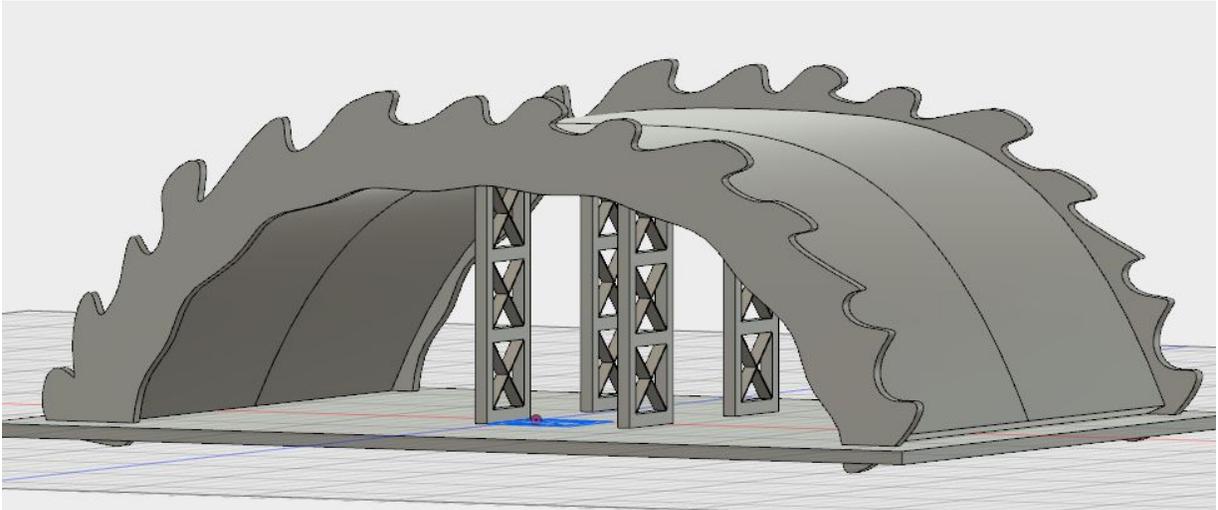


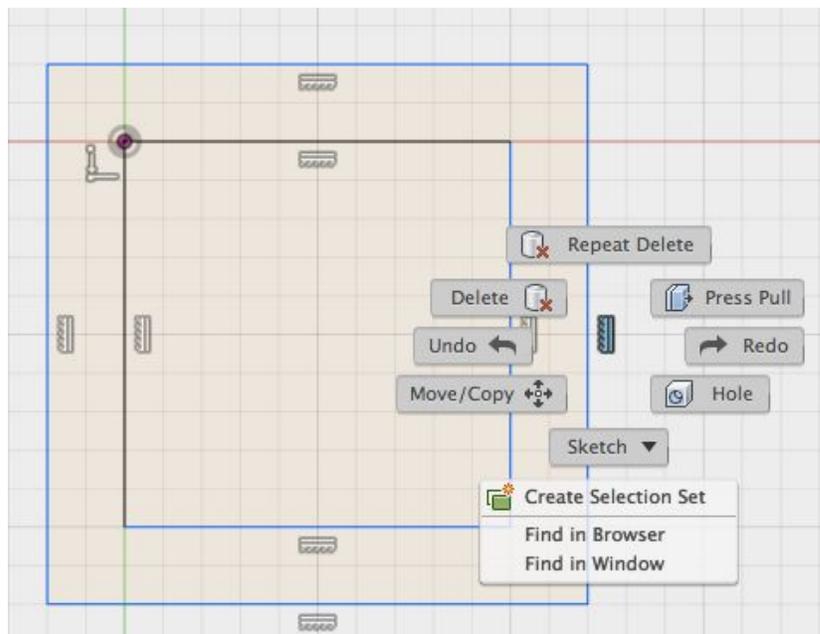
Project: Bridge

Description: This tutorial will guide you in quickly building a cool curvy bridge! You'll learn some more advanced tools to speed up your modeling, such as patterns, curves, and offset planes. If you need help, message one of the instructors!

