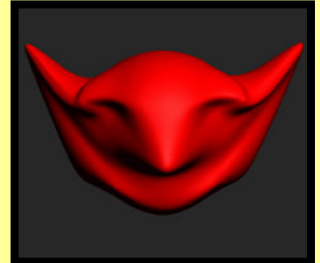
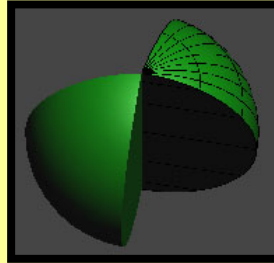
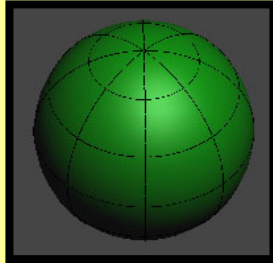


Power Sphere Tool

In this tutorial, you will learn how to create a Power Sphere and be shown how to:

- **Edit Control Points and Handles.**
- **Edit Spline Cage Settings.**
 - Smooth Bezier Curves, C1 Bezier Curves.
 - Rotational Symmetry, Slice From, Slice To.



Tool Used In This Tutorial

This tutorial will be accomplished with the following tool:



Power Sphere tool (**Pwr_Sphere**).


Creating Power Sphere

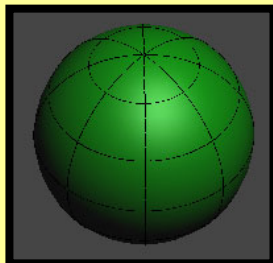
In this section we will discuss:

- A) Smooth Bezier Curves for the Power Sphere
- B) C1 Bezier Curves for the Power Sphere

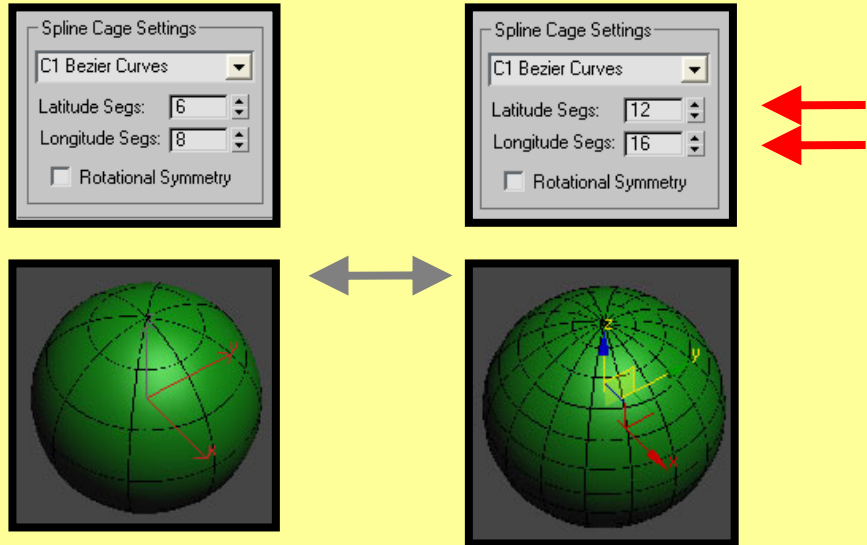
Procedure – Power Sphere Tool

The Power Sphere tool provides a convenient way to create a spline cage that consists of 1 or 3 Rail Sweep surfaces. The initial shape is a full sphere or partial sphere with a slice removed from it. The shape of the sphere can be modified by editing the points and curves of the associated spline cage sketch or using the Sub-Object Point or Sub-Object Curve editing on the Power Sphere object itself.

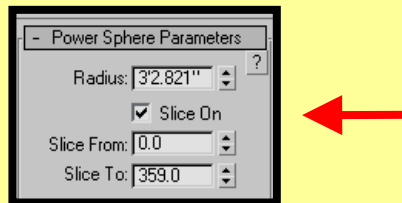
- 1) Start off by accessing the Power Sphere tool .
- 2) In the user view port use the click/drag method and create a Power Sphere shape.



