

Intro to Blender Mesh Modeling

Spinning a Mesh

By Mr. D at Delta 3d

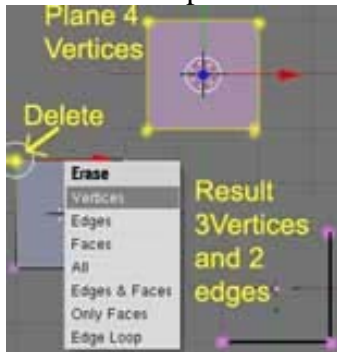
Spinning is taking an edge profile and ‘**Spinning**’ it to produce a mesh object. In Blender you can start with a profile made directly with edges, or a Bezier or Nurbs curve which has been converted into a set of mesh/edges by doing a ‘**Convert Object type**’ action. In other programs this is known as lathing or revolving a shape.

If you’ve just started Blender, go ahead and delete the default ‘Cube’ that shows up in 3D VIEW TYPE. Now since Blender v2.42a used here does not have a way simply start putting down Vertices and Edges, we need a primitive mesh shape to start with.

We could have started with the cube, or now create a sphere or cylinder. But it is probably easiest to start with a plane; this is because a plane is a nice flat shape, no depth, and you want the vertices that make up your edge shape to lay on flat on the same plane.

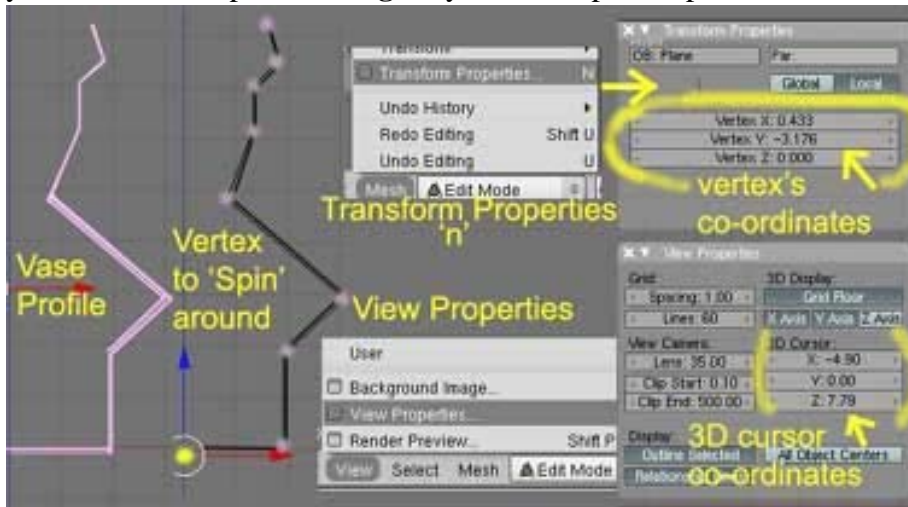
So we will setup or Plane in the **flat** ‘Orthographic View’ of FRONT, by choosing that ‘View’ then from the Users Preference Header Bar do a **Add >Mesh >Plane**.

NOTE: Remember Blender adds the new primitive at the location of your ‘3d/Marking Cursor’, which is why you should be in a flat orthographic view when creating the mesh. That way you know the mesh is flat in that window, so in a front view it is laying flat on the X/Z build plane.



Next in ‘**Edit Mode**’- Vertices, select one of the corner vertexes and delete it, leaving you three vertices and two edges. These shall form the basis for your Edge Profile Shape that you’re going to ‘**Spin**’/Lathe.

First to make a few more Vert/Edges, so go either end vertex and click on it. To add your Vertices you will do an ‘**Extrude**’ action by Header Menu **Mesh >Extrude**, or keyboard ‘**e**’. A new vertex is created and as you Move it away you will see an edge connecting it to the original vertex you clicked. Keep **Extruding** till you build up a Shape Profile of the object you want.



For this paper I’m going to first build a profile of a common vase to use for the ‘**Spin**’.

I want a bottom to this vase so I designed a flat edge for that purpose. Next

I'll need to pick out a Vertex to do my 'Spin' around, and here that is the bottom left vertex which would be the center bottom of my vase.

My next concern is that Blender does its 'Spin' based on the location of the '3D Cursor', meaning that I would like the 'Cursor' and the 'Spin Vertex' to be at the same location. Best way to do this is using 'Numeric Input' with Vertex selected do a) find out the Vertex's XYZ location by in **Edit Mode** doing **Mesh > Transform Properties**, or 'n'. b) numerically match the '3D Cursor' to those numbers by bringing up the **View > View Properties** on the **3D View Header Menu Bar**. In the View Properties pop up is an area showing the 3D Cursor's location, which you can 'Numerically Input'.

