

# The Jack in the Box

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## Abstract

In the process of making my modified Jack in the Box will be designed in Fusion 360 and 3D printed. SHU will be on the inside box which will pop out, so that it can teach students school pride, since it is being advertised to children. There are also going to have 5 LED lights that will be connected to a (not attached to the box itself) bread board. A mechanical movement will also be incorporated in so that the SHU can act like the "Jack in the Box".

## Introduction

The of making my modified Jack in the Box will be designed in Fusion 360 and 3D printed. Internally there will be a box that will act as the mechanical aspect of my project which will have a SHU on it so that it can teach students school pride, since it is being advertised to children. The external box will be used when it is on its side, and have the lid of it to open like a door. I designed a hinge so that the the box can print out all in one piece. The design consists of a box with a circular cut out on the bottom. The cutout will have a cylindrical piece to fix into it, so that when inserted the box in the center will pop out. There are also going to have 5 LED lights that will be connected to a (not attached to the box itself) bread board. The lights will be place on the topside of the box and will be triggered by that room lighting to blink in an orderly sequence.

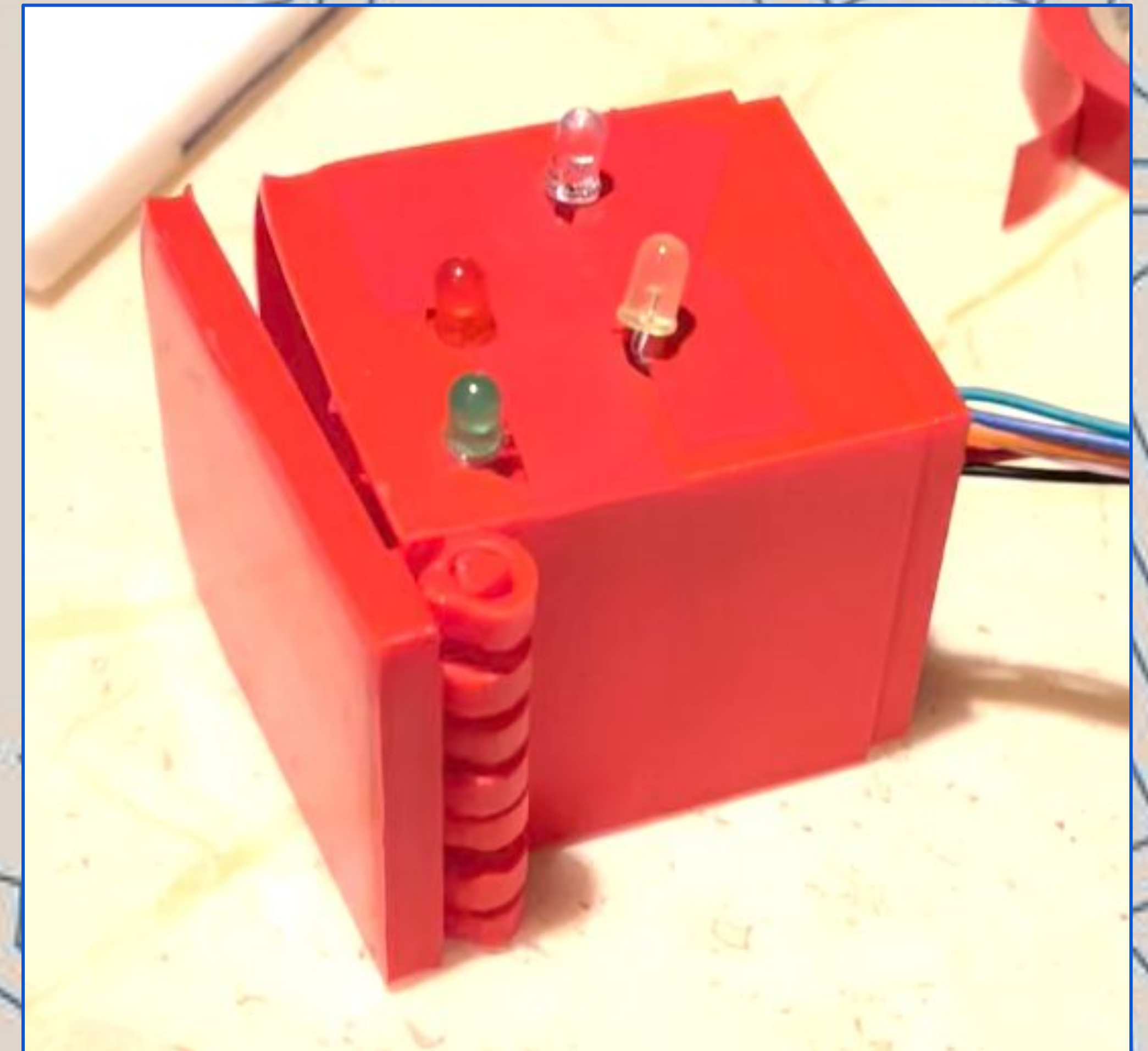
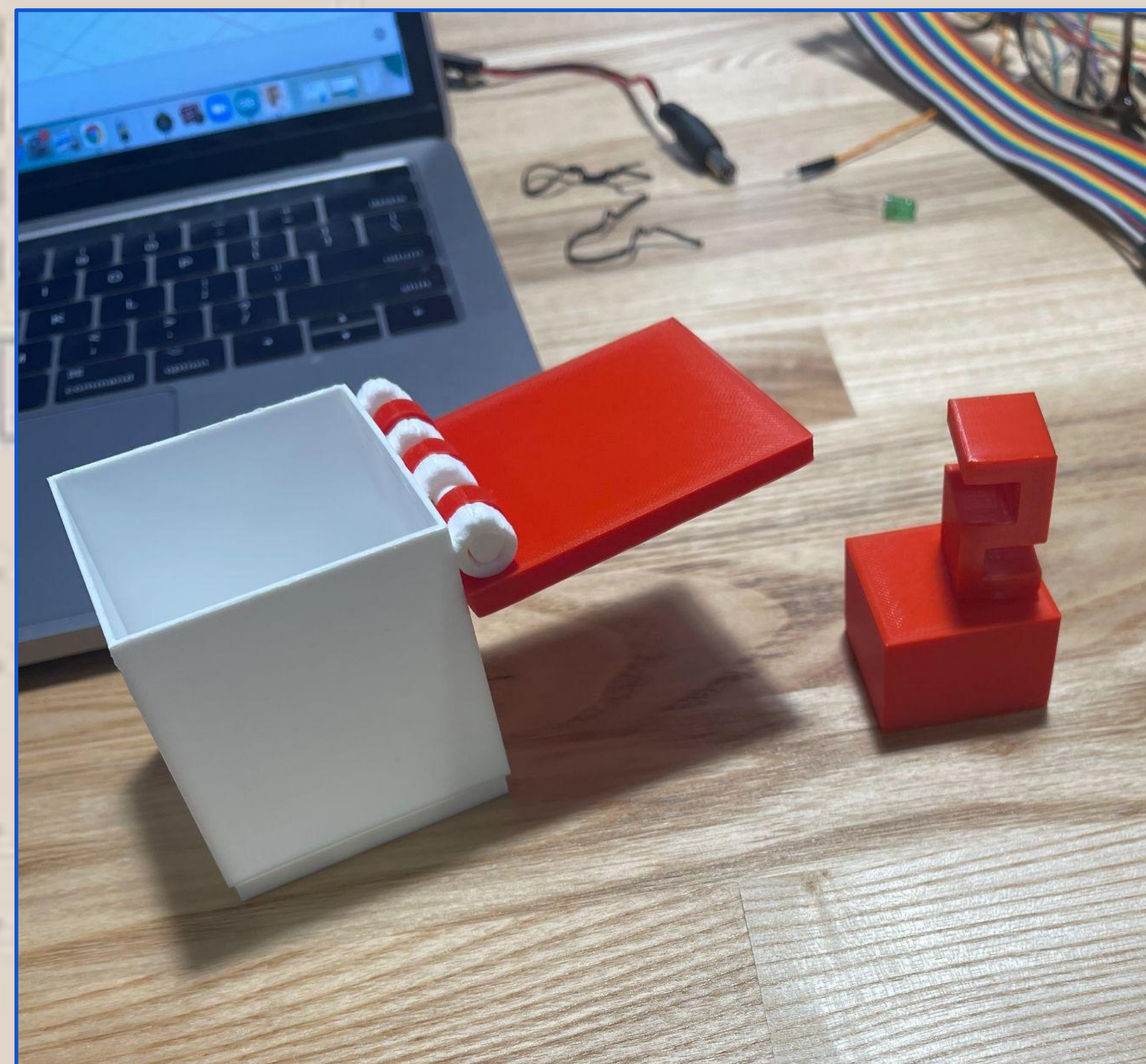
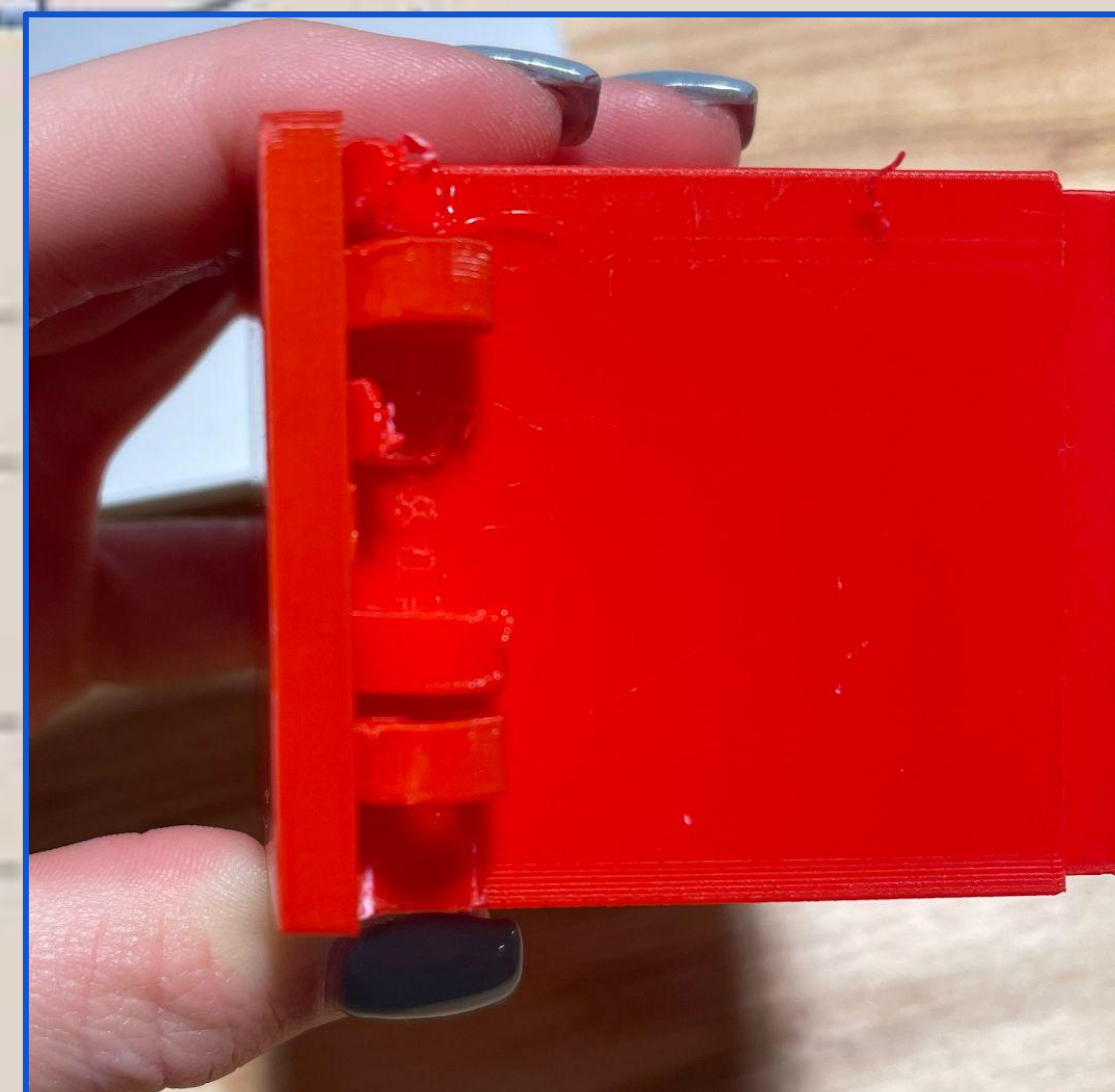
## Methods and Materials