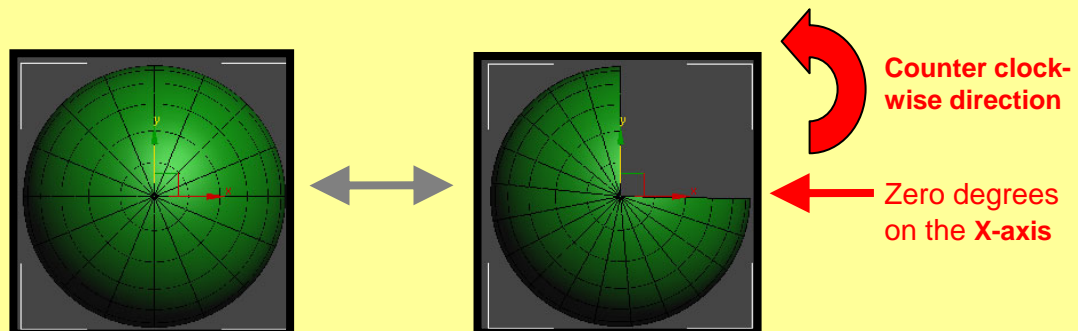
3) While the shape is still selected, go into the modify mode. Under the Power Sphere Parameters roll out, you can change the Latitude segments, and Longitude segments of your shape by adjusting the spinners. Change the Latitude Segments to 12 and the Longitude segments to 16 for this example. By increasing the number of segments in your shape will allow for more detail.

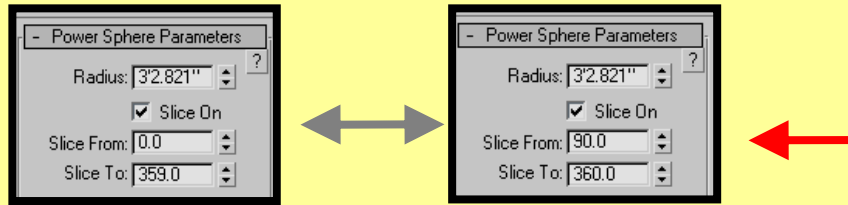


4) Check the “Slice On” option under the Power Sphere Parameters roll out. When enabled, this option will create a Slicing of the Sphere and the creation of corresponding start and end face rail sweeps.

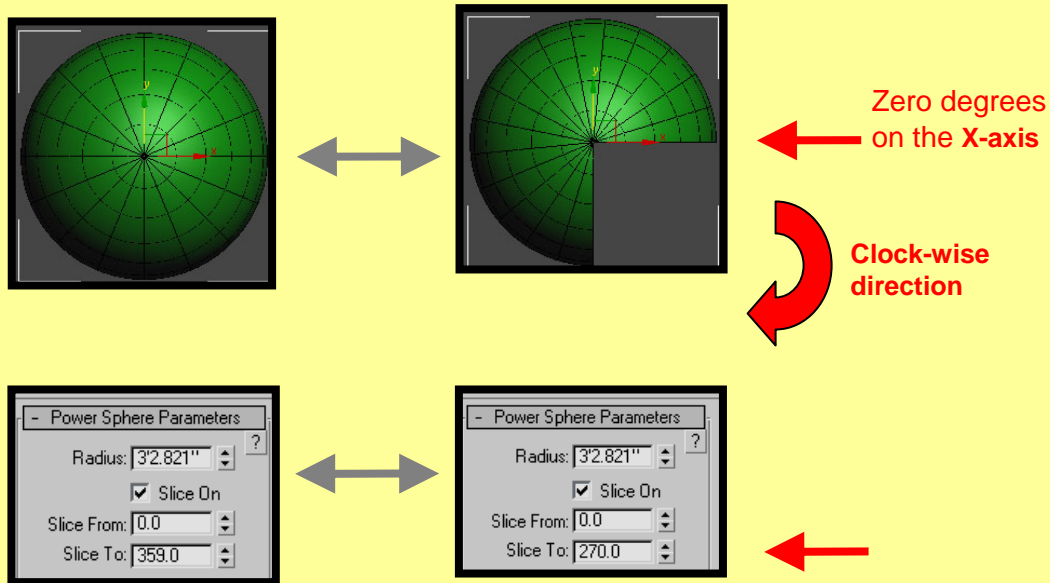


5) Now adjust the “Slice From” spinner. As you adjust the spinner, an angle opening occurs starting from zero degrees on the X-axis. This sliced space will open in a counter clock-wise direction. (Observing from the top view point.)



