

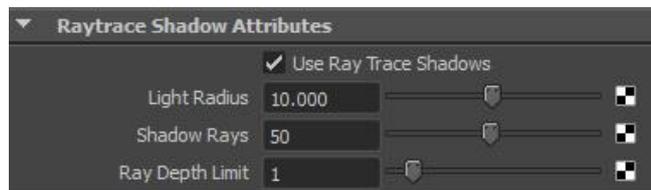


## Chapter 3: Texturing

For the scene lighting I have used three point lights, a front light a side light and a back light. The side light I have reduced the intensity to 0.5, otherwise all settings are left at default. The models I have chosen to import for this tutorial are the ones we built in the modelling section earlier, the ear and the hand. These should give a good representation of how skin shaders will look on your own models.

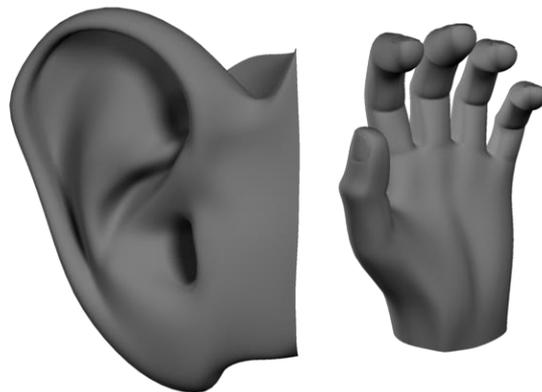


I have enabled ray-traced shadows on the front light with the following settings to give the scene some depth.

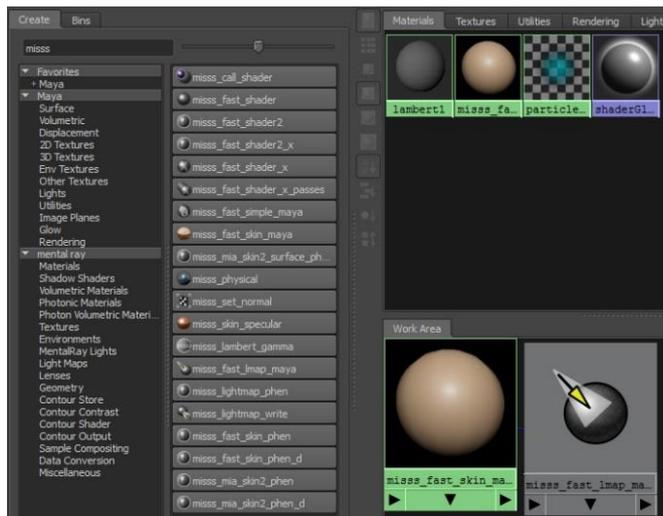


If we hit render then, we should see something like this:

You can see the influence of the soft shadows being created and we can also see a little of the backlight breaking across the edge of the hand.



## Chapter 3: Texturing

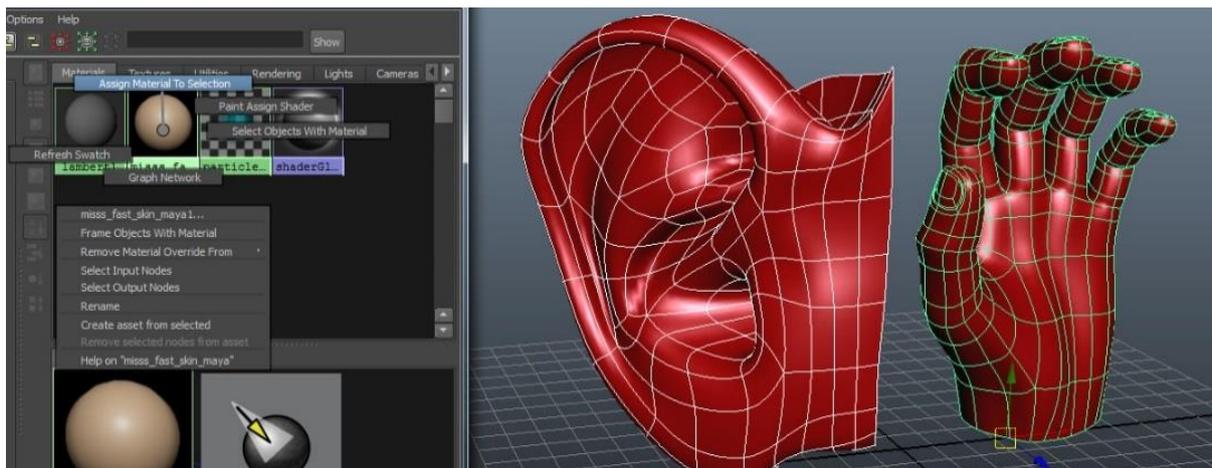


Open your Hypershade window (*Window > Rendering Editors > Hypershade*) and in the search bar type “*misss*”. This will filter all of the subsurface scatter nodes. We are going to use the *misss\_fast\_skin\_maya* node so click on that. (A node will appear in your materials window and Work Area).

You will find that another node, the *misss\_fast\_lmap\_maya* node has been

automatically created and linked to the skin node for us.

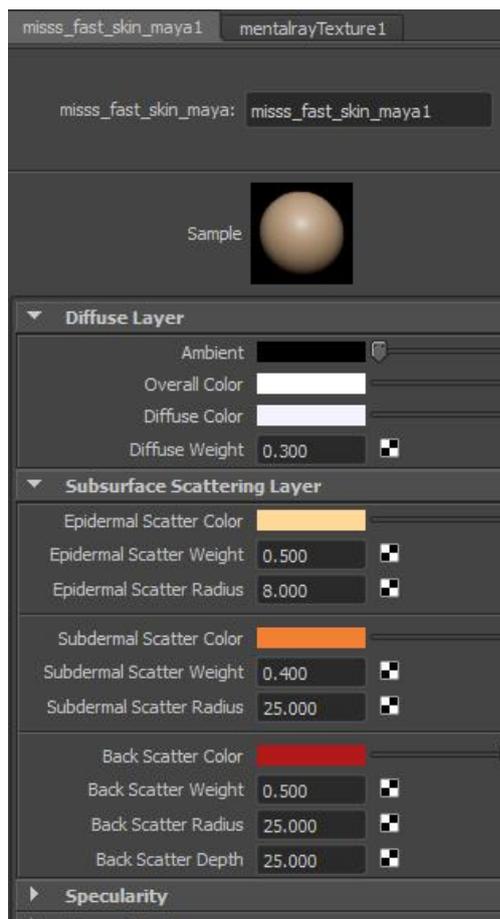
Select both of the objects and right click hold the skin shader and select Assign Material to Selection. You will most likely see the objects turn bright red, this is ok – it is because Maya’s viewport cannot render subsurface scattering.



Render your scene. You can see that although the shading is nice, there is a long way to go to make it realistic. It is too pale and orange and not enough backlight is filtering through.



## Chapter 3: Texturing



Double click on the material in the Hypershade to open the Attributes Editor and expand the *Subsurface Scattering* Layer panel. This is where most of our adjustment will come in.

The *Diffuse Layer* carries the main colour attributes.

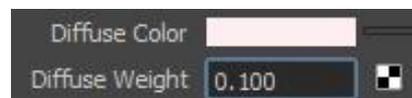
The *Epidermal Scatter* is our primary focus, this is the colour of front light reflecting off the surface.

The *Subdermal* is the 'flesh' part of our skin.

Finally, the *Back Scatter* is the light passing in from behind, which is why we have the extra attribute *Depth*. This controls how far into a surface the light can penetrate.

The *Radius* value controls how much the scatter will spread over our model and finally the *Weight* value controls how much influence each colour will have over our final skin material.

The Diffuse colour is going to have very limited influence, change the value to 0.1 and change the *Diffuse Color* to a very light pinkish tone.



The easiest way to see exactly what we are getting with each of the scatter colours is to work with them one at a time. Set the *Scatter Weight* for the *Subdermal* and *Back Scatter* attributes to zero.

We will work on the *Epidermal* first. This is going to be our primary colour so set the *Scatter Weight* to one and The *Scatter Radius* is far too high so bring that down to about two. We should get a nice, lit skin colour coming from our model when we hit render.

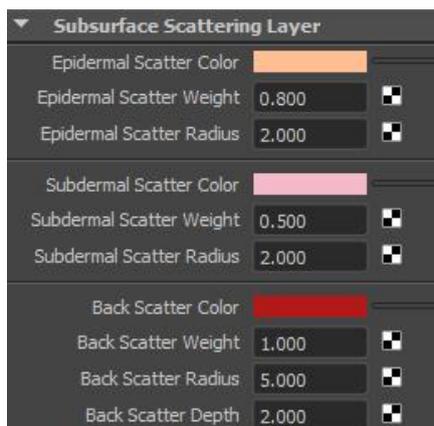


## Chapter 3: Texturing

For the *Subdermal*, (remember to set the *Epidermal Weight* back to zero first) we want a more pinkish 'flesh' colour and we don't want the influence to be too high, a *Scatter Weight* of about 0.5 should suffice. We will set the *Scatter Radius* to two again.

