HOW TO CREATE A BRAID

A Technical Paper By Erika Johnson
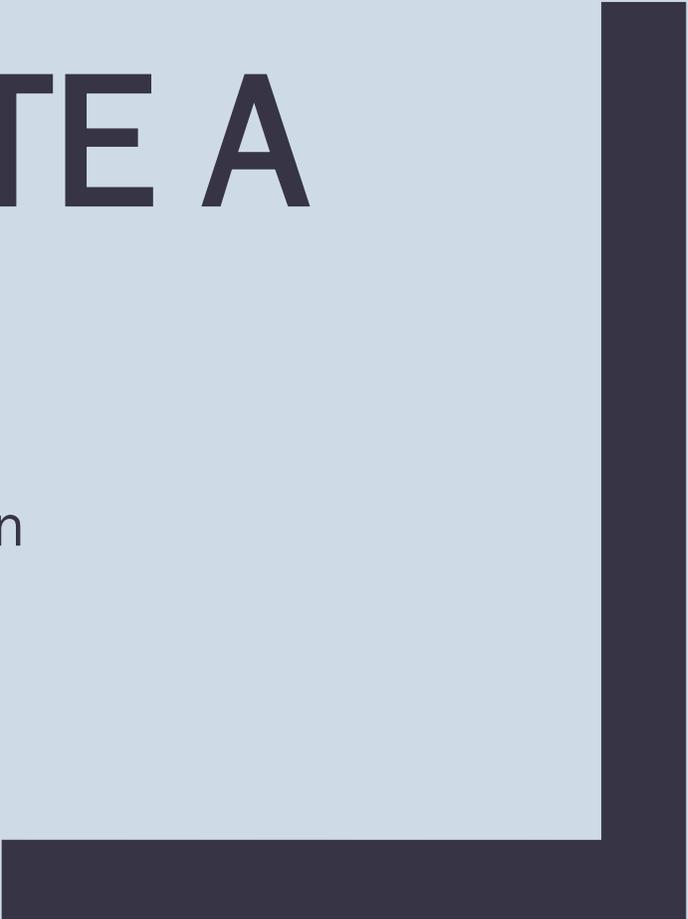
# Step 1: Create a curve for the braid shape

– In the FRONT viewport, make a wavy curve with the CV curve tool
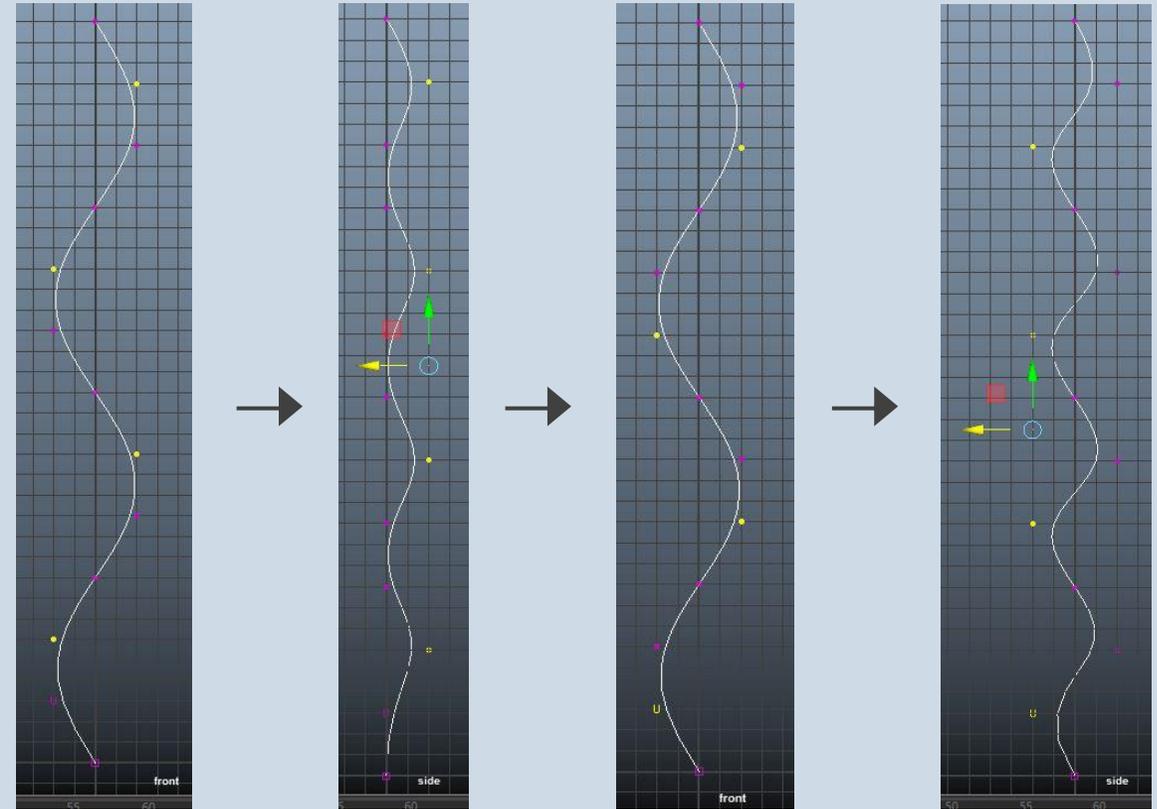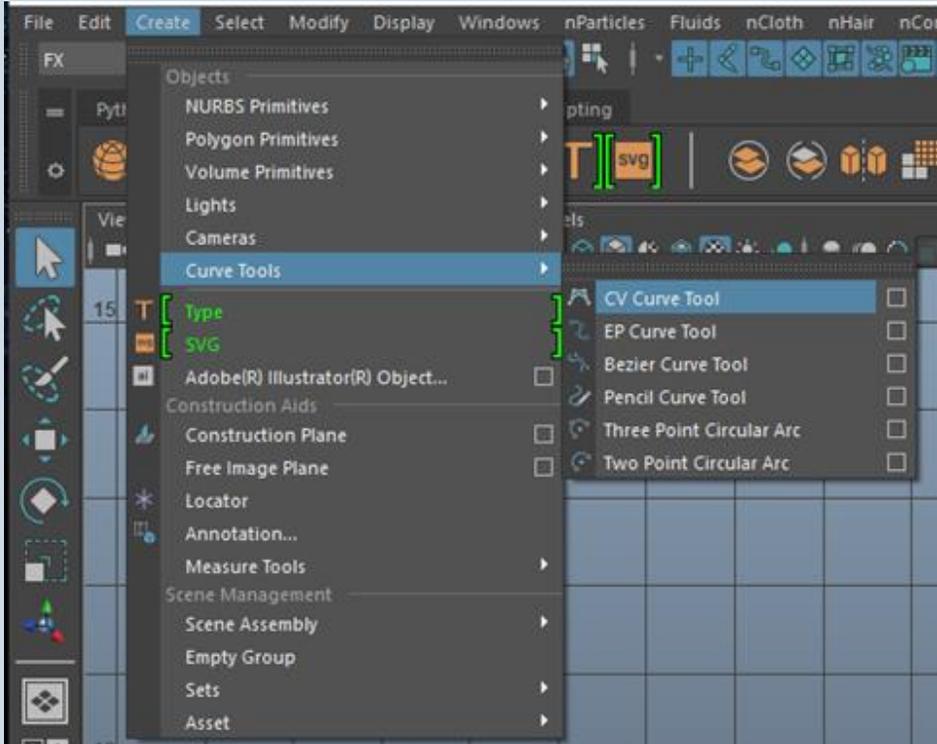
> Select every other 2 vertices from the curve and go into the SIDE viewport and move the selected vertices to the right

