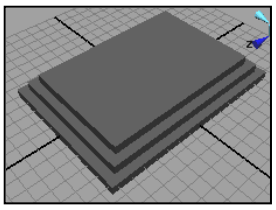
Modeling 1 – Creating a simple temple

In this tutorial we will be creating a simple temple using primitive shapes. We will introduce a set of few new tools and also begin basic object grouping for scene management.

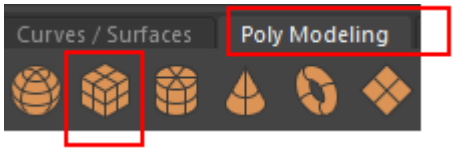
Before you start, please turn off the "Interactive creation" of objects. **Create→ Polygon Primitives → Interactive Creation** and make sure that the box does NOT contain any check mark. You may have to do the same for the NURBS primitives when you have to use it.

Creating the foundation



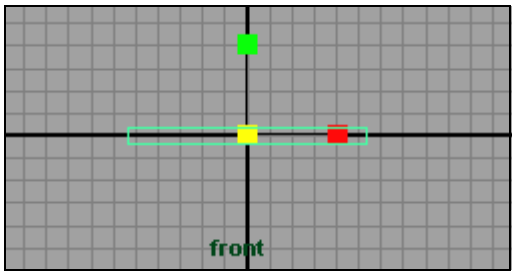
The first part of the temple will be to create the base foundation. The foundation will consist of three polygon cubes, stacked on top of each other such that each one is scaled smaller than the previous one to create the idea of steps. The final product will look like the image on the left.

1. Create a new project with all default directory structure in it and name the project temple.
2. Create a polygon cube from the shelf by selecting the Polygon tab and clicking on the cube button **or** by clicking on **Create → Polygon Primitives → Cube**. Name this object **StepOne.** With cube created press 5 key to go to shaded mode in the panel.

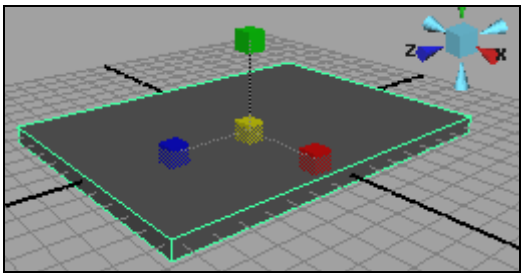


3. Select the Four View by clicking on the  icon in the bottom section of the hotbox.  Using the four different views scale the cube using the **scale manipulator (R key)** (or through the channel box or attribute editor) so that it matches the shape of the bottom steps. Make sure it has dimensions of about: **4, 0.1, 6**. Front and side views are the easier to make and adjust this shape. Your model should look like the one pictured below:

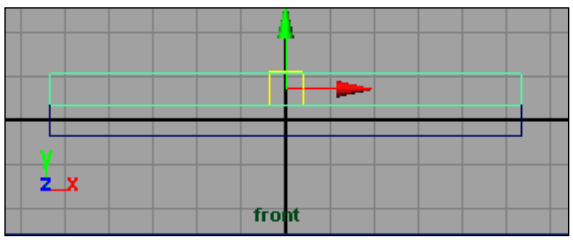
Help Tip: If you want to make any view in the panel full screen make sure your mouse is over top of the view and then tap the spacebar. To get back to the four view simply tape the spacebar again.



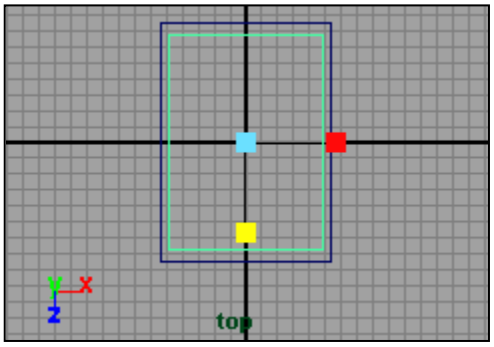
Front view with Scale Manipulator


Perspective view with Scale Manipulator

4. Now that you have the base foundation we will use the duplicate tool to create the next two levels. Make sure the cube in the scene is selected then from the main menu click on **Edit → Duplicate** (Ctrl + d), a duplicate cube will be created on top of the existing cube. The duplicate cube will already be selected.
5. Change to the **Move Tool**  and from either the front or the side view move the duplicate cube so it is approximately on top of the original cube. Name this object **StepTwo.**

