

Revolving Curves In Maya - Modeling a Champagne Flute

<http://3d.about.com/od/Creating-3D-The-CG-Pipeline/ss/Revolving-Curves-With-Maya-Modeling-A-Tea-Set.htm#step-heading>

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Introduction

There are literally dozens of [modeling techniques](#) in Maya, but one of the first processes beginners are typically shown is how to create geometry by revolving a curve around a pivot.

In the long run, it's a technique you probably won't end up using as much as the *extrude* or *insert edge loop* tools, but it's a perfect introductory material because it allows beginners to see tangible results very quickly.

Revolving a curve is a quick and easy way to model cups, plates, vases, columns—any cylindrical geometry that radiates from a central point. Using curves, a modeler can generate very complicated radial shapes in very little time.

Before we get into modeling, I just want to bring up a few quick points about curves in Maya.

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Anatomy of a Curve



Control Vertices: Curves are made up of points called control vertices (CVs). After a curve is drawn, its shape can be modified by selecting a CV and moving it along the x,

y, or z [axis](#). In the image above, the CVs show up as small purple squares. The third control vertex from the bottom of the left curve is currently selected for translation.

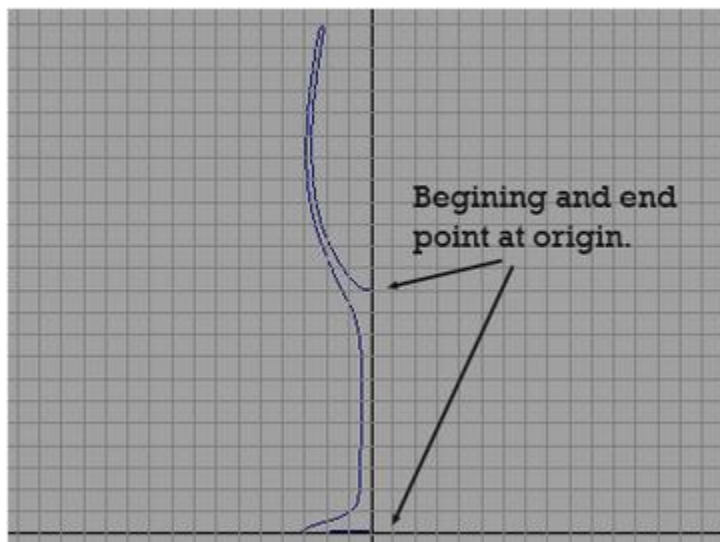
EP vs. CV Curves: When you go to draw a curve, you'll notice you have a choice between either the EP or CV curve tools. The best thing to keep in mind about EP and CV curves is that *the end result is exactly the same*. The only difference between the two is that with the EP tool, control vertices lie directly on the curve itself, while the control points on a CV curve always fall on the convex side of the line. Use whichever feels more comfortable.

Curve Degree: You can see I've gone ahead and drawn out two curves and placed them side by side. The two curves are virtually identical, except for the fact that one is smooth and the other is linear. In the curves option box, set the degree to 1 (linear) for angular shapes, and 3 (cubic) for smooth ones.

Directionality: It's worth noting that [NURBS curves](#) in Maya *do* have a specific directionality. Notice the two red circles drawn on the image above. The curve on the left has its origin at the bottom, meaning that it flows from bottom to top. The curve on the right is reversed, and flows top to bottom. Although curve direction doesn't matter when using the revolve function, there are other operations (like extrusion) which take directionality into account.

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Drawing the Profile Curve



It's easier to create a curve in one of Maya's orthographic cameras, so to switch out of the perspective panel, strike *spacebar*. This will bring up Maya's four panel layout. Move the mouse so that it hovers in either the side or front window and hit *spacebar* again to maximize that panel.

To access the CV Curve tool, go to **Create -> CV Curve Tool**, and your cursor will turn into a cross-hair. To place a control point, click anywhere in the window. CV Curves are smooth by default, but Maya can't interpolate smoothness until you've placed three vertices—the curve will appear linear until you've done so.

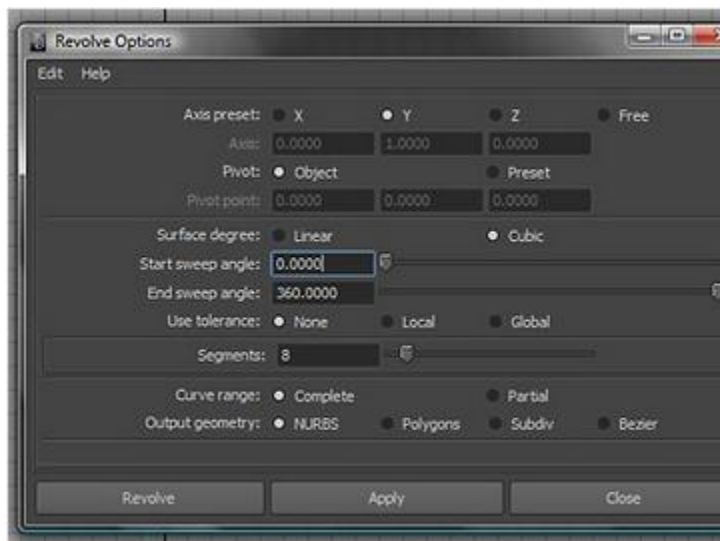
When placing CVs, you can snap them to the grid by holding **x**. This is incredibly useful when modeling game environments.

Creating a Profile Curve

To create the champagne flute, we'll use the CV curve tool to draw out *half* of the shape. Snap the first point to the origin, and continue drawing the profile from there. Refer to my finished curve in the image above, and remember—you can modify the position of the CVs later on, so don't sweat it if you don't get them right the first time. Play around with the curve tool until you've got a profile shape you're happy with. When all your control vertices are in place, strike **enter** to build the curve.

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Revolving the Curve



At this point, the hard work is finished.

To finish the champagne flute, make sure you are in the **surfaces module**.

With the curve selected, go to **surfaces -> revolve** and choose the options box to bring up the window shown in the image above.

In this case, default settings will work perfectly fine, but there are one or two options we should probably take a look at:

- **Axis:** More often than not you'll be revolving around the default Y axis, but x and y are available if you ever need them.
- **Output Geometry - NURBS or Polygons:** Notice, you can either output a NURBS surface or a [polygon object](#). For now NURBS can stay selected, but if your model will eventually end up in a game engine, it's a good idea to use polygons.
- **Start & End Sweep:** If you don't want your curve to revolve a full 360 degrees, you can change the end sweep value. Rotating a curve by 90 degrees can be useful for creating rounded corners in architectural modeling.

From the options box, click **revolve** to finish the mesh.

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Finished!



There you are. Through the use of Maya's *revolve curve tool* we've managed to model a nice little champagne flute in no time flat.

We'll leave it here for now, but maybe in the near future we'll do a tutorial on [rendering](#) caustics!