

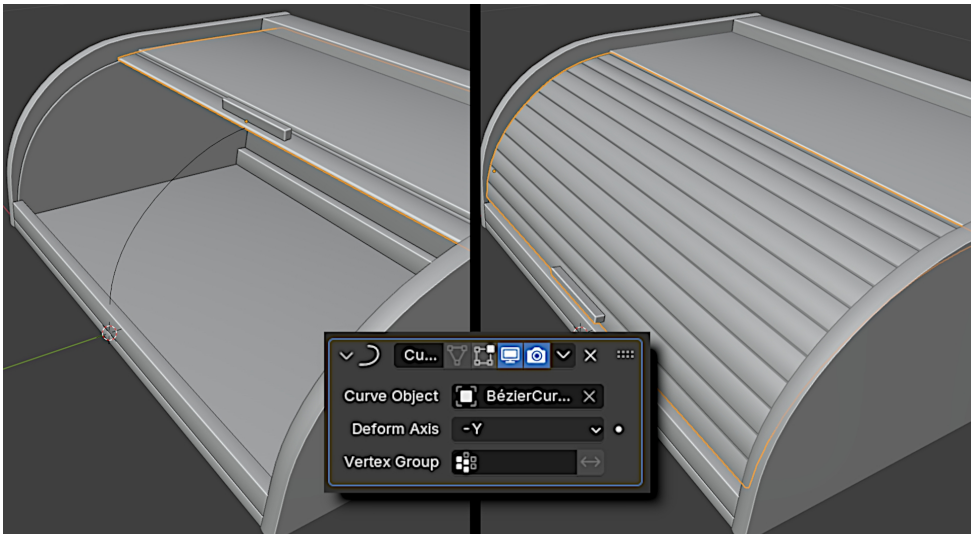
How to Deform an Object Along a Path Using the Curve Modifier in Blender 4.3

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video version: <https://youtu.be/LTCJRQxyhMg> (Scheduled for March 31, 2025)

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Hello everyone! In this tutorial, I will show you how I used the Curve modifier in Blender 4.3 to deform an object along a path, specifically to create the opening and closing motion of a bread box lid.

The Curve modifier allows for various effects. For example, it can deform the shape of an object by modifying the control points of the curve, as long as the object and the curve are initially overlapping and the object has a good number of subdivisions.

It can also be used to arrange copies of an object along a path, which can be freely modified, when combined with an Array modifier.

Lastly, the Curve modifier deforms an object when it moves along the path. This is the case we will analyze in this tutorial. I will also discuss some elements, such as tilting or direction inversion, which can lead to incorrect results if not properly examined when using the Curve modifier.

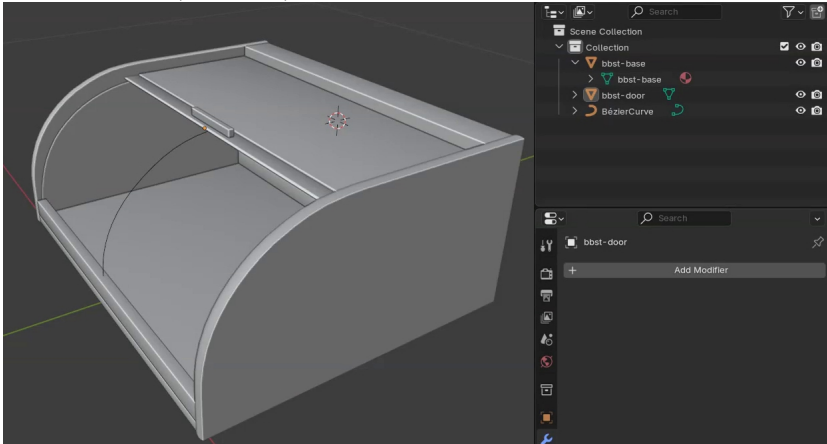
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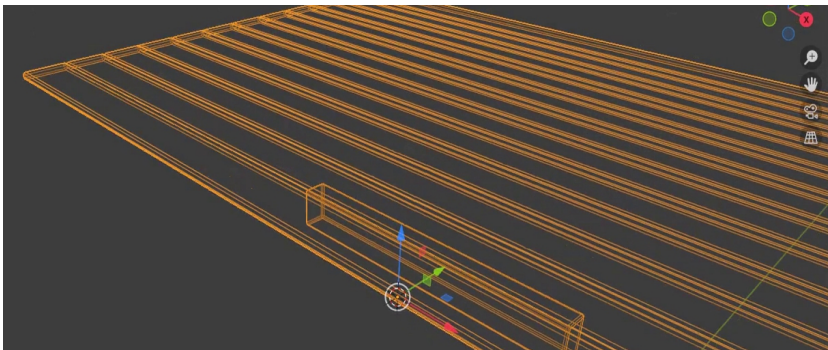
As with many of my other tutorials, the PDF version of this tutorial is available for free at the link in the description. This is also a great time to subscribe to the channel and enable notifications so you won't miss upcoming tutorials!

The scene used for this example contains three objects. The bread box container has no modifiers and, for now, I can set it aside to focus on the rest.



The second object to analyze is the bread box lid. As you can see, this object is initially straight because it will be deformed by the path curve. There are also several horizontal cuts, made using Loop Cut and Bevel, which will help deform the object properly when it moves along the curve.

I position the object's origin at what would be its base when the lid is closed. This position is not random, as it represents the entry point of the object into the path curve.



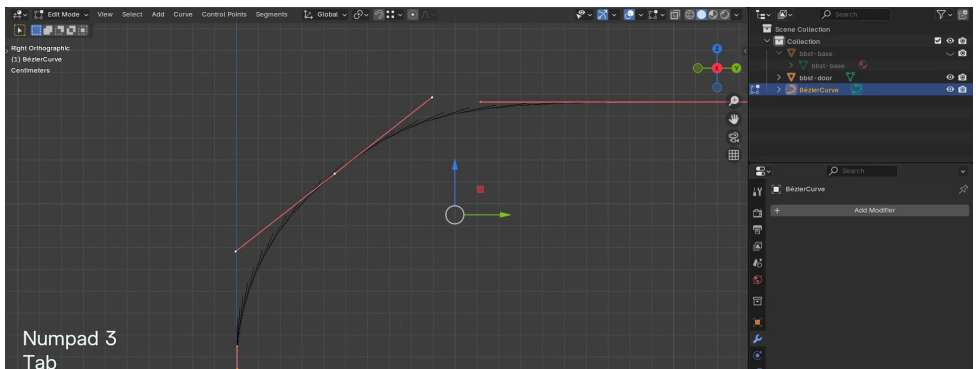
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When using modifiers, it is crucial to correctly apply rotation and scale transformations by pressing **CTRL A** and selecting **Rotation and Scale**. The Curve modifier is no exception. In fact, incorrect results when using this modifier often stem from failing to properly apply rotation and scale to both the object being modified and the path curve.

The third object is the path curve. This curve is simply a **Bezier Curve** object, which I modified by moving its control points to shape it into the path the lid should follow.



I moved the curve's origin to what will be the entry point of the object into the path, so in effect, the **Origins** of both objects coincide.

Just like with the lid, it is important to apply **Rotation and Scale** to the path curve using **CTRL A** and selecting **Rotation and Scale**.

With the objects positioned this way, I apply a **Curve Deform** modifier to the object that needs to be deformed. In this modifier, two key parameters must be set: the object to be used as the path and the deformation axis.

The object to be used as the path is, of course, the **Bezier Curve**.

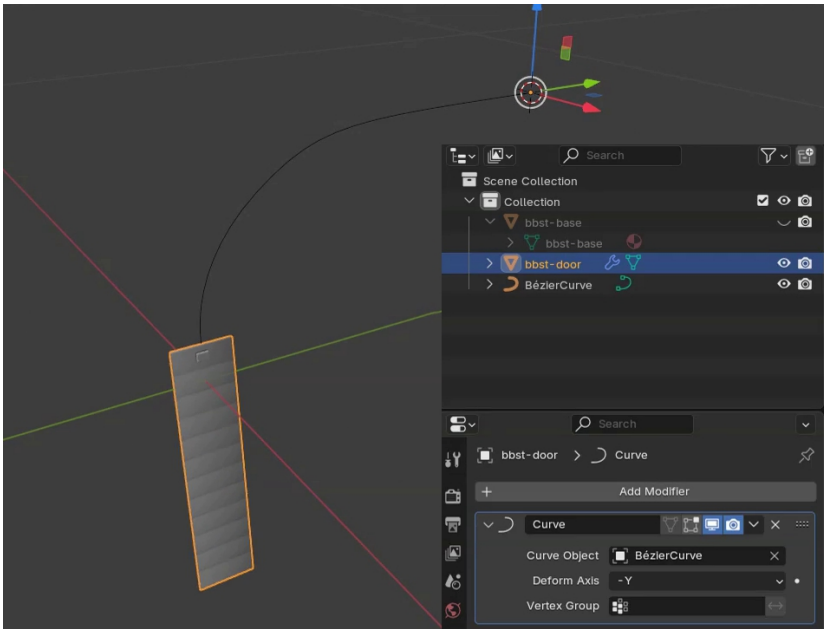
As for the deformation axis, in my case, it is the **Y axis with a negative direction**, because I want the lid to slide along the curve by moving it along the **negative Y axis**, as indicated by the transformation manipulators.

Setting up the modifier this way results in a complete mess. So, let's see how to achieve the correct outcome.

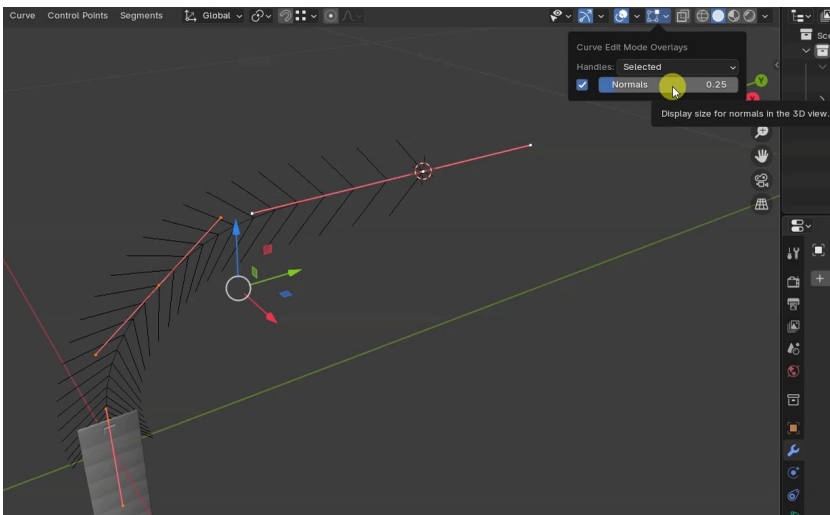
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The first two aspects to keep in mind for the curve are **Tilting** and the **curve direction**. These can be analyzed in **Edit Mode** by enabling the **Normals** visualization in the **Overlays** menu, located in the **header of the 3D View**.

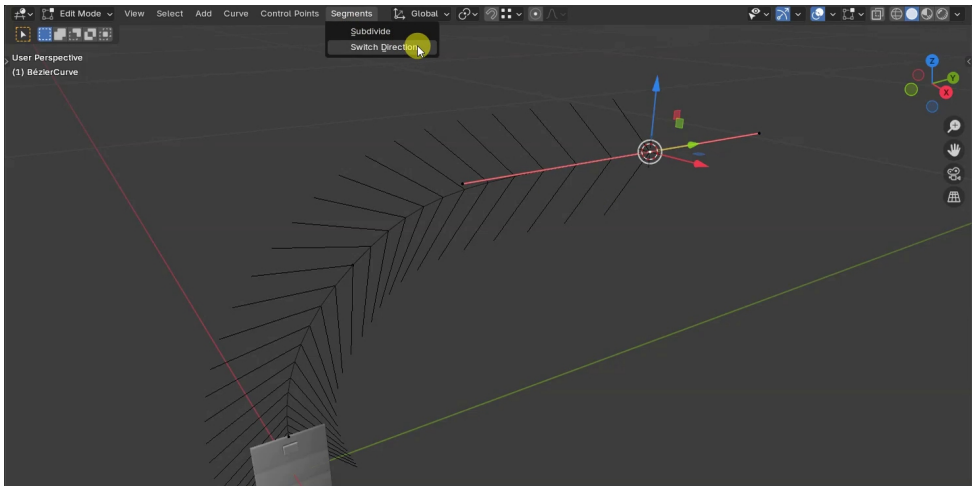


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Let's start with the **direction**, which in this case will immediately help reposition the object where it should be. To **invert the direction** of the path curve, I select at least one control point in **Edit Mode** and use the **Switch Direction** tool from the **Segments** menu.



Now, the lid is in the correct initial position, but it is **rotated 90 degrees and squashed along one dimension**.

Tilting represents the **rotation of the curve's control points along the path direction**. Objects modified with **Curve Deform** follow this orientation, so it's necessary to set the tilting correctly.

Tilting can be adjusted by **selecting one or more control points** and setting the desired value in the **Transform** panel, or by using the **CTRL T** shortcut and entering the desired rotation value.

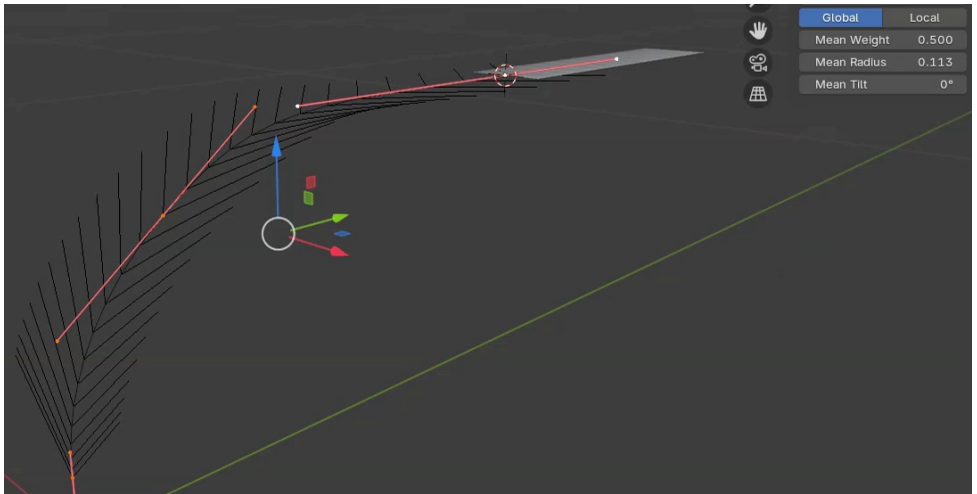
You can also **reset the tilting** of one or more selected control points using the **ALT T** shortcut.

In my case, the tilting of the control points is **90 degrees**. Simply selecting all of them and resetting this value with **ALT T** solves the problem... or at least, it seems to, as we'll see later.

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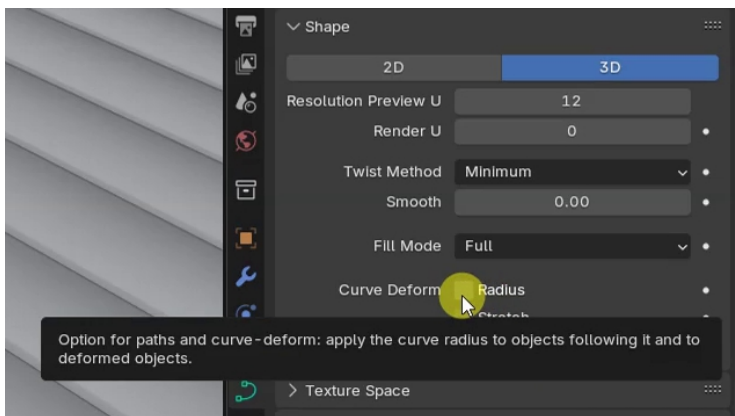
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At this point, I can return to **Object Mode** to address the final issue: the object being **squashed along two dimensions**.

To fix this, I select the **path curve** and disable the **Radius** option in the **Curve Deform** section of the **Object Data Properties** panel.

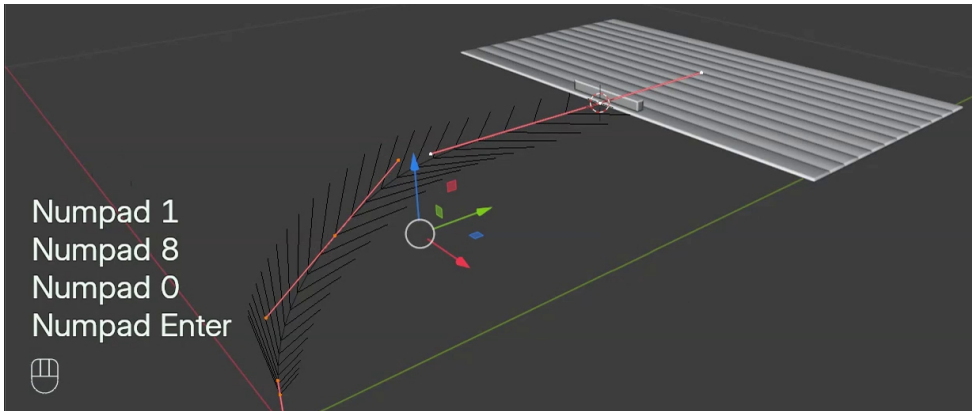


The lid now appears upside down, meaning the correct **tilting value is actually 180 degrees**. So, I switch back to **Edit Mode**, select all the control points of the curve, press **CTRL T**, type **180**, hit **Enter**, and return to **Object Mode**.

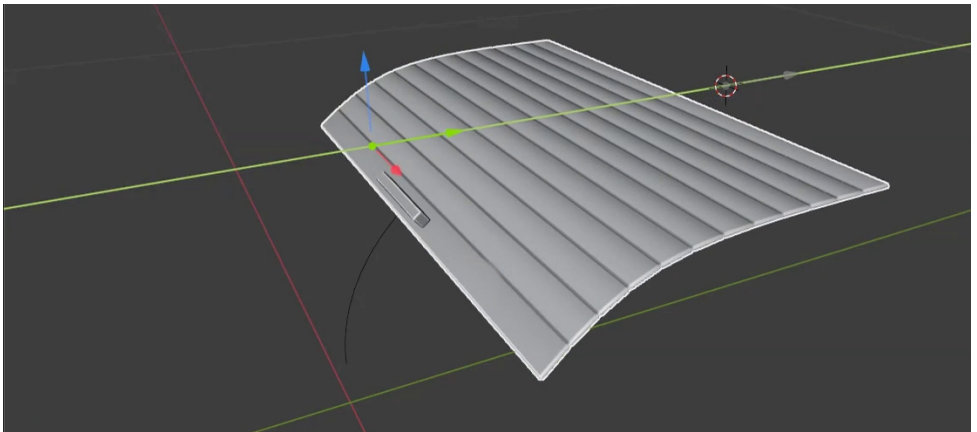
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Now, I can select the lid and move it along the **path curve** in **Object Mode**, achieving the desired result.



Before finishing this setup, I make the **path curve** and the **lid children** of the **container**. This way, when the container is moved, rotated, or scaled in the scene, these transformations will also be applied to the lid and the path curve, keeping everything consistent.

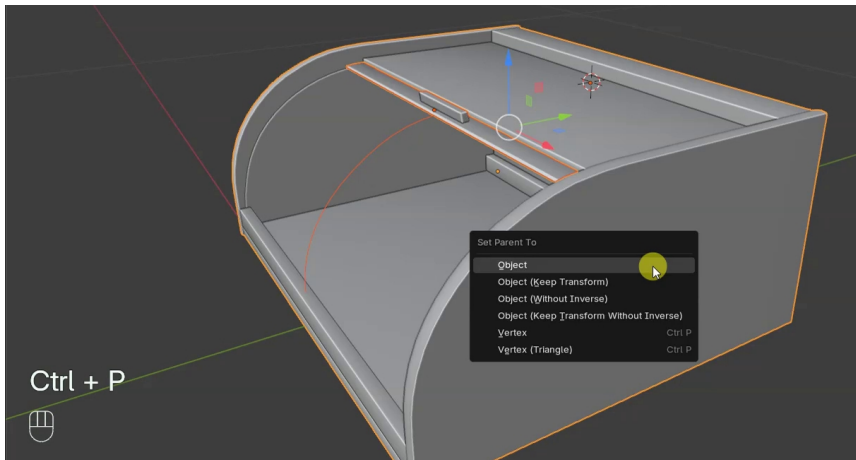
First, I select both the **curve** and the **lid** and position them properly inside the container.

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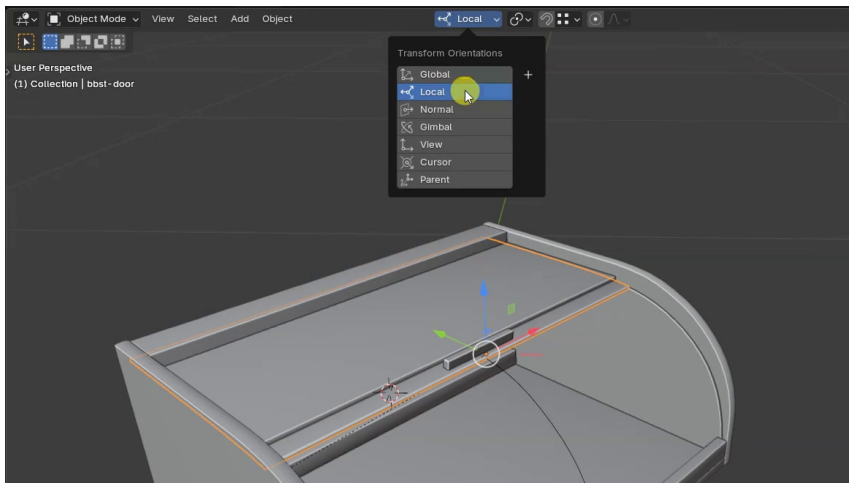
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Parenting or hierarchy is established by selecting all the objects to be linked in a **multiple selection**, making sure to select **the parent object last**, and then pressing **CTRL P** to create the parent relationship. I perform this operation with the three objects in the scene, selecting the **container last**.



If I now rotate the **parent object**, the movement direction of the **lid** will no longer correspond to the **global Y axis**. To move the lid easily, I switch to **local axis visualization** in the **header of the 3D View**, allowing me to move the lid along its **local Y axis**.



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So, to recap:

- I positioned the **object and the curve** with their **Origins coinciding**, ensuring both were aligned along one of the **global axes** of the scene.
- I applied **Rotation and Scale** transformations to both objects.
- Then, I checked the **tilting** and **curve direction** in **Edit Mode**, enabling **Normals visualization** for convenience.
- I **disabled the Radius option** in the **Object Data Properties** panel of the curve.
- Finally, I **parented** the curve and the lid to the **container**, allowing me to position, rotate, and scale the entire setup consistently within my projects.
- The **lid** can now be moved along one of its **local axes**.

Well, that's it for this tutorial! I hope you found it useful! See you next time!