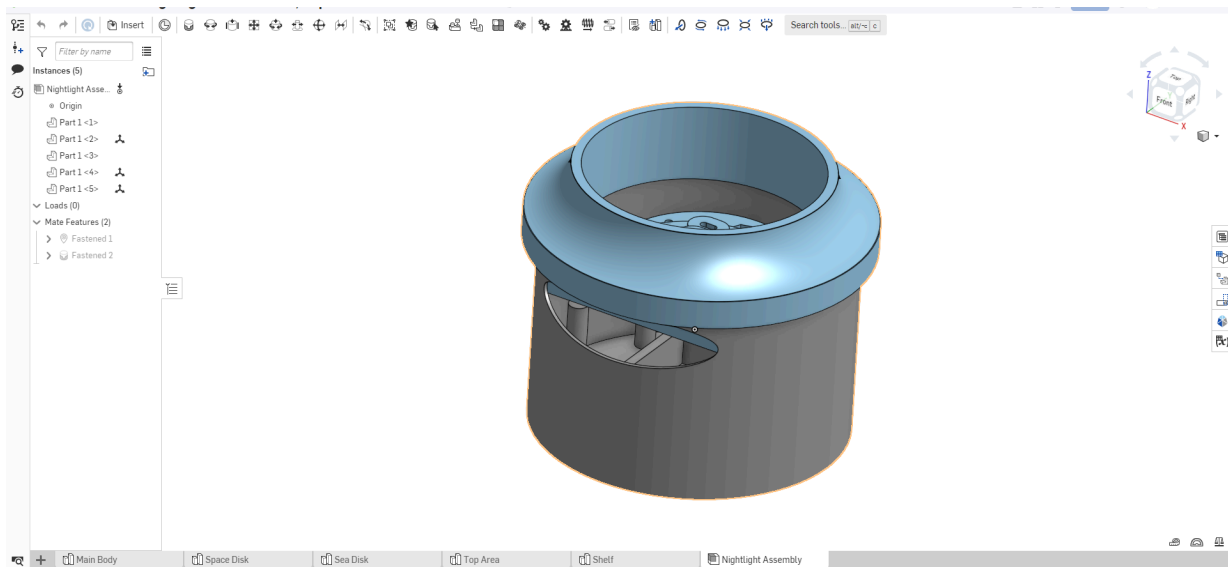


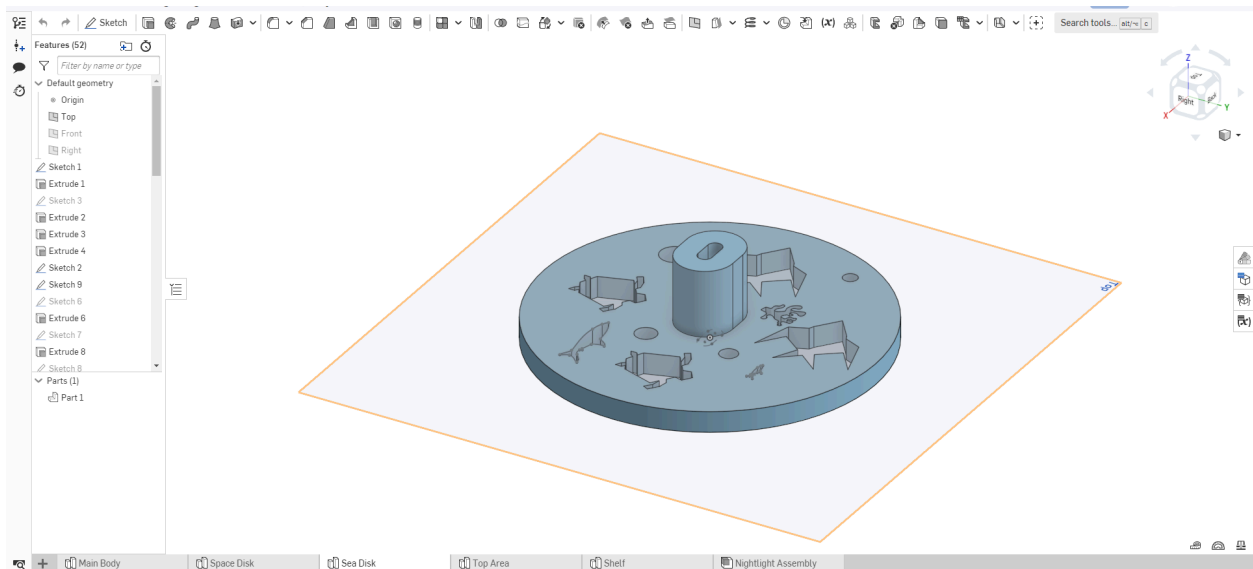
pqba

Created under the Engineering Summer Program at UW Madison summer of 2023. It was a fantastic experience where I learned about design, circuitry, and 3D-printing, all in the space of around a month. The design was a projector that spun a motor to display moving images. The disks that projected the etched images were spun by a motor, powered by a 9V battery, and the software was developed in Arduino (C++ based) to time the rotations. Additionally, Ultimaker was used to fabricate each part, and the design was drafted in OnShape, an online CAD tool. This document briefly notes stages of the project and gives insight into its creation.