> Go back to the FRONT viewport and select the other vertices. With the vertices selected, go into the SIDE viewport to move the selected vertices to the left

Step 2: Create a nurbs circle for the base structure

– Now that the curve is wavy in both the FRONT and SIDE viewport, make a nurbs circle with 6 sides
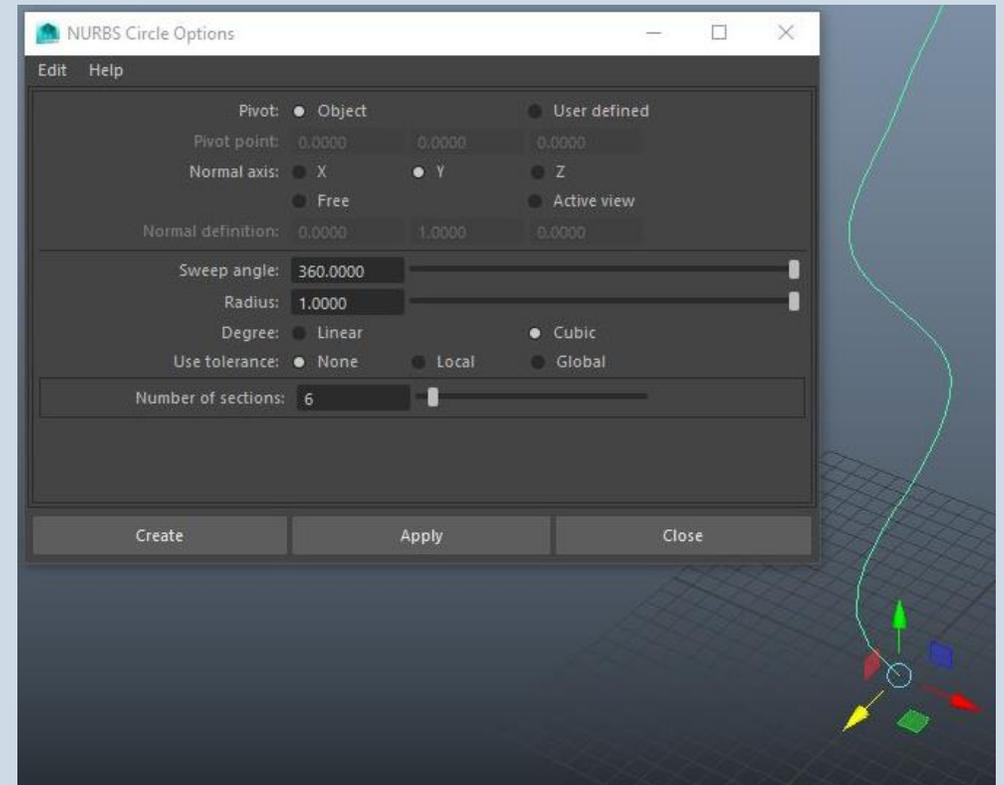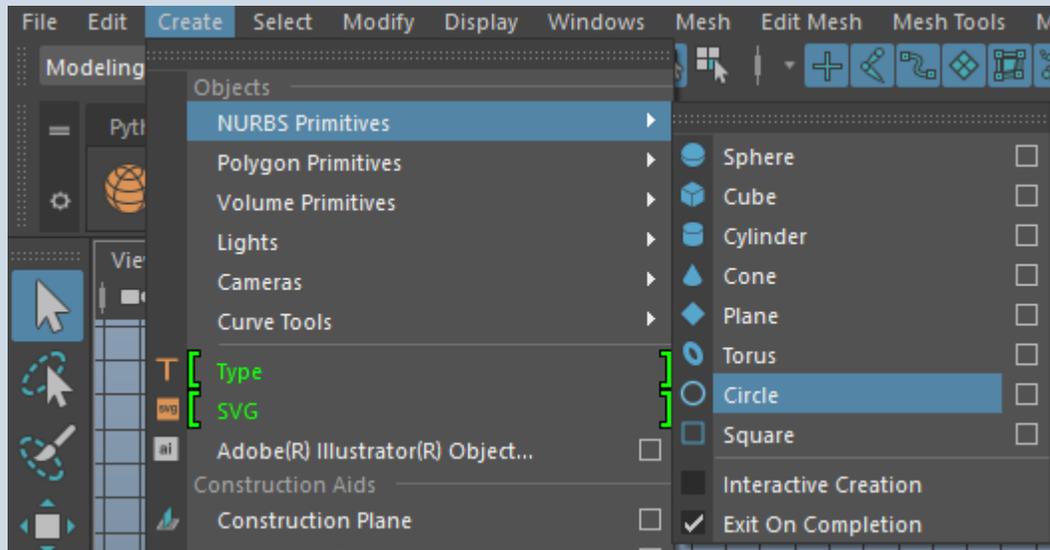