Or and even simpler snapping method, of in Vertices Mode pick your spin Vertex, then do a '**Shift s**' to bring up the **Snap** popup. From the list choose **Cursor -> Selection** to snap the Cursor to the vertex selected. Just remember how to get to the Transform and View Properties pop ups, you may need them at other times.



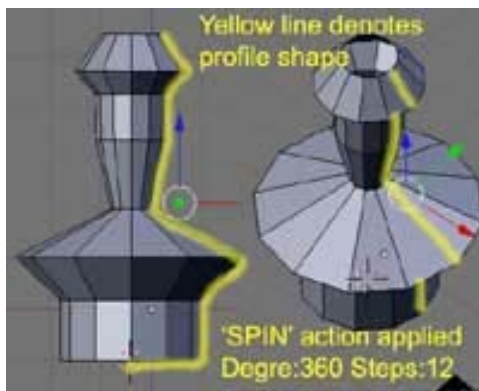
Now select either all the Vertices (Vertex Mode) or Edges (Edge Mode) of the Shape Profile, and have a 'Window Type' set up for 'Buttons'.

In the Buttons Window Type, have the Panel set for 'Editing', then look to the 'Mesh Tools' Menu.

Here you are looking for three items.

- The 'Spin' Button which when clicked executes the action.
- Degr: or Degrees with 360 degrees being a full revolve.
- Steps: how many steps or slices around in the Spin. Higher the number the more rounded the end mesh will be.

Here is a full 'Spin' of 360 degrees and 12 steps applied.



Once you've got your numbers as you like them, you will press the 'Spin' button. Now your mouse cursor turns into a '?' mark, as Blender wants to know what axis you want the Spin to

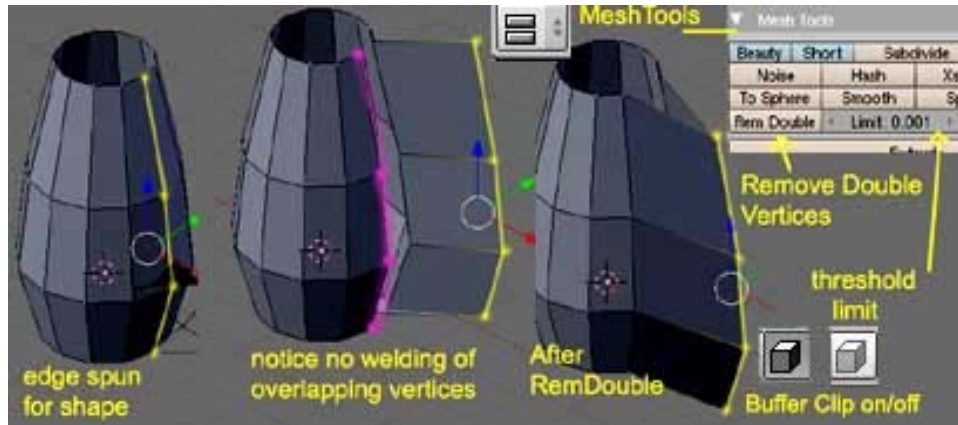
happen on. In the above picture notice I built the profile along the **Z-axis** in 'Front' view/**global** co-ordinance. If this was in **local** co-ordinance that would be the **Y-axis**, but Blender does not ask what axis to 'Spin' on. What it is looking for you to do is: move your cursor into the window from whose view matches the axis you which to use for the 'Spin'.

In this case I built in 'Front' view but I want to do the 'Spin' based on the 'Top' view. Why? Because the **Global Z** I wish to use runs up and down, meaning to look along it I need to be in a 'Top' view looking down along its length. So I put the cursor in that 3d View Window and click.

To help you get a handle on this concept try using 'Ctrl z' to Undo the 'Action' and do it again picking a Side or Front view to do your 'Spin' around.

Note: It is important here to note that while the object is spun 360 degrees, there is no welding of the vertices at the profile line.

To fix this you will need to weld the overlapping vertices at the shape edge. Or in Blender you **'Remove Double'**



vertices. So in the **Buttons Window Type** look again at the **Mesh Tools** actions and find **'Rem Double'**. The 'Limit:' numeric box next to it sets a value as to how close the vertices have to be next to each other to be considered a double.

Since you are dealing with over lapping vertices, and you do not wish to weld/remove any nearby vertices set this number very low, the default of .001 should be fine but adjust if needed.

