

Item	Sketch identification	W [mm]	L [mm]	H [mm]	Diameter [mm]
ABS enclosure	01	117.4	117.4	60.0	N/A
Arduino Board	02	57.6	80.8	16.2	N/A
Switch	03	15.1	20.9	24.9	N/A
LCD 2X16	04	36.3	80.1	20.3	N/A
Buzzer	05	N/A	N/A	10.8	22.0
Temperature sensor	06	N/A	N/A	18.4	4.4
LED	07	N/A	N/A	27.8	5.1

Figure 1: Table of Relevant Dimensions

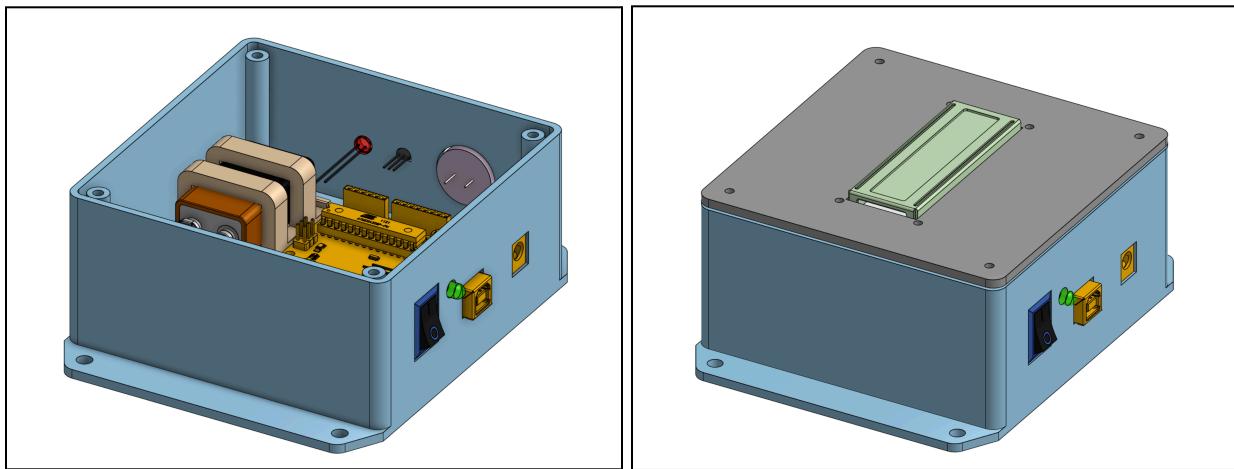


Figure 2: CAD Drawings

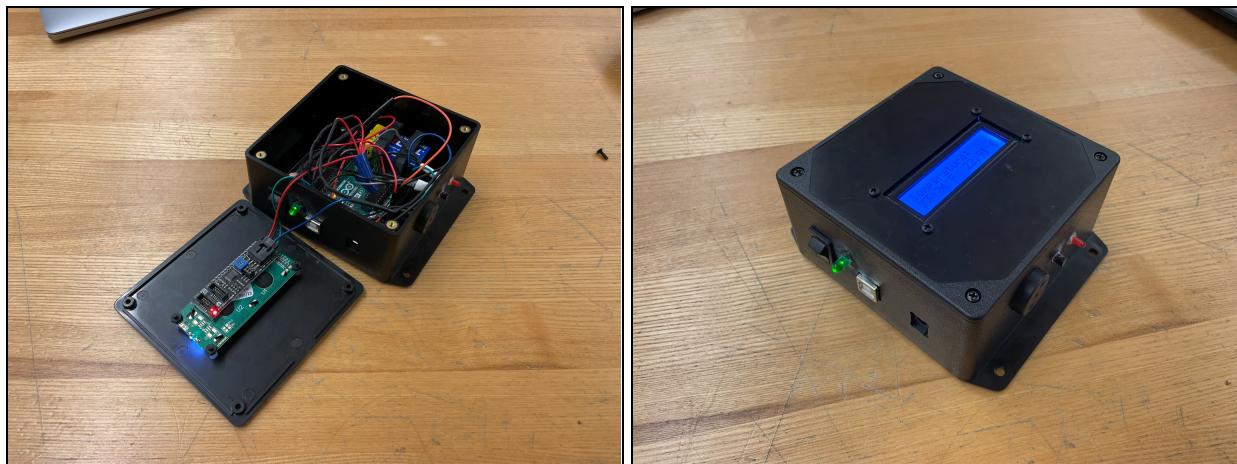


Figure 3: Pictures of Final Product

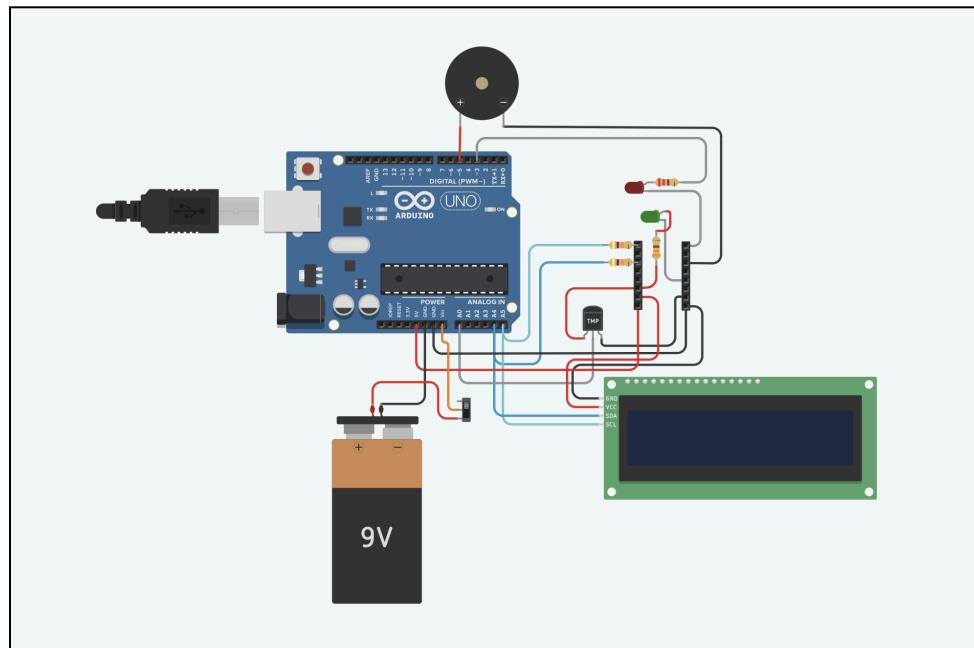


Figure 4: Wiring Diagram

```

#include <Wire.h>
#include <LiquidCrystal_I2C.h>

#define redLED 5
#define greenLED 3
#define buzzerPin 5
#define switchPin 2
#define tempPin A0

LiquidCrystal_I2C lcd(0x20, 16, 2);

float tempF;
float tempC;

void setup() {
    pinMode(redLED, OUTPUT);
    pinMode(greenLED, OUTPUT);
    pinMode(buzzerPin, OUTPUT);
    pinMode(switchPin, INPUT_PULLUP);
    lcd.init();
    Serial.begin(9600);
}

void loop()
{
    // Define the notes array
    const int notes[] = {262, 294, 330, 349, 392, 440, 494, 523};

    lcd.backlight();
    digitalWrite(greenLED, HIGH);
    lcd.clear();
    lcd.setCursor(1, 0);
    lcd.print("Temperature:");
    lcd.setCursor(1, 1);
    lcd.print("Loading...");
    delay(1000);
}

lcd.clear();
while (true)
{
    tempF = analogRead(tempPin) * 0.48828125;
    tempC = (tempF - 32) * (5.0/9.0);
    lcd.setCursor(0, 0);
    lcd.print("Temperature:");
    lcd.setCursor(0, 1);
    lcd.print(tempF);
    lcd.print(" F ");
    lcd.print(tempC);
    lcd.print(" C");
    if (tempF >= 76 || tempF <= 70) {
        digitalWrite(redLED, HIGH);
        // Play "Hot and Cold" melody
        for (int i = 0; i < 16; i++) {
            tone(buzzerPin, notes[i % 8], 250 * (i / 8 + 1));
            delay(250 * (i / 8 + 1));
        }
        digitalWrite(redLED, LOW);
        delay(500);
    }
    else {
        digitalWrite(redLED, LOW);
        noTone(buzzerPin);
    }
    delay(500);
}

