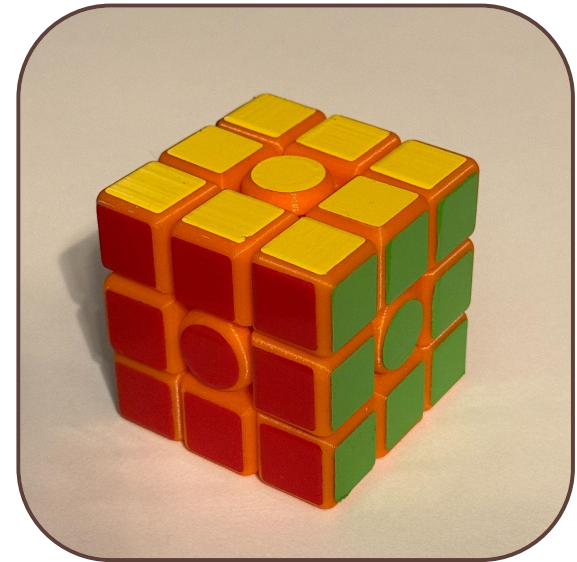# Rubik's Cube Engineering Portfolio
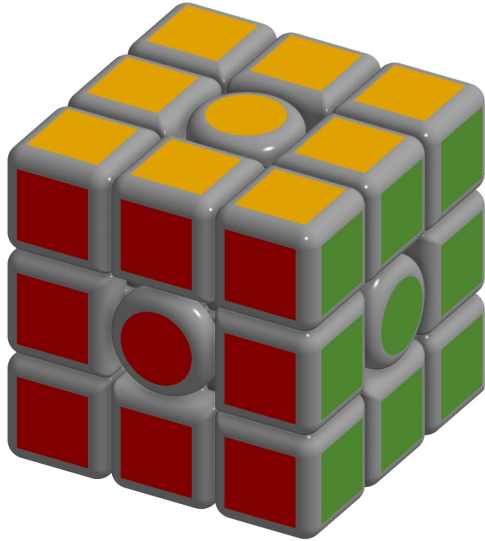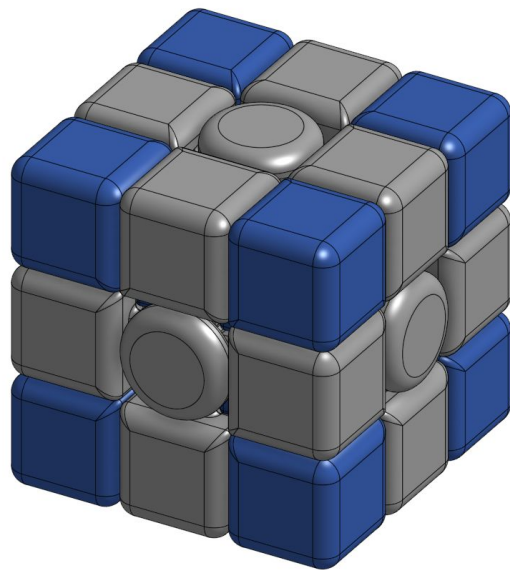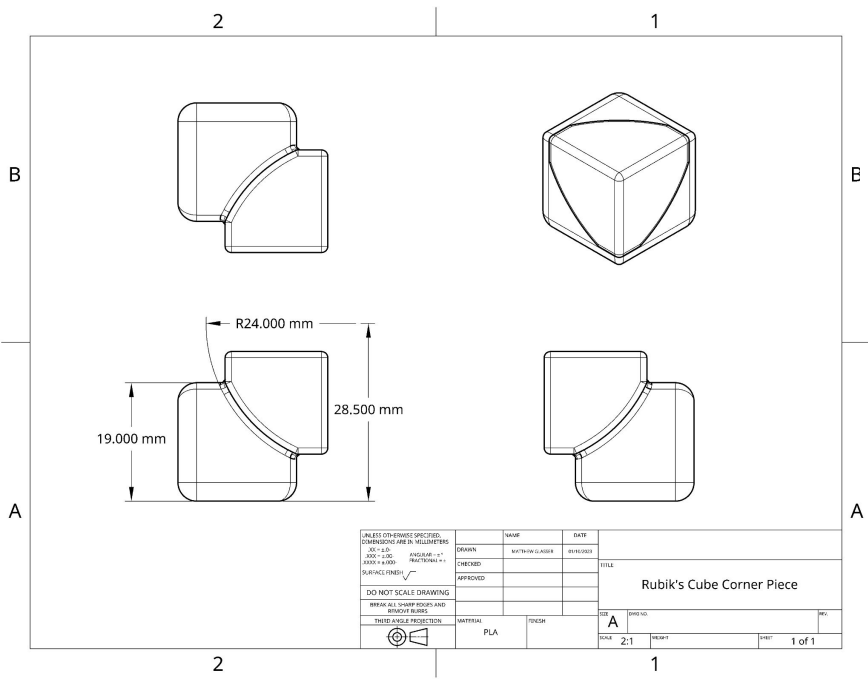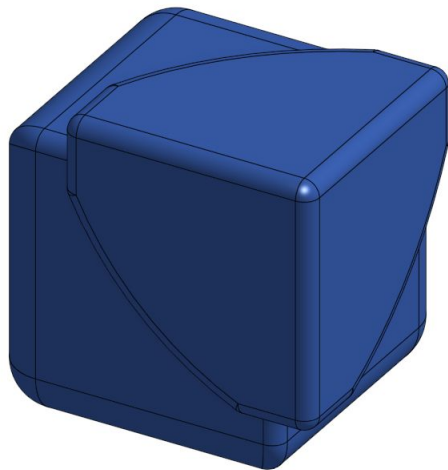
Matthew Glasser

