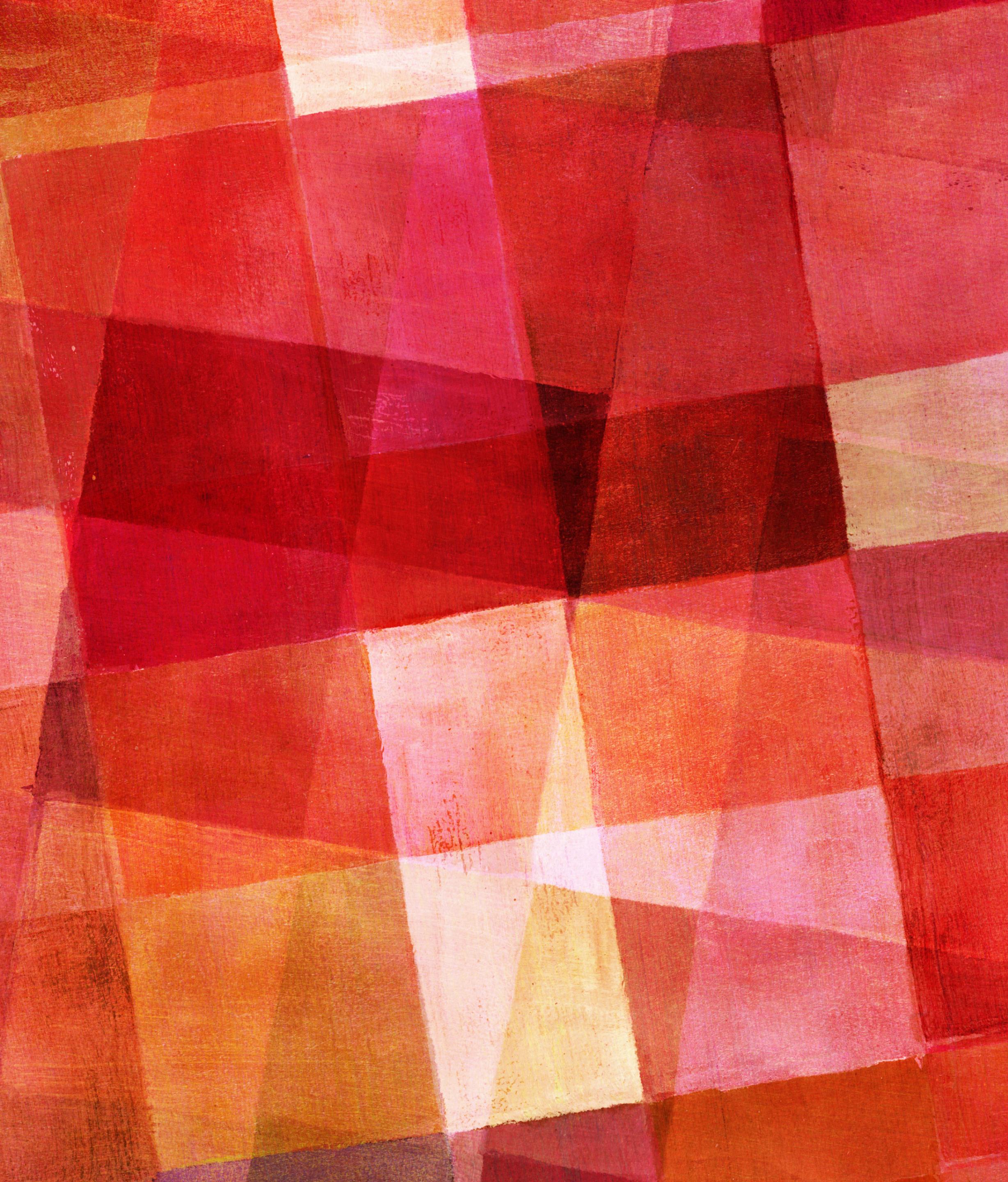




# MUSICAL INSTRUMENT

---

*G2-B Stephen. Shen*



## DEFINITION

---

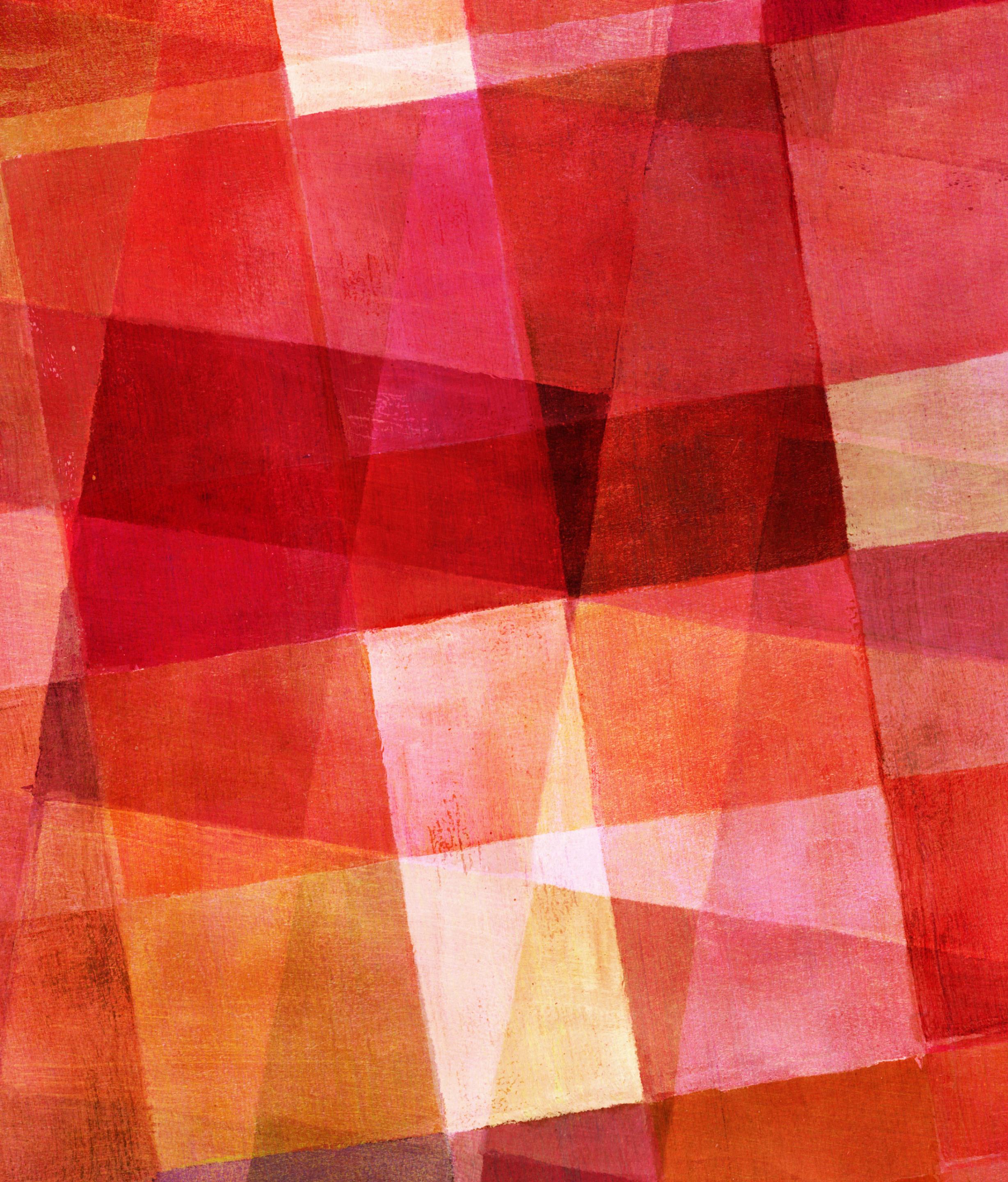
A **musical instrument** is an instrument created or adapted to make **musical sounds**. In principle, any object that produces sound can be considered a musical instrument