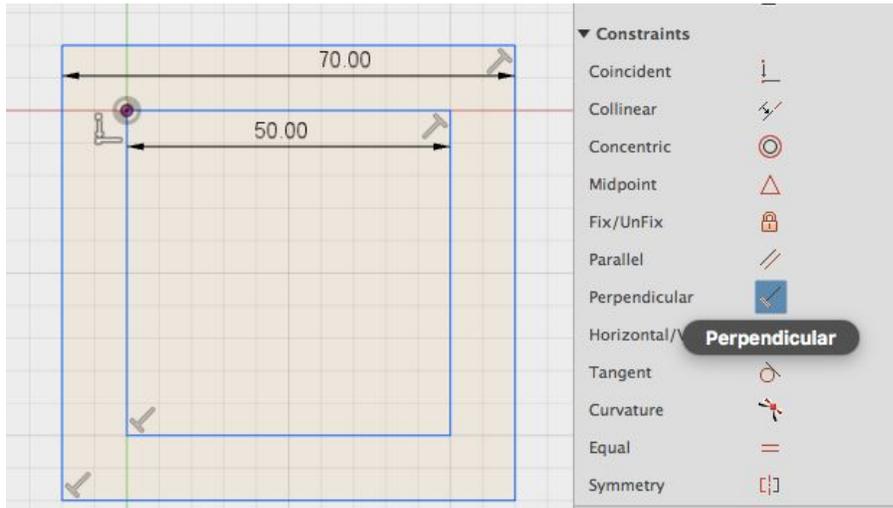


1. Build the support square

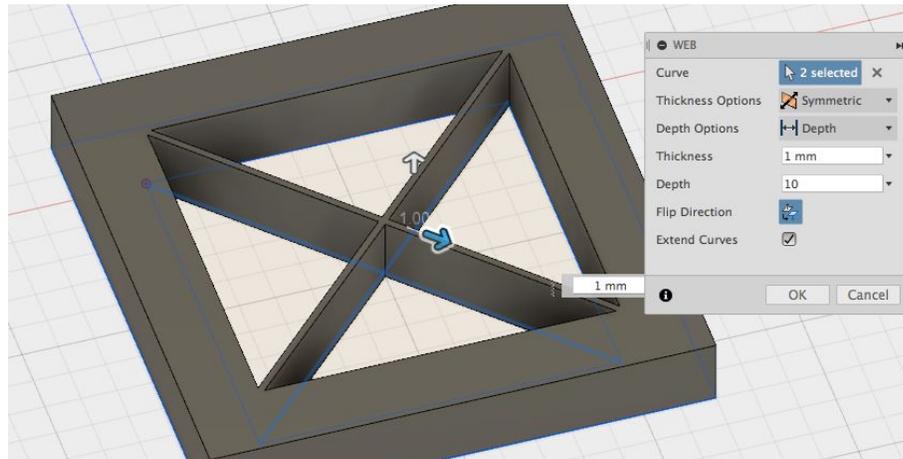
- a. Sketch -> Rectangle -> 2-Point Rectangle: Place one corner at the origin and the other 50x50 away (50x50)
- b. Sketch -> Rectangle -> 2-Point Rectangle: Place one corner 10x10 away from the origin, enclosing the previous rectangle (70x70)
- c. Right click each of the automatic constraints, and select 'Delete'



- d. Sketch -> Sketch Dimension: Define one edge of the smaller rectangle as 50; define one edge of the larger rectangle as 70
- e. Sketch Palette -> Constraints -> Perpendicular: Add four perpendicular constraints. This will allow us to fully define our support square

