Introduction to 3d – Asset Creation

This tutorial will cover basic modelling, unwrapping and texturing.

Contents

Introduction

The aim of today's exercise is to use Maya and Photoshop to create a finished asset.
Today's asset is a retro Mesa Boogie Mark II amplifier.
We'll be following the following workflow:

1. Model in Maya
2. Unwrap in Maya
3. Texture in Photoshop

Preparing to model

The first thing to do when starting an asset is to collect reference of the object you plan on modelling so that you can really plan your approach. Here are a couple of good reference images:

The next thing should do is decide what details should be achieved by modelling it into the geometry and what details should be placed in the texture. The separate models I would break this up into are as follows:

- The grill, wood casing and front plate.
- A knob
- A switch
- A slider
- An input
- The handle

The Modelling Tools

Effective modelling practices rely on using the right tool for the job. In the following section, we'll demonstrate various techniques using a small selection of tools.
Every component on the amp can be started from a primitive cube.
Use these tools to construct your amp components (they are all found under the **edit mesh** menu).

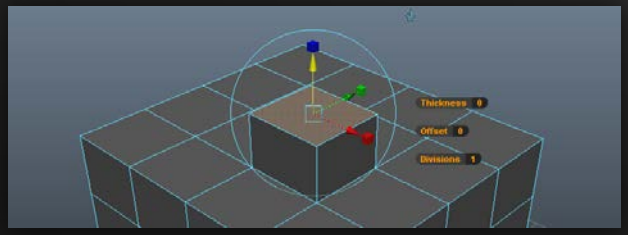
- The extrude tool
- The insert edge loop tool
- The append to poly tool

Attempt to only use quads in these models.

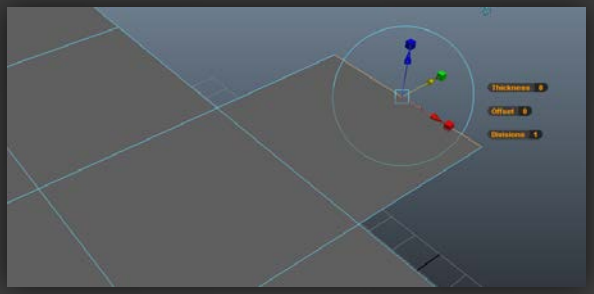
The Extrude Tool

Extruding

This is useful for both extruding a selection of faces from an object:



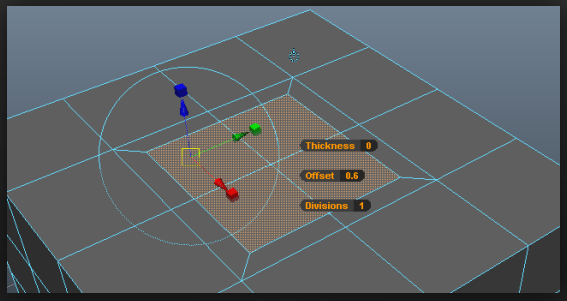
Or for extruding an open edge:



The tools manipulator allows you to transform faces relative to the normal of the face.
Simply select the faces, execute the extrude tool and drag on the manipulators handles.

Offsetting

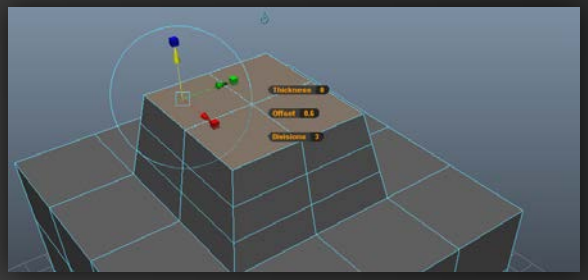
The offset widget is useful for insetting faces. This can be useful as a starting point for extruding frames, panels, windows etc.



Select the faces, execute the extrude tool and LMB click and drag on the offset widget.

Divisions

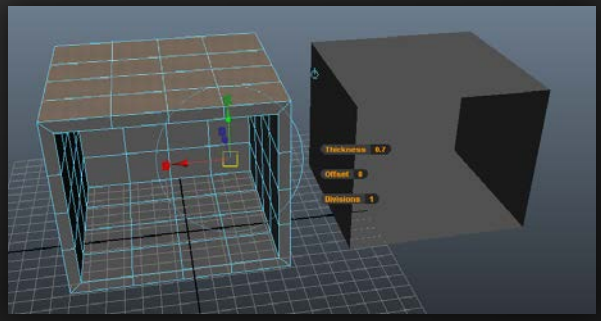
Increasing divisions allows you to add evenly spaced divisions in the extrusion.