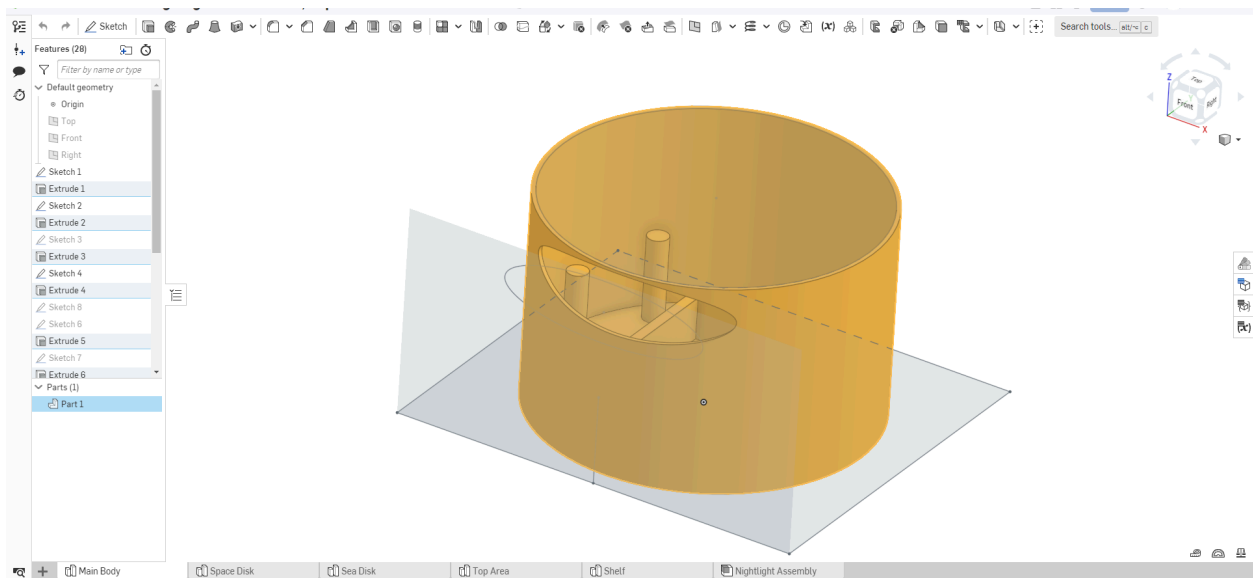
## Design Mockups:



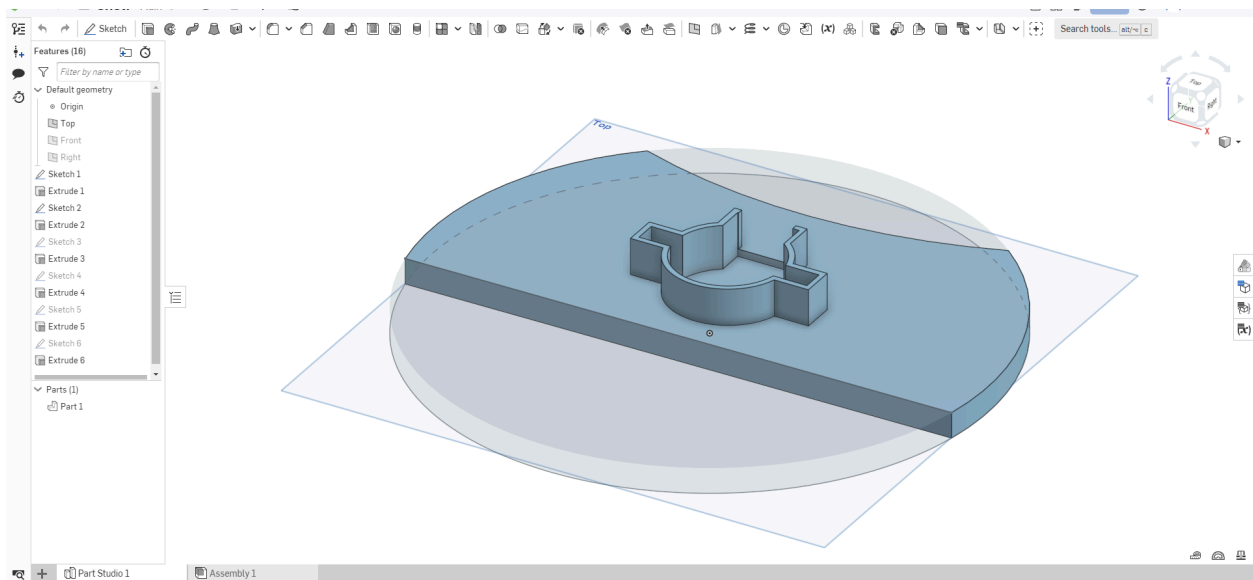
## Spinning Disk schematic in closer detail



