



IT-Midterm Study guideline for grade 7

The exam will be two parts:

(written(15 marks) + practical(15 marks)) includes these experiments:

1- Blinking LED.

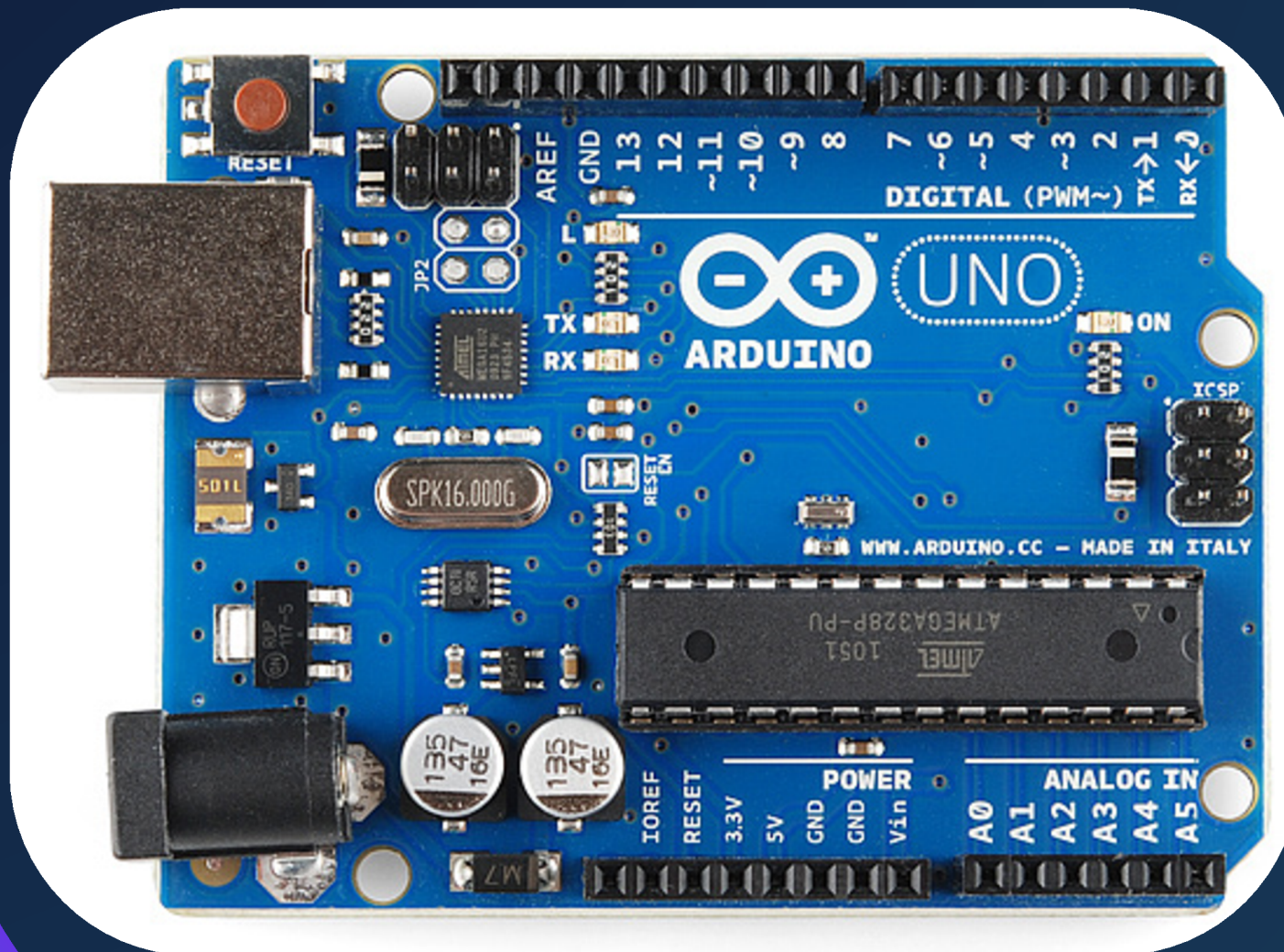
2-RGB LED.

3-Servo motor

- **Written part includes all material related to the 3 experiments.**
- **Practical part includes designing circuits using Tinkercad.(with coding for Blinking LED & Servo motor) (without coding for RGB LED).**

Type of questions **(Written):** Tick True or False, Fill in the blank, match.

Arduino Experiment 1: Blinking LED



Rose Barakat

WHAT IS TINKER CAD?



A simulation tool to
build and test
circuits online.

Why Use It?