Extrude a selection of faces, then LMB click and drag on the Divisions widget to add extra divisions.

Thickness

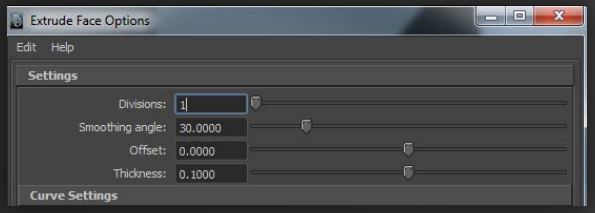
Thickness is an effective tool when dealing with open edged objects (such as sheets of paper) to add thickness to these otherwise infinitely thin shells.



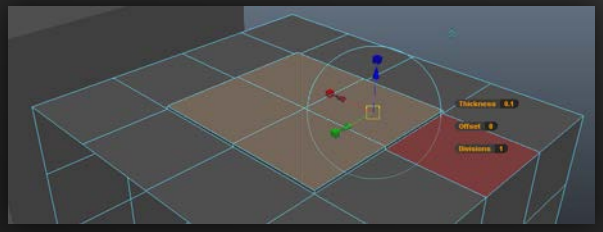
Simply select your open object and execute the extrude tool. LMB click and drag on the thickness widget.

Useful Extrude Tool Tips

The moment you click the extrude tool, the extrusion will be executed. This can cause extremely messy meshes if you are not careful. To stop this being an issue when you perform your first extrude, open the option box and apply a thickness of 0.1 in the dialogue.



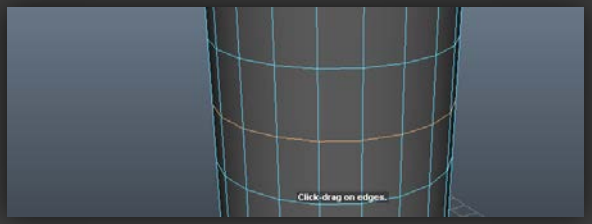
This will automatically apply a small thickness to your extrusions on execution of the tool from now on, giving you valuable visual feedback.



The Insert Edge Loop Tool

Relative Distance from Edge Insertion

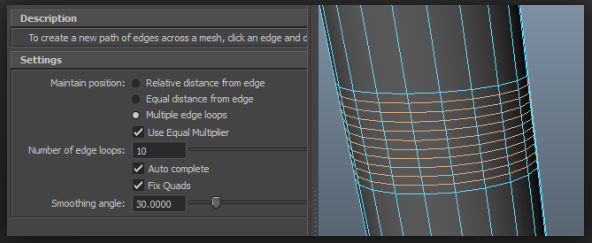
By clicking and dragging on an edge, you will insert an edge loop perpendicular to that edge.



Execute the insert edgeloop tool and LMB click and drag on an edge, releasing the LMB will finalise the insertion point and insert a new edge loop.

Multiple Edge Loops Insertion

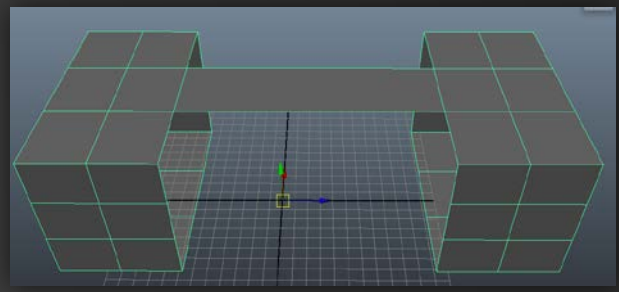
Multiple edge loop insertion allows you to insert single or multiple edge loops at regular intervals between two existing edge loops.



Execute the tool, open the tool settings and switch the **maintain positions setting** to **multiple edge loops.** Select the number of edge loops to insert and LMB click on the edge where you want to insert the new edge loops.

