

The Goal

The reason we wanted a C-Channel Binder is to make stronger, longer parts for our robots. While a 35 hole long C-Channel already exists, it has a big weak spot in the center, leaving it susceptible to bending. The C-Channel Binder can couple two smaller parts, making it stronger than the stock Vex C-Channel. I also wanted this as a cost-saver. Instead of paying extra money for getting a twenty-long C-Channel, you could get two ten-long C-Channels that you already have and couple them together.

The Process

To build the C-Channel Binder, I used Autodesk's Fusion 360, version 2.0.9142. This program significantly eased the development process. To build this part, I first imported two C-Channel models for reference. I then made a sketch and extruded it to make a cube. (Image 1)

I could have made the cube thinner, duplicated it three times, and moved them together. However, because of past experiences of the parts 3D Printing incorrectly, I decided to make the Binder longer and thicker, using the cut tool to cut it to the right length while still keeping it as one body. Unfortunately, we didn't have time to 3D print our part. With a lot of room to work with. I cut the part down (Image 2) and used the shell tool (Image 3) to take out the material, so the C-Channels would have a gap to sit in.

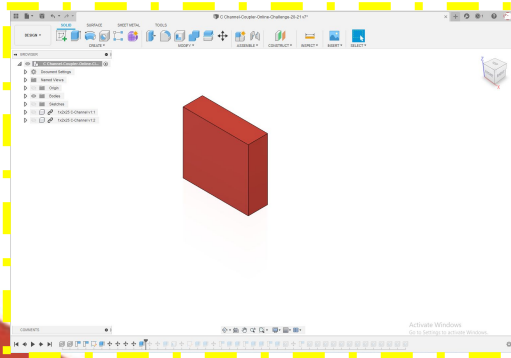


Figure 1

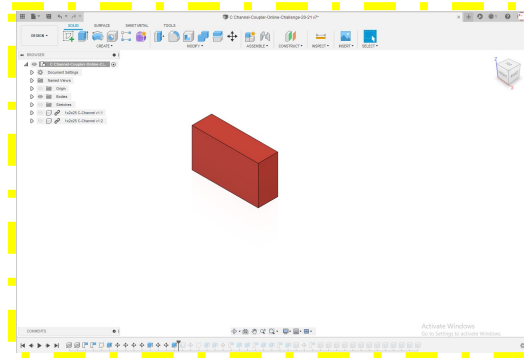


Figure 2

The Process (Continued)

However, there still was material on the sides, which we don't want. So I drew a sketch, and used the extrude tool in cut mode to cut out one side, moved the sketch to the other side, and used the extrude tool in cut mode once again. Now we had our basic shape. However, this was a little too short, so I extruded the top, used the cut tool on the inner roof face of the part, making it the perfect size.

Now we needed the holes for the C-Channel to attach to the Binder. I then used the hole tool to make holes that would fit the C-Channel hole size and spacing. (Image 4) And with that, the part is done!

Conclusion

While working on this project, I learned a lot about how Fusion 360 works, and how I can use it and its tools to improve my workflow. I can use these tools and tricks to help not only with this project but also with future ones, like CADing our Robot. I also learned how to use real-life measurements to form a part around measurements. To summarize, I learned about Fusion 360 and its tools, along with strategies to improve my workflow. I used some of these strategies and tools to finish my C-Channel Binder.

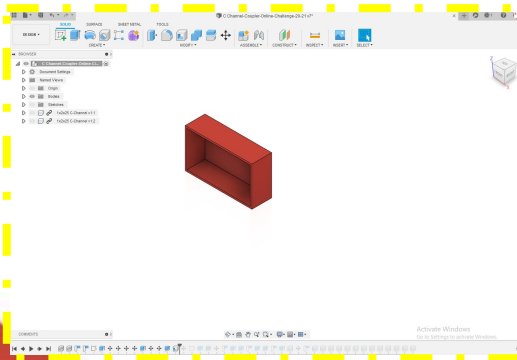


Figure 3

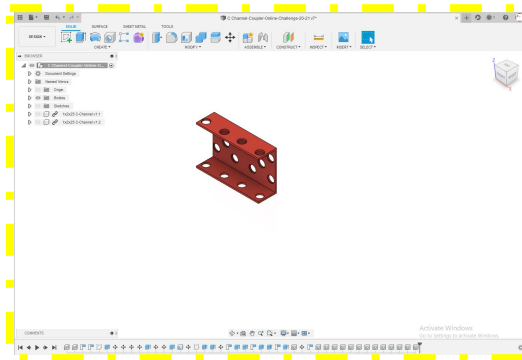


Figure 4
(Final
Product)