

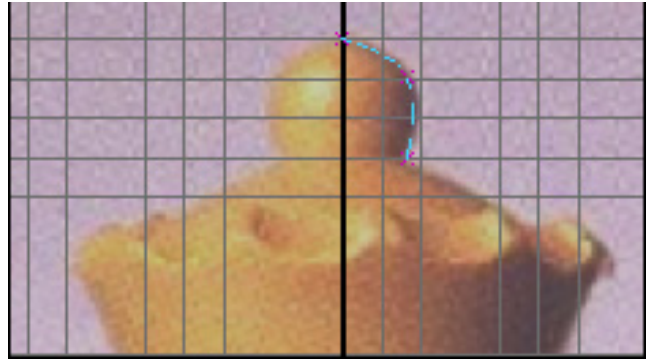
# Maya Complete 4.5

Modeling a simple chess piece.

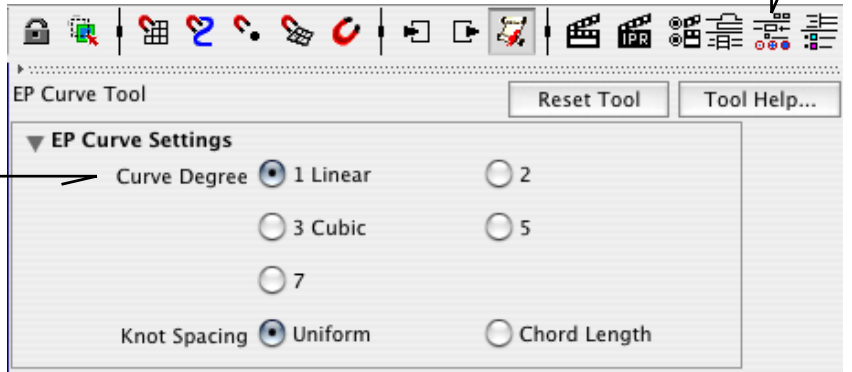
So far we have created a profile to model our Pawn. This is a simple model without much detail but the other pieces are a little bit more complicated and require a slightly different approach other than just revolving a single profile. We'll delve further into NURBS models to get a basic understanding of how different component parts relate to each other.

Either continue in the same scene or start a new project.

Set the grid spacing to suitable density and turn on Snap to Grid and Snap to View Planes (as we did in the previous class lesson). In the Front Viewport, using EP Curve Tool draw a profile of the peak of the Queen's crown (make sure the tool's been Reset).

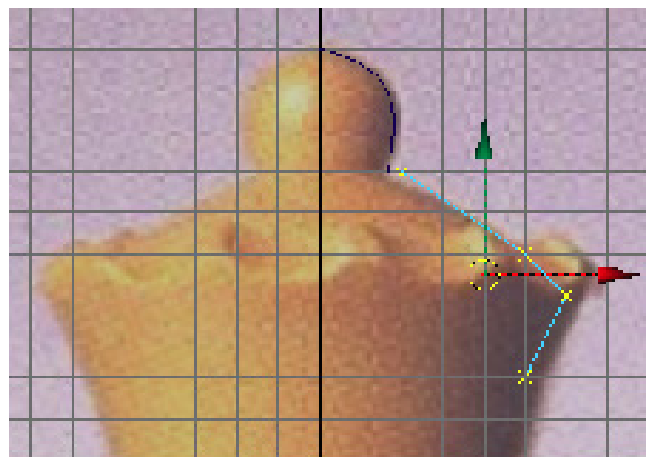


Open the EP Curve Tools Settings. By Curve Degree click 1 Linear.

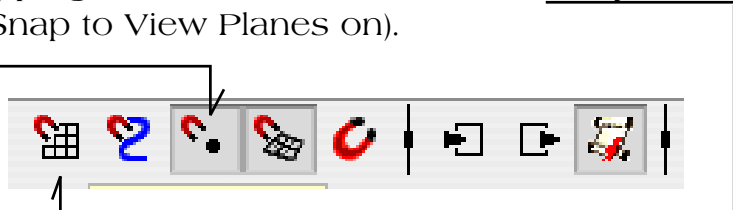


Then continue to draw the rest of the Crown as shown below.

We're going to join the two Curves together, the reason for drawing them individually is because tool setting changes cannot be made while the tool is in use and we require a line with curvature and a line that is linear to achieve a profile without compromising too much.