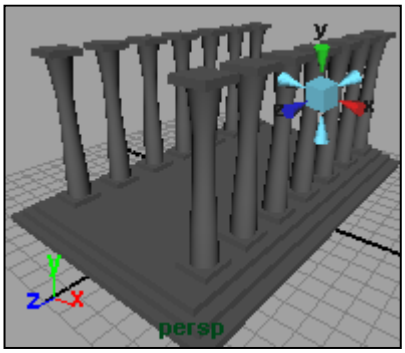


6. Since the cube is a duplicate of the original, we don't need to worry about how tall it is. Change back to the **Scale Tool**, and then change to the **Top** view and scale the cube in the X and Z direction. So that it is smaller than the original cube.



7. Create the top step by going back to step three, but this time duplicate the middle step instead of the original cube. Name this object **StepThree**.

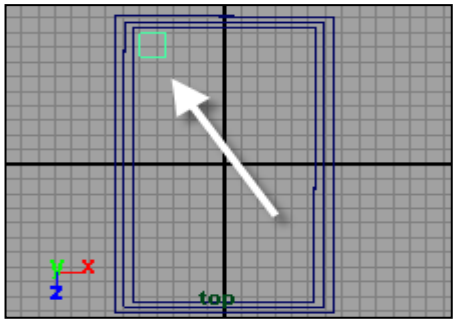
8. We now have the base foundation of the temple completed. At this point I recommend you **save** the project by going to **File → Save** from the main menu and choose a location and filename.



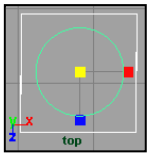
Creating the pillars

In this section we will be creating pillar columns around the entire temple foundation. These pillars will be created by mixing polygon and NURBS objects, grouping them together and then duplicating with transforms around the length of the base. The result will be similar to the image on the right.

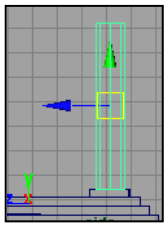
1. Create a polygon cube as we did in the previous section. Go to the **top view** and select the **Move Tool** (w) just as before. Move the cube to the top right corner of the top step and scale it down to approximately 1/10 the size of the step. Make changes in the other views as necessary to make sure the cube is sitting on the top step. This will be our pillar base. Name it **pillarBase**.



2. Next create a NURBS cylinder by selecting **Create → NURBS Primitive → Cylinder** from the main menu.



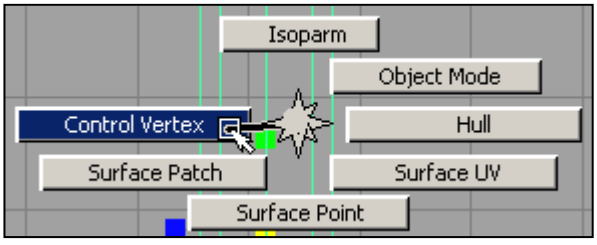
3. From the top view use both the Move (w) and Scale (r) tools to bring the column in the middle of the pillar base we created. This will make sure the pillar is lined up properly for the next step.



4. Change to the side view use the Move (w) and Scale (r) tools to make the column taller and place it on top of the pillar base. Be careful to only scale the pillar in the Y direction as we already made sure the X and Z were set in step 3.

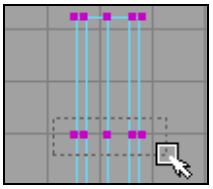
5. Remain in the side view and make sure the column is selected. Click and hold the **right mouse** button anywhere inside the column. A marking menu will come up. Select "**Control Vertex**" from the menu.

   Alternatively, you will be able to also use icons on status line to do the same (select by component type: points).