Another Point: As the vertices overlap you will need to grab both to **'Remove Double'**, so if you want you can simply hit the **'a'** key to select all vertices. Just clicking will only select one of the overlapping vertices, where you could hold down the 'Shift' key and try to keep clicking till you get the underlying vertex.

But you'll make it much easier on yourself if you do not want to select all (perhaps your model has other close by vertices you do not want to be included), to try using the **'Marquee' select-'b'** or the **'Lasso' grab of 'Ctrl RMB'**.

Plus remember to check to see that your **'Buffer Clipping'** visibility button is off (right side of Header Menu Bar), before you do the 'Lasso', because if it is on Blender considers the overlapped vertices to be behind the front ones and so they are considered **'clipped'**; meaning they won't be selected by the Grab because to Blender they are not visible.

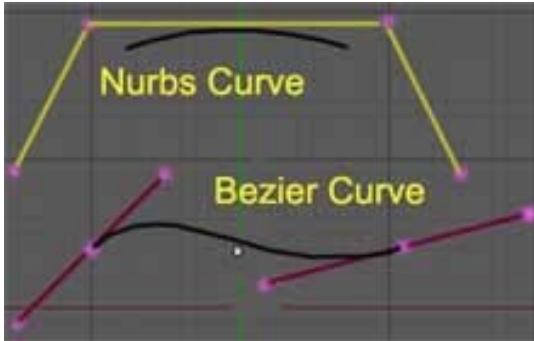
Making A Spin Shape With Bezier and Nurb Curves

A very short piece on using spline and nurb curves to make a spun mesh shape.

Some times when making more organic objects that need a highly rounded profile shape, you can use Bezier and Nurbs curves to more quickly get the desire profile then by 'Extruding' vertices of Edge over and over to create the rounded shape.

A Bezier curve is a parametric curve in which the curve (or Line) has control points at each end of the curve. These control points deal with the shape and amount of the curvature. Each control point has a set of lines coming off it at whose ends are items called handles that help set the curve by placement and distance from the control point.

A nurbs curve is a non-uniform rational b(asis)-spline, with the main difference for model being that a nurbs curve has two end points and two control points. These are not part of the curve like in Bezier, but acts as control shapes of the curve.

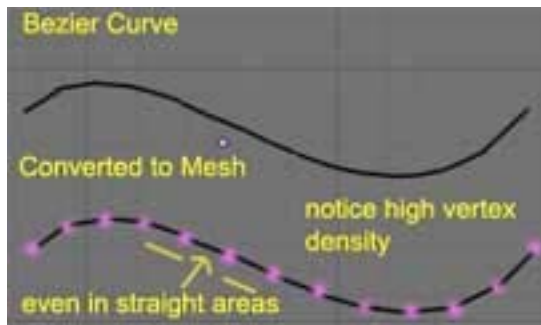


Best thing to do is go to the **User Preferences Menu Bar** and **Add** both a Bezier and Nurb curve as in the image to the left, and try moving control points about to see their effect.

Pretty much this works the same as with the edge spinning above. Make either a Nurb or Bezier curve. Like above go to an end point, but remember these are NOT vertices but control points. Now 'Extrude out more points to build up your shape. Then manipulate the *control points and/or handles* to form your shape.

Now before you can do a 'Spin' you will need to *convert your Bezier or Nurb into a Mesh* Edge Shape. So go into 'Object Mode' and do *Object > Convert Object Type* or 'Alt c'. A pop up appears with a choice of conversion types, in this operation there is only one listed 'Mesh', so highlight and click on 'Mesh'. You now have an Edge Shape.

IMPORTANT: You'll go back into 'Edit Mode' now to do your 'Spin', but take a moment to notice how many more vertex/edge segments you have. These were needed to make the nicely rounded shape you see in the Bezier or Nurbs curve, and would be



the number you would have had to extrude out in 'Vertex Mode'.

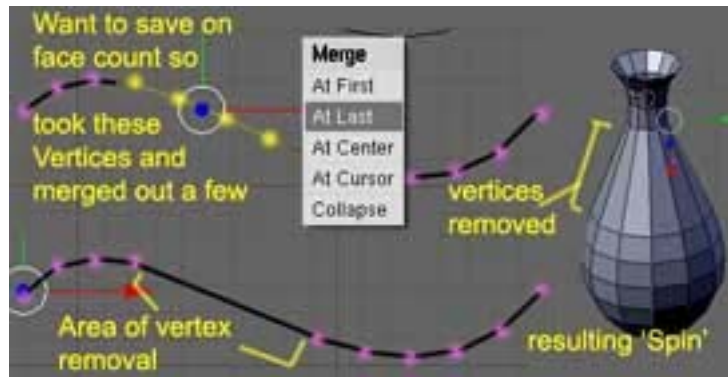
But also notice how in even fairly straight areas there are still a dense number of vertices. Bezier and Nurb curves do not optimize themselves, and if you are making a low poly count object you'd need to optimize your new Edge Shape before you Spin it.