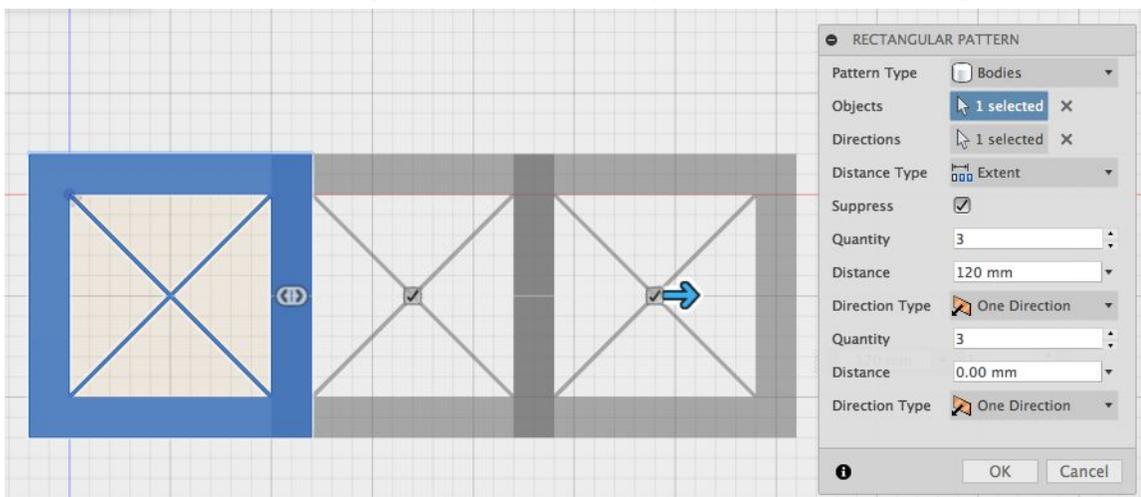


- f. Create -> Extrude: Extrude the border in the Z direction by 10
- g. Sketch -> Line: Draw two lines in an 'X' shape on the original rectangle sketch
- h. Create -> Web: Curve: Select the two lines from the previous step to turn them into supports
 - i. Note: If 'Depth' field does not appear, change 'Depth Options' to 'To Next', then change it back to 'Depth', and it should appear (F360 is buggy)