The Append to Poly Tool

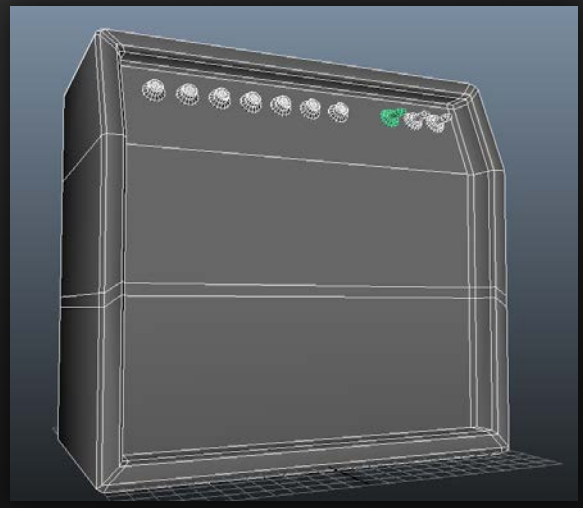
The append to poly tool allows you to create a new face between two open edges.

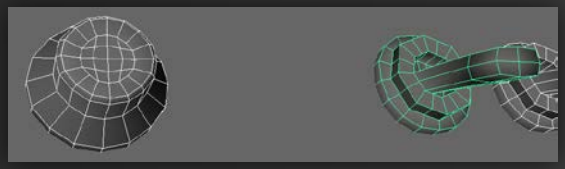


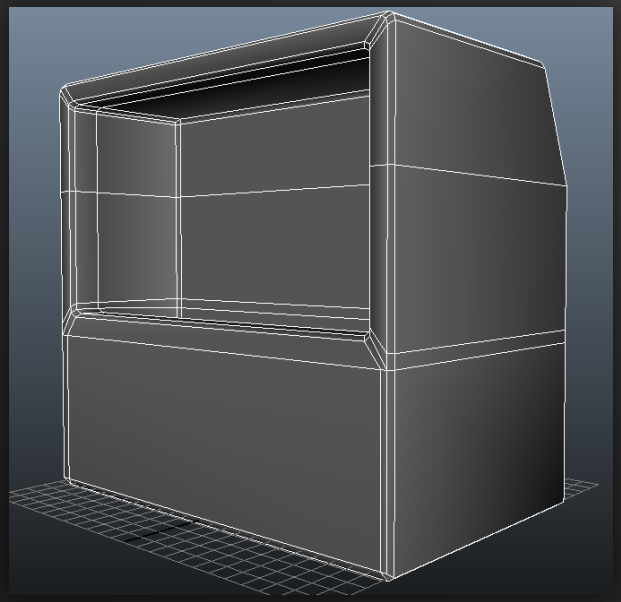
Execute the tool and click on an open edge. The available open edges will be highlighted in pink. Click on one of these and the new face will appear. Press enter to finalise the action.

Desired Outcome

Using the discussed tools, you should have no problem creating something similar to the following model.







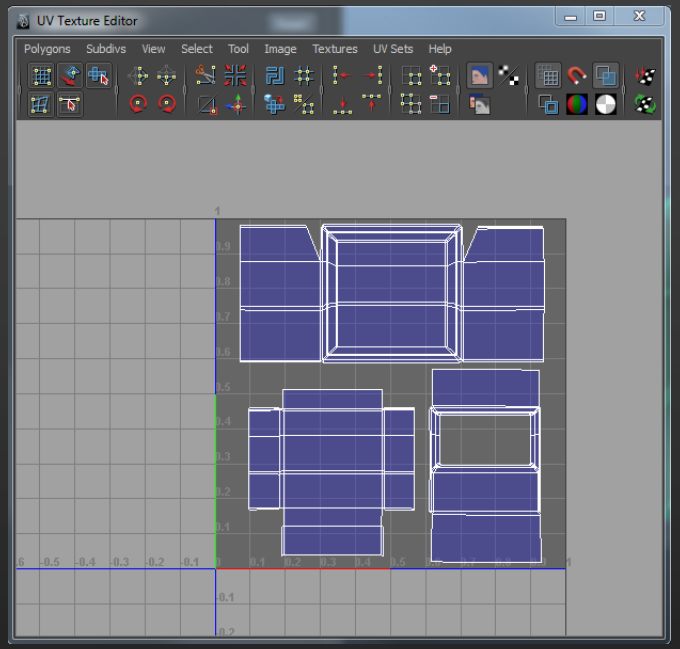
The Unwrapping Tools

Now that we've constructed the 3d form, we need to prepare the model for texturing by laying out its UV coordinates appropriately. To do this we will use the following tools and editors:

- UV Texture Editor
- Create Uvs based on camera
- The sew UV edges tool
- UV Snapshot

The UV Texture Editor

The UV texture editor allows you to see and directly interact with the UV coordinates of your object. To open it, go to **edit UVs->UV Texture Editor**.