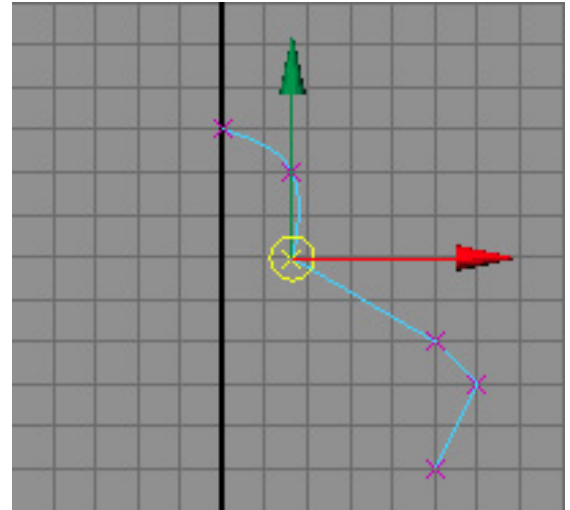


In the Status Line, where the snapping tools are located, turn off Snap to Grid and turn on Snap to Points (leave Snap to View Planes on).

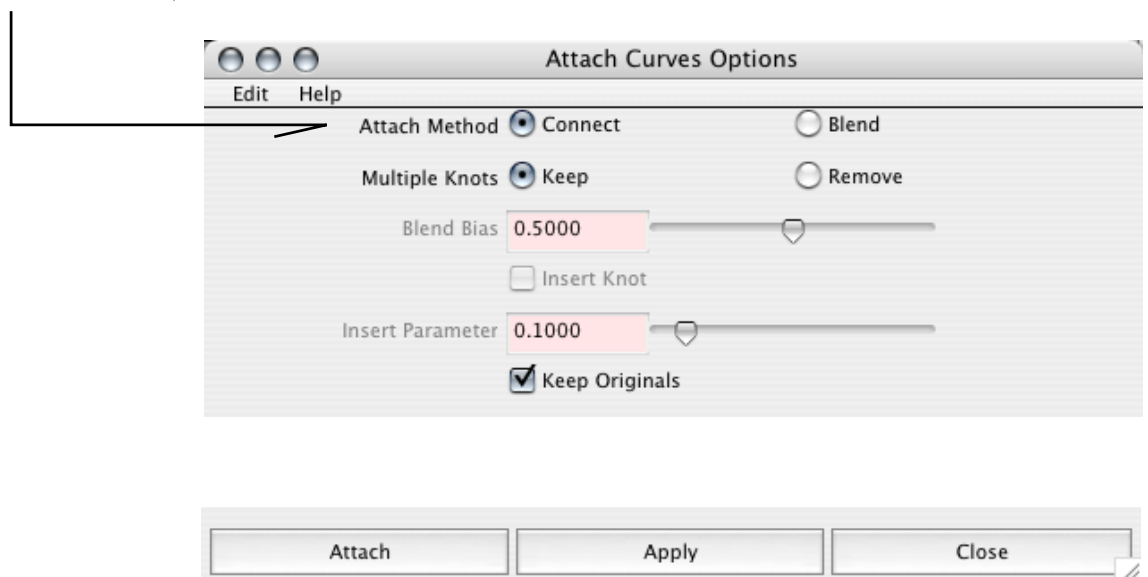


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With the linear line selected (2nd profile you created), go into component mode (right click on the linear line) and select Edit Point. Select the first point that was made, hold down Shift key, select the curved line (1st profile you created), right click and select Edit Point for this line. Move the selected point toward the point of the curved line nearest. They'll snap to each other so confirming they're in contact. Using this method assures that the two lines are matched accurately.



Come out of Component Mode (right click over a curve, slide down to Select), marquee select both curves. In Menu Bar click Edit Curves>Attach Curves and open Attach Curves Options window (click on the small box). Next to Attach Method click Connect (as shown below).