No need for physical
components, easy
debugging

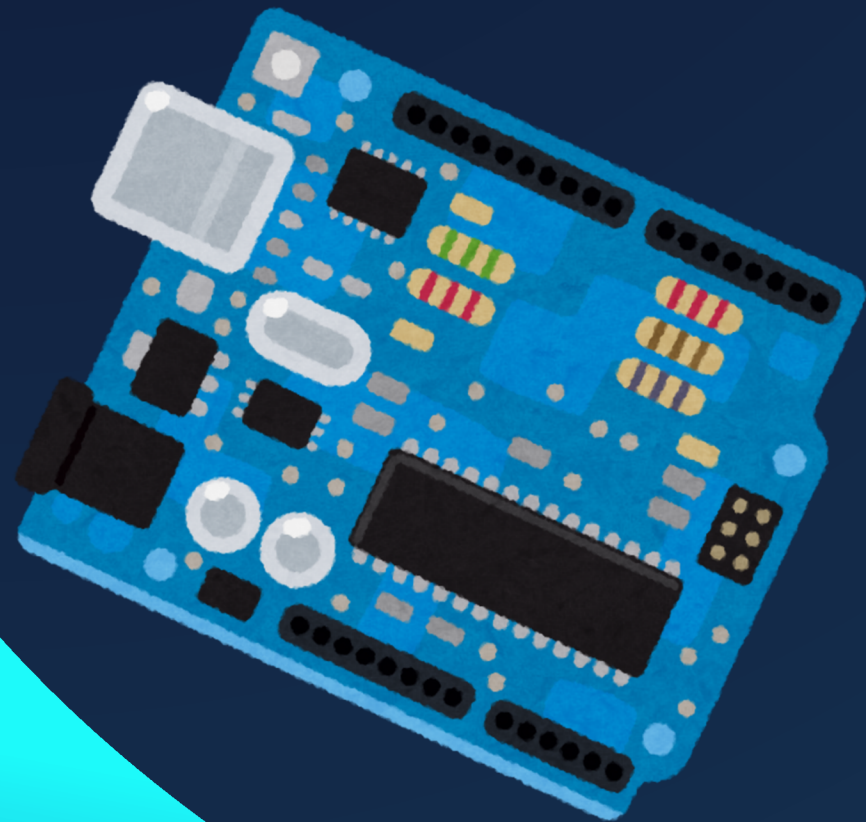




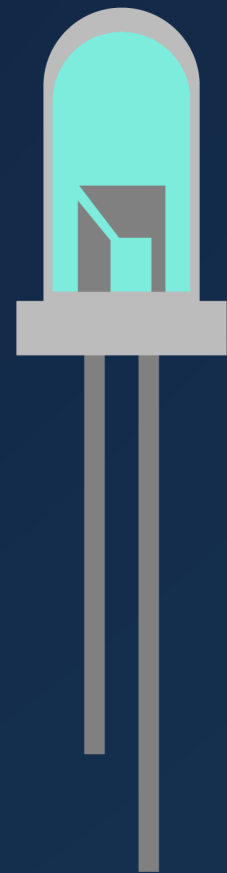
SETTING UP THE CIRCUIT

Components Needed:

1- Arduino



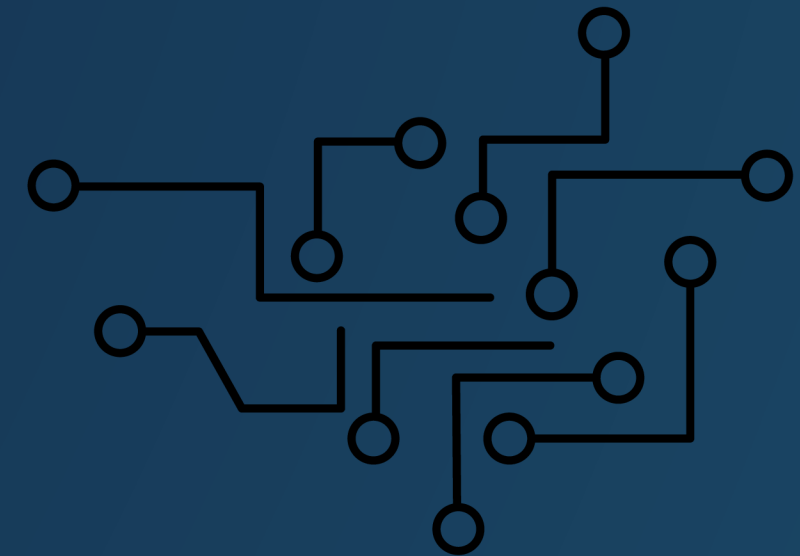
2- LED



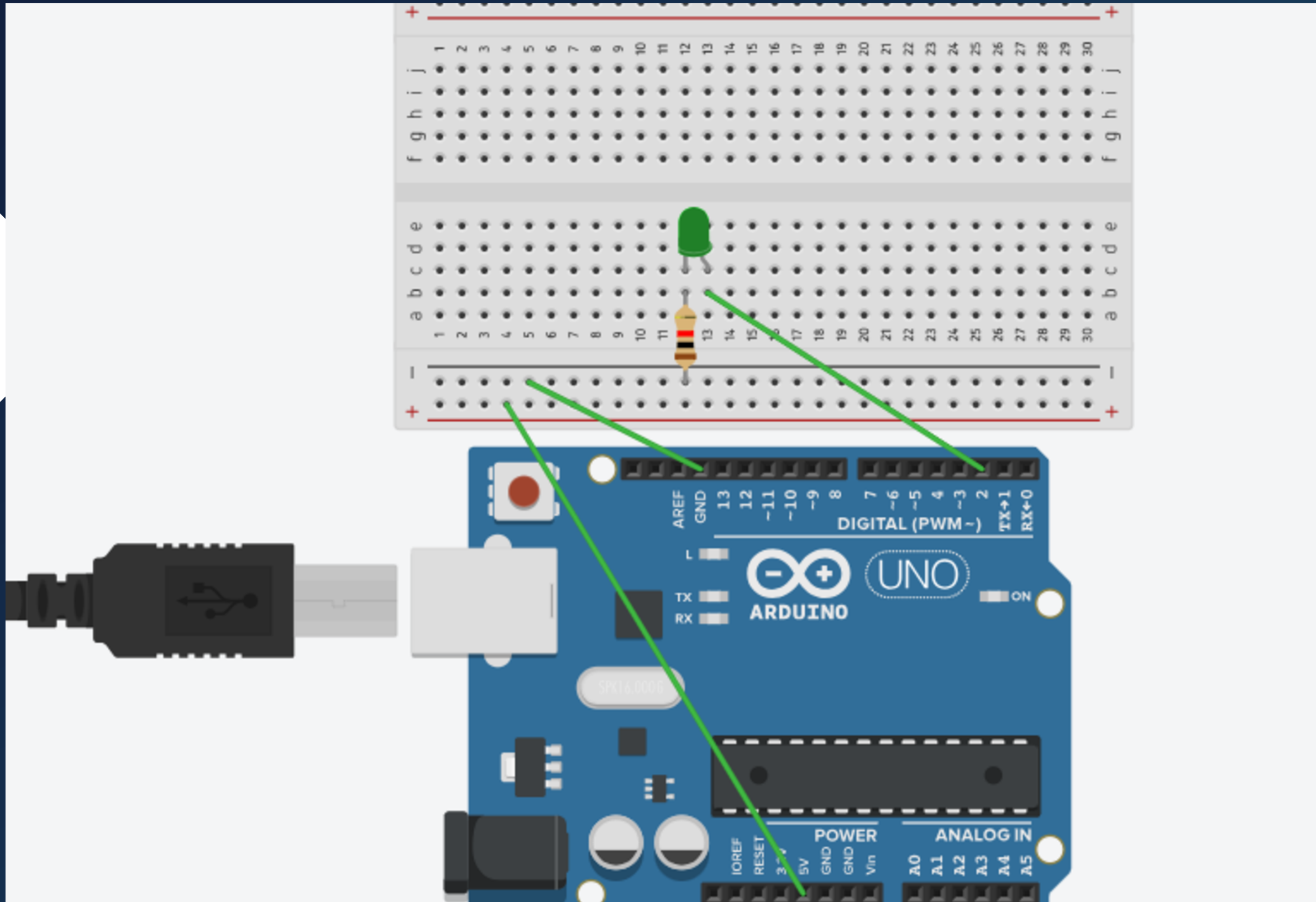
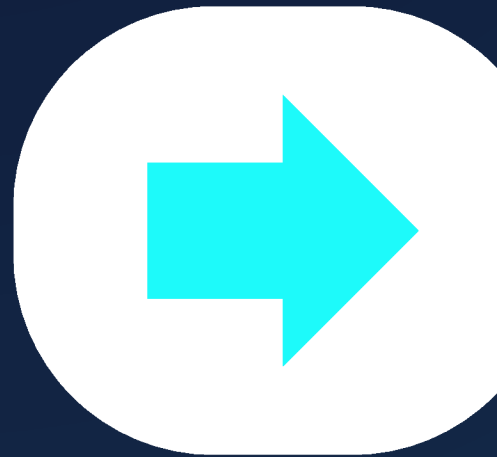
3- Resistor