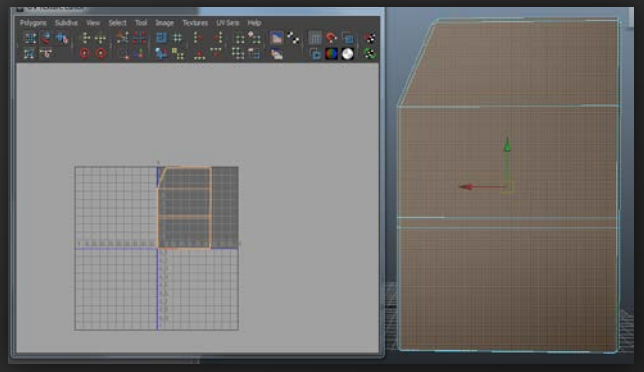


The user interface consists of a menu bar, a tool shelf and a work area. To edit UVs you must be in your UV component mode in the editor (RMB click and hold to bring up the marking menu).
For a full description of all the menu items see here
For a full description of all the tool shelf items see here

The dark grey region of the workspace is called the 0-1 space and represents the area of the image to be used as a texture.

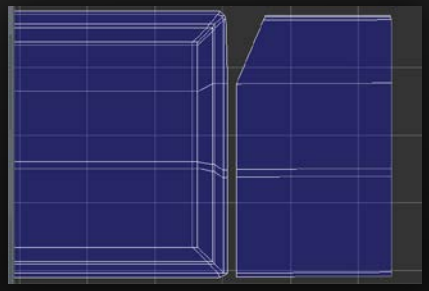
Create UVs based on Camera

This tool will reproject the UVs of any selected faces into the UV layout as they are being seen from the camera.
Simply select the faces you want to project the UVs for, navigate your camera so that you're looking at them and go to **Create Uvs->Create Uvs based on camera**

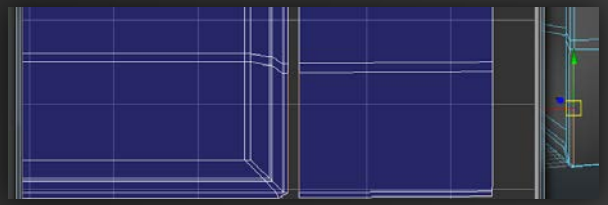


The Sew & Cut UV Edges Tool

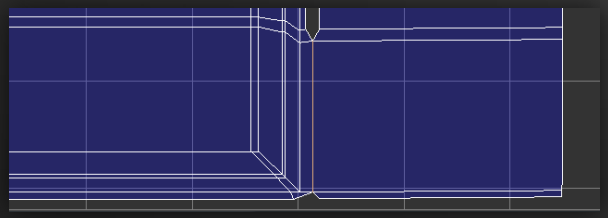
These tools allow you to split UVs edges apart or join UV shells back together in order to eliminate seams.
To use the sew tool, position your two UV shells so that the shared edges are lined up.



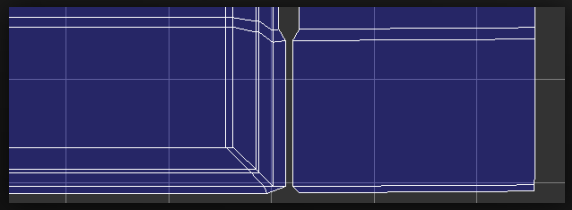
Select one of the shared edges (its counterpart will be automatically selected).



Either use the tool shelf shortcut  or go to the UV texture editor menu **Polygons->Sew UV edges**. The two edges will be sewn back together.

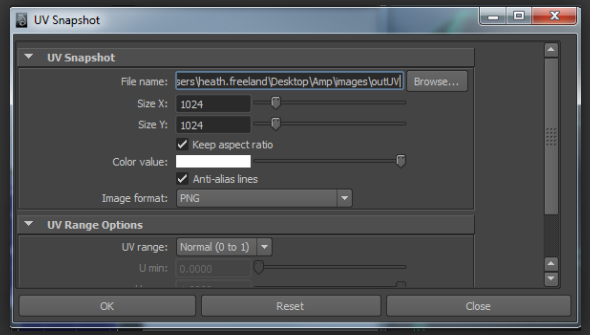


To use the cut tool, select the edges you wish to split, and use the tool shelf shortcut  or go to the UV texture editor menu **Polygons->Cut UV edges**. The UVs will now be able to be separated along that edge.