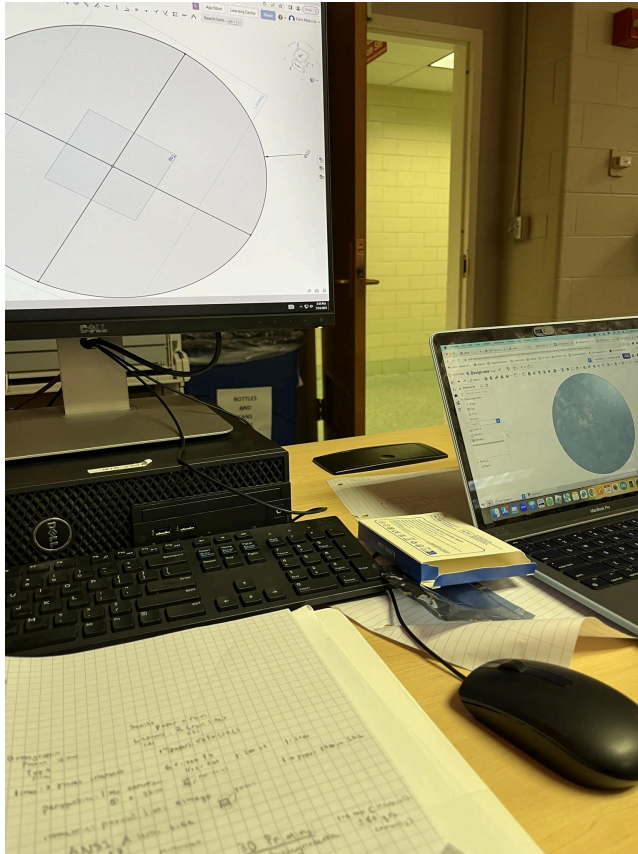
## The main body of projector



## The shelf for holding Motor and opening for circuitry.



The designs early stages in our group, using Desktops, laptops, and sketchbooks, and electronic tests



