



This object shows the five platonic solids. We have chosen to nest them like a Russian nesting doll. We specifically directed this object at getting children excited about the Platonic solids, and the fact that there are only five of them. In addition, the method of nesting one in another is based on a pairing (or *duality*) between them, which gives rise to a natural way to embed one in another.

The five Platonic solids are classical, and I probably learned of them in high school, but I did not know the fact that they come in pairs with a natural nesting of one into the other until graduate school, and I did not decide to illustrate them until now. This type of thing is ideally suited for 3D printing, in that it involves multiple interlocking 3D objects.

This project is joint work with Jack Love at George Mason University. On our first attempt, we did not put any padding between the outside and inside of the shapes, and they each fell into pieces upon printing. On our second attempt, we did not leave any extra space between the objects, and we could not close each piece to fit around the inside piece. (This 3D printing issue would not be an issue for a laser-cut object.) On our third attempt, we realized that there was no way to hold it up, and made a customized stand to hold it.



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3D-printed plastic

For a video of the nesting in action:

<https://gmumathmaker.blogspot.com/2019/11/nested-platonic-solids.html>