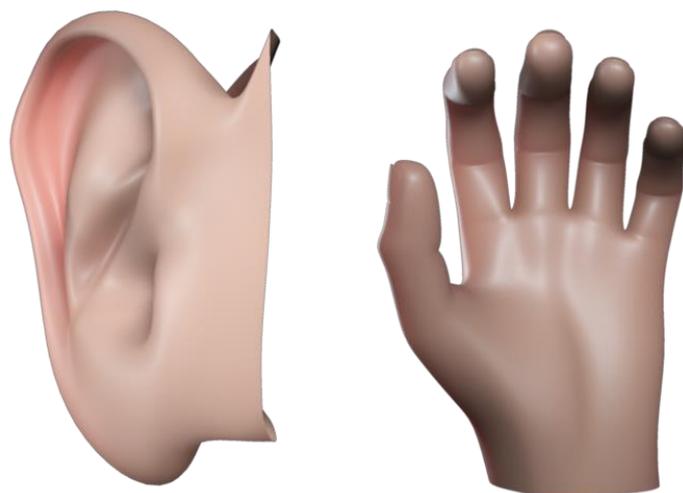


For our *Back Scatter* colour we can keep the deep red colour and set the *Scatter Weight* to one. We want a slightly wider Scatter Radius somewhere around five and the *Scatter Depth* Value depends on your scene and model scale, for me a value of two is sufficient. You can see that especially the thin tip of the ear, the red comes straight through, and on the hand the edges are highlighted.



Finally, we want to combine these settings. Set the *Epidermal Weight* to 0.8, the *Subdermal Weight* to 0.5 and the *Back Scatter Weight* to one and hit render.

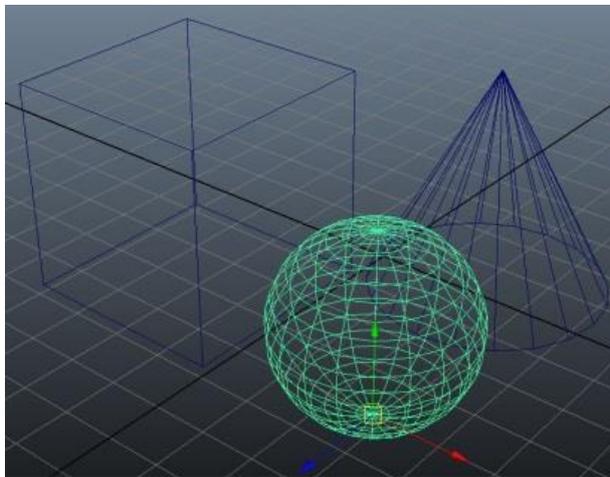
Now we have a simple skin material that you can customise and tweak for your own specific needs.



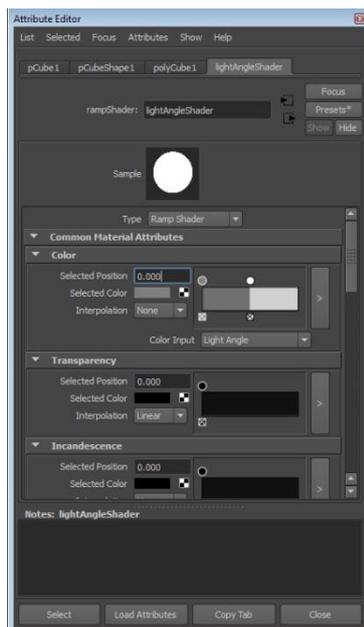
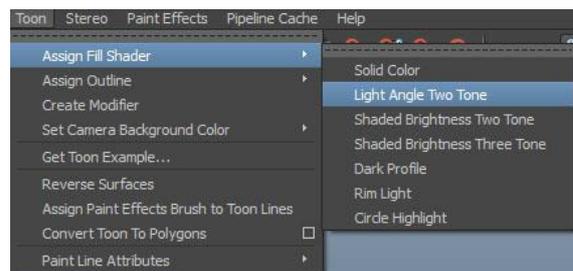
## Chapter 3: Texturing

### PC | Toon Shading

There are two main components to toon shading; on the one hand there is the flat shading itself and on the other there is the solid outline on the objects themselves. For this tutorial we are going to focus on the two tone shader.

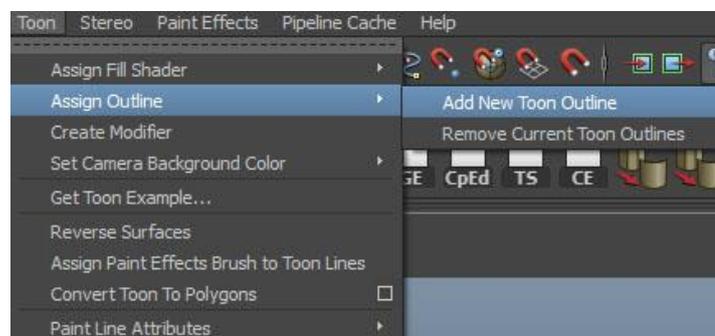
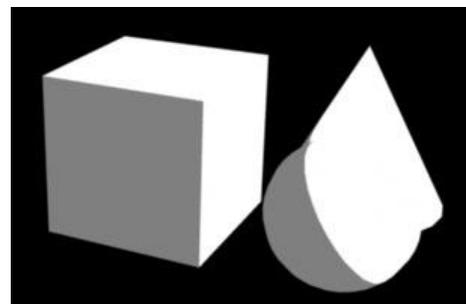


Create a point light and a few objects in the viewport. With one of the objects selected, and in the Rendering menu set, click on *Toon* > *Assign Fill Shader* > *Light Angle Two Tone*.

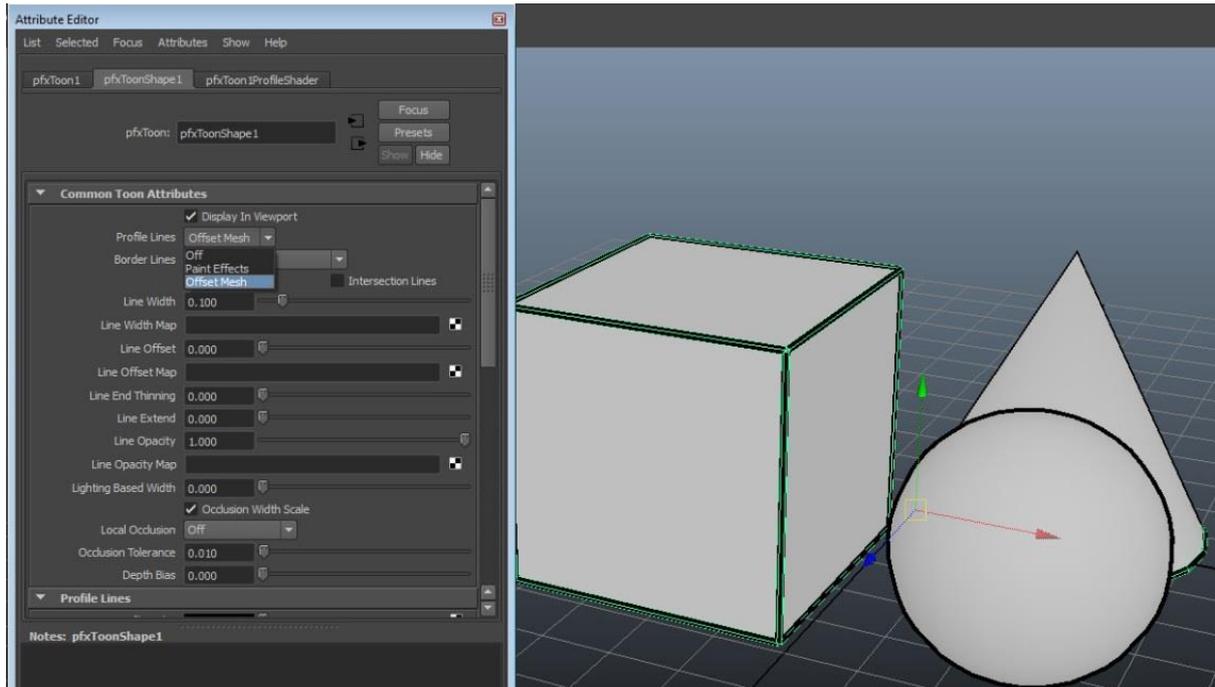


The attribute Editor will open with a focus on a newly created *lightAngleShader*. If you render the scene you will see the shader at work, splitting objects into two clean shades of grey.

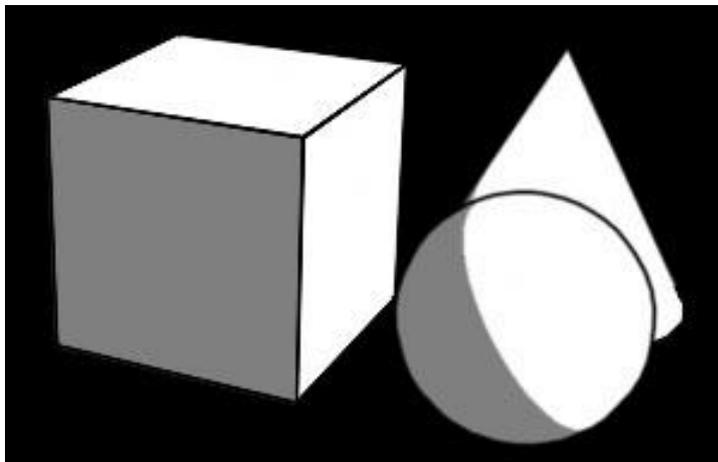
To build an outline around the shapes, select all the objects and select *Toon* > *Assign Outline* > *Add New Toon Outline*.