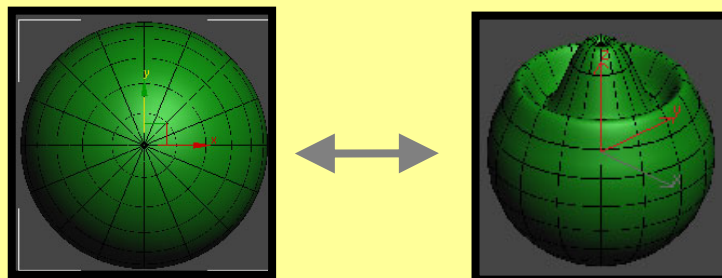


5) By adjusting the “Slice To” spinner, an angle opening occurs starting from zero degrees on the X-axis. Though, just the opposite of the “Slice From” spinner, the “Slice To” spinner will open in the Clock-wise direction.



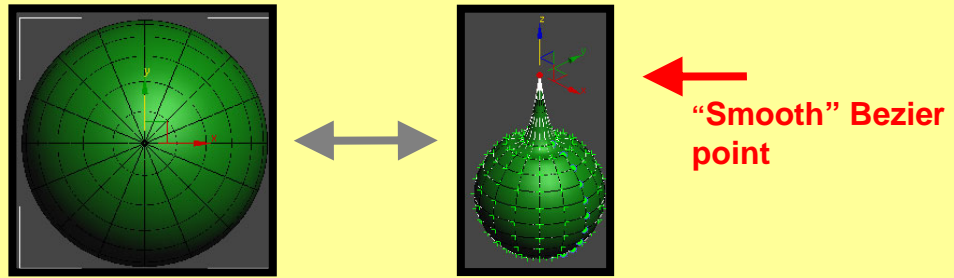
A) Smooth Bezier Curves for the Power Sphere

1) Change the Spline Cage Type to “Smooth Bezier Curves”, if not already done. Select the “Sub Object Points” option of your “Pwr_Sphere” sub-object. Highlight three rows of points on the top portion of your sphere. Drag the selected points downward. Now, grab the first two rows of points on the top portion of your sphere and drag upwards.



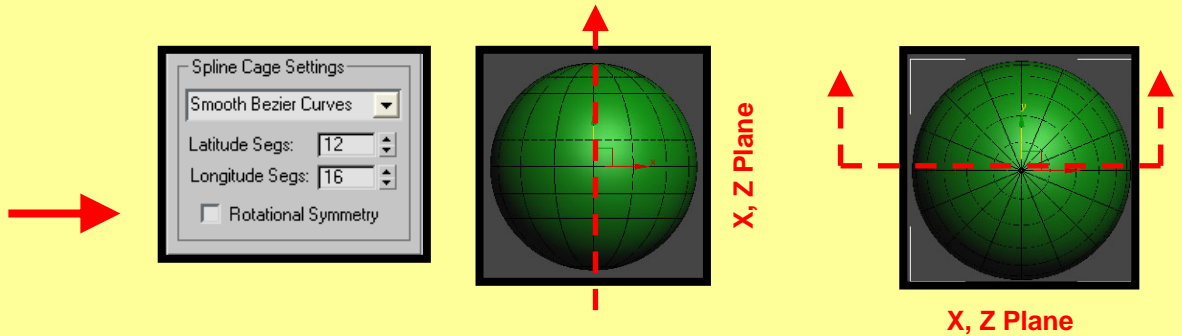
- When working in the “Smooth Bezier Curves” mode, the Smooth Bezier Curves will consist of “Smooth” Bezier points. These points will allow you to alter your object in a variety of ways.