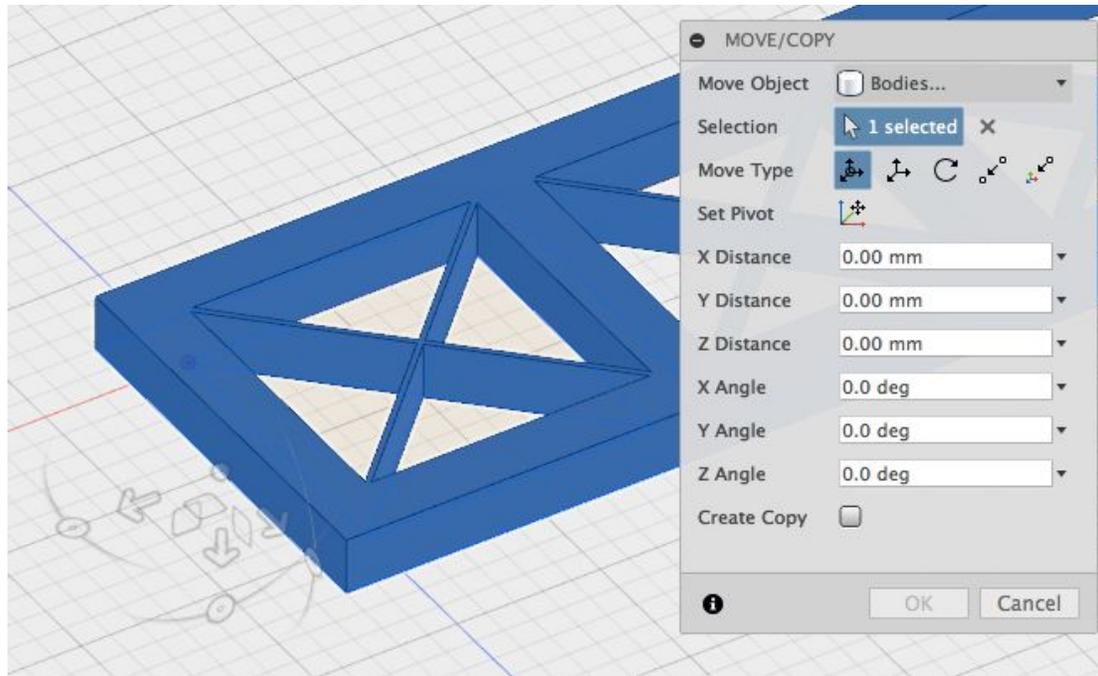


2. Build two support columns

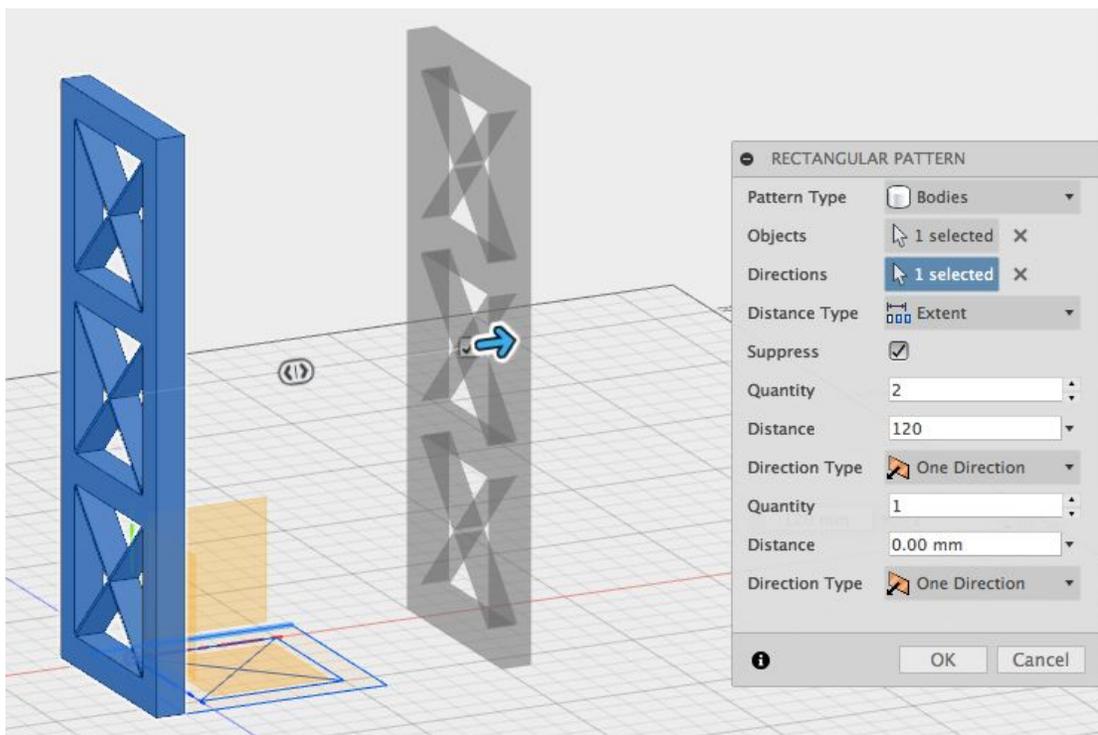
- a. Create -> Pattern -> Rectangular pattern: Repeat your support square to get a column



- b. Modify -> Combine: Combine the three bodies into one
- c. Right click your body -> Move/Copy: Rotate support column to stand up (y, 90), remember to select the bottom-most edge when selecting your pivot edge