The materials used for my 3D printed Jack in the box was PLA plastic filament that was extracted through the 3D printer itself. To make that actual design of the project I used a software which is Fusion 360 to actually sketch and construct the blueprint of the actual object. Once I was done with the Fusion 360 design which took a handful of weeks to perfect the vision I was looking for. The materials used for my 3D printed Jack in the box was PLA plastic filament that was extracted through the 3D printer itself. Once the base of the main portion was done being printed I used electrical tape in a coordinating color so that it would blend into the body of the box to attach the LED lights. As for the lights they are just basic LED lights that are connected to an arduino board and triggered by normal room lighting to commence the random light pattern. To conclude, that is all the methods and materials behind my Jack on the Box

## Results

Overall my Jack in the Box design turned out well and the mechanical mechanism works well and performs the function I intended it to. The LED light also work well and are set up according to my vision.

## Working Process



Final Product

## Conclusions

To conclude the journey in making my Jack in the Box I did hit some major setbacks in the printing of my hinge that joins the lid and body of the box together. At first the circles that were attached so that a dowel could be inserted where printed too thin. Then they printed too small, and following that it then printed detached from the box. On the last print I finally perfected the moving hinge as you can see in the pictures. Another problem I encountered was with the insert that spells out SHU. I at first could not get the letters all attached together, but then the next print I combined them into one object. After those few modifications the base and lid of my project had printed as planned originally.

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