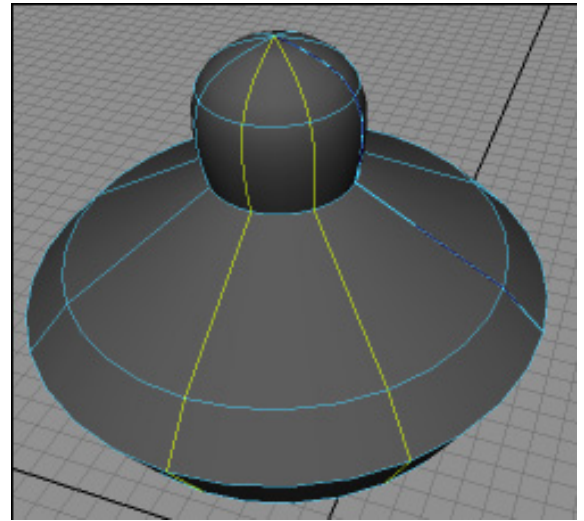
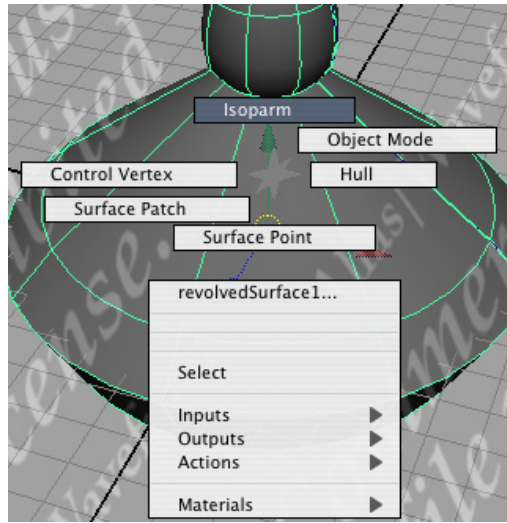


Click Attach button. Select the two curves (if you want to use the Outliner without changing Viewports - Menu Bar>Window>Outliner ...) you created originally and delete them. Use the same procedure to draw the stem and base of the model but keep the two attached curves separate.

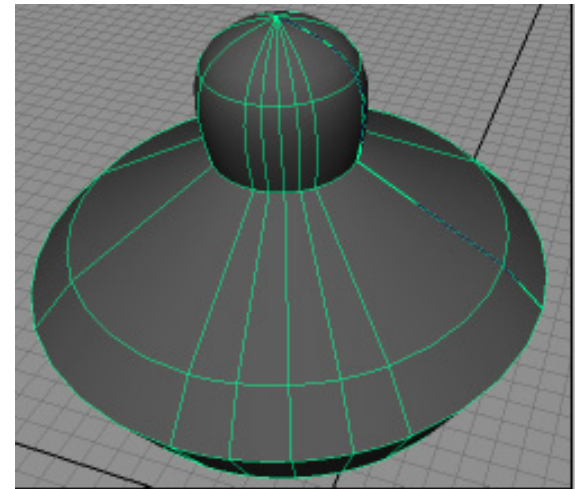
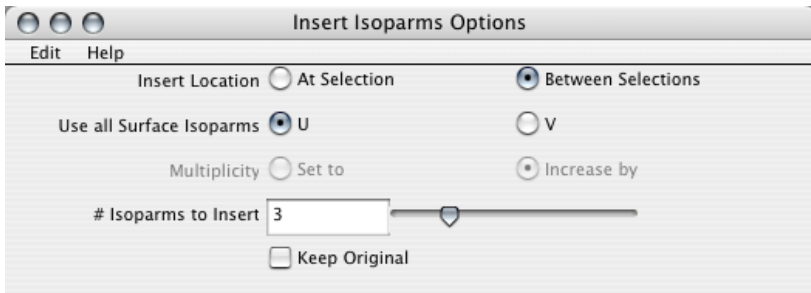
Select the Attached Curve that profiles the Queens crown and Revolve it. Looking at our reference image we can see that we have created the basic structure but the model lacks detail; Essentially the points of the crown. We'll do this by making the NURBS mesh more dense to provide us with additional Vertices that will be pulled into the required positions.

Modelling a simple chess piece.

Right click over the Revolved surface and select Isoparm. The green lines (Isoparms) will turn blue when you're in this component mode. Select two Isoparms as shown below. Make sure you click on the Isoparms accurately, as this can be tricky zoom in if necessary.

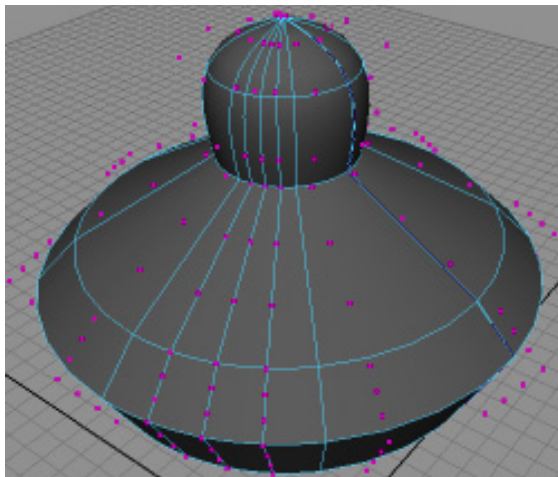


In the Menu Bar click Edit NURBS>Insert Isoparms (click the small box, click Between Selections and adjust #Isoparms to Insert slider to 3. Click Insert button in the bottom right of the Insert Isoparms Options window.