## MATERIAL

---

- Arduino mainboard
- Cans
- Wire
- Electrical elements

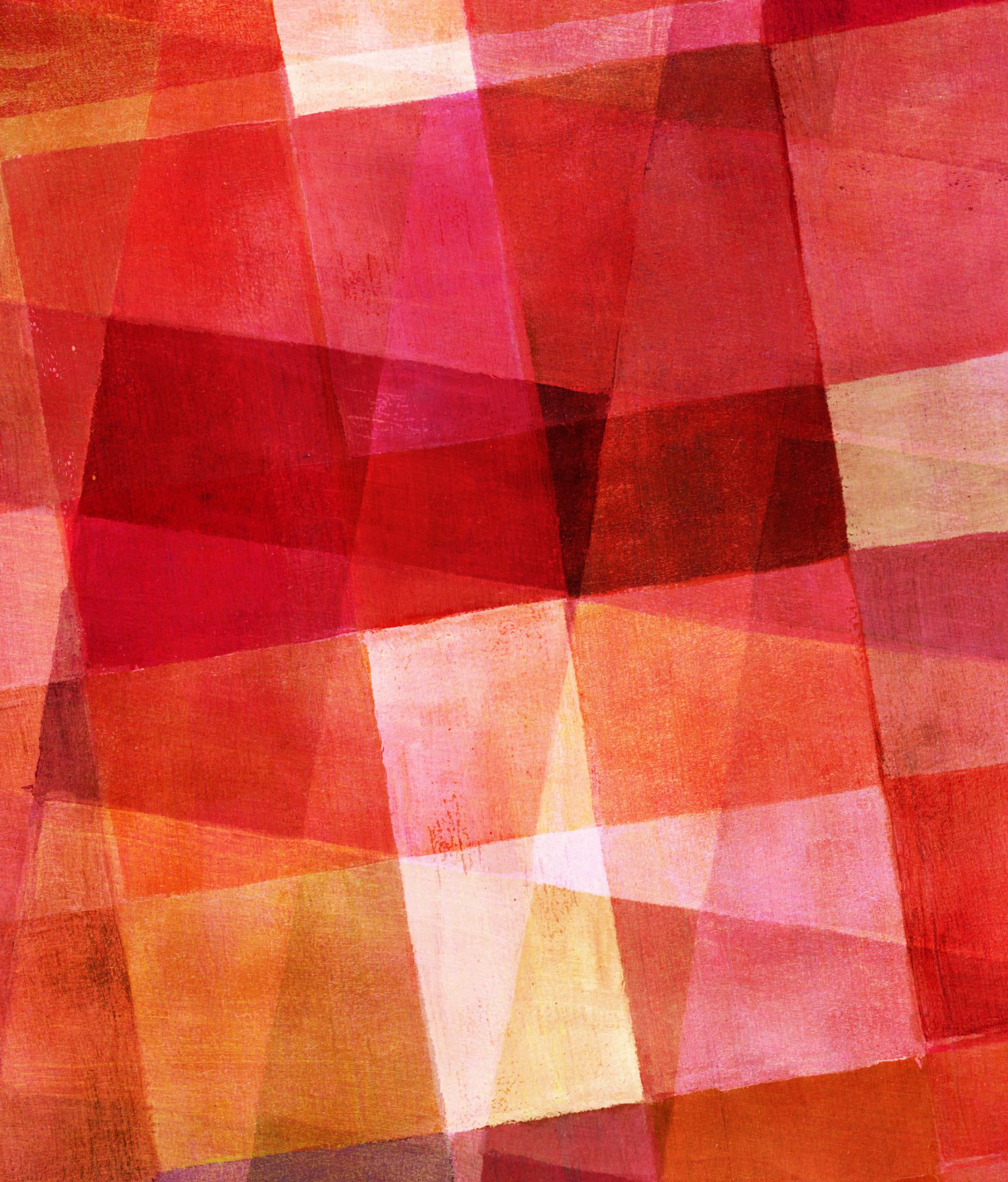


## ORIGINAL PRINCIPLE

---

- Let the cans exert a fixed number of voltage
- Once the human body touches the can, the human body will automatically create an earth wire and bring all the electrons to the ground.

*FAILED*



## CHANGED PRINCIPLE

---

- Instead of using cans to conduct electricity, I decide to use switch to control the flowing direction of the electricity and sent waves to buzzer to create sound.

```

// Define the state of the buttons.
bool ButtonState1 = HIGH;
bool ButtonState2 = HIGH;
bool ButtonState3 = HIGH;
bool ButtonState4 = HIGH;
bool ButtonState5 = HIGH;
bool ButtonState6 = HIGH;
bool ButtonState7 = HIGH;

//Define boolean State as LOW at the beginning.
bool State = LOW;

//Define the five notes with fixed frequencies.
long a = 440;
long c = 261.63;
long d = 293.66;
long e = 329.63;
long g = 392.00;

//Initialise the frequencies of five variables.
long frequency1 = c;
long frequency2 = d;
long frequency3 = e;
long frequency4 = g;
long frequency5 = a;

void setup() {
    // put your setup code here, to run once:
    Serial.begin(9600);
    pinMode(13, OUTPUT);
}