Some of our sample early code and schematics to test motor and system

```
#include <Stepper.h>

int stepsPerRevolution = 200;
int stepperSpeed = 1;
int stepDelta = 1;

int timeDelay = 100;
int ledIndx = 2;

Stepper myStepper(stepsPerRevolution, 8, 9, 10, 11);

void setup() {
  myStepper.setSpeed(stepperSpeed);

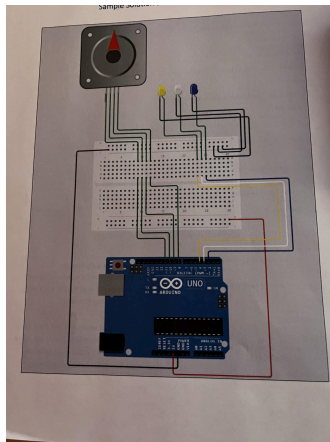
  for (int i = 2; i <= 4; i++) {
    pinMode(i, OUTPUT);
  }

  Serial.begin(9600);
}

void lightToggle() {
  if (ledIndx < 4) {
    ledIndx = ledIndx + 1;
  } else {
    ledIndx = 2;
    Serial.println("Color Switch at: " + String(millis()));

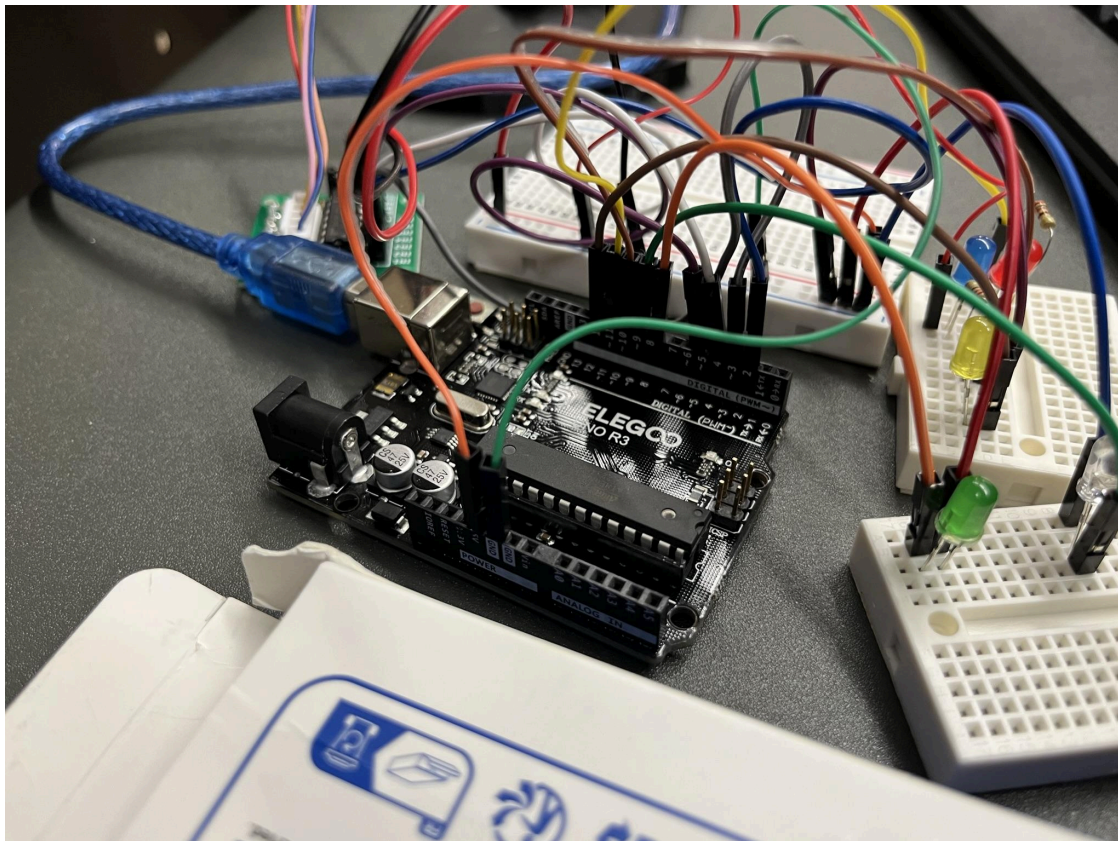
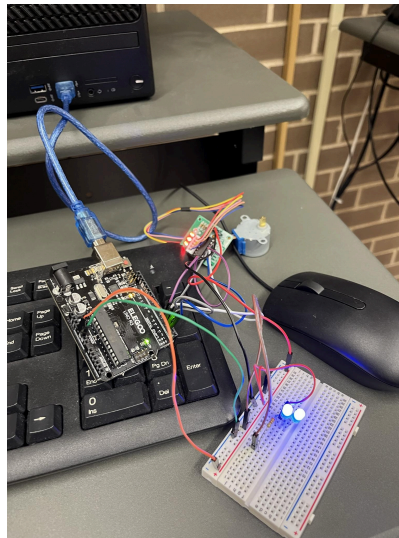
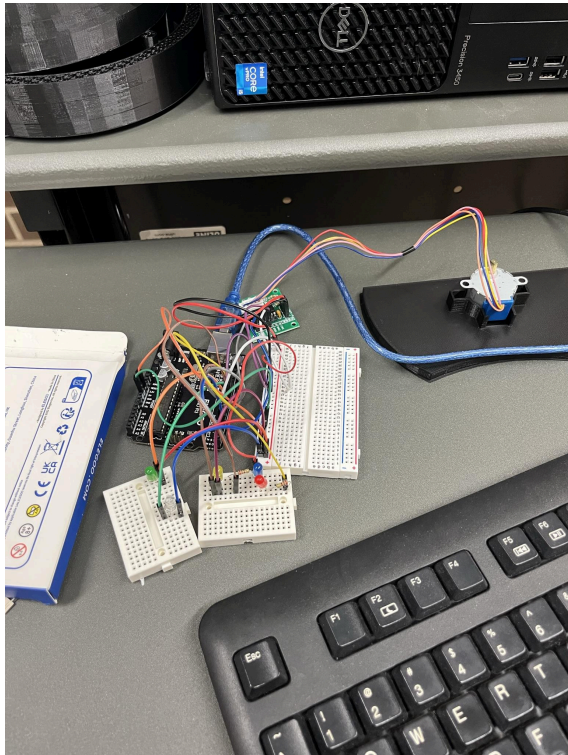
    for (int i = 2; i <= 4; i++) {
      digitalWrite(i, LOW);
    }
    digitalWrite(ledIndx, HIGH);
  }
}

void loop() {
  lightToggle();
  myStepper.step(stepDelta);
  delay(timeDelay);
}
```





The actual development phase. Testing of circuits, refining Arduino code, and motor speed, fab parts





Our final design right before the showcase!!! It turned out better than I could've imagined.