## Chapter 3: Texturing



This will create a new paint effects shape around the outline of the shape and also against any sharp edges. In some cases (for example when rounded surfaces come to a point) you may get a more accurate result if you set *Profile Line* to *Offset Mesh*.



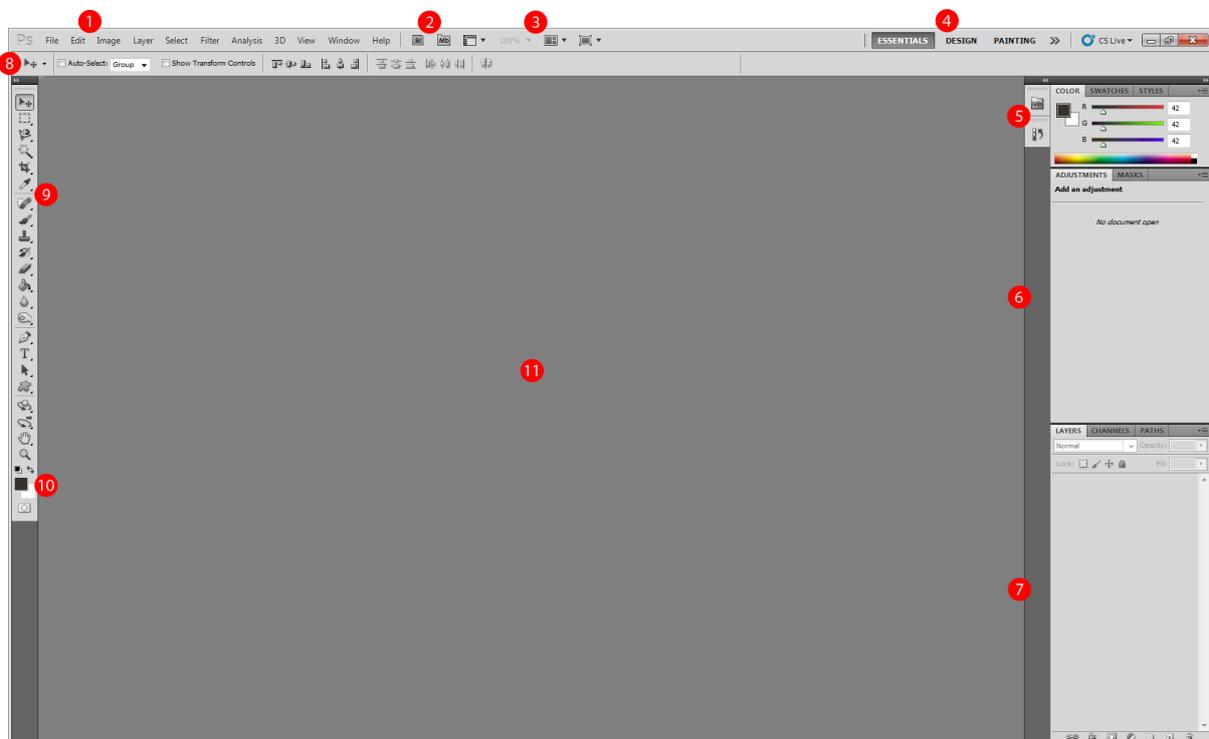
Experiment with the options and ramps in the *lightAngleShader* to get your desired effect.

## AH | Photoshop Basics

### Introduction

Photoshop is a powerful image editing application that provides industry standard versatility and optimised tool sets allowing for the creation of professional and sophisticated images. Many animation books can often take for granted an understanding of Photoshop, but we know from experience many people do not always have this knowledge. So as oppose to you having to search for further tutorials we have dedicated this section to go over the basics of Photoshop and its uses within Maya.

### Photoshop Layout

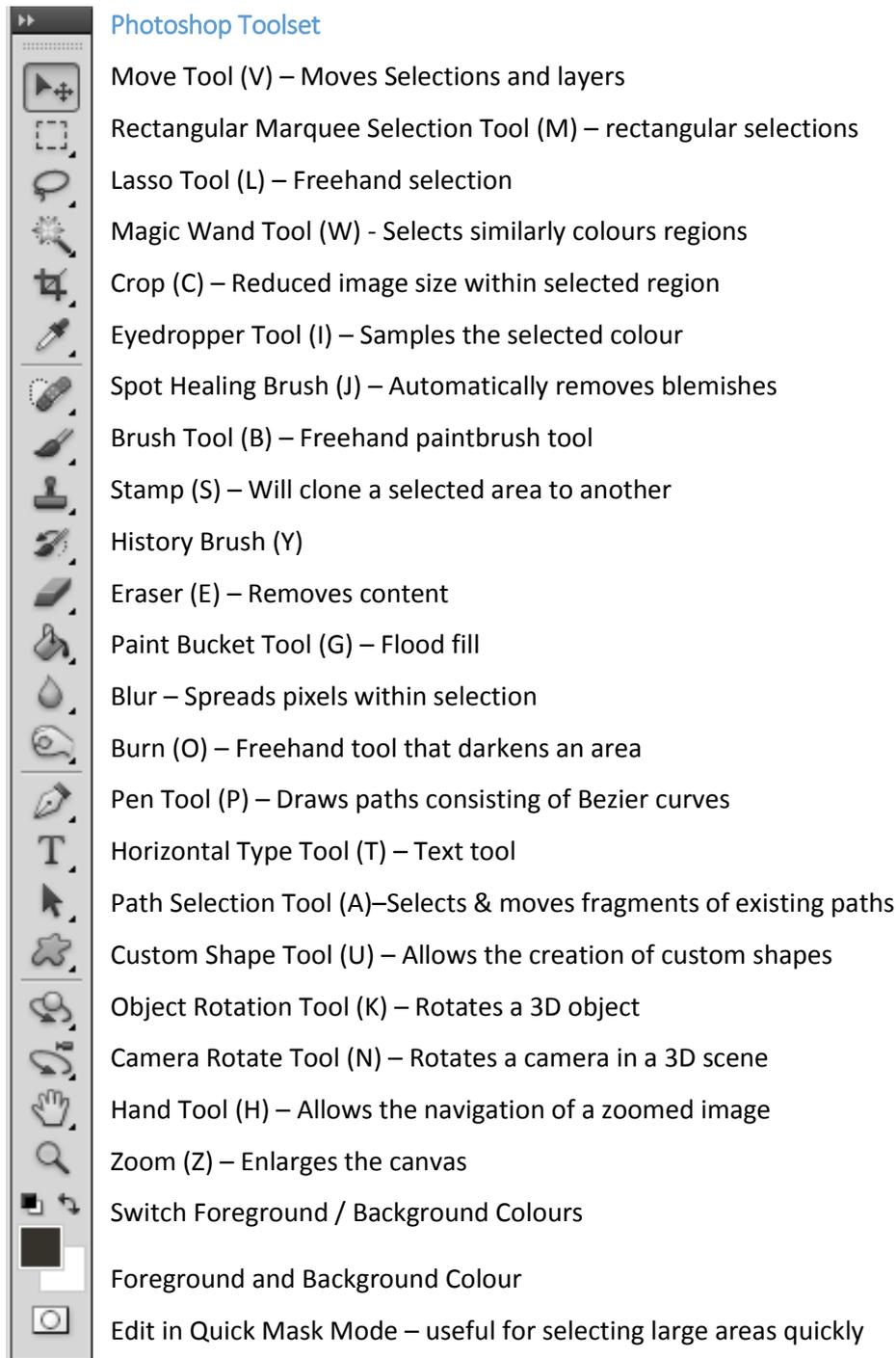


1. Main menu bar
2. Additional views and Bridging options
3. Zoom and image pane options
4. Pre-configured Menu-sets for appropriate design stages
5. Colours / Styles / Swatches options (all dependent on Menu-sets).
6. Adjustment masks / Fonts / Brushes (all dependent on Menu-sets).
7. Layers Menu, with appropriate tools
8. Currently selected tool and further options
9. Tool shelf
10. Colour selection pallet
11. Workspace



## Chapter 3: Texturing

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All icons that have a small arrow in the bottom right hand corner indicate there are further tool options available within that specific tool set.

## Chapter 3: Texturing

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### Mouse vs. Tablet

Can you do everything a tablet does on a mouse? Almost, the tablet however has the fundamental advantage of being able to use the pressure sensitivity attribute enabling you to taper off lines and blend colours more subtly. Similar effects can be obtained with a mouse combined with Photoshop features but as you all know a mouse click is either on or off, there is no in-between, you will have to put in a lot more work to attain similar effects to that of a tablet. In today's market you don't have to spend a fortune on a tablet but we would recommend getting one if you are interested in creating your own textures.

### The Colour Palette

#### *To Save a Colour to the Palette*

- Open the swatches tab
- Select the paint bucket tool
- Left click within the swatches tab
- Save colour, naming it accordingly

### Brushes

#### *Editing a Brush*

You may need to edit the appearance of a brush to get the desired effect needed for your texture. By default brushes are usually solid, uniformed and repetitive almost the opposite of what we want at this point. Therefore to break up the brush's continuity follow the below instructions.

- Choose an appropriate colour
- Select a default brush that will suit your requirements
- Go into the brush window *Window > Brushes (F5)*
- Edit all or some of the following characteristics at your discretion.
  1. Brush Tip Shape > Spacing: Use the slider to separate the brush strokes so there is a gap between each one.
  2. Shape Dynamics > Size Jitter: Slide to randomise the sizes and/or use the dropdown menu (if you're using a tablet) to link this attribute to pen pressure.
  3. Scattering > Scatter: Slide to randomise the positioning of the brush strokes.
  4. Size it to a reasonable scale.
  5. Plus any other adjustments you feel are necessary.