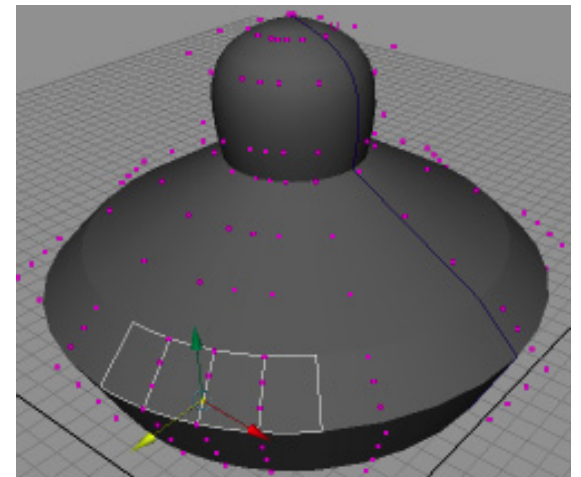


You should have three new Isoparms between the two that were selected. In the Status Bar turn off Snap to Points but make sure Snap to Grid and Snap to View Planes are turned on.

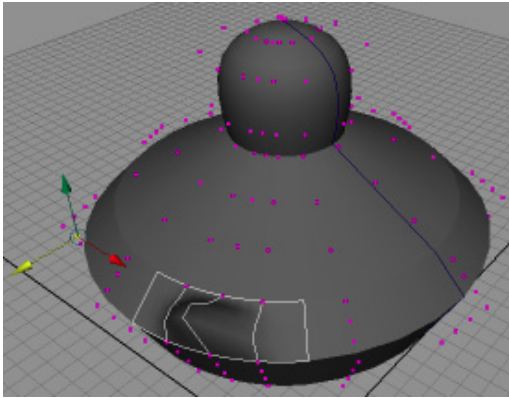
As before, right click over the Revolved surface, select Control Vertex. All the Vertices for the model are displayed.



Select the vertex as shown. These have been created from the new Isoparms that were inserted previously.

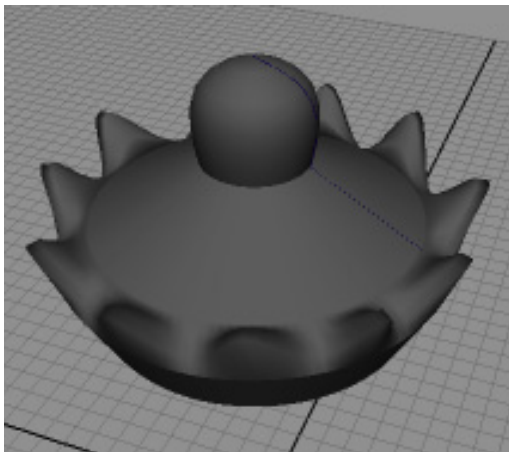


Modelling a simple chess piece.



Move the Control Vertex up in the Y axis and then forward in the Z axis to form a spike in the crown.

Notice how the Snapping Tools are keeping the directions we're moving in under tight control thus insuring that when the procedure is repeated the same results will be achieved. This aids us when working in the Perspective View to prevent CV's (Control Vertices) from being pushed in a completely different place in 3D space that may not be noticeable until we rotate the view.