```

Figure 5: Arduino Code

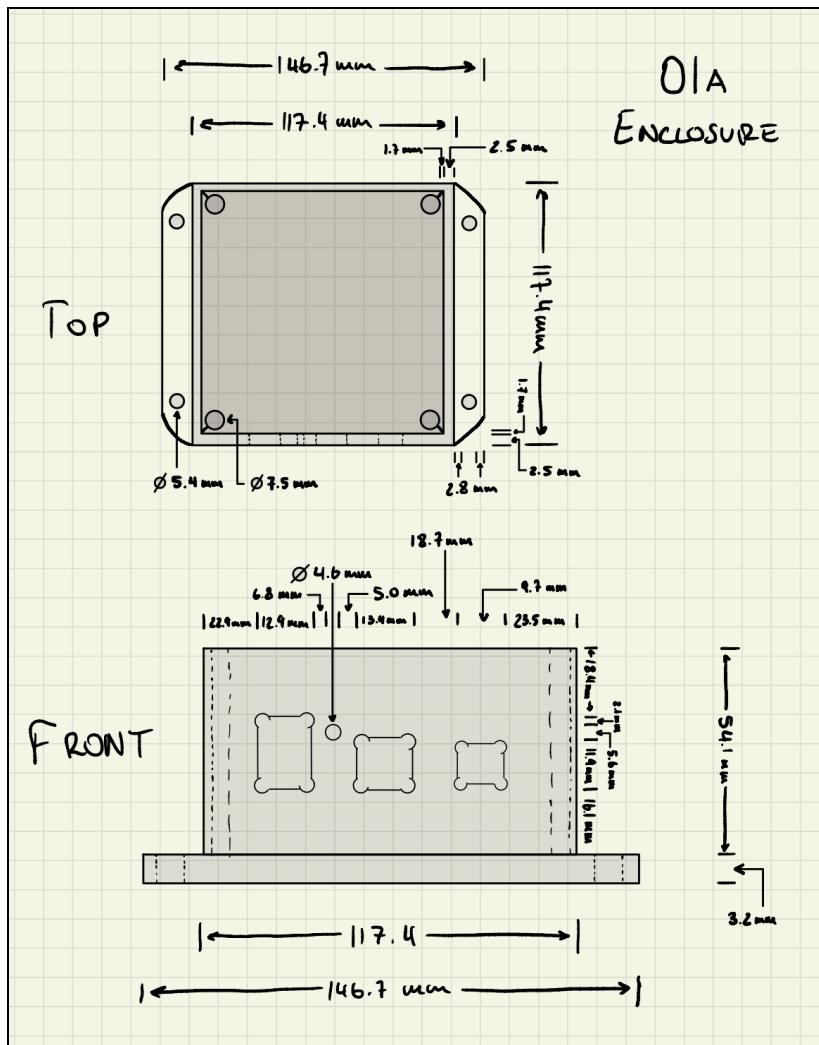


Figure 6.1: Sketches of Enclosure