## Chapter 3: Texturing

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### Creating a New Custom Brush

Under some circumstances you may require a brush to create a unique or repetitive shape for uses like adding blemishes. To create a custom brush:

- *File > New*
- 50px by 50px workspace area, ensure you have a transparent background
- Locate a brush to give you a starting point (optional)
- Create your brush using the relevant tools.
- *Select > All*
- *Edit > Define brush Preset*
- Chose a name for your brush, once saved it will appear in the brushes pallet

### Photoshop and Maya

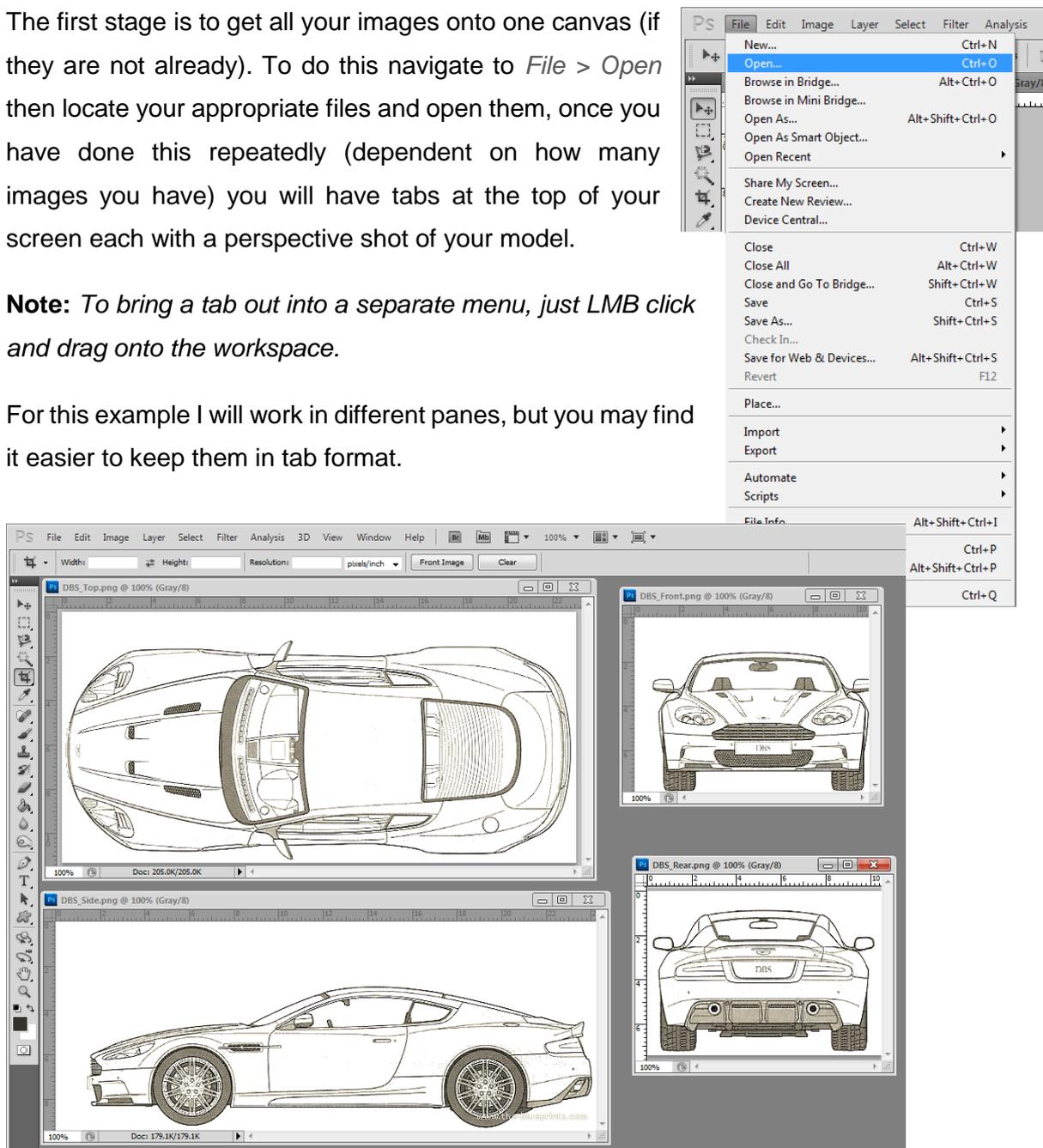
Photoshop can save in a variety of image formats all of which Maya can recognise pushing these two programs to become widely recognised as industry standards. There are however a few issues when using PSD files as textures within Maya that you are wise to take note of. They become apparent when using standard methods of layer blending and layer opacity.

### AH | Preparing image planes for use in Maya

The first stage is to get all your images onto one canvas (if they are not already). To do this navigate to *File > Open* then locate your appropriate files and open them, once you have done this repeatedly (dependent on how many images you have) you will have tabs at the top of your screen each with a perspective shot of your model.

**Note:** To bring a tab out into a separate menu, just LMB click and drag onto the workspace.

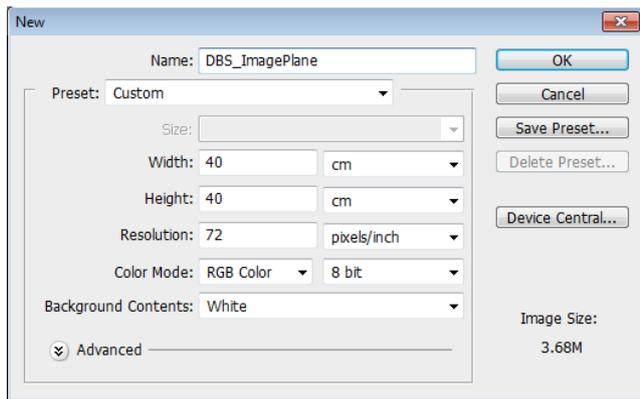
For this example I will work in different panes, but you may find it easier to keep them in tab format.



We now have our 4 separate images that we need to bring into one, but we need to ensure that the canvas we create will be of sufficient size to hold our complete image. Select a tab or a window, and navigate to *Image > Canvas Size* and click the option you will be presented with the size of the image, at this point make a mental note or write down the dimensions. The top of my car is approximately 24cm x 12cm (w x h), and the front of my car is approximately 11cm x 9cm. On a quick calculation we need a canvas at least 33cm x 35cm to house our images, so to give us some manoeuvrability we'll round it up to 40cm x 40cm.

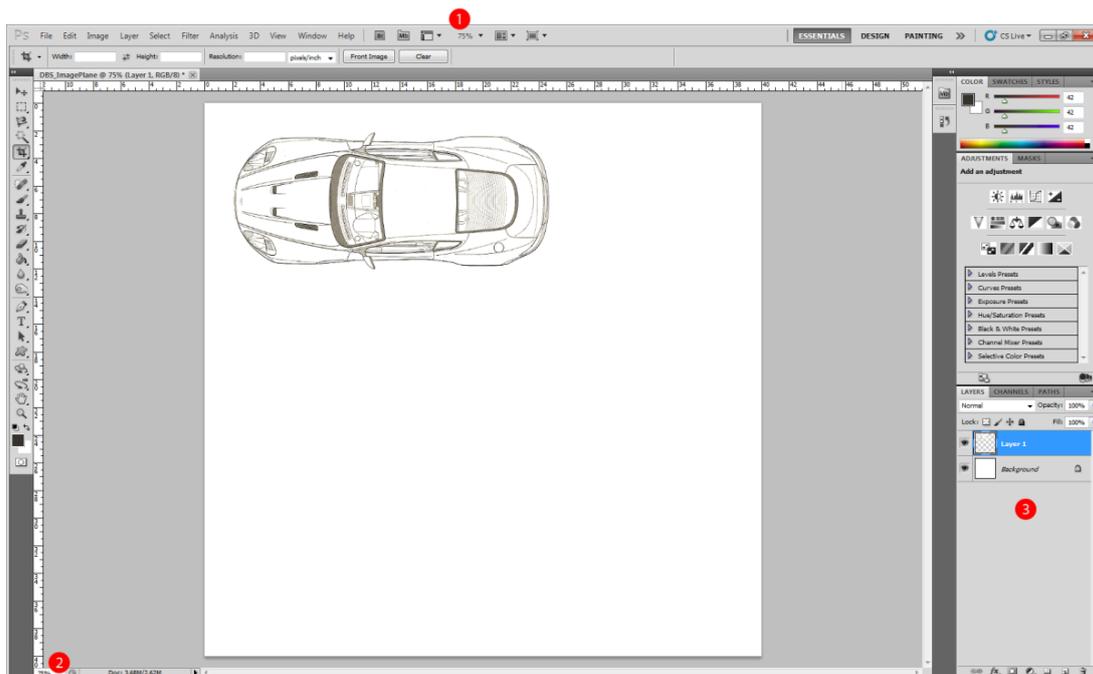
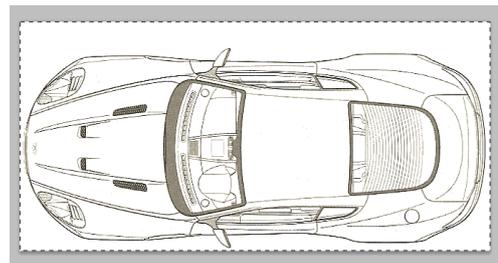
## Chapter 3: Texturing

*File > New* and you will be presented with the following box. Fill in your required fields (40x40) ensuring the measurement in the right hand column is in centimetres. Give your file a name (at the top) then click OK.