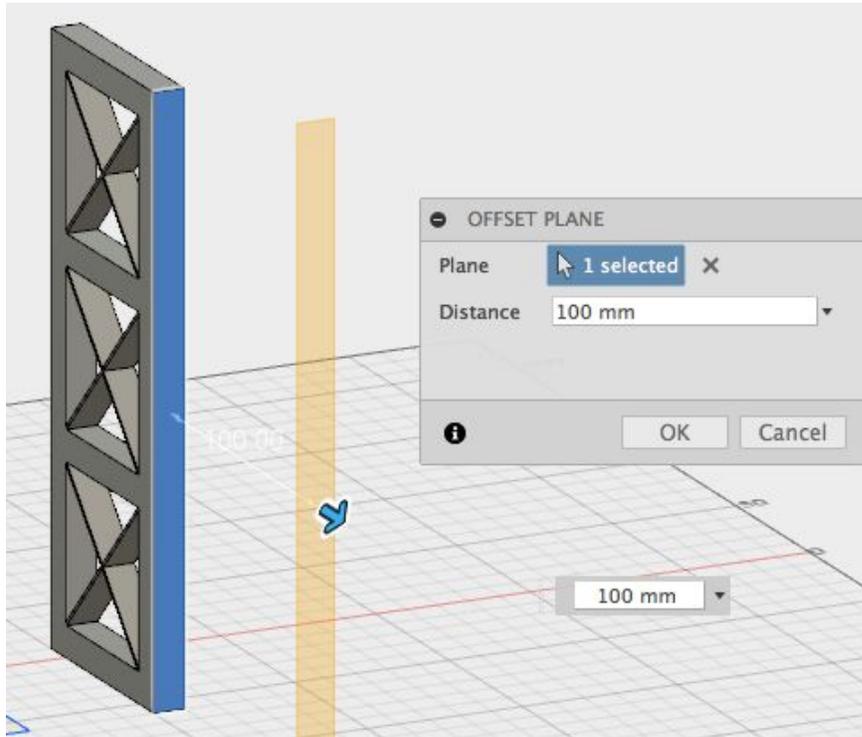


- d. Create -> Pattern -> Rectangular Pattern: Copy your column, so that you have two of them. For 'Direction', select the axis perpendicular to your column's face.

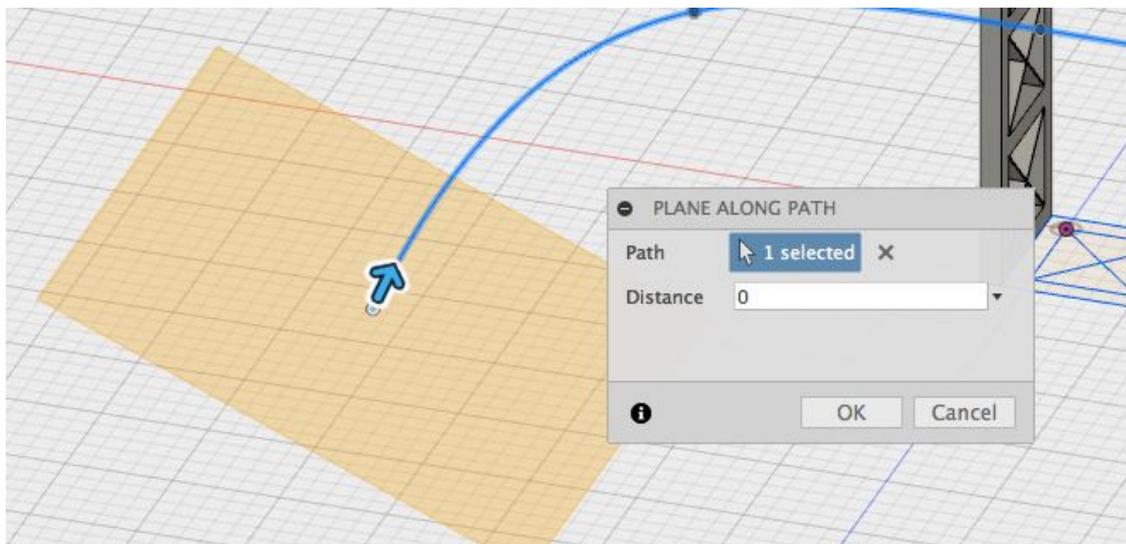


3. Build the bridge platform

- a. Construct -> Offset plane: Create an offset plane from the side of your support column at a distance of 100