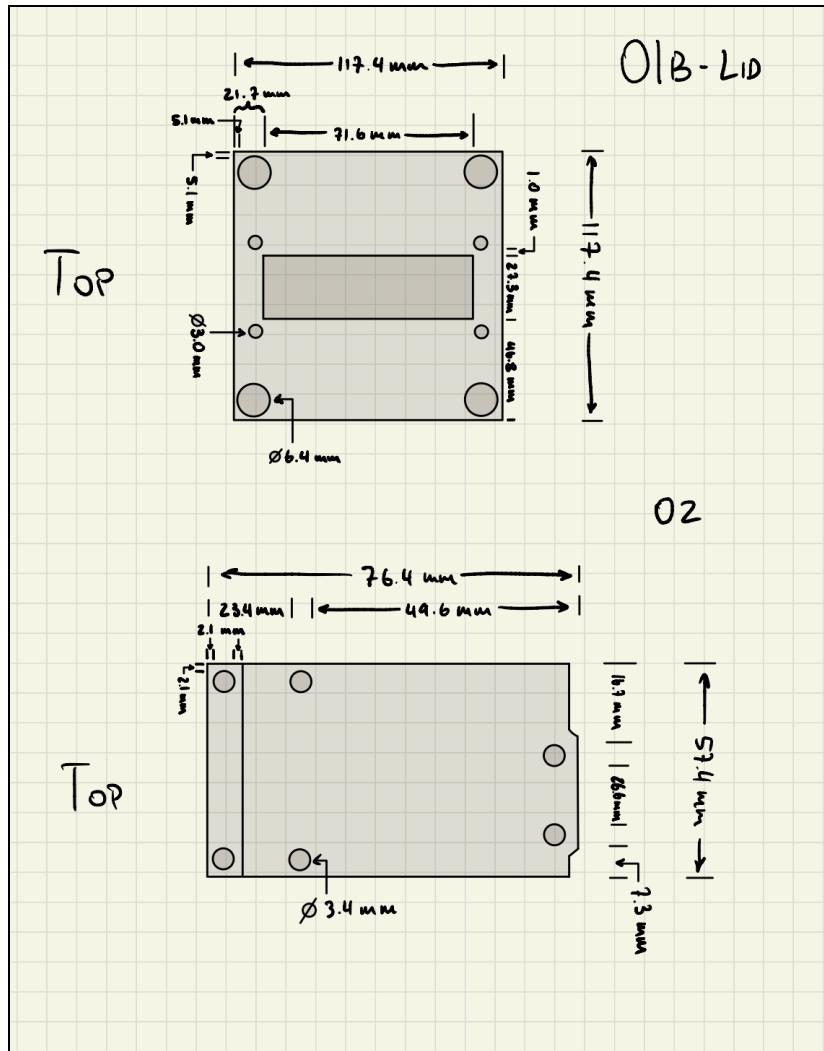


Figure 6.2: Sketches of Lid and Arduino Board

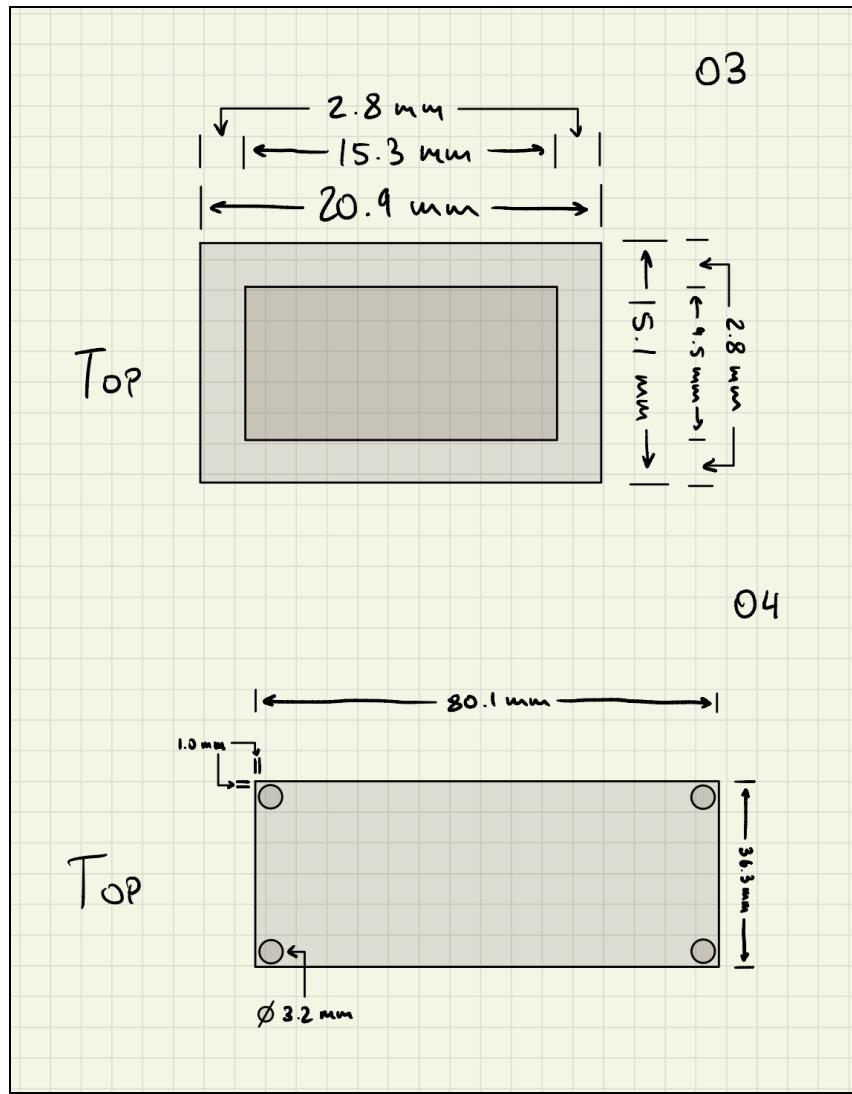