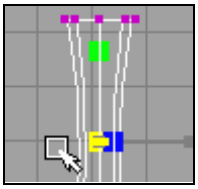


6. You will now see the individual Vertex points on the NURBS Cylinder. **Click-drag** around the **2nd** set of points from the top so that all the vertices

are selected. Now switch to **the Scale Tool** (r) and scale the vertex points in from the **center**. You will see the NURBS object begin to grow / shrink from that point. Scale the points in so that it looks as shown below:



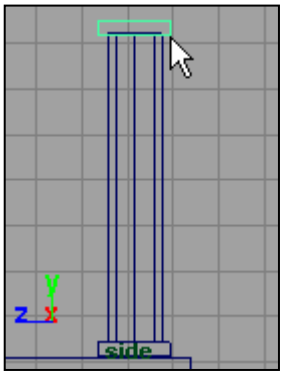
Click drag the vertex points



Scale in the vertex points

7. Once you are satisfied with the scaling Click and hold the **right mouse button** on the object again to bring up the same marking menu as before. This time select **Object Mode** to get back to the standard Object Mode (or click on the select by object type icons on status line).

8. Remain in the side view and select the **pillarBase** cube we created earlier. **Duplicate** the cube by selecting **Edit → Duplicate** from the main menu or by pressing Ctrl + d on the keyboard.

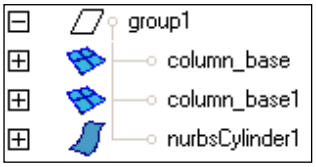


9. Switch to the **Move Tool** (r) and move the duplicated pillar support in the **Y-direction** so that it is resting on the top of the pillar.

   Now that we have finished creating the pillar we need to duplicate it around the steps. Before we do that we need to group the three pillar objects together. This gives us the ability to select the whole pillar as though it were one piece. This also gives us the benefit of being able to uniformly move, scale, or rotate the pillar as a whole.

10. **Shift + click** or click-drag the three pillar pieces from any view you want. Make sure that only those three objects are selected. Select **Edit → Group** from the main menu (press Ctrl + g on keyboard). A new group is created with those objects inside that group.

    Open the **outliner** by clicking on the  button on the Hotbox. This will put the outliner in a Panel with the perspective view. If you would rather have the outliner in a separate window click on **Window → Outliner** from the main menu.

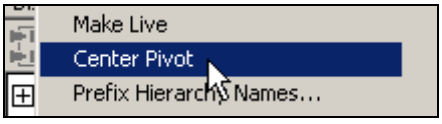


    The outliner is a hierarchical list view of all the objects in your scene. If you look in your outliner you will see an object called Group1. This is the name of the group you just created. Click on the plus icon next to the group and it will expand to show you all the items inside that group.

> **Help Tip:** You can rename the group name by double clicking on the name. The outliner will then allow you to change the name of the group. The same can be done to any object in the scene. Always name your objects so that you can better organize your objects.

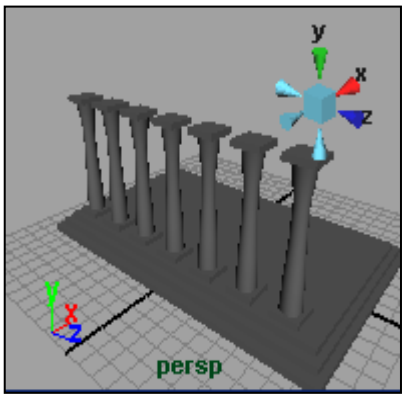
11. Now that the group is created we can begin duplicating the columns. Select any part of the column with the **select tool** (q). You will notice that only the part you selected is highlighted but when you press the **up arrow** on your keyboard, the entire group is selected. This is because the keyboard arrow keys allow you to cycle through objects in a hierarchy.

12. Now that the whole group is selected we will center the pivot point of the object to make it easier to move. Click on **Modify → Center Pivot** from the main menu.

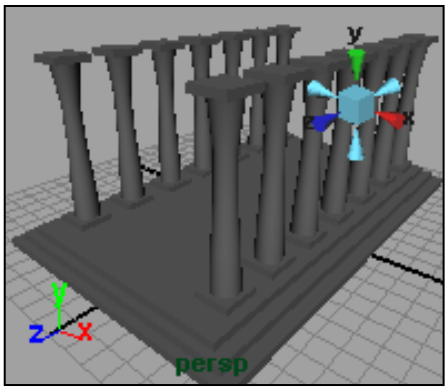


13. We are going to first duplicate the column along the longer side of the temple. Duplicate the entire column by clicking on Edit → Duplicate (Ctrl + d) in the main menu.

