

# 3D Printed Shape Recognition Game

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Engineering Explorations

## Abstract

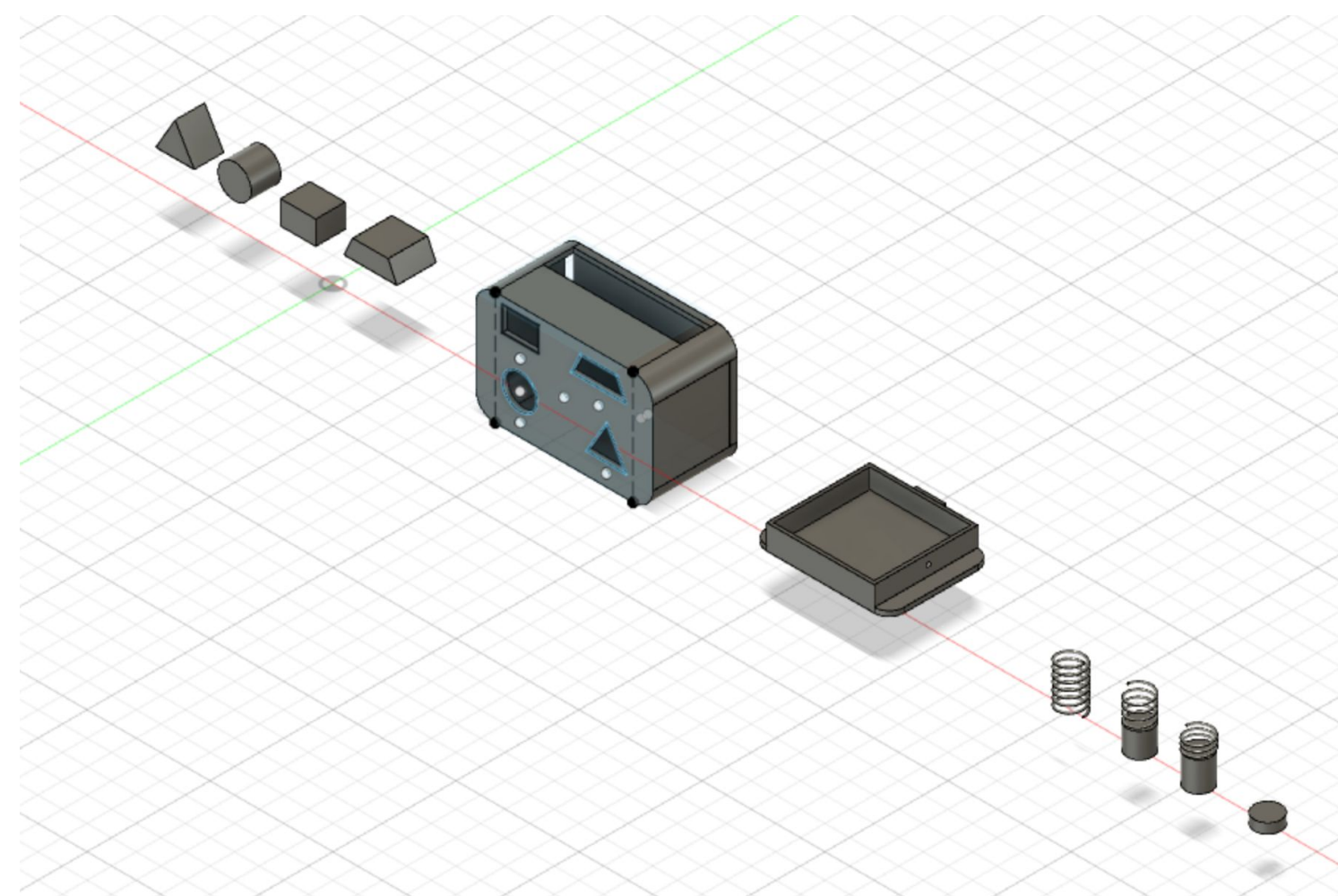
This is a project to help children learn their shapes and work on their memory. Based on the classic toy used by children, this is made with LED lights and mechanical movement to enhance the toy. Once the child inserts the drawer into the box, the LEDs will start to blink colors for the child to remember and to catch their eye so they are motivated to continue to practice. Additionally, this toy features a drawer to provide easy access to the blocks once each is inserted into the hole. This is also a great method to avoid messes.