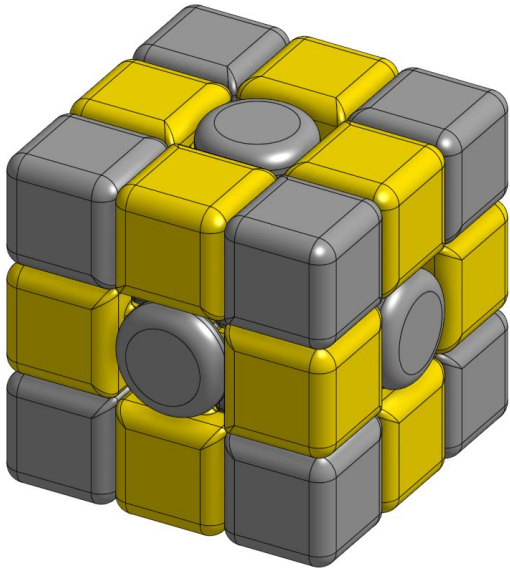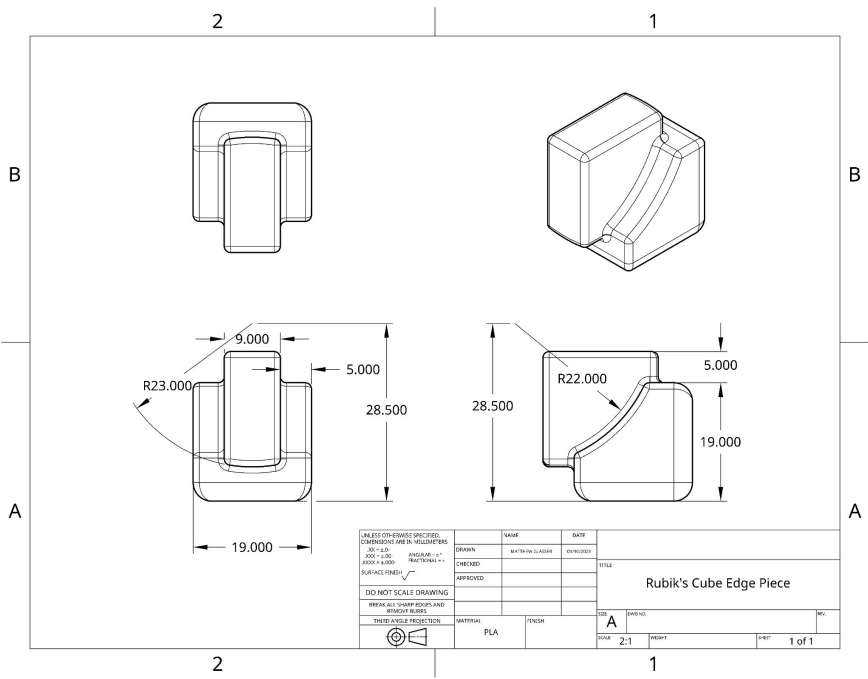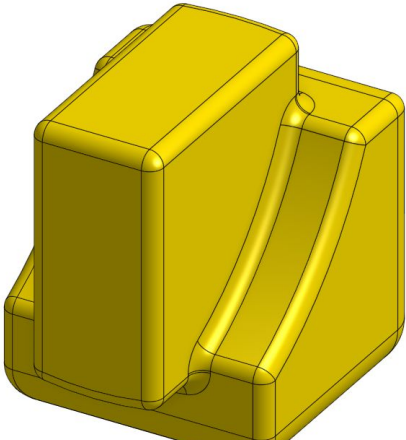# Building a Custom 3D Printed Rubik's Cube

My first engineering project was designing and making a functional 3D Printed Rubik's Cube. This portfolio shows the pieces I designed and my iterations for the core mechanism.