14. With the duplicated column still selected move it so that it is spaced next to the previous column. Make sure **not** to deselect the column. We will now use the duplicate with transform tool to create another copy that will duplicate the movement you performed on the second column.



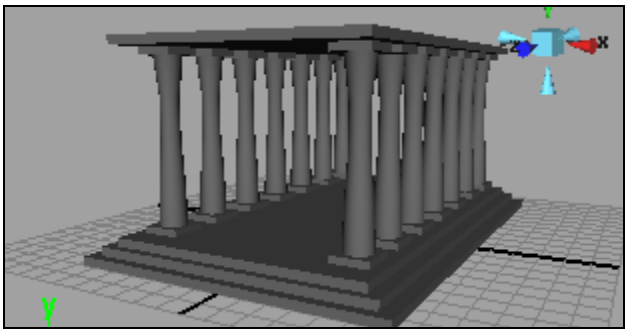
With the second column still selected click on **Edit → Duplicate with Transform** (Shift + d). You will notice that another copy of the column has been made, but this time it is exactly the same spacing away from the second one. Continue Duplicating with transform on each new column until you have reached the end of the row.



15. Now that you have one full row completed **Click-Drag** to select all of the columns and press the **up** arrow on your keyboard. Once you have made sure all of the columns have been selected, do a standard duplicate by clicking on **Edit → Duplicate** (Ctrl + d) from the main menu. Make sure not to deselect the duplicated columns. Select the **Move** Tool (r), and move the entire column row to the other side of the temple.

Finally we need a roof for the temple. To do this we are simply going to **duplicate** and move the **top step** and put it on top of the pillars.

16. Click select the top step cube object with the **Select** Tool (q). Now duplicate the object by clicking **Edit → Duplicate** (Ctrl + d) from the main menu. From the view of your choice select the **Move** Tool (r) and move the duplicated cube so that it is aligned with the top of the pillars. The result should look like the image below.

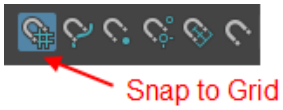


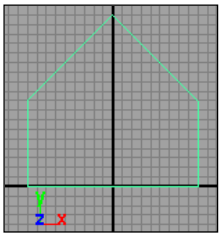
Congratulations you have completed your first modeling project using primitive shapes in Maya.

Building A House

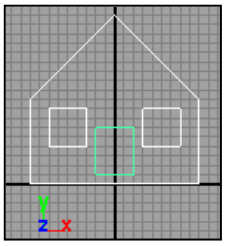
If you haven't turned off "Interactive creation" of objects in previous steps, please do it now. **Create→ NURBS Primitives → Interactive Creation** and make sure that the box does NOT contain any check mark.

1. Enter the front view. Once you are in the four view, select **Create → CV Curve Tool options box (□)**. Change the **Curve Degree to Linear**.
   Turn on grid snapping by pressing the grid snap button on the Status Line.





2. Begin drawing the basic house shape by clicking on the grid to place your curve points. Once done, press the ENTER key to complete the curve. The overall shape should look like the one on the top right.

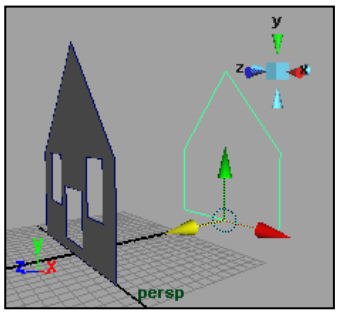


3. Create the curve for the windows and the doors but make **sure** the bottom of the door is at least one square higher than the bottom of the house (This will become very important later on).

4. Select main house curve. Then hold the Shift key on the keyboard and Click-Drag select the other three curves.

5. Make sure you are in **Modeling** mode and then from main menu select **Surfaces → Planar**. Press the 5 key on the keyboard to enter shaded mode.

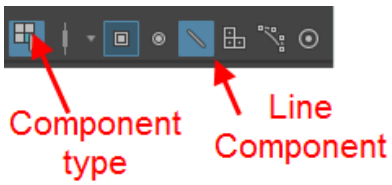
   Activate the **Select** tool and select the original house curve that we made in step 2. Using the keyboard press **Ctrl+d** (**Edit → Duplicate**) to duplicate the curve.