4- Wires



THE CIRCUIT



CODE PART



Explanation

```
void setup()  
{  
  pinMode(2, OUTPUT);  
}
```

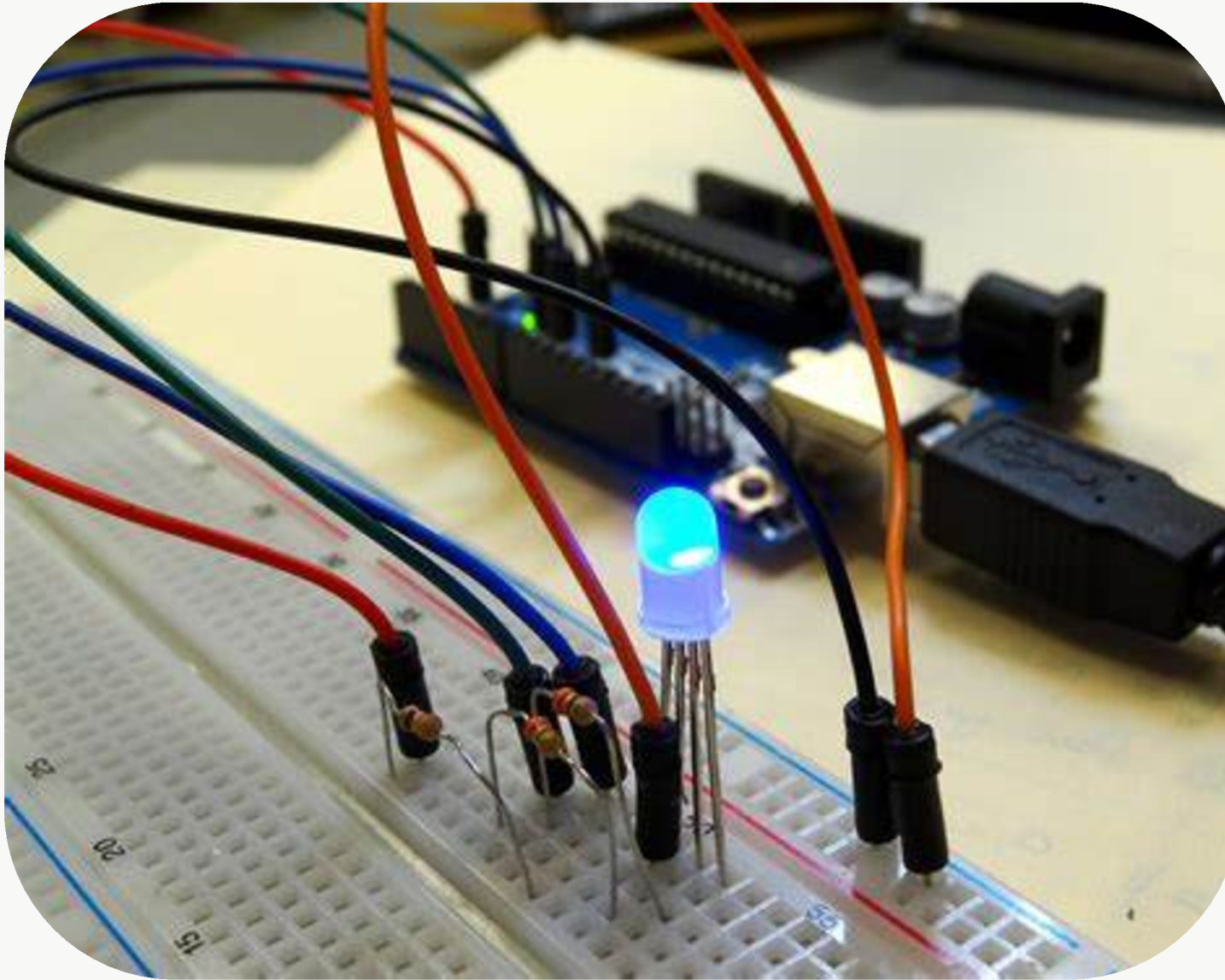
```
void loop()  
{  
  digitalWrite(2, HIGH);  
  delay(1000); // Wait for 1000 millisecond(s)  
  digitalWrite(2, LOW);  
  delay(1000); // Wait for 1000 millisecond(s)  
}
```

void setup() {} Runs once, setting pin modes
void loop() {