Corner Piece

R24.000 mm

28.500 mm

19.000 mm

	NAME	DATE
DRAWN	MATTHEW GLASSER	03/10/2023
CHECKED		
APPROVED		

TITLE

Rubik's Cube Corner Piece

SIZE **A**   DWG NO.   REV.

SCALE **2:1**   WEIGHT   SHEET **1 of 1**

MATERIAL **PLA**   FINISH

Edge Piece

Rubik's Cube Edge Piece

Dimensions:
- 9.000
- 5.000
- 28.500
- R23.000
- 19.000
- R22.000
- 5.000
- 19.000
- 28.500

Center and Core

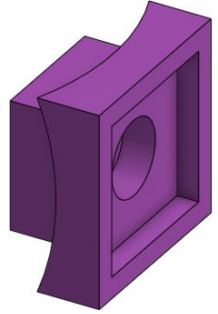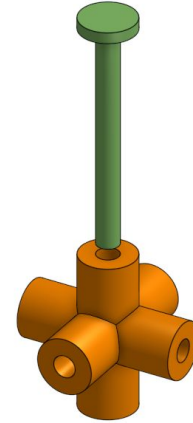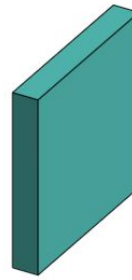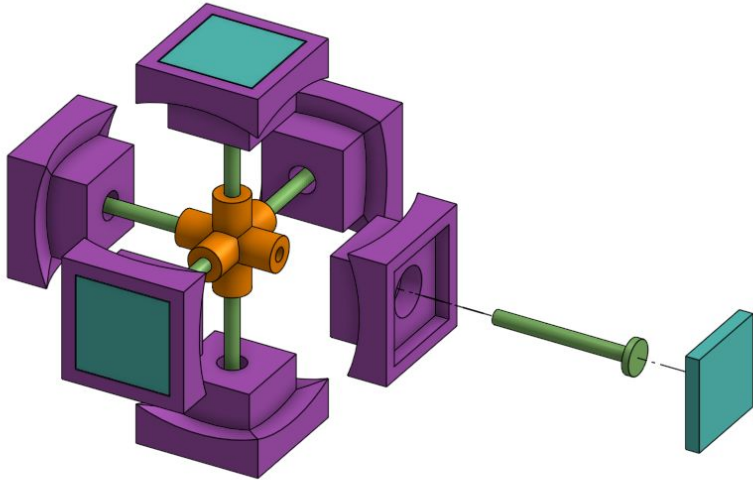Dimensions shown: 57.000, 5.000, Ø8.000, Ø19.000