6. Change to the **Move** Tool (w) and push the duplicated curve so it appears behind the original curve as shown on the right.

7. With the duplicated curve still selected run the planar command by clicking on **Surface → Planar** from the main menu.

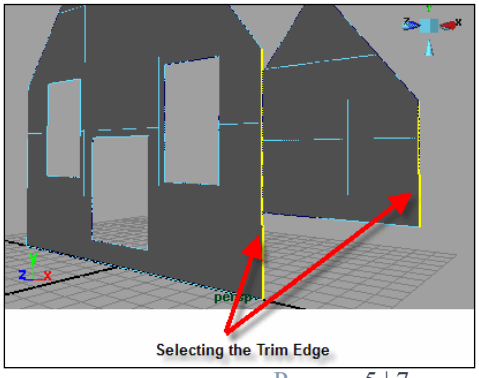
8. Now we will join the two sections of the house using the **loft** tool. We do this by selecting the edges of each side of the house and then lofting them together. The loft tool creates a NURBS **plane** between two or more selected curves

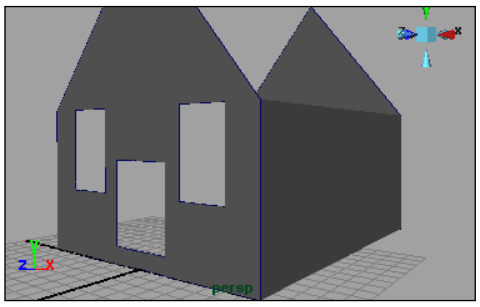


9. Choose perspective view. From the Status Line click on the selector to enable **Select by Component Type** and then unclick every object type except Select by Line Component.

10. First click on one of the objects to make it active. Then click on the very edge of any side on the object. The side if selected properly will turn yellow. This is called the **trim edge**.

    Next hold the **shift** key and click anywhere on the second object to make it selected. With the shift key still pressed click on its corresponding edge to select its trim edge. The second objects edge should also now be **yellow**.





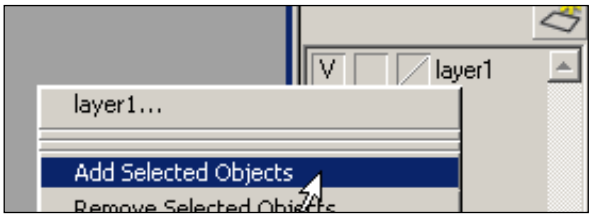
11. From the main menu select **Surfaces → Loft**. You should now see a plane that has been drawn from the one edge of the first surface, to the corresponding edge on the other surface.

12. Repeat the processes for the remaining sides until your house looks similar to the one pictured to the right (still partially done).

13. You can now switch back to Object mode (**F8**).

14. With your house project open **Click-Drag select** the entire back face of the house so that only the front face is unselected. You can easily accomplish this from any of the views.

15. Open the Channel/Layer Box. At the Layer Box, click on the new layer button  to create a new layer. The layer by default will be called "Layer1". With your mouse right click on the word "Layer1", a menu will come up. Select "Add selected objects". You have just added all the selected objects in the scene to Layer1.

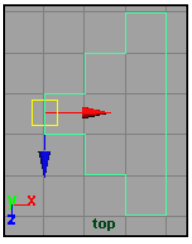


16. Next to the layer you will see three boxes. Click on the box with the V inside. It is to make a layer visible/hide. Next button allows to cycle through the characteristics **Normal → Template → Reference.**

Adding details using the Extrude Tool

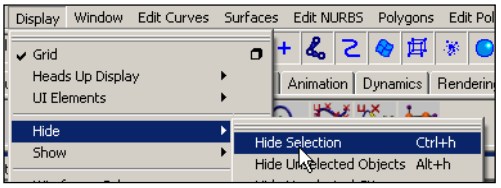
17. Choose wire frame mode and Switch to **top** view and select the **CV curve** tool. (Make sure the curve is still set to **Linear**).

Draw a shape similar to the one shown at the origin on the grid. Don't worry about its size. This shape will be used to extrude a frame around the door and windows. Since we drew the shape at the origin the pivot point will be at the tip of the object. This becomes important when we extrude the shape.