Now open one of your existing tabs or windows that has one of your perspective views within it, and navigate to *Select > All (ctrl-a)*.

A dotted line will have appeared around the edge at this point which means your image is selected. Navigate to *Edit > Copy (ctrl-c)* then open your newly created blank 40x40 canvas and select *Edit > Paste (ctrl-z)*. You should then have something that looks like the below screen.



We've highlighted 3 points that might be of interest for you at this point:

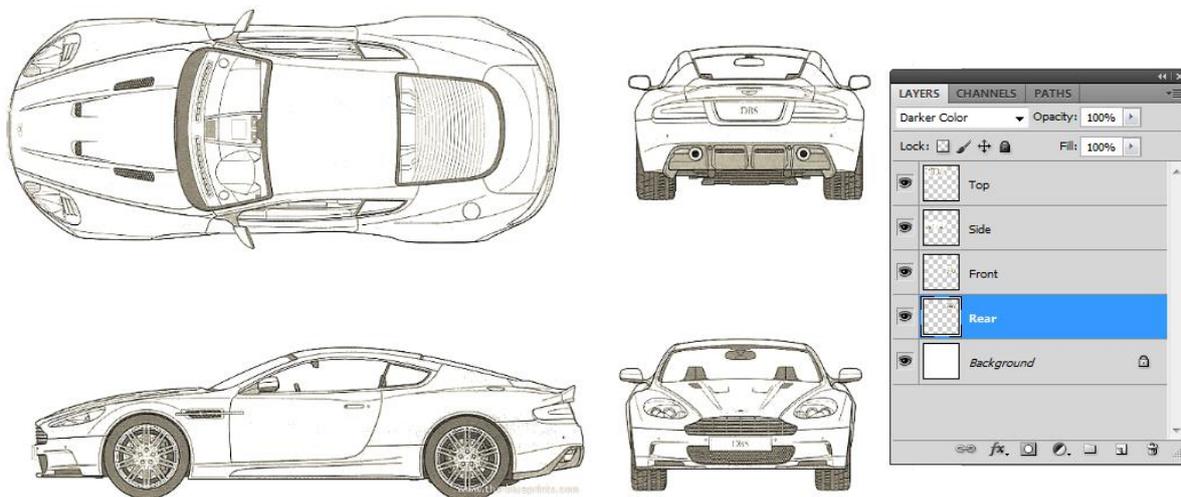
1. Zoom menu – if your workspace looks unusually large or small, resize is using a percentage scale.
2. Also a zoom menu (as above).
3. Layers Menu – you will notice you now have two layers, one most probably stating background with a padlock and the other saying layer 1.

## Chapter 3: Texturing

### Photoshop Layers:

As you would expect; layers allow you to isolate items separately allowing you to manipulate or alter them in ways that will not affect the remainder of the canvas. Once you have a layer selected any alterations will only affect that layer and no other, if at this point you want to reposition your layer, ensure its selected, click the Move Tool (v), top icon LHS, then click and drag accordingly. You may have also noticed an eye on the LHS of each layer, by clicking this you will toggle the layers visibility on/off.

You now need to repeat the process three more times until all your perspective images are situated within the same canvas. You should then be presented with something that looks like this.

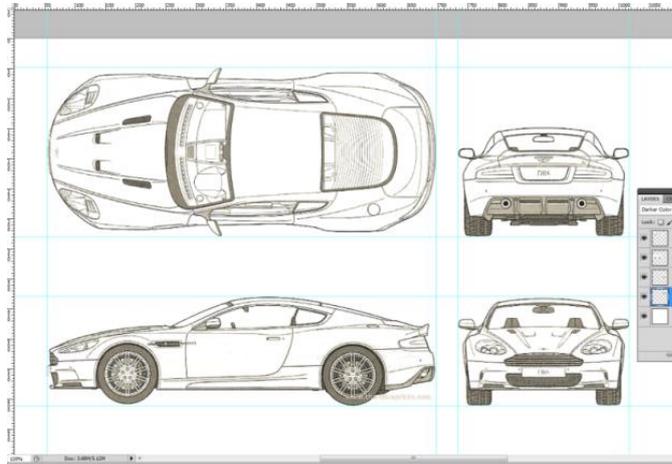


You may notice our layers now have names, so to add layer name firstly you can either select the layer *RMB click > Layer Properties* which will enable you to rename (and colour code, which we will not be using) or double click on the text itself where it says the layer name, being careful at this point to only click the layer name as double clicking the layer itself will open the *Layer Style Menu*, which at this point we will also not be using. We altered the dropdown option under where it says layers (default to *Normal*), to *Darker Colour*. The reason being it removes the white background from each image so if we move them closer together one of them will not disappear.

At this point I would recommend experimenting with the overlap options, highlight one of your images temporarily place it on top of another and filter through the dropdown menu to see the effect.

## Chapter 3: Texturing

The next stage is to add in some guide lines that allow us to match up our image perspectives in order to provide us with the most accurate scale possible. To do this ensure the rulers are being displayed around the border of your work area, if they are not go to *View > Rulers (ctrl-r)*. To create the light blue ruler lines you see on the image below, click on the white ruler



section that surrounds the canvas and simply drag them onto your image, (vice versa to remove) and position them in such a way so you can determine if their scale matches or whether they need adjusting. If the image needs adjusting select the appropriate layer and either navigate to *Edit > Transform* and select the appropriate modification tool:

- Scale
- Rotate
- Skew
- Distort
- Perspective
- Warp



Or use *Edit > Free Transform (ctrl-t)* and you will be able to manipulate it accordingly, if you want to scale in proportion ensure you're holding shift and if you want to skew hold *Ctrl*.

**Note:** If you make an error in Photoshop, to step back one process its *ctrl-z*, to continue stepping backward you need to press *ctrl-alt-z*.

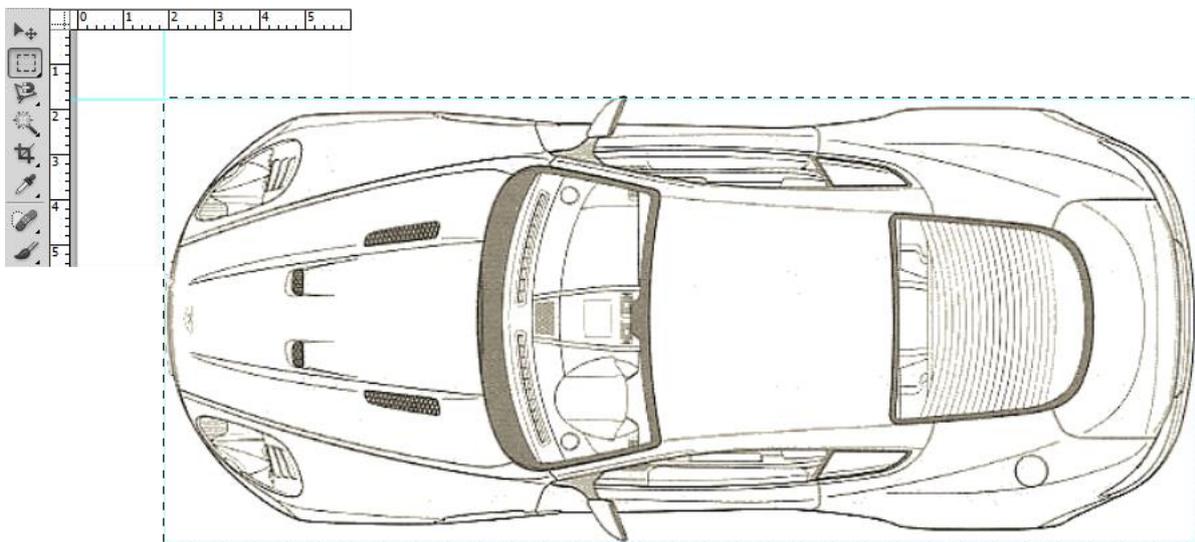
Once you have your images lined up as above its important to check that the width of the top correlates with that of the front/rear. A few ways to do this would be to rotate one of them 90° and see if it's within the margins. Another way is to navigate to *Window > Measurement Log* then select the *ruler tool* (click and hold on the eyedropper tool to be able to select).

Then with this tool selected you can click on the guidelines one at a time and with the measurement log open click *Record Measurements*. Our measurements are 4pixels apart which we can live with.

## Chapter 3: Texturing

ANIMATION (FRAMES)		MEASUREMENT LOG								
Record Measurements										
	Label	Date and Time	Document	Source	Scale	Scale Units	Scale Factor	Count	Length	Angle
0001	Ruler 1	06/11/2010 16:17:43	DBS_ImagePlane	Ruler Tool	1 pixels = 1.0000 pixels	pixels	1.000000	1	279.958854	-90.000000
0002	Ruler 2	06/11/2010 16:17:58	DBS_ImagePlane	Ruler Tool	1 pixels = 1.0000 pixels	pixels	1.000000	1	283.510036	0.000000

The final preparation stage is to save out the re-sized images back to singular files. There are a few ways to do this, the first of which is being to select the Rectangular Marquee Tool (by default it will snap to the ruled lines when in the vicinity) and highlight the image, copy the selection (*ctrl-c*) then going to *File > New* Photoshop's default sizing's in the box at this time will be the exact same as the copied image, so by clicking OK and then pasting (*ctrl-v*) the image it will fit perfectly. If you want to increase the canvas size to a whole number i.e. 8cm x 12cm for easy referencing navigate to *Image > Canvas Size* (this doesn't alter the image size whatsoever), save the file to complete.