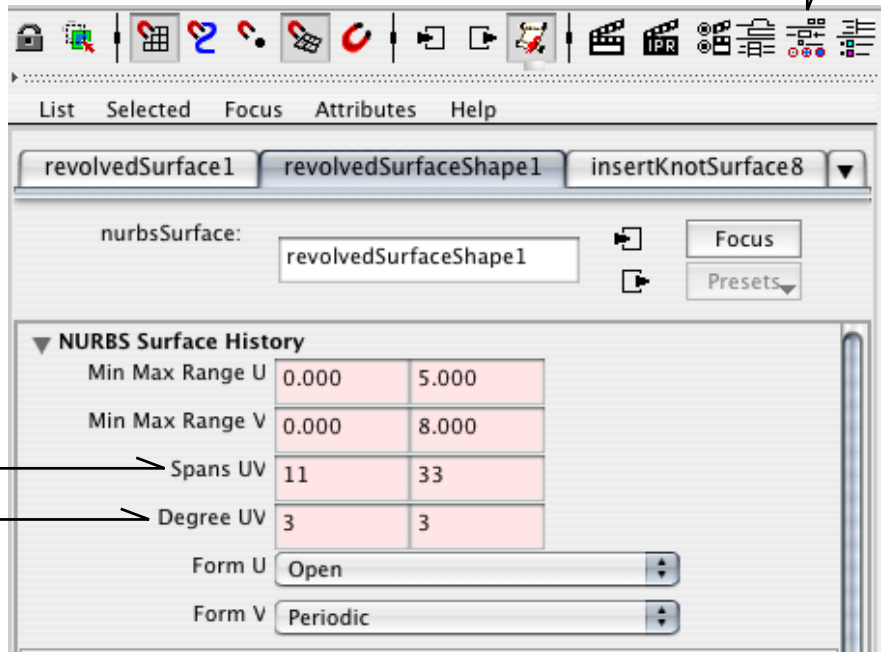


Repeat the process of Inserting Isoparms and CV manipulation on the other sections of the Queens Crown, working in a systematic way to complete this section of the model.

With this section complete we now need to join the two sections together to make one single model but first we have to check the surface properties of the two sections. What this means is they are no longer equal in mesh density. If we go back to the stage where we inserted Isoparms we added more lines, or Spans as they're correctly termed, but prior to performing this action both parts had equal Isoparm Spans. If the sections were joined now there would be anomalies in the single model that may not be possible to correct later so what we can do now is to match the two sections surface properties so they'll join together cleanly.

Modeling a simple chess piece.

First select the crown then Click on Attribute Editor (Ctrl+A) in the Status Bar.



Look at NURBS Surface History. Shown in the values box are Spans UV.

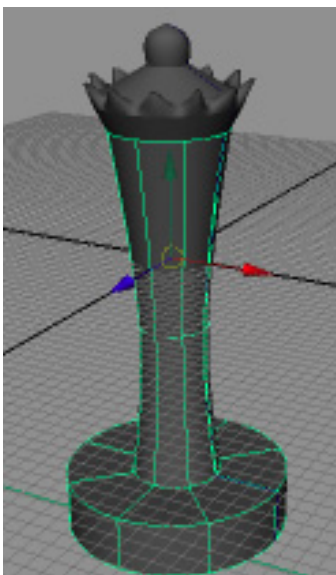
Also take note of Degree UV.

These values cannot be adjusted in the Attribute Editor but display the necessary information that show the surface properties of the selected item. With the Attribute Editor window still open select the stem and base of the the model in the Viewport. You'll see Spans UV and Degree UV change to the values, respective to this section of the model.

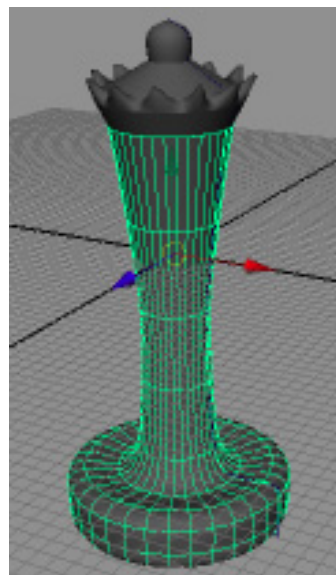
N.B. If your values are different from those shown here don't worry. You've inserted a different amount of Isoparms but the following procedure will still work,

Select the Crown, in the Menu Bar click Edit Nurbs>Rebuild Surfaces, click on the small box to open the options window. Type in the values for Span UV and Degree UV from the attribute box. Then select the stem and base section of the model, click Rebuild button in the bottom left of Rebuild Surfaces Options window.

You've now matched the surface properties of the selected section so that they'll both match when joined together.



The Stem and base section of our NURBS Queen Chess Piece model before Rebuild Surfaces was applied.



The same section after the surfaces have been rebuilt. The calculation has made further modifications necessary to match surface topology.

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The final stage of our model is to connect the two sections together. Every attach action we've made has resulted in a copy. These can either be deleted or kept (you'd only need one copy, so if there're multiple Curves and surfaces delete them) and used as quick Morph Targets for animation later.

Select the Crown, then the Stem and Base. In the Menu Bar go to Edit NURBS>Attach Surfaces, click the small box to open the options window. Click Blend where the Attach Method buttons are displayed, click Attach button in the bottom left of the window.

Move the selected copy out in the X axis to get a clear view of your work.



If you have questions regarding the exercise we've just completed please feel free to ask them in the classroom. I'm trying to make the tutorials easy to follow despite NURBS modelling being a complicated subject when it comes to technical issues. Experiment with different settings when repeating exercises, branch out and try to discover what methods work for you. If a subject takes your eye try modelling it on your own; The more you experiment the more you'll learn.