A) Smooth Bezier Curves for the Power Sphere

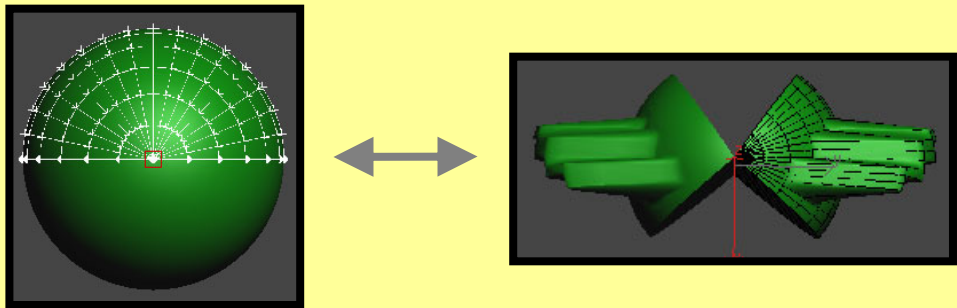


- The "Sub Object Curve" sub-object allows you to grab a complete curve on your object. You can also use the "Ctrl" key to select multiple Sub Object Points and Curves.

2) Let us discuss **Rotational Symmetry**. This option specifies a symmetry is to be applied about the plane defined on the sphere axis using the X, Z plane. Create a sphere object and turn on Rotational Symmetry.

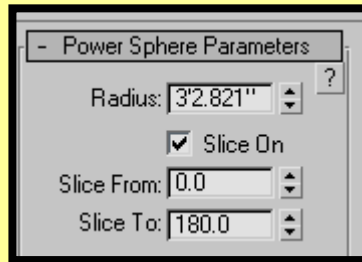


As illustrated above, the Sphere is divided in half along the X, Z plane which is a 180 degree half Sphere object ($360/2 = 180$). The other half Sphere is the mirrored object of the first. You can tell this by observing that half the Sphere has the "Power Sketch" lines and the other half does not. Any sub object points altered on the original side will be duplicated on the mirrored side.



Also, notice that the "Slice On" option was automatically selected when the "Rotational Symmetry" option was turned on. In addition, the "Slice To" option was set to 180.

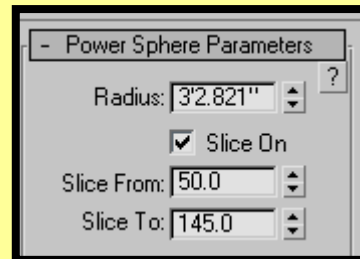
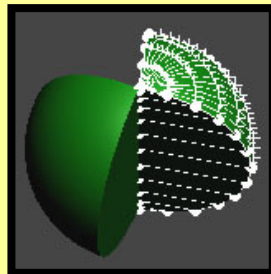
A) Smooth Bezier Curves for the Power Sphere



← "Slice On" selected

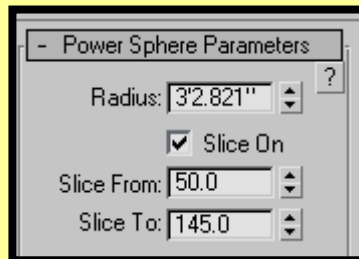
← "Slice To" set to 180

Now you can adjust the "Slice On" and "Slice From" spinners for some interesting effects.



3) While the shape is still selected, you have the option to adjust the Radius settings under the Power Sphere Parameters roll out of your shape.

Radius: Radius of the Sphere.



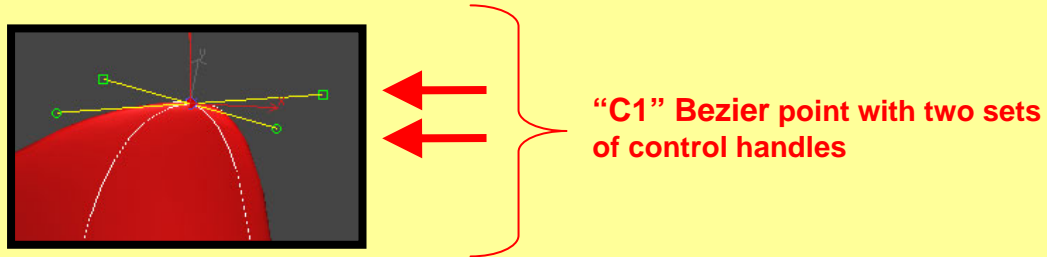
Note: the modification of the Radius, Slice On, Slice From and Slice To elements will reset the spline cage to the shape of the cylinder and loose any edits done on the spline cage. Once you have modified the spline cage, you can change the number of segments without resetting the shape because the new spline cage is generated using the existing surfaces.