Figure 6.3: Sketches of Switch and LCD

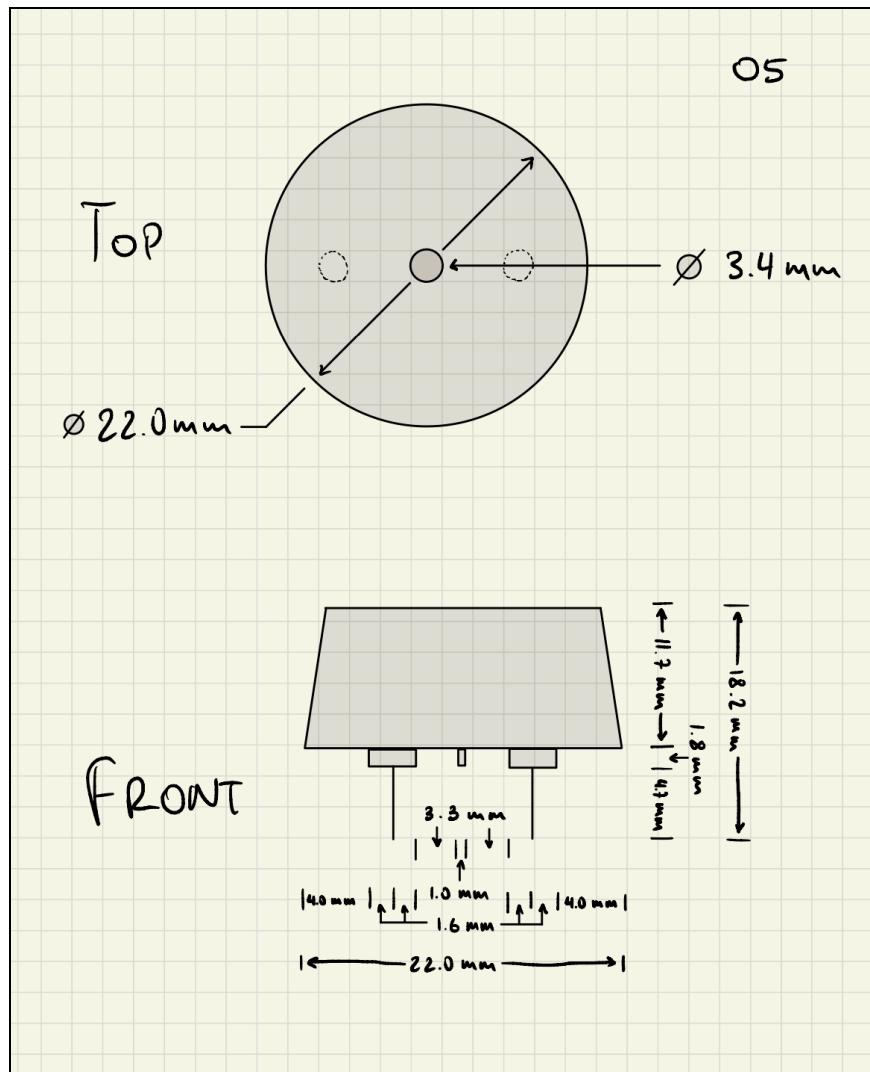