The 'Spin' is as before, where first locate the point for your spin by placing your '3D/marking Cursor' at what point you wish the spin to occur around. Remember if on a specific vertex point you can 'Shift s' to bring up the 'Snap' menu, and then with your vertex selected do a *Cursor -> Selection*.

In the *Buttons Window Type > Panels > Editing* setup your number of **Degrees and Steps** values in the **MeshTools** area. Now click the 'Spin' button, but remember to move to the **3D View Window looking down the axis** you want to 'Spin' around.

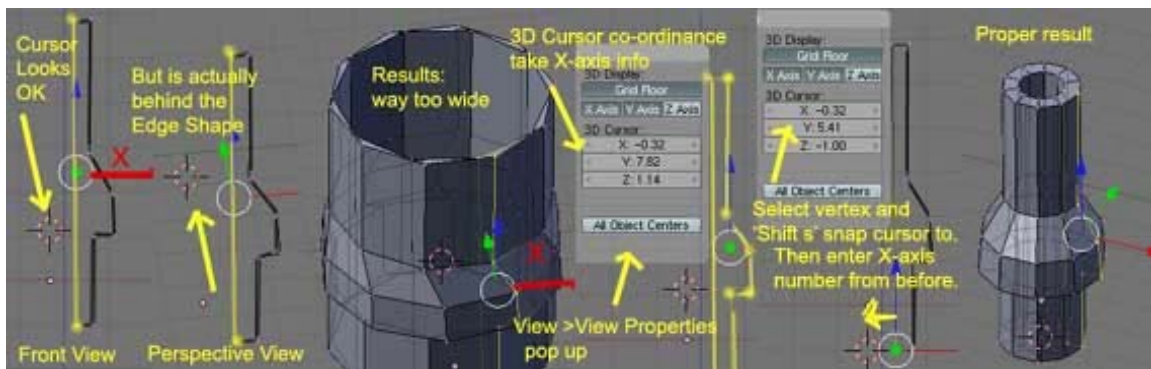
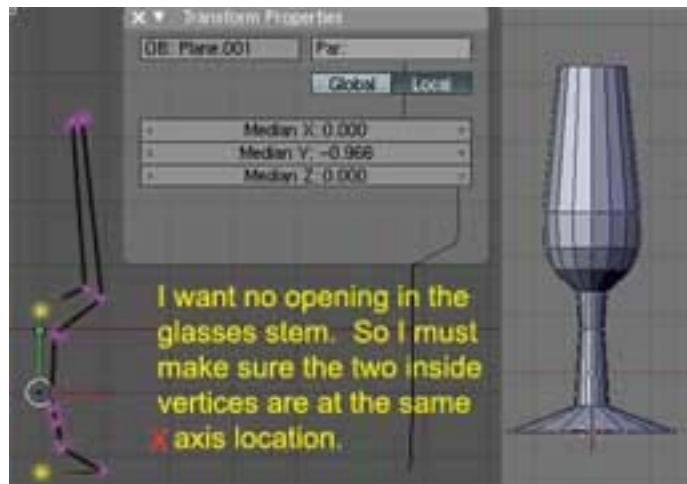
Here you will notice how I used Vertices Merge to reduce unnecessary vertices along a straight section of Edges.

Keep in mind if you are modeling low poly meshes Bezier and Nurbs curves may require some editing to save face counts. Much quicker to edit when it is just an edge shape, than after it's been spun into a Mesh.



A FEW TIPS:

Here is a problem where I want to make a wine glass, but I need to be sure the two Vertices must be located the same distance along the X-axis. So to simply check pick a Vertex and hit the 'n' key to bring up the 'Transform Properties' pop up. Then numerically make the numbers match. Next 'Snap' the 3D Cursor to the last Vertex set by using 'Shift s'.



Remember 3D Cursor is in 3D space, so while it may look OK it might not be where it appears to be in a 2D view. Here I want a pipe so I could not directly snap to a vert, but what you can do is 'Shift s' snap to selected in the Ortho view you build the Profile in. Then using the View > View Properties pop up numerically change the distance along whatever axis is needed to place the Cursor the proper distance away.