A) Smooth Bezier Curves for the Power Sphere

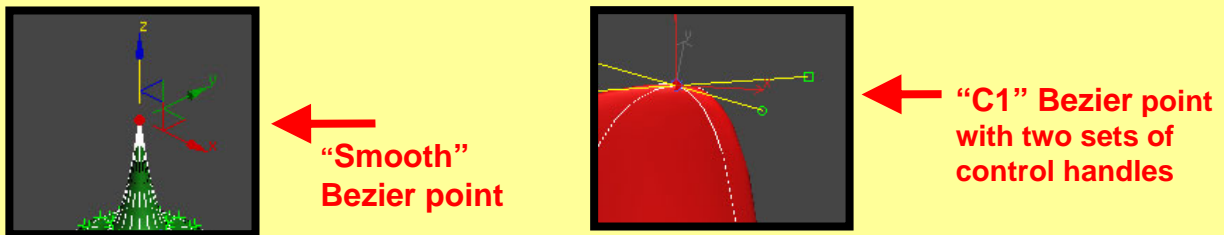
The “C1 Bezier Curves” spline cage type works very similar to the “Smooth Bezier Curves” spline cage type except for the operation of the Bezier curves.

1) Let us look at the operation of the “C1 Bezier Curves” points.

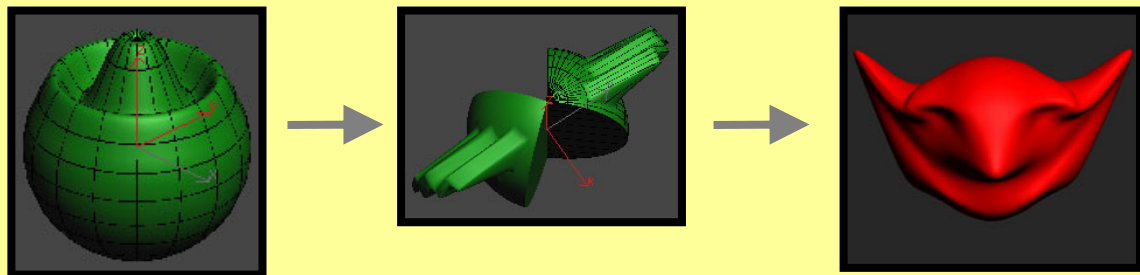
When working in the “C1 Bezier Curves” mode, the C1 Bezier Curves will consist of “C1” Bezier points. The C1 Bezier point contains two sets of Control Handles for each point.



Recap: For the Sphere, the “Smooth Bezier Curves” use “Smooth” Bezier points and the “C1 Bezier Curves” use Two sets of Control Handles.

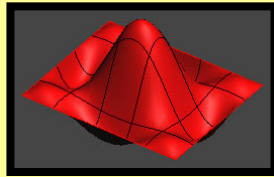


2) By altering the Control handles you can create interesting forms.

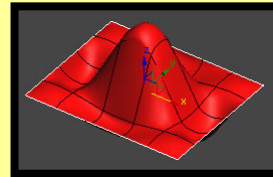


Also, another interesting difference between “C1 Bezier Curves” and “Smooth Bezier Curves”. The “C1 Bezier Curves” has less rippling effects on the surface of your shape because of the added vector constraints to the localized edits. Notice the difference in the wavelike motion between the “Smooth” and “C1” bezier curves.

A) Smooth Bezier Curves for the Power Sphere



↑
“Smooth”
Bezier point



↑
“C1”
Bezier point

Because the “C1” and “Smooth” bezier curves parameters work very similar, refer back to the “A) Smooth Bezier Curves for the Power Sphere” section in regards to:

- “Latitude” and “Longitude” Segment settings
- “Rotational Symmetry
- “Radius” settings
- “Slice From” settings
- “Slice To” settings

Summary

In this tutorial, you were shown how to create a Power Sphere using:

- Smooth Bezier Curves spline cage type
- C1 Bezier curve spline cage type

You were also shown how to modify a Sphere using:

- “Latitude” and “Longitude” Segment settings
- “Rotational Symmetry
- “Radius” settings
- “Slice From” settings
- “Slice To” settings



Power Sphere tool (**Pwr_Sphere**).