Core Version 1

My first design consisted of 6 center pieces connected to a core with round pins, allowing them to spin. The pins were covered with a cap to stop them from falling out.
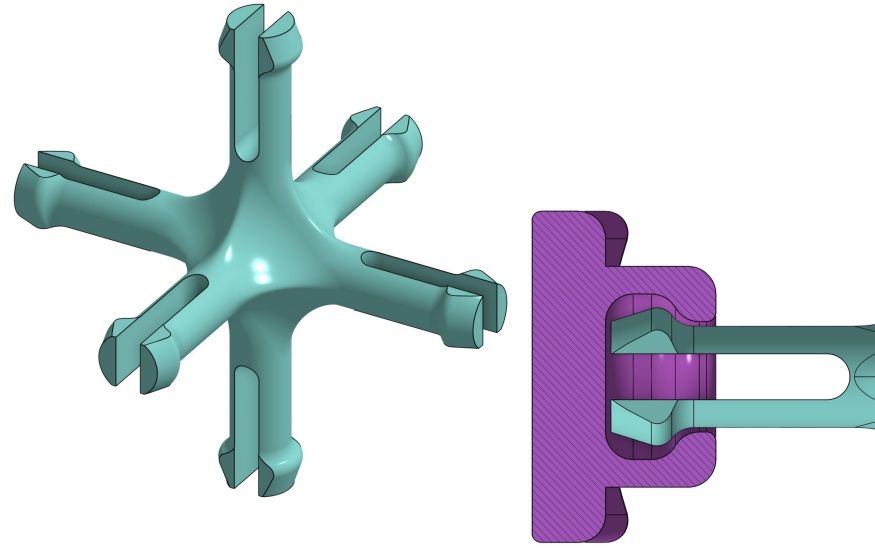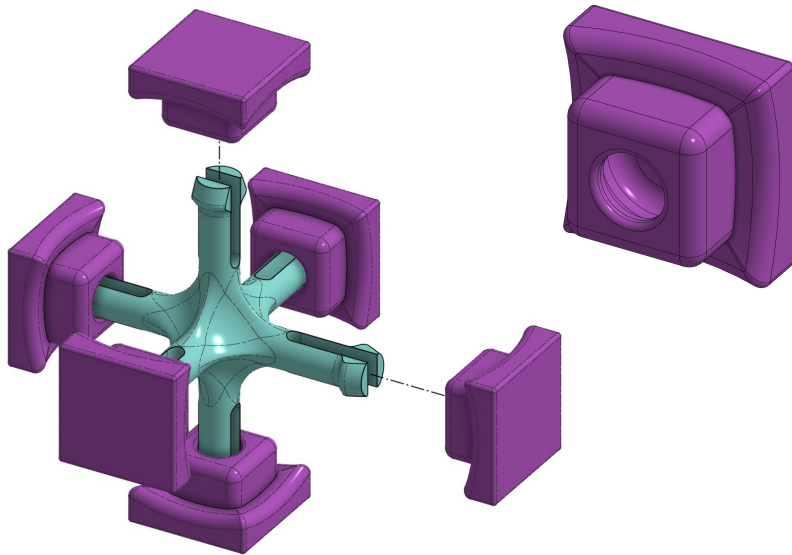

Pros:
- Mostly worked

Cons:
- Required many parts and a lot of assembly
- Didn't turn smoothly

Core Version 2

To reduce assembly and improve the turning, I made pins that click into place for the next version.
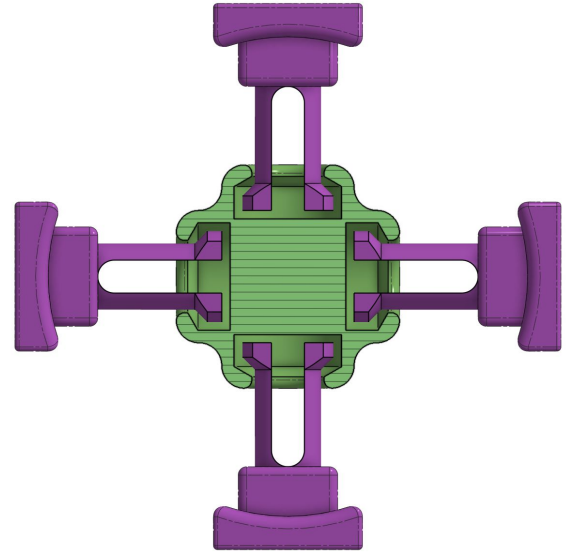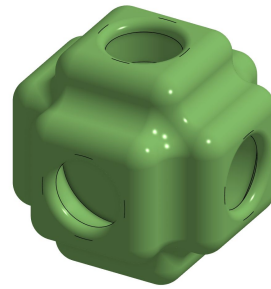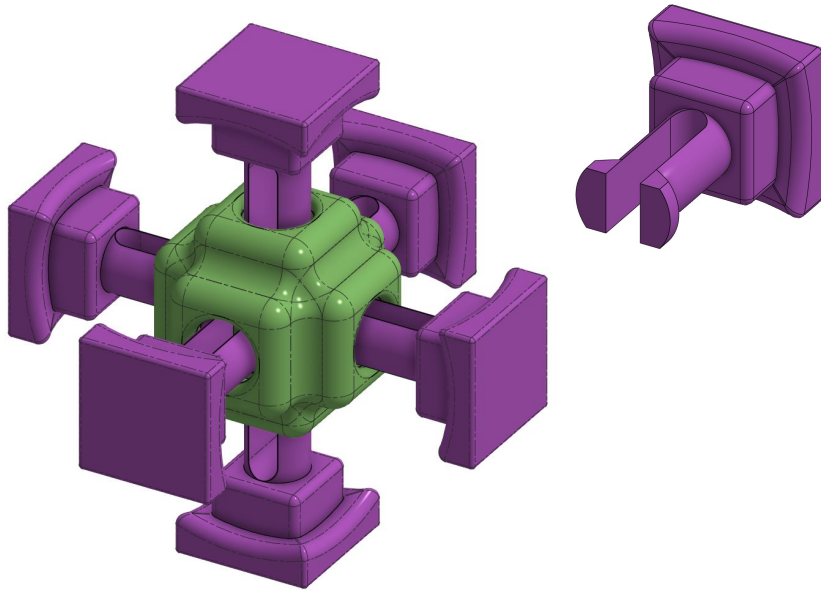