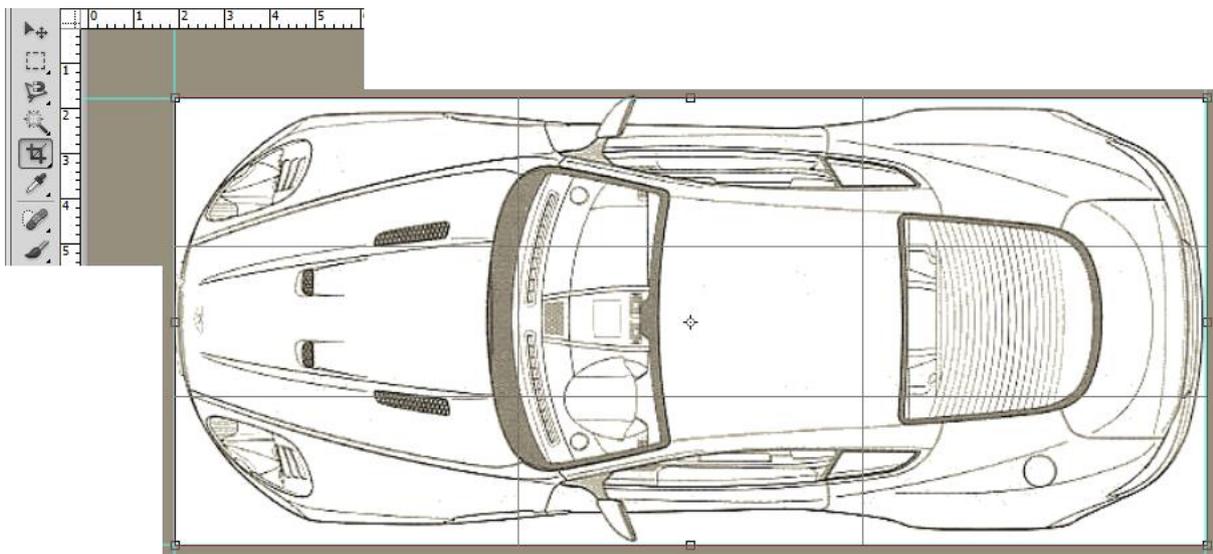


## Chapter 3: Texturing

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When you get to the rear image (as it hasn't got guide all around) the car, to keep correlation with the front I hide/remove the front layer and fit the image between its guidelines this way you know it will be the exact same size.

The second option uses a similar selection technique but with the cropping tool instead. Once the image is highlighted double click within the selection and everything will disappear. Save the image then press *ctrl-alt-z* until you're presented with your full image again and repeat. Typical naming convention "Car\_Top".

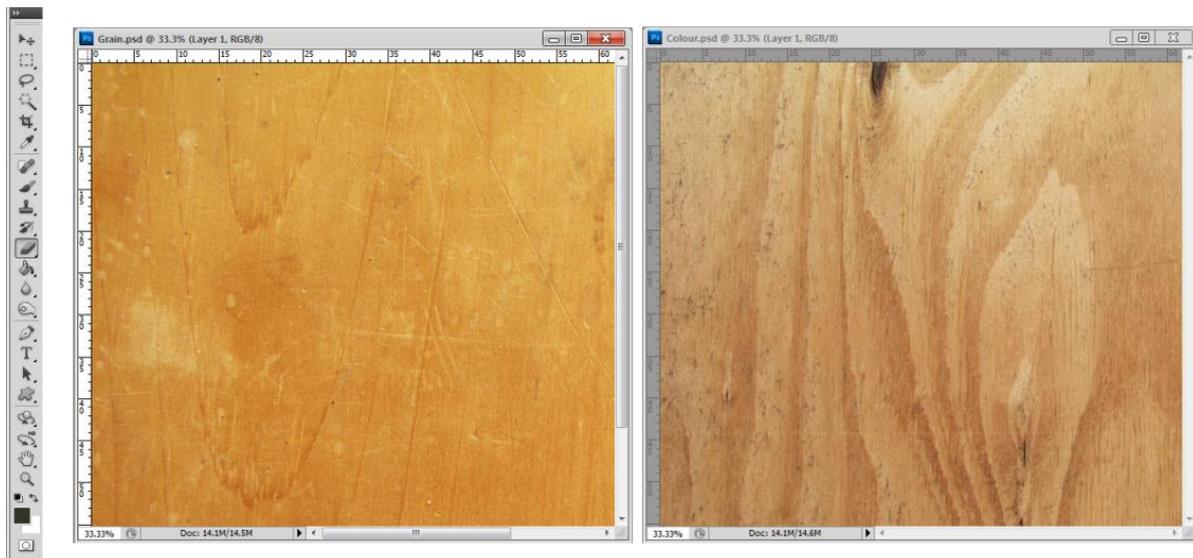


### AH | Colour Matching

There will be times when you like the design or print of one image but prefer the colour of another; in this section we will show you how to overcome this problem with various techniques.

#### Match Colour

- 1) Open both your files in Photoshop. For all intents and purposes I'm going to say that I prefer the grain on the left image but the colour of the one on the right.



**Note:** for reference purposes you may wish to create a duplicate layer before continuing.

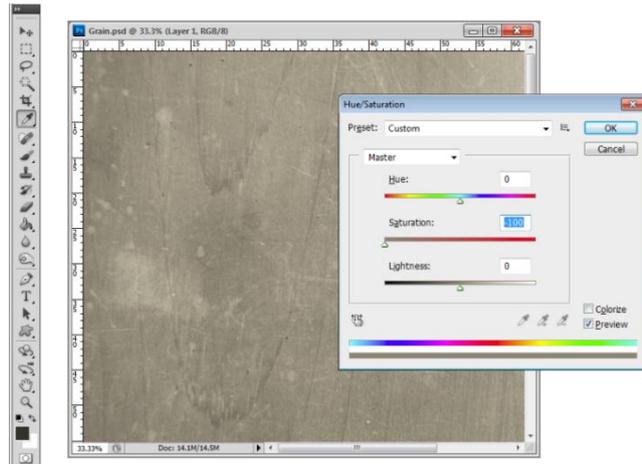
## Chapter 3: Texturing

2) (Optional step – *completed in demonstration*) Click on the left image and desaturate (remove all colour) *Image > Adjustments > Hue/Saturation* (Ctrl+U), drag the saturation slider all the way to the left (-100). You will then be left with a greyscale image.

3) (Optional step – *not completed in demonstration*) Blur the colour you

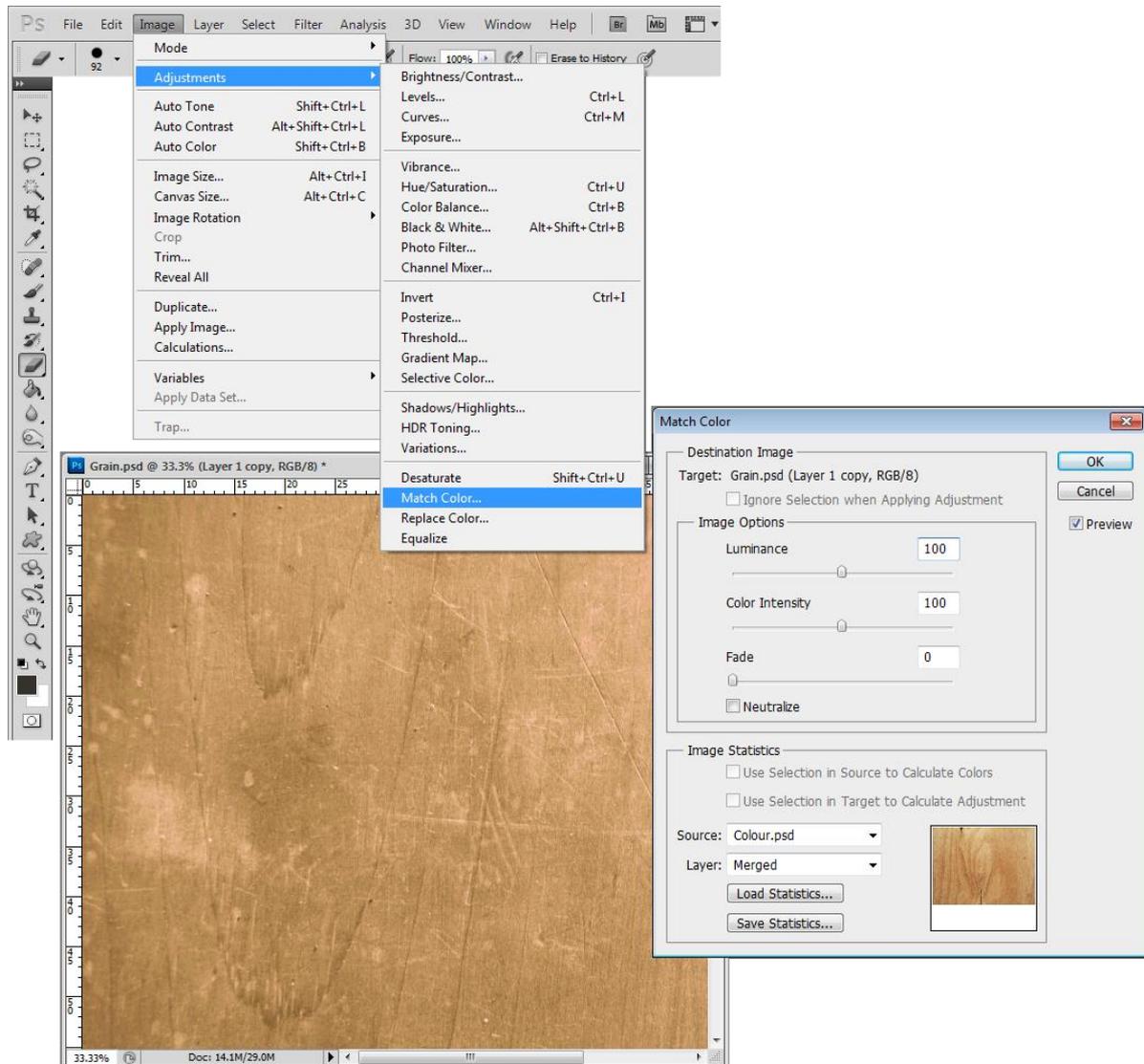
intend to match, select the file (in our case it would be the one on the right), navigate to *Filter > Blur > Gaussian Blur* (transition sliders accordingly).