## Introduction

This project is designed to be a learning tool for young children. This is a great way for children to learn their shapes and work on their memory by following the LED light sequence in order to complete the activity.

## Methods and Materials

This was designed in the Fusion 360 software in order to 3D print it using 3D filament. There were six total prints, each used to improve off the last in order to get the best results. The electronics utilize LED lights, a photoresistor, a breadboard, and an arduino to program the lights, the rest of the project was made out of filament.



## Results

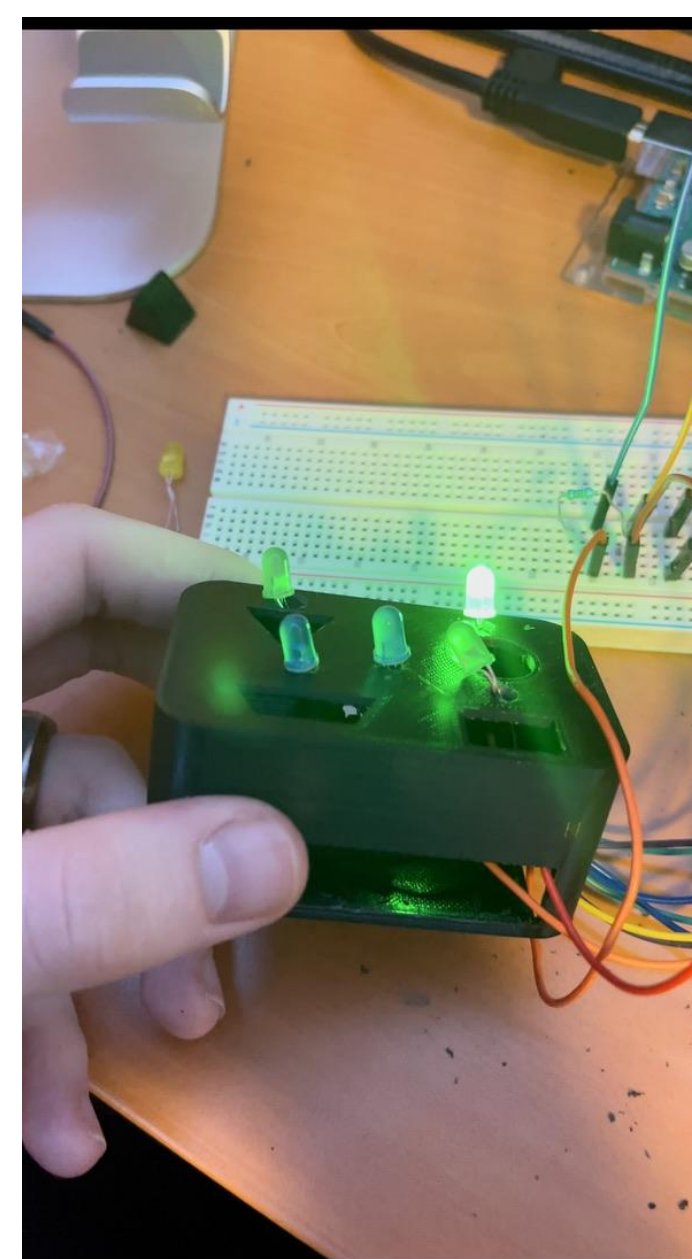
There was a lot of trial and error in the design. The early prints showed issues with the early version of the drawer, most of the time there was issues with the drawer fitting in the slot due to poor calculations or not enough room being provided.

Another common error was the shapes had trouble fitting in their respective holes, this was also due to poor calculation and not enough room. This issue also depended on the print, some came out inconsistent, resulting in the shapes having trouble fitting.

There was also some issues with the shapes when they fell into the drawer. The shapes were too tall when in the drawer to be able to pull out. The shapes were then made smaller and the opening was made taller.

I wanted the drawer to be operated by a spring which would let the drawer sit as is but when pushed inward, it would give it back out. Unfortunately, the spring really did not workout how I wanted it to.

The final result is still a rough prototype with issues with the shapes fitting in the drawer and issues with assembly with the electronics. But this is a much more realized look than what was established before.



## Conclusions

in conclusion, this is by no means a perfect product and still needs some time perfecting and managing. However, this idea has potential to be a fun yet effective educational tool for young children to learn their shapes and work on memory.