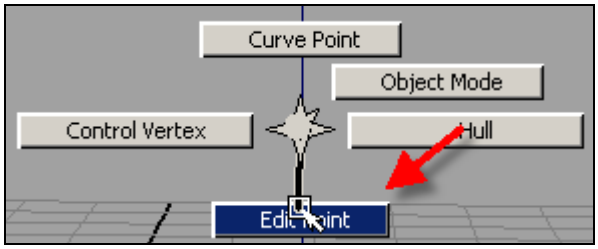


18. Select main house surface. **Select Edit → Delete by type → History** from the main menu.

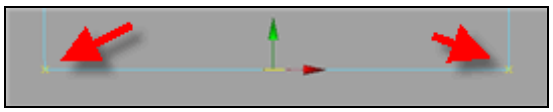
19. With the house surface still selected select **Display → Hide → Hide Selection**. This will hide the front house surface, so it doesn't get in the way of our curve.



20. Click and hold down the right mouse button on the door curve and select "**Edit Point**" from the marking menu that comes up. You are now in Edit Point mode, hold shift and click drag to select the bottom two corners of the door curve (sill).

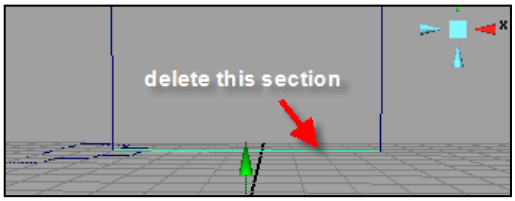


Enable edit point mode on the door curve



Select the two bottom points on the curve.

21. Now that the points are selected go to **Curves → Detach Curves** from the main menu. You can now select the bottom portion of the curve and delete it by pressing the **delete** key on the keyboard.



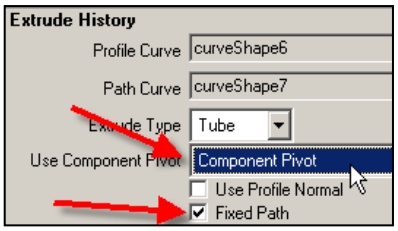
22. Repeat steps 21 – 22 on both of the window sills.

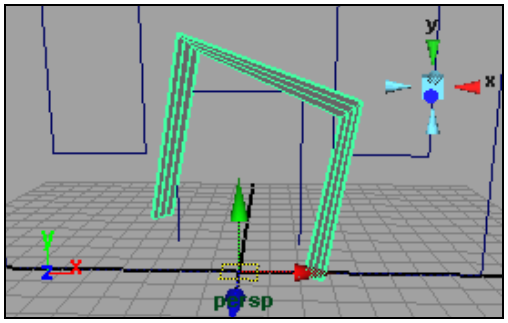
23. Scale down the shape we made in step 17 in relation to the size of the door frame.

24. Rotate the shape so the smaller side is facing towards the door. Now **Shift Select** the shape and then the door frame so that both objects are selected. Then go to **Surfaces → Extrude**. The shape has now been extruded over the curve of the door frame. However, it will probably look a little strange, so we have to make some changes.

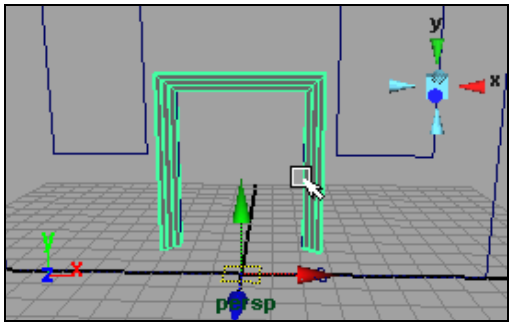
25. Make sure the extruded shape is still selected and then open the attribute editor by pressing **Ctrl+A**.

26. In the attribute editor under the Extrude History. Change the "**Use Component Pivot**" drop down box to "**Component Pivot**", and then enable the "**Fixed Path**" checkbox. You should see the extrude change to fit properly overtop of the curve.





Original extrude



Extrude after changing options

27. Repeat steps 26 – 28 for each of the two window frames.

28. Now that the trim has been created, we are almost done. Go to **Display → Show → All** from the main menu to unhide the front face of the house.

29. The last step is to create the front step. Create a cube and resize it so that it fits underneath the moulding we created for the front door.