```

## THE CODE

```

void loop() {
    // put your main code here, to run repeatedly:

    ButtonState1 = digitalRead(8);
    ButtonState2 = digitalRead(7);
    ButtonState3 = digitalRead(6);
    ButtonState4 = digitalRead(5);
    ButtonState5 = digitalRead(4);
    ButtonState6 = digitalRead(3);
    ButtonState7 = digitalRead(2);

    if(ButtonState1 == LOW || ButtonState2 == LOW || ButtonState3 == LOW || ButtonState4 == LOW || ButtonState5 == LOW){
        State = HIGH;
    }

    if(ButtonState1 == HIGH && ButtonState2 == HIGH && ButtonState3 == HIGH && ButtonState4 == HIGH && ButtonState5 == HIGH){
        State = LOW;
    }

    else{
        frequency1 = c;
        frequency2 = d;
        frequency3 = e;
        frequency4 = g;
        frequency5 = a;
    }

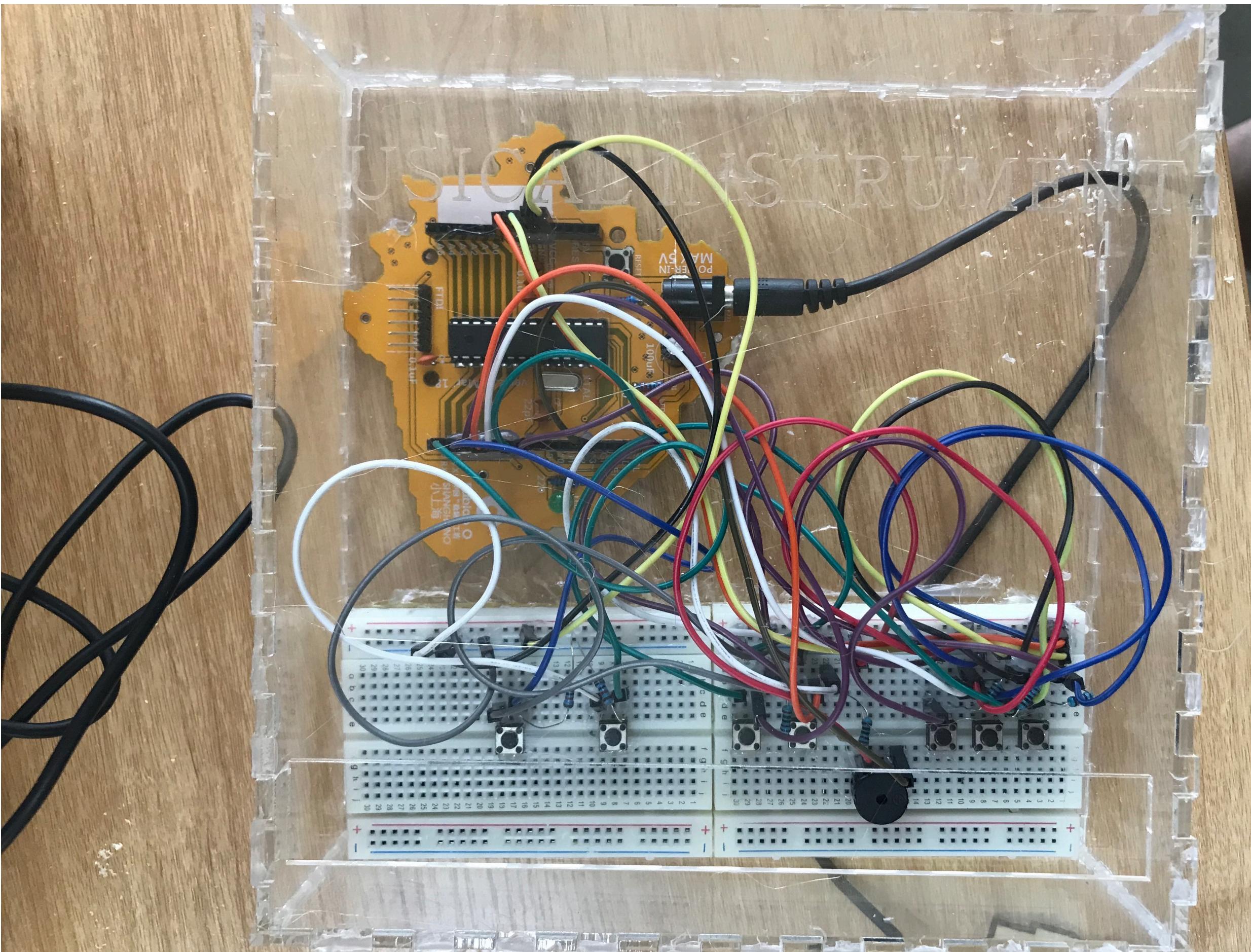
    if(State == HIGH){
        if(ButtonState1 == LOW){
            tone(13,frequency1);
            // delay(100);
            //noTone(13);
        }
        if(ButtonState2 == LOW){
            tone(13,frequency2);
            // delay(100);
            //noTone(13);
        }
        if(ButtonState3 == LOW){
            tone(13,frequency3);