UV Snapshot

The UV snapshot feature allows us to make a template image for use when texturing using a 2d painting program.
Select your object in object mode. In the UV texture Editor, go to the UV texture editor menu **polygons->UV snapshot...**



You're essentially saving your UV layout as an image to be edited in Photoshop. Clicking OK will create the image file in the location written in the file name field (usually in the images folder of your project folder).

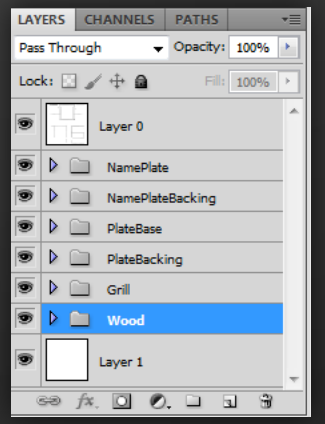
Texture Workflow

When texturing your item, it's important to establish a workflow that allows for approval at various milestones. This example workflow allows you to block in the most important elements of your texture design, and slowly build up details in a non destructive manner.
The steps are as follows:

- Block in general colours
- Define forms with tonal variance.
- Add painted details.
- Add high frequency texture using photographic source material.

Blocking in base Colours

We'll start by blocking in our base colours in Photoshop. For this phase, I've established what the different elements of my amp are, and separated them onto different layers. I place these elements into their own layer groups (**ctrl+g**).

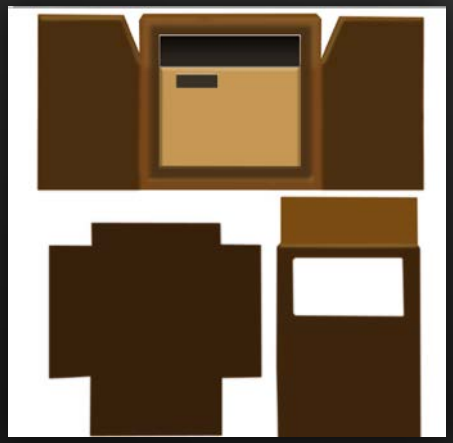


I use the polygonal selection tool  in conjunction with the flood tool  to block in the general colours. This ensures that as I work, I stay on palette.

Defining Forms

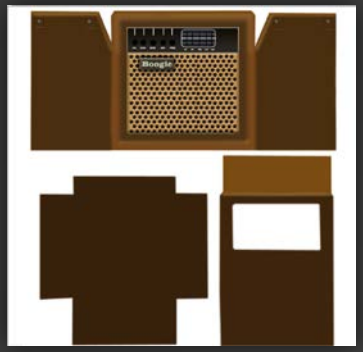
We can enhance the forms of our models by alluding to lighting information in the texture itself.
I start by making some masks based on the base colour layer by **RMB click on the layer thumbnail** and choosing **Select Pixels** in order to make a selection based on the layer transparency.

I then use the **Add Layer Mask** button  to add a new mask based on the selection.
For each of the elements, I make a new layer and paint in lighting information for each of the elements.



Add Painted Detail

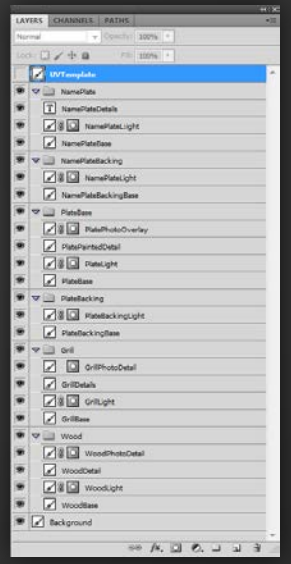
We can now start really going to town on painting in the finer details of our model.
Once again we do this on a separate layer for each element.



High Frequency Detail

We can now use photographs as a source of the high frequency details of the surfaces of our objects.
Once again we do this on a new layer for each of our elements.
I generally use grey scale images and different layer blend modes to achieve the desired result.

The final layer layout will be quite elaborate, but should also be easy enough to navigate.



And here is the final result in Maya.