4) The next stage is to navigate to *Image > Adjustments > Match Colour...* The 'Match Colour' dialogue box will appear and you will need to select the source at the bottom before you can adjust the values. The source will be the other file you opened at the beginning and you can specify a layer if you wish. Once the source has been selected (Colour.psd in our case) you can then use the sliders to create the image tone that you require, once finished click OK.



## Chapter 3: Texturing

Occasionally on aspects such as wooden floors the divisions between them may require re-emphasising after the merge, to do this select *Filter > Sharpen > Smart Sharpen* and alter the sliders until the desired end effect is achieved.



As you can see it creates a nice colour merge between the two textures, resulting in a professional and realistic alternate wood effect.

### Ah | Seamless Texture Creation

In this section we will take you through the process of creating a texture that can be repeated seamlessly, and reducing any repeating patterns that may arise. Bricks are a little more challenging than say a wooden floor but the processes involved are identical.

#### Step 1: Importing into Photoshop

Locate the file and import this into Photoshop, it makes for good practice that texture images are square and our preferred size is 1024 x 1024. When re-sizing an image try to make a little less work for yourself by not having half / quarter bricks visible on top and bottom, try to keep them whole, this isn't essential but a good practice.



#### Step 2: Offsetting the Image

Once the file is within Photoshop (as sized accordingly) navigate to *Filter > Other > Offset*. Offset both approximately 50% (512 pixels) and generally at this stage you will have the appearance of a cross in the centre of your image



#### Step 3: Seam Removal

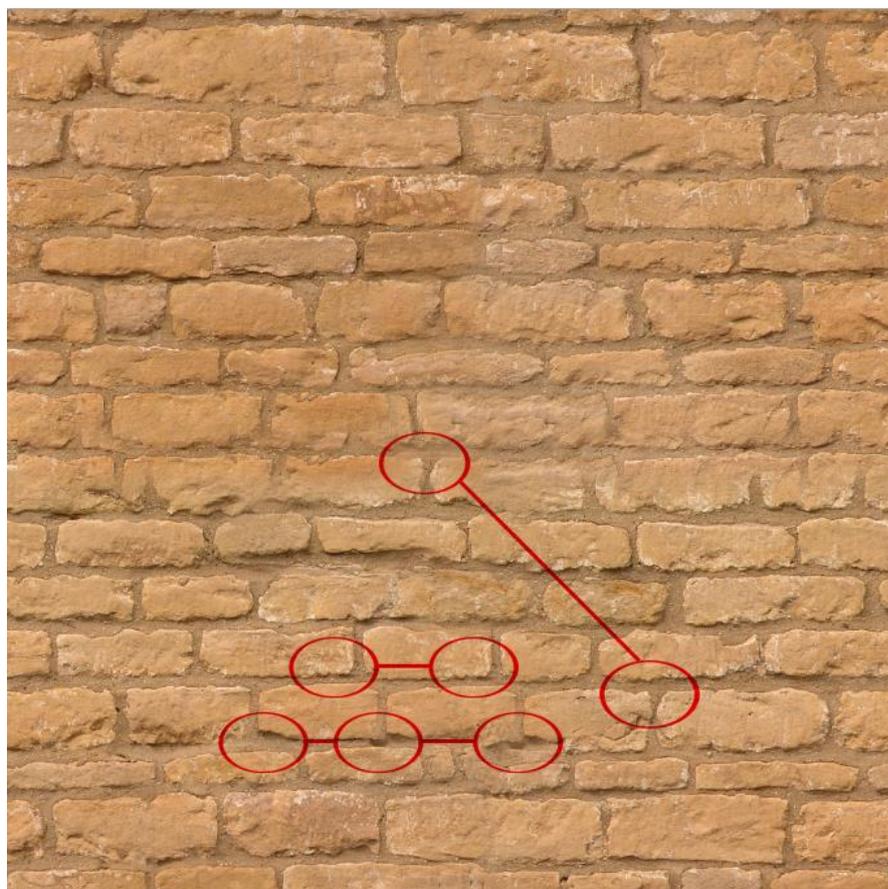
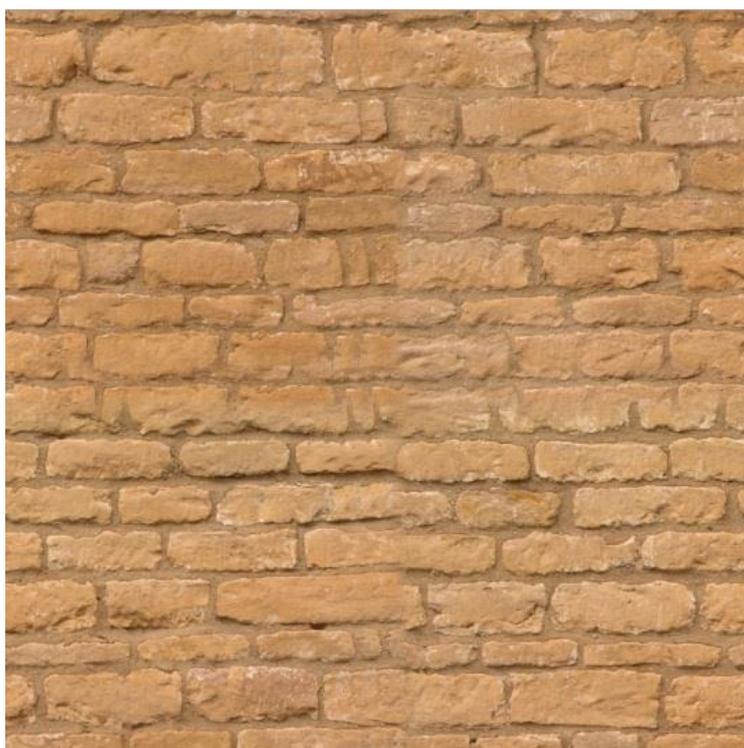
The next step is to use the clone stamp at 100% with feathered edges to remove the sharp visible seams both horizontally and vertically. To use this tool select an appropriate brush size (50-70px), hover over an area that you would like the clone to commence (usually something in the general vicinity is best suited as colours are often similar) hold *Alt-LMB*. This gives the starting point for the clone, then when you hover with your mouse cursor you will see a preview of the stamp within the circular boundary of your cursor. The tool moves in accordance to your mouse navigation so if this is your first time using the tool it may take some getting used to.

## Chapter 3: Texturing

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### Step 4: Tidying up the texture

You will then most probably need to tidy things up a little, whilst also noticing that the horizontal line is not as visible as the vertical as we cropped this earlier at a suitable point. The majority of the initial work outlay it best carried out with the *clone stamp* with no opacity applied. Below we hoped to illustrate the ideology behind this process by paying particular attention to duplicating the corners and edges of similarly sized bricks we are able to help mask the seam down the centre.



Continue defining the corners and edges, and using random brick features to define and distinguish others. You may find at times sections become blurred, to counteract this once you have found the feature you want to replicate, click in the same place repeatedly to apply the stamp more visibly. If as well keep referring back to the same sections or can still see the seams etc., the

easiest thing to do is jump back to **step 2**, (offsetting the image for a second time using different numbers), then continuing with the above process.