Pros: ●   Easier assembly

Cons: ●   Pins were hard to press in
                   ●   Difficult to print, especially with side pins

Core Version 3

To improve the quality and function of the pins, I mounted them on the center pieces instead of the core.
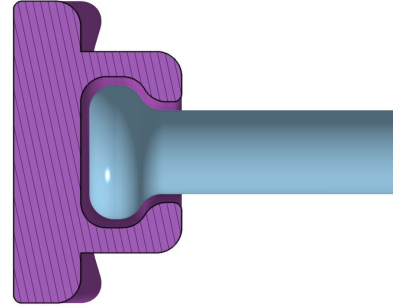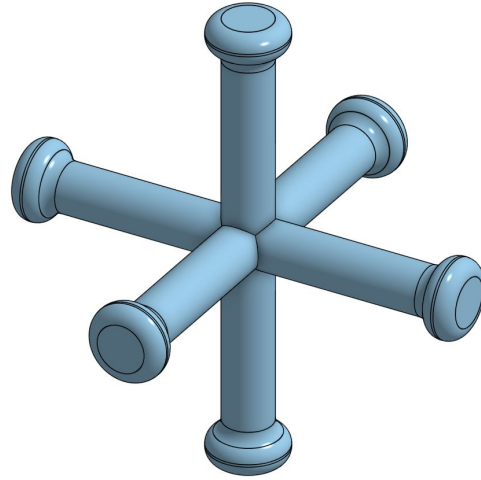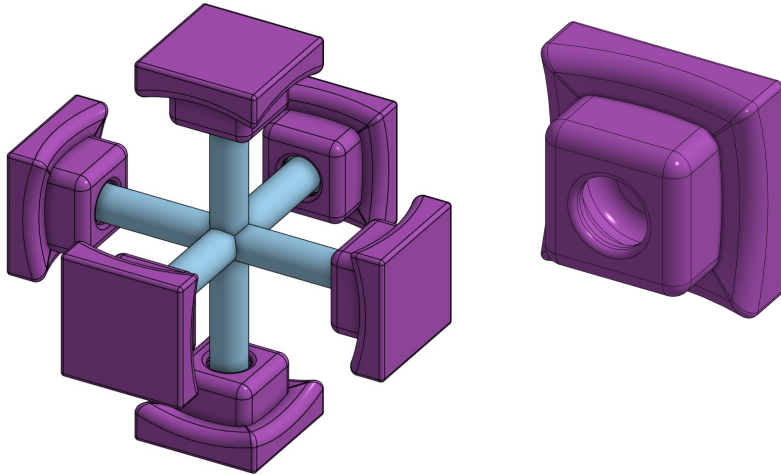
Pros:
- Able to print pins vertically
- Pins worked better

Cons:
- Sometimes the pins were loose, wouldn't go in, or snapped

Core Version 4

To reduce assembly and allow for smoother spinning, I tried attaching the centers in CAD and printing it in place.
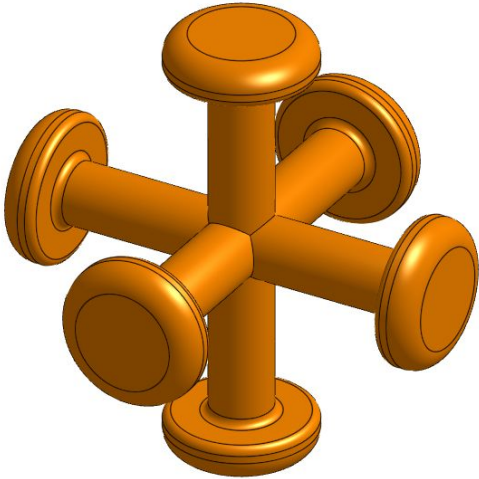
Pros: • Required no assembly

Cons: • Very difficult to print without the parts sticking together, not moving, or being too loose