            // delay(100);
            //noTone(13);
        }
        if(ButtonState4 == LOW){
            tone(13,frequency4);
            // delay(100);
            //noTone(13);
        }
    }

    if(ButtonState5 == LOW){
        tone(13,frequency5);
        // delay(100);
        //noTone(13);
    }

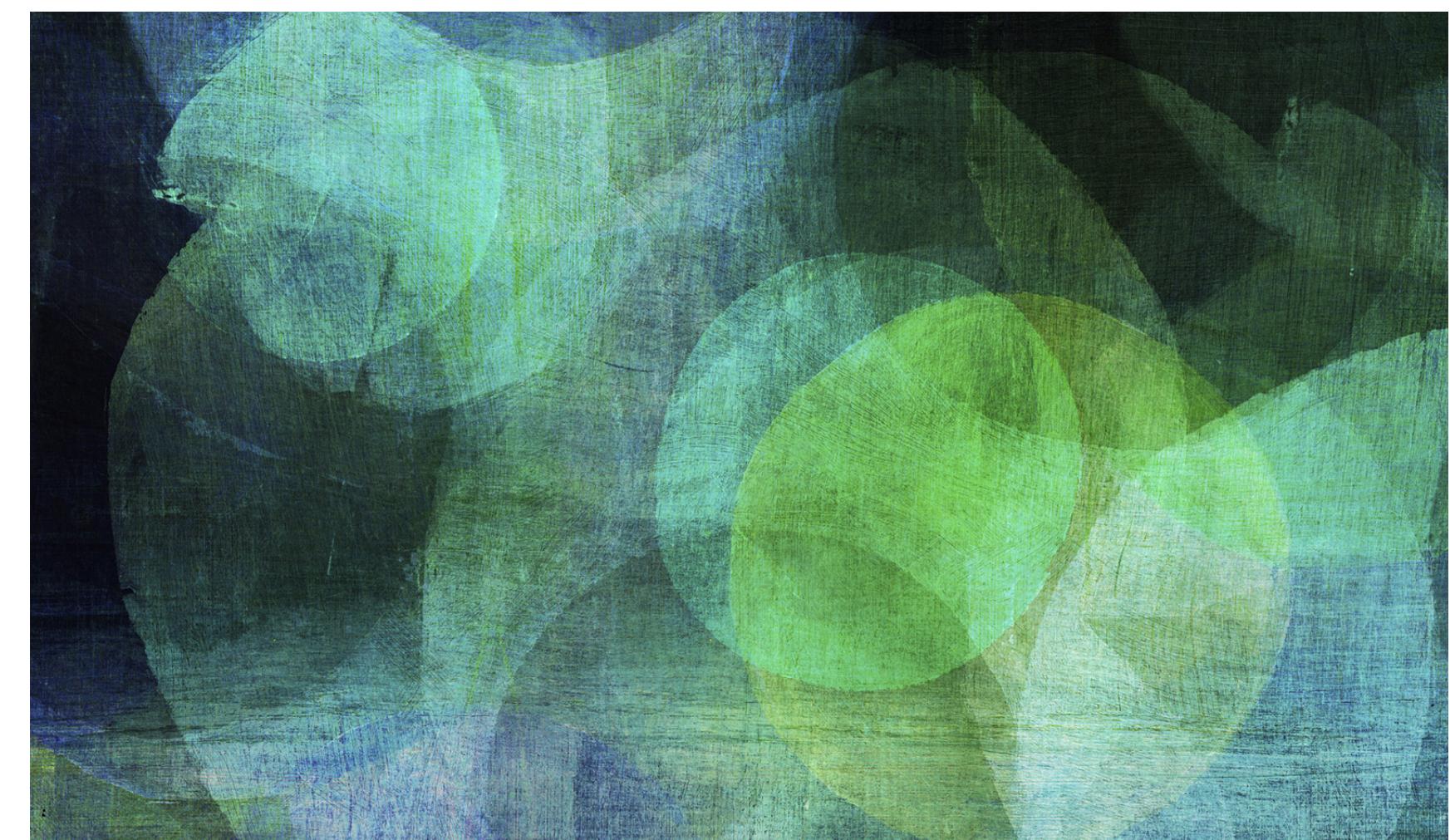
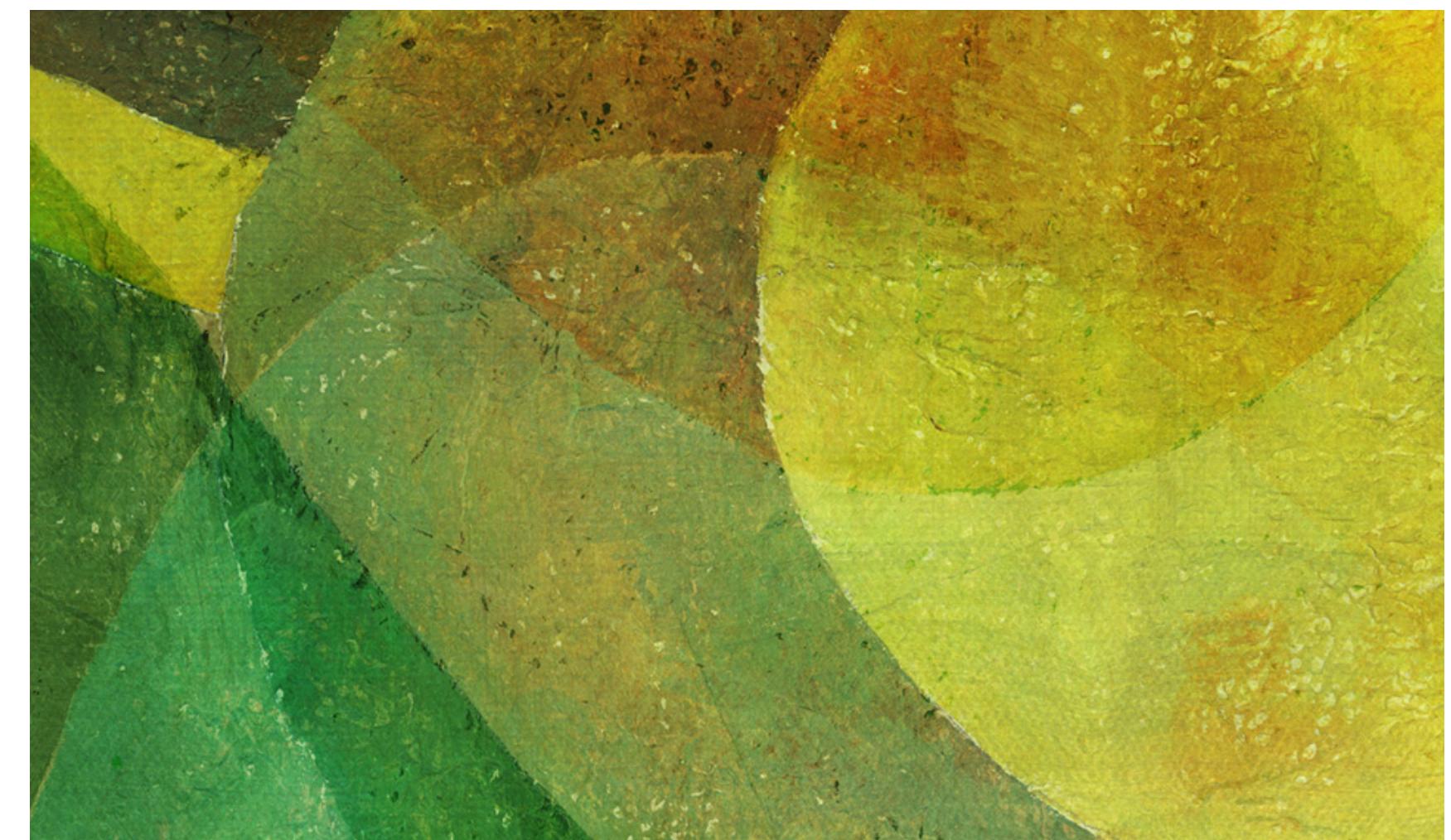
    else{
        noTone(13);
    }

    Serial.print(ButtonState6);
    Serial.print(frequency1);
    Serial.println();
}

```



# *The circuit*



*PLAY TIME*

THANK YOU!