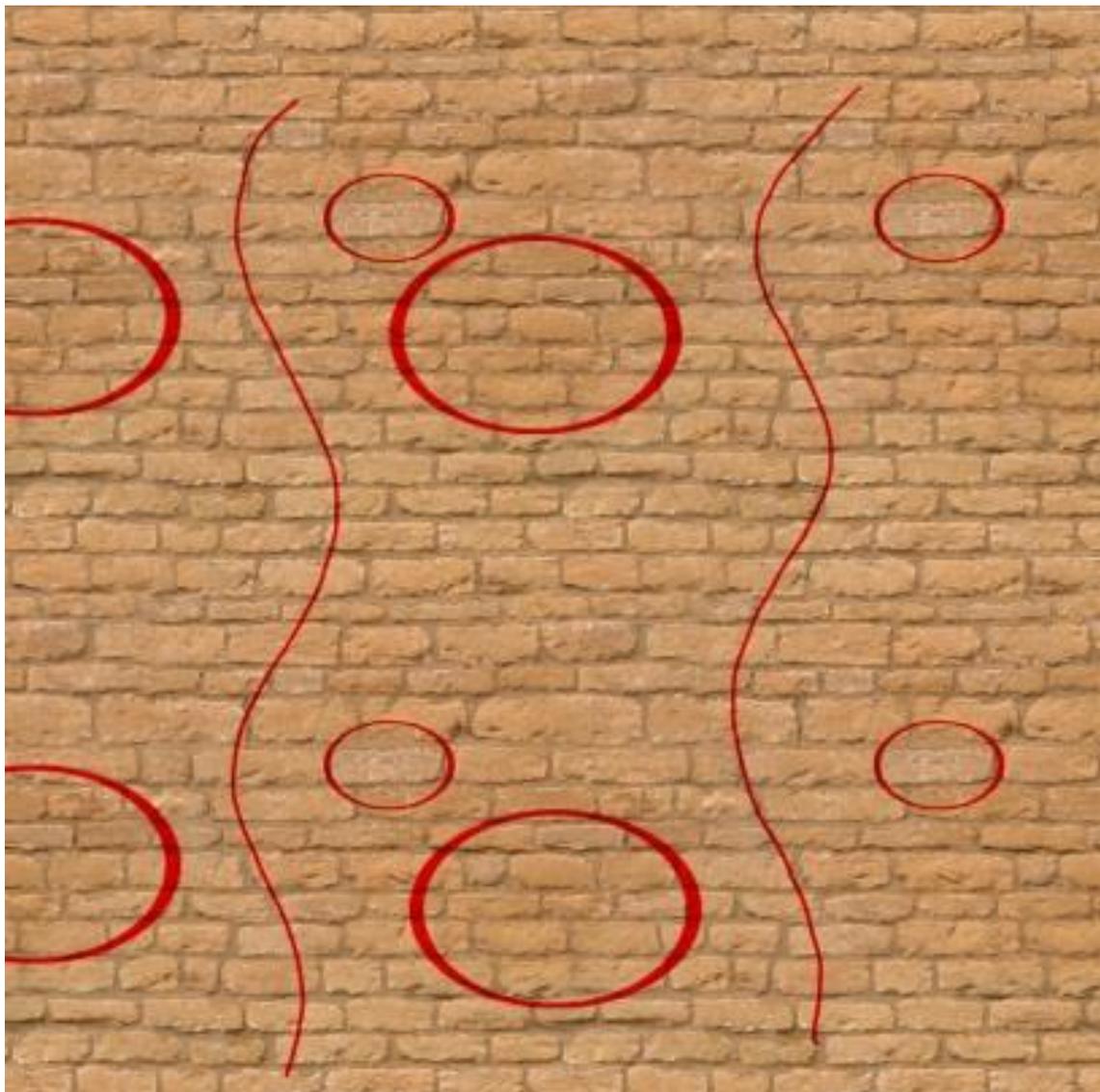
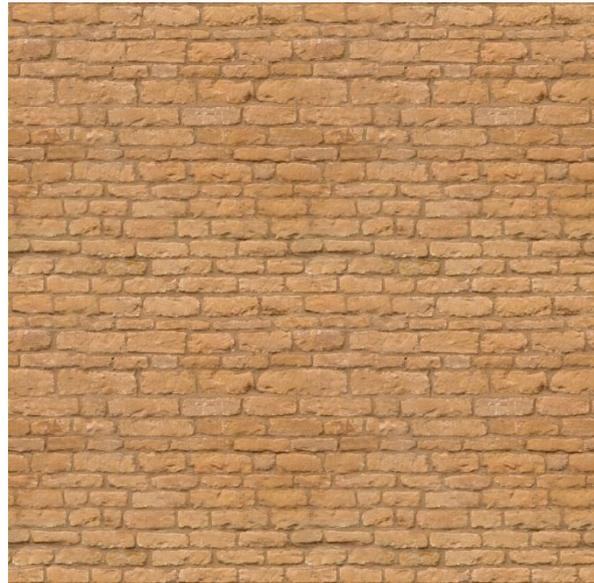


## Chapter 3: Texturing

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### Step 5: Checking Seams / Enlarging the Image

The next step you can see if what you have done makes for a seamless texture. Create a blank canvas 2048 x 2048 and past in your image 4 times and position appropriately, from all accounts we have achieved a seamless texture but the only thing is the human brain is exceptionally good at recognising patterns, so if this is to be spread over a large area without additional props you may want to look into disguising these “repeating attributes”. We’ve highlighted a few obvious ones, which will always generally include a distinguishable brick pattern, some shading and a brick that simply stands out from the rest of them.



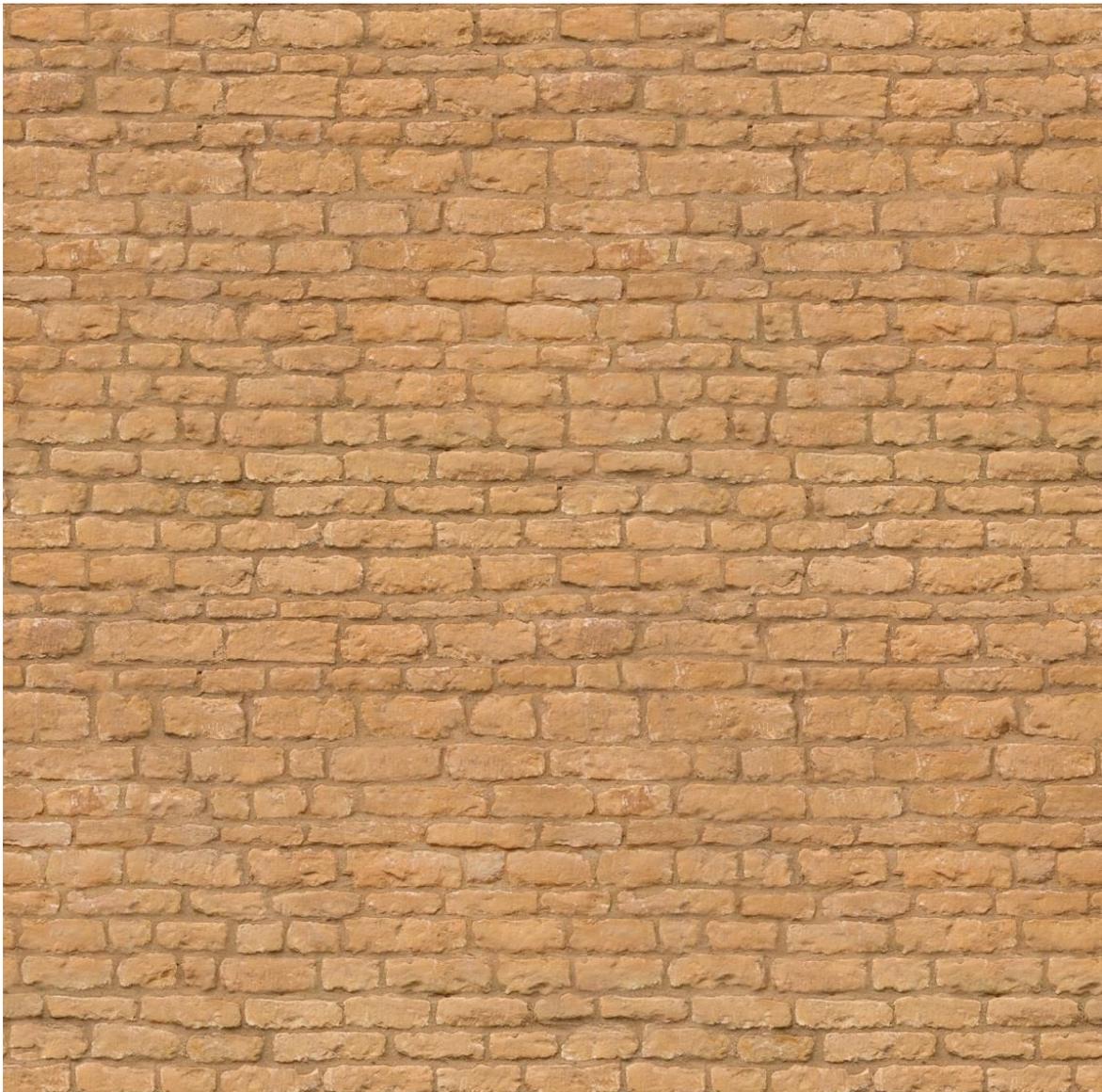


## Chapter 3: Texturing

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Whether you want to stick with the larger image or refer back to the previous one the general processes will be the same.

- To lighten your dark spots use the dodge tool on a low (5%) exposure until satisfactory.
- If using the large image take out the key repeating features, colour some of the bricks and alter their appearance using techniques from earlier steps to give a truly authentic feel.



The above image has had “arguably” the most distinguishable repeating features removed/disguised. The process can take a little bit of time in the early days but you’ll quickly adhere to the tools and techniques if done regularly.

You can of course advance on these textures as you see fit, however once you have finished tweaking or if you decide to perform tasks such as colour matching, just ensure you offset the

## Chapter 3: Texturing

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UV's to check no seams have been re- created, (if visible they should only be slight and at this stage it shouldn't take long to rectify)