Figure 6.4: Sketches of Buzzer

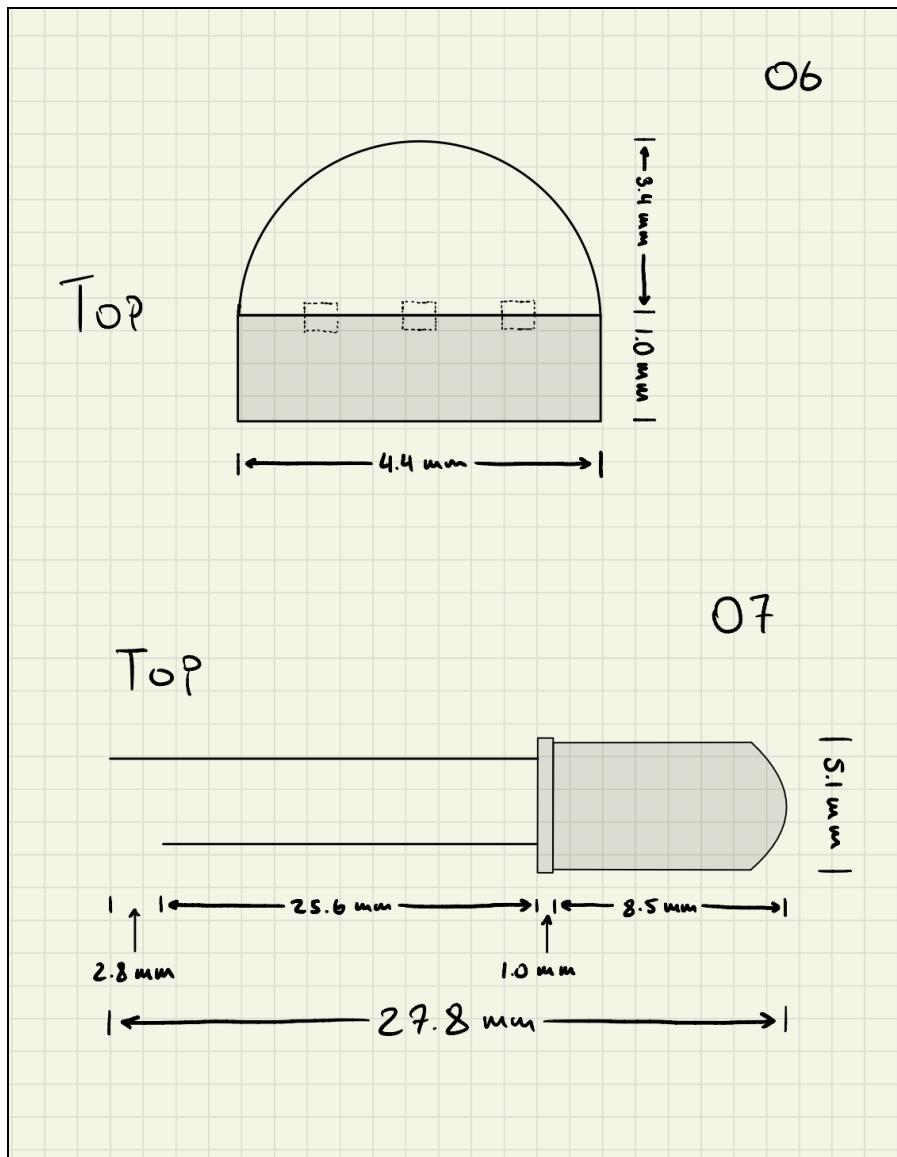


Figure 6.5: Sketches of Temperature Sensor and LED