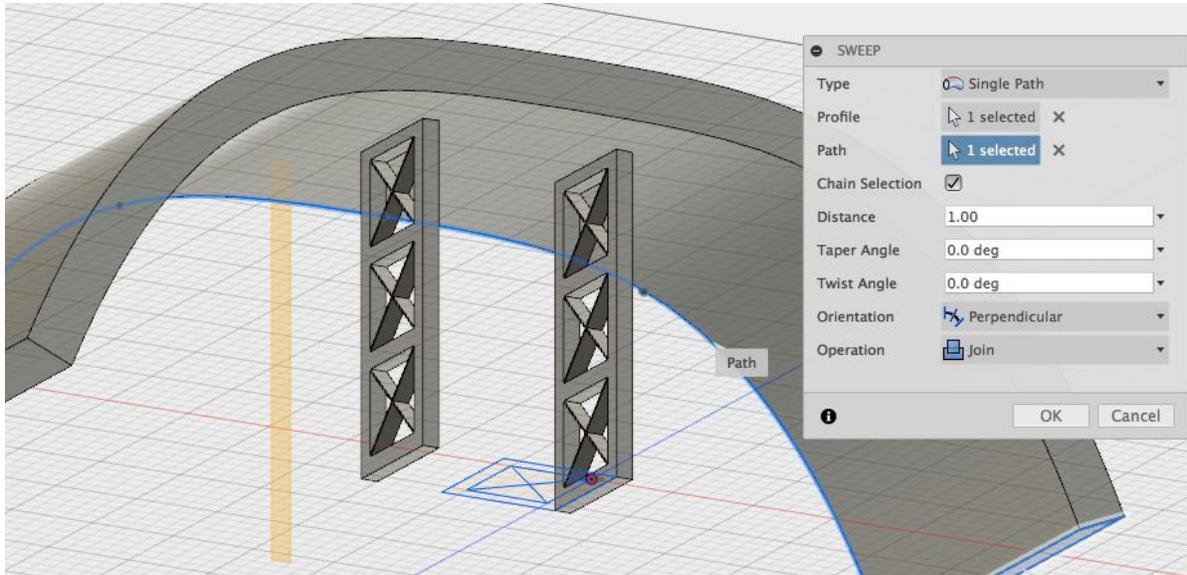


- b. Sketch -> Spline: Draw the bridge's profile-shape on the construction plane
- Place endpoints of your spline on the ground level
 - Be careful to have a smooth spline, otherwise you'll get errors ("Body would intersect itself") later!
- c. Construct -> Plane Along Path: Prepare a construction plane for you to sketch the profile of the bridge platform on
- Add a construction plane perpendicular to your spline. You can do this by clicking the starting point of your spline



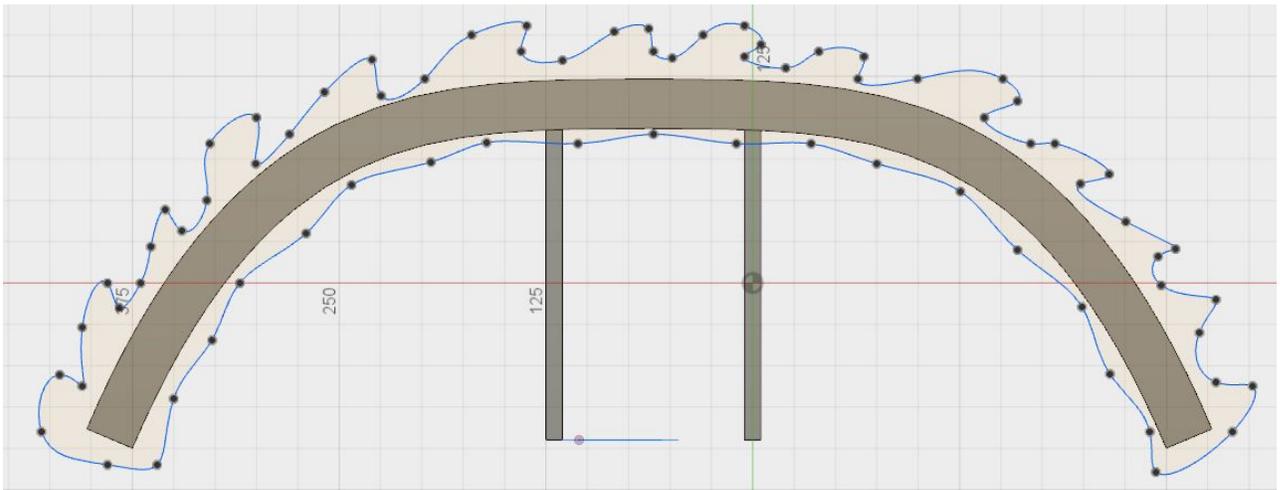
- d. Sketch -> 2-Point Rectangle: Draw a reasonable shape on the construction plane that is tangent to your spline. We will 'sweep' this shape across the entire spline!
- e. Create -> Sweep: Sweep your shape across your spline to create the platform
- For 'Path', select your spline

- ii. For 'Profile', select your reasonable shape
- iii. For 'Operation', select 'Join'



4. Add a cool railing to your bridge!

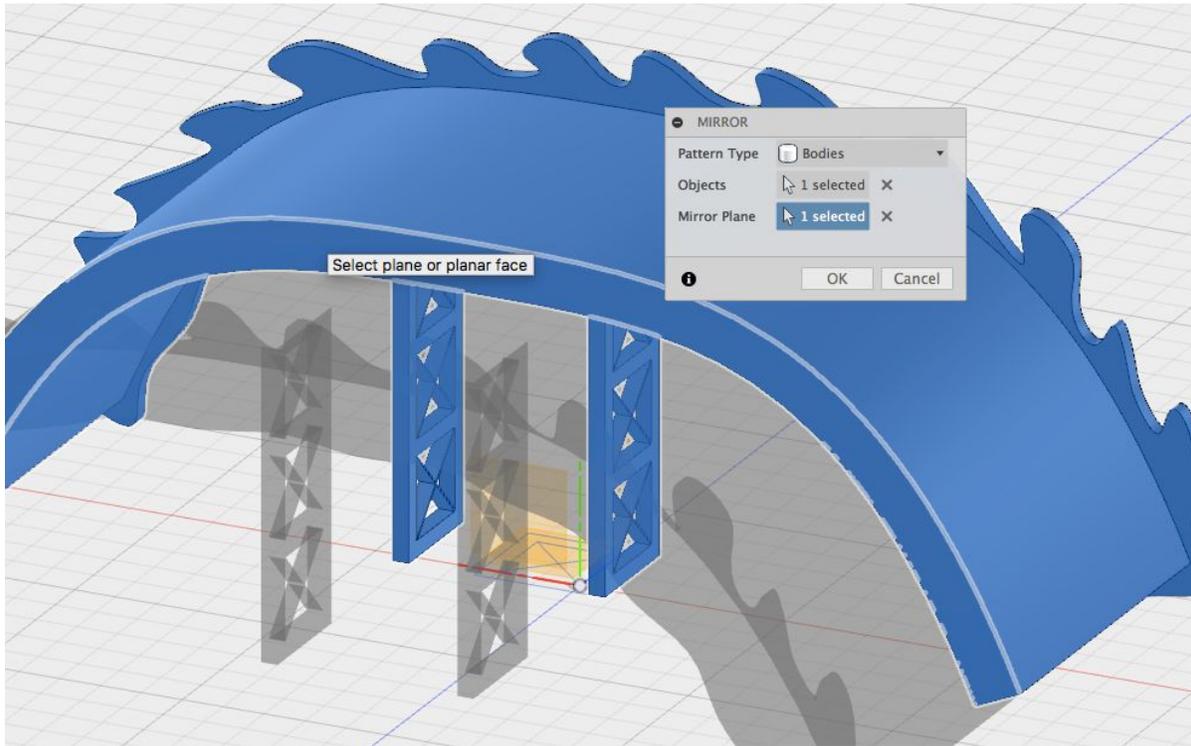
- a. Sketch -> Spline: Sketch a spline on the construction plane you just made. Be sure that the ends of your spline meet! (Mine is vaguely supposed to look like ocean waves)



- b. Create -> Extrude: Extrude your closed-spline shape into a 3D railing (10)

5. Add the second side of your bridge, using the mirror tool!

- a. Create -> Mirror: Mirror your bridge, so that you have two sides!
 - i. For 'Pattern Type', choose 'Body'
 - ii. For 'Objects', select your bridge
 - iii. For 'Mirror plane', select the side of bridge without the railing



6. Create the ground plane
 - a. Sketch -> Rectangle -> 2-Point Rectangle: Draw a rectangle all around your bridge
 - b. Create -> Extrude: Extrude that rectangle downwards
 - i. For 'Distance', enter -10
 - ii. For 'Operation', choose 'Join'

7. Finished! This tutorial has hopefully taught you the following skills:
 - a. Modelling efficiently using patterns and mirrors
 - b. Utilizing offset planes to place sketches in effective locations
 - c. Using sweeps to quickly create large curved platforms
 - d. Modelling irregular shapes using splines

8. Extra credit! (Not really)
 - a. Try modeling a roller coaster!
 - b. Use the Pattern tool to create square support columns
 - c. Use the sweep tool with different shapes and splines