Core Version 5

For the final design, I made the core one piece with round centers, allowing the other pieces to spin around them. This design requires no assembly and gave the smoothest rotation out of all of the iterations.
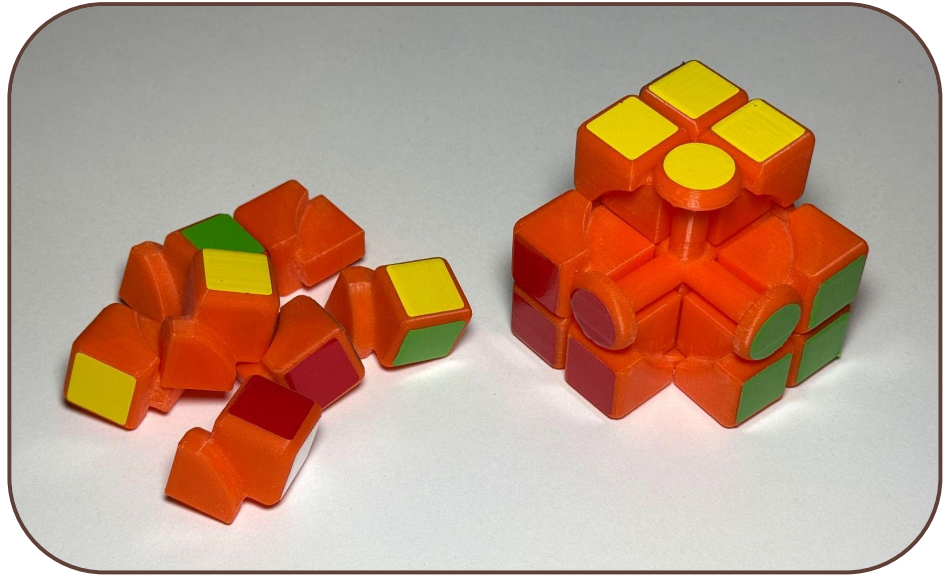
Pros:
- Requires no assembly
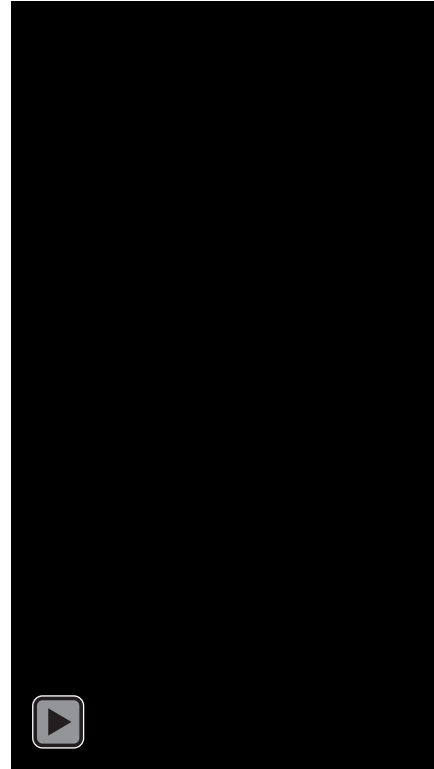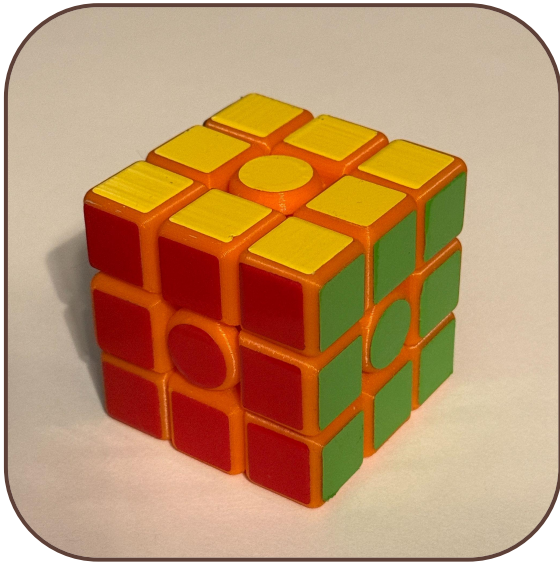- All pieces rotate smoothly

Cons:
- Centers stand out as circles

The Final Project

I finished by 3D printing the pieces, adding vinyl stickers for the colors, and assembling the cube.

Video Demonstration

If the video doesn't play, you can find it at matthewglasser.org/rubiks