- With the nurbs circle selected, shift select the curve and go to Surfaces > Extrude□
 - > Make sure At Path and Component are selected, then click Extrude
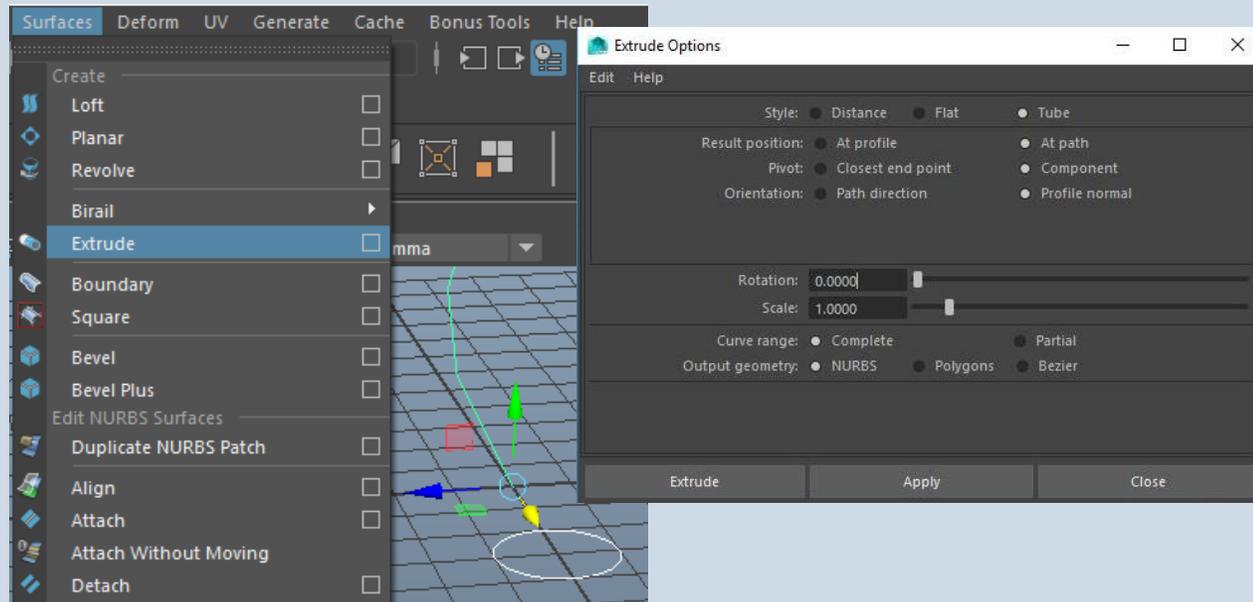
- Delete the history from the Extruded Surface, curve, and the nurbs circle
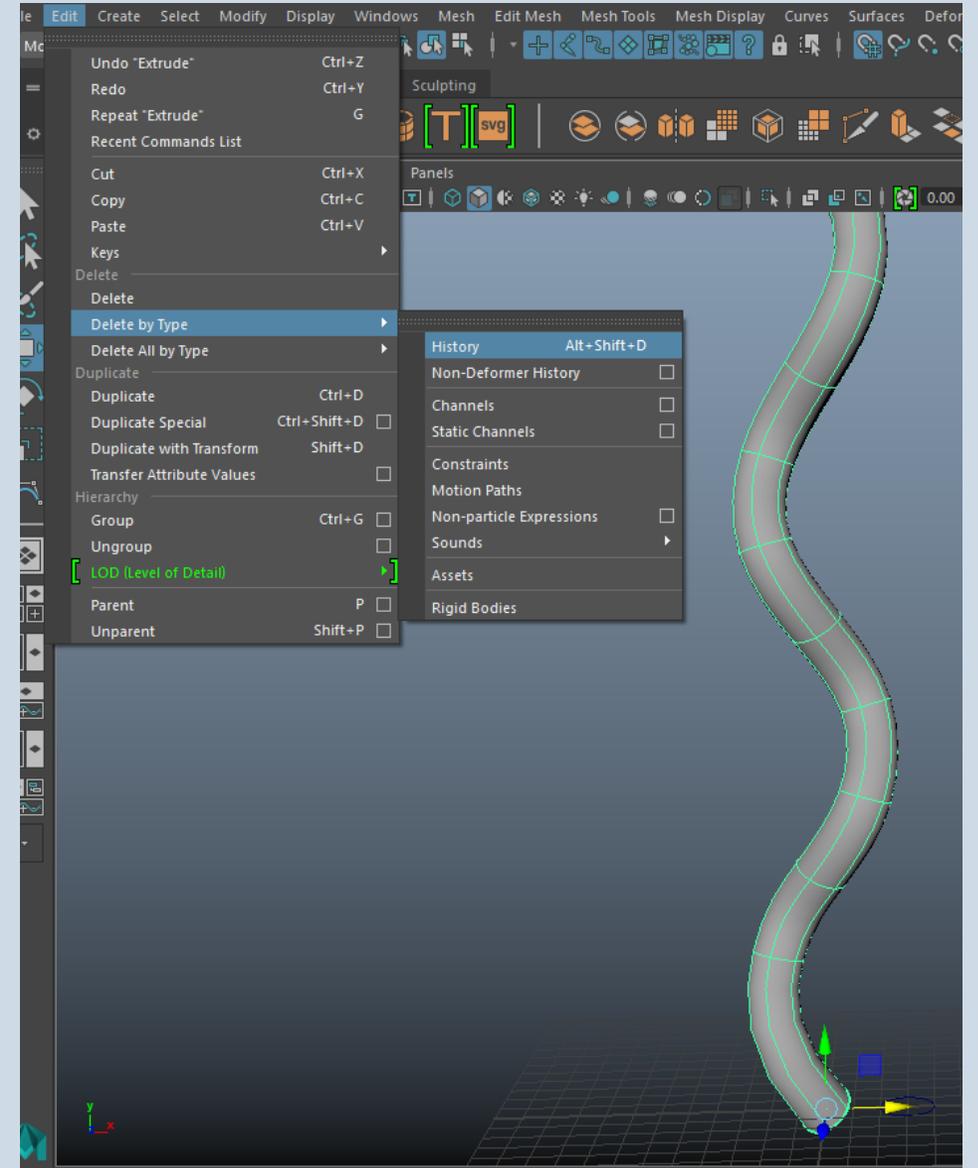
Step 3: Creating the form of the Braid

– Change the name of the extruded surface to Braid1

– Duplicate (Ctrl + D) Braid1

> Change the Y Translation of Braid2 to 6

– Duplicate Braid2

> Change the Y Translation of Braid3 to 12
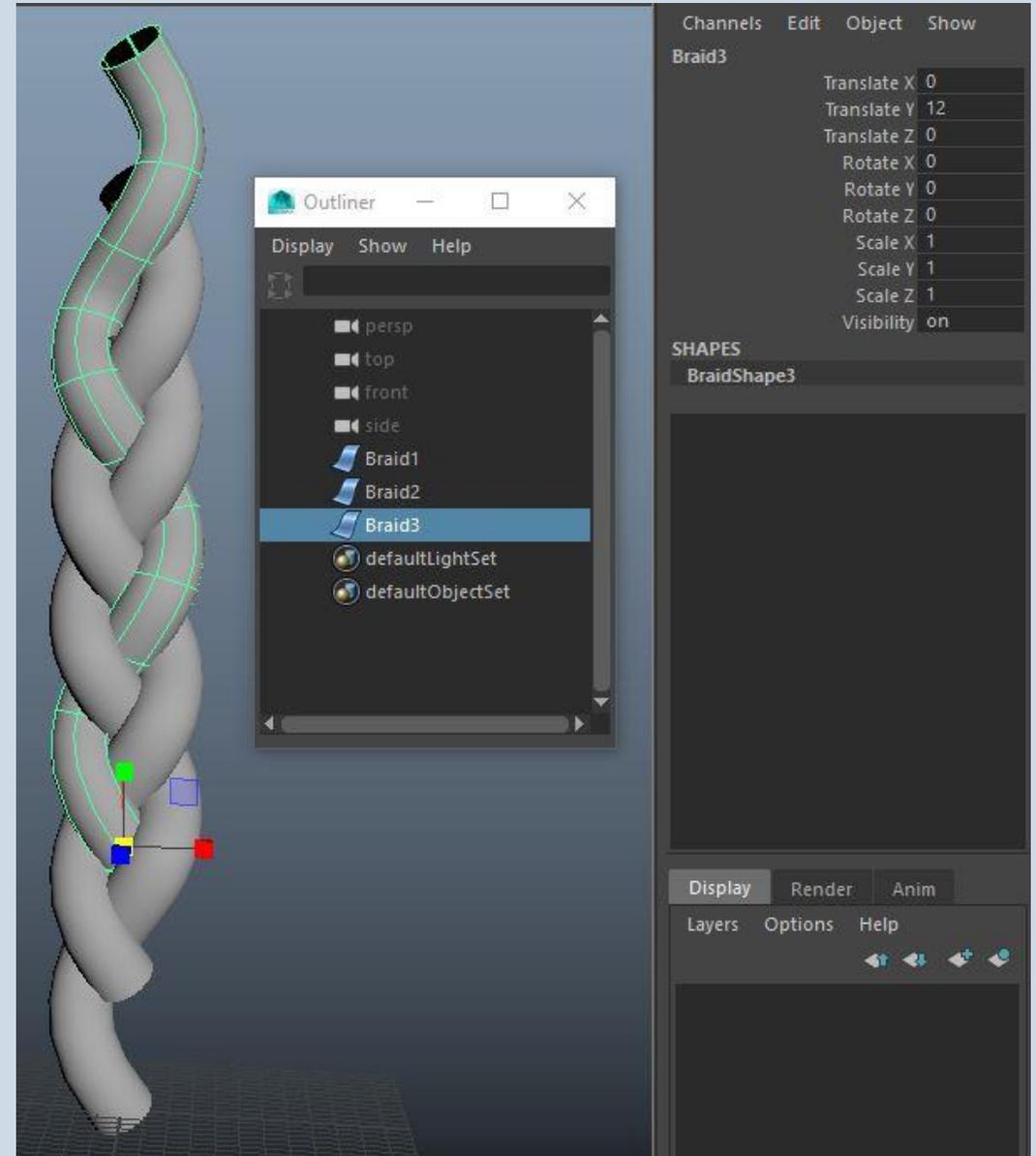
- Select Braid1, Braid2, and Braid3 and go to Modify > Convert > nurbs to polygons
 - > Make sure to check Quad and Control points, then click Tessellate
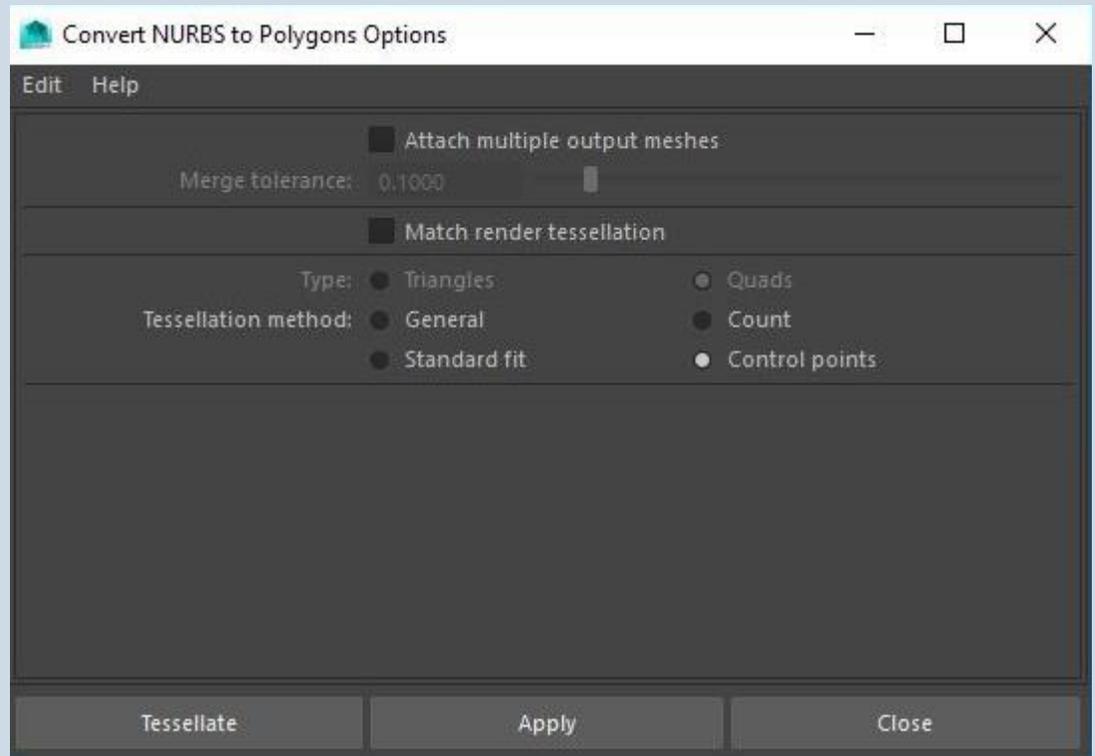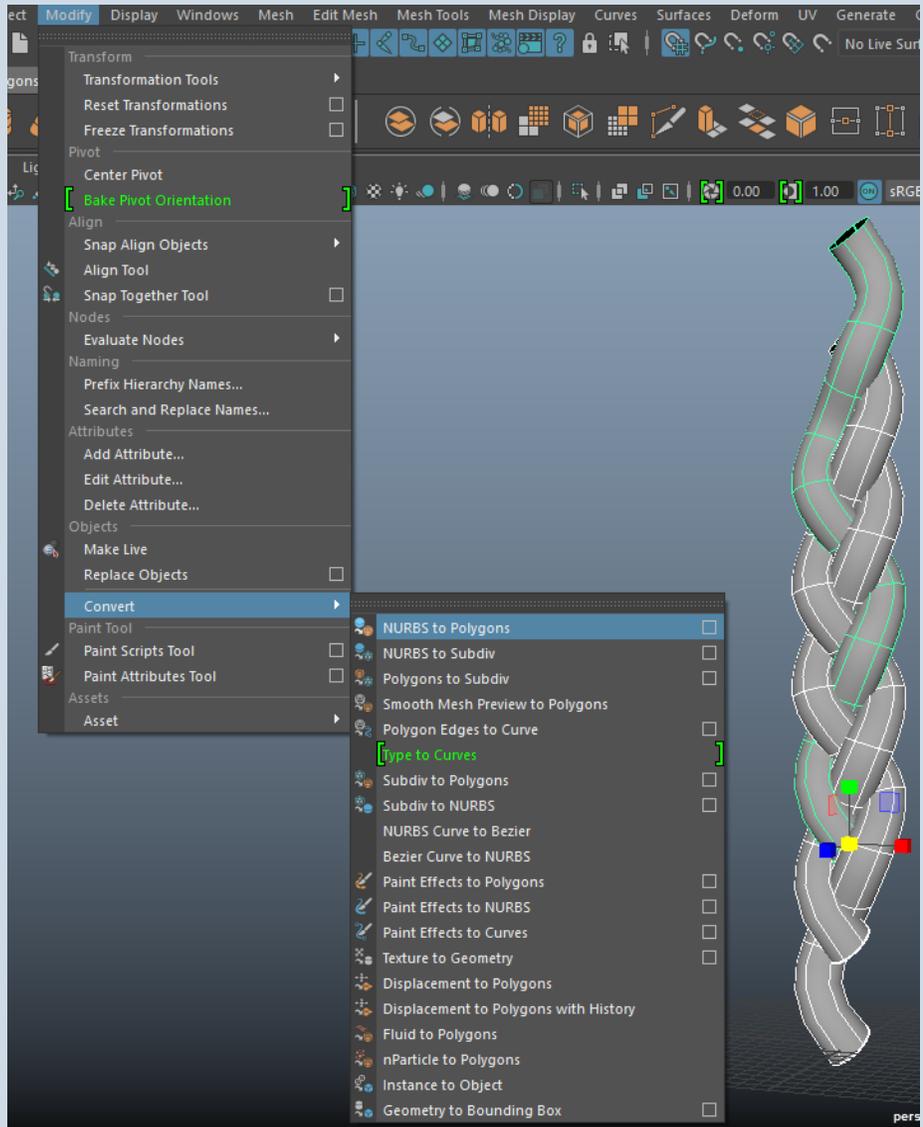
- Delete the nurbs surfaces

- Combine the three new polygon objects into one object and delete history
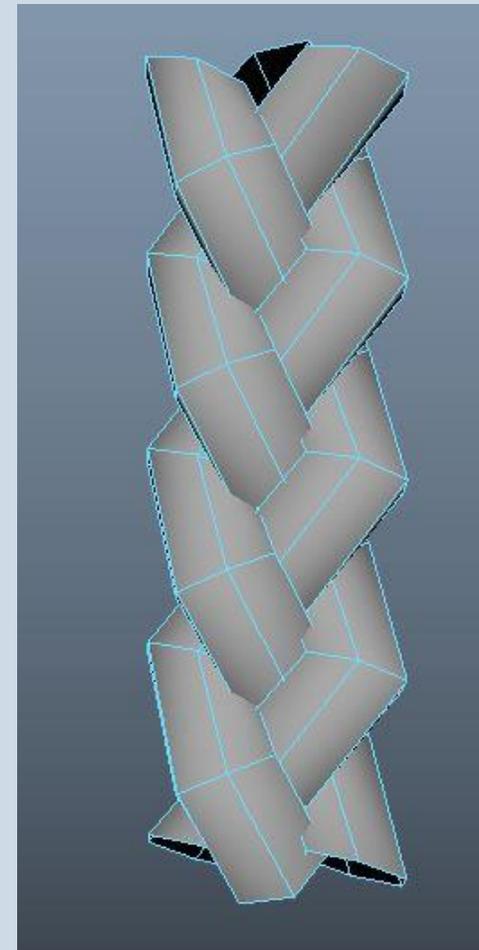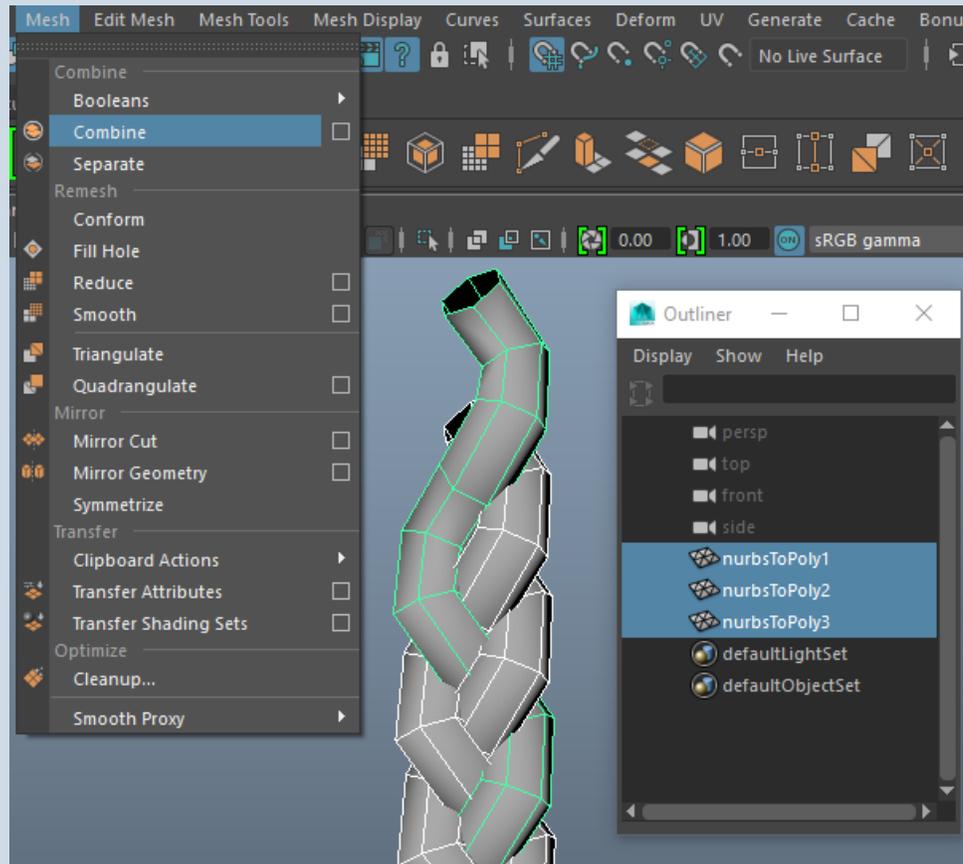
- Select the extra faces from the top and bottom that do not make up part of the braid and delete them
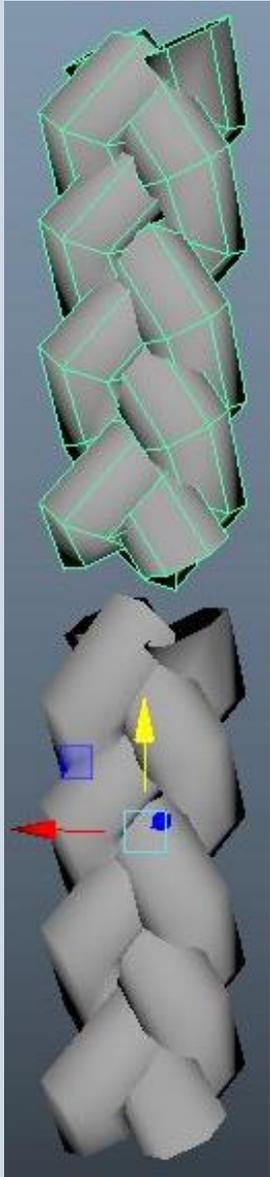
– This is only a section of the braid. To make it longer:

   > Duplicate the braid and move the duplicated braid up so that the bottom can match up with the top of the original braid

   > Combine both objects and merge the vertices

   > Repeat until desired length

   > Delete history

– The length of the braid can also be determined in the beginning by how long the curve is
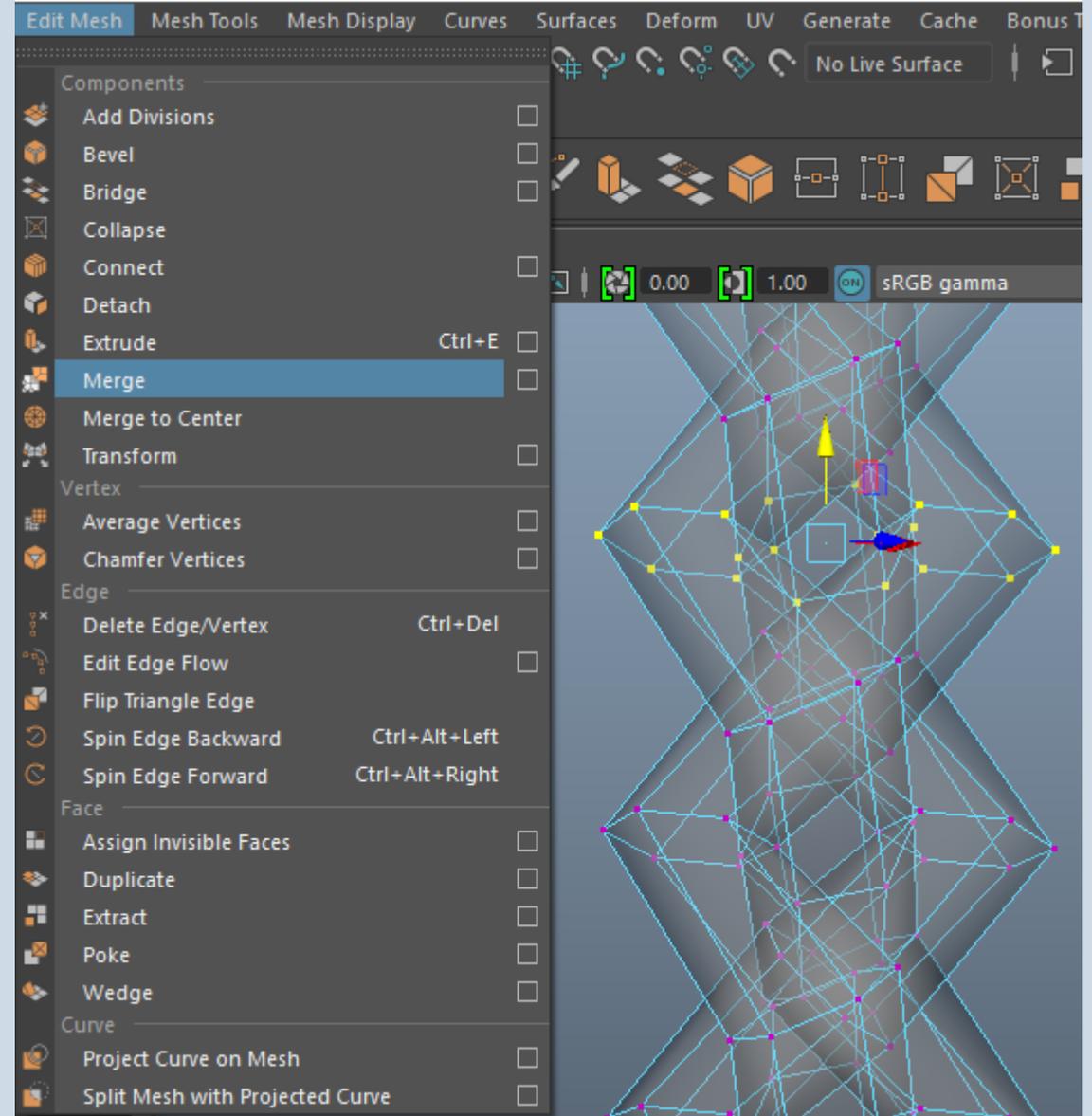
Step 4: Smooth the braid
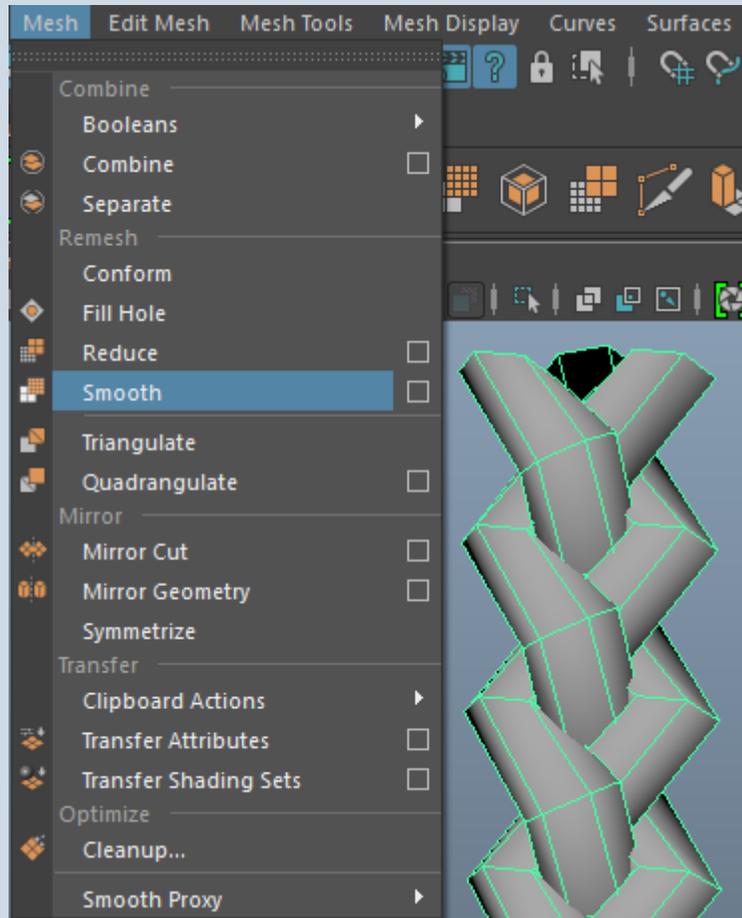
- Go to Mesh > Smooth

- Bring up the divisions to 2 to have a smoother look
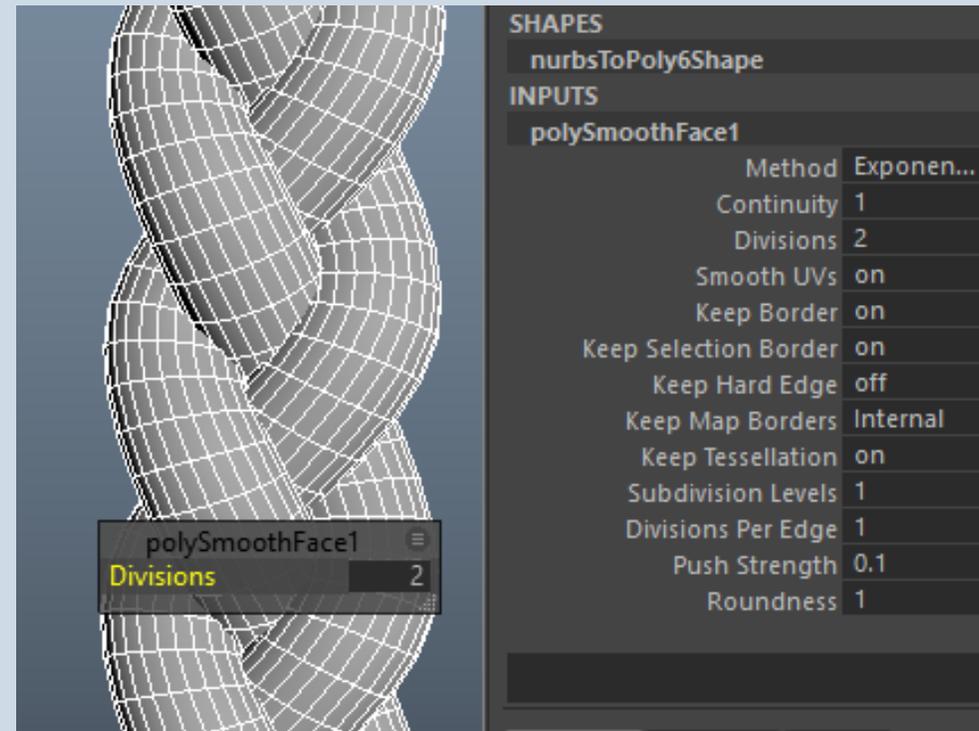
# Step 5: Quad Draw

– We created a braid but we cant have intersecting geometry as it will create problems down the road. Therefore we are going to use the shape of the braid we just created to create a braid on top of it using Quad Draw.

- Quad Draw Tool allows you to create a clean mesh over your reference surface by retopologizing the mesh

– Select the braid and make it a live object
  > The object cannot be selected anymore
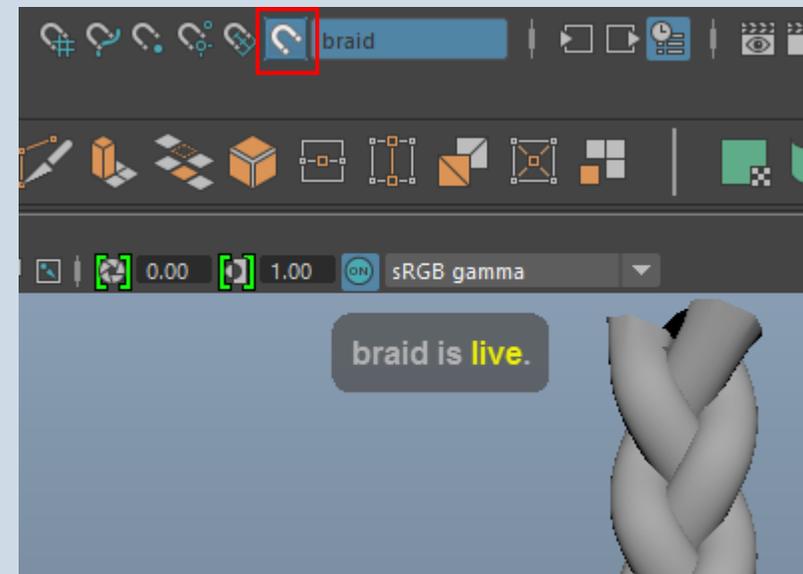
- Go to Mesh > Quad Draw
  - Left click – places vertices on top of the live object
  - Shift + left click – creates polygons from the vertices you placed
  - Control click – adds edge loops

- When retopologizing the braid, make sure to think about the edge flow of the braids, making the polygons flow down the braid
  - Make sure to create the same amount of polygons for each section of the braid as this will help the edge flow and look of the braid along with UVing the braid afterwards
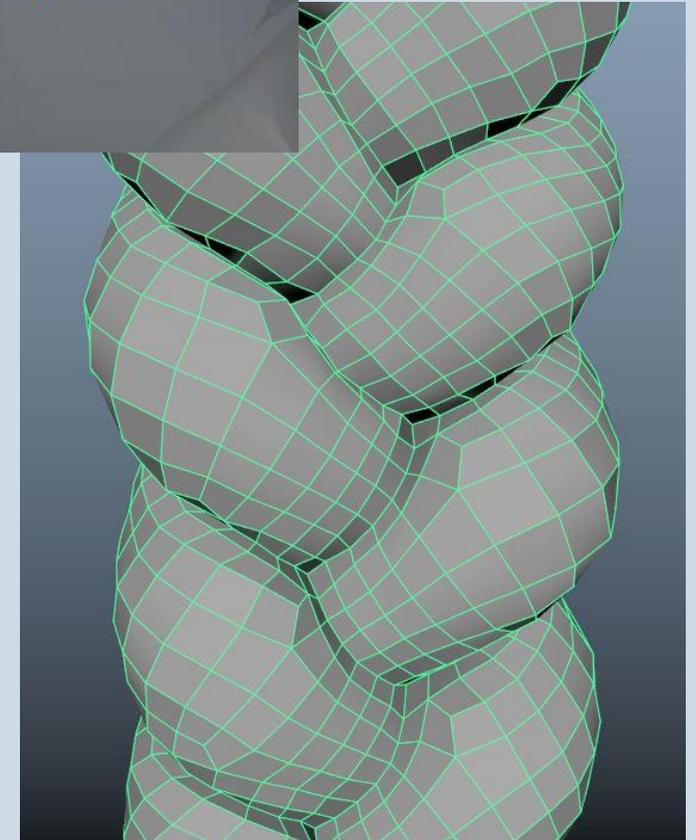
- When done, take the original braid off live and delete it

- The new braid now has no intersecting geometry
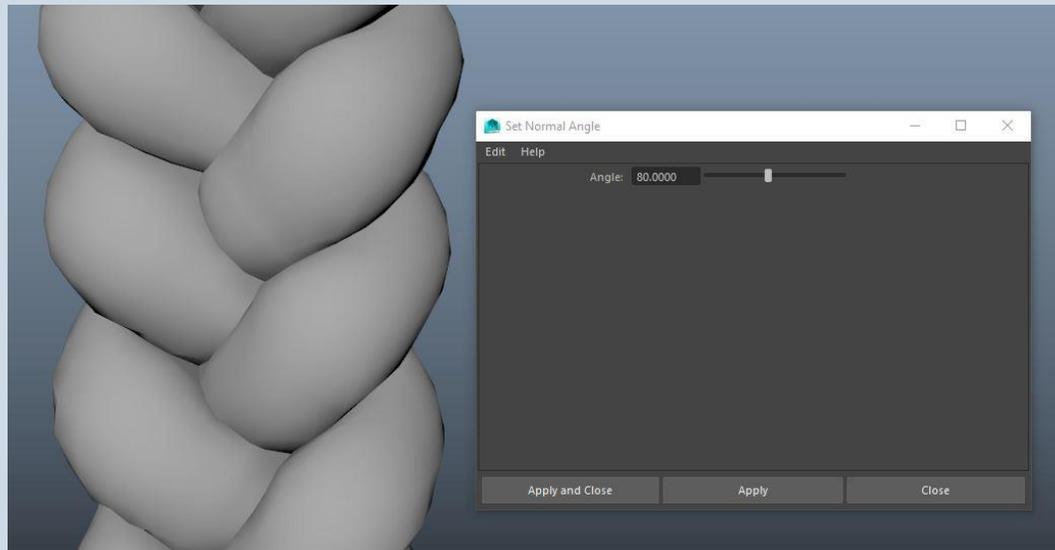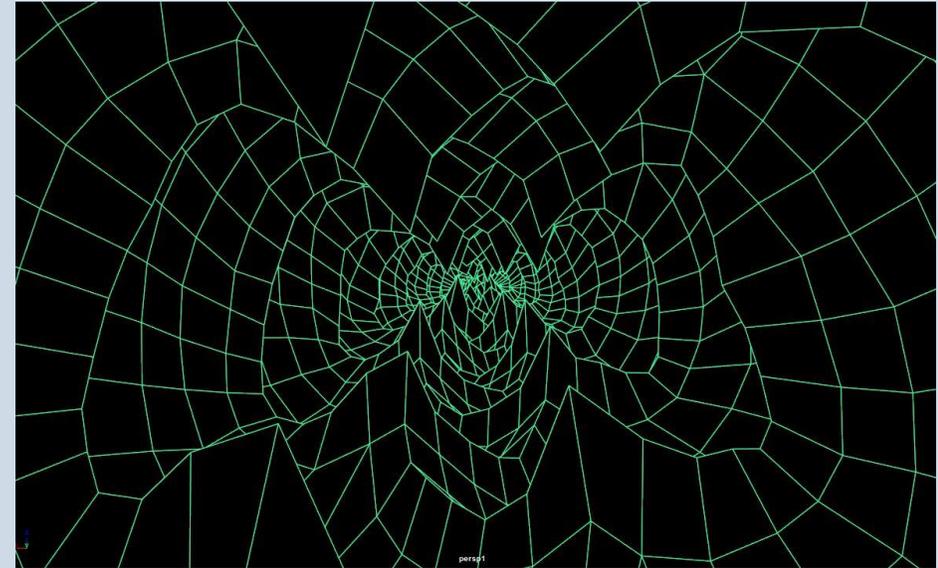
- To fix the rigid look of the braid:
  > Go to Mesh Display > Set Normal Angle > Set to 80 and click Apply

– Depending on what the braid is for, you can close the top and bottom of the braid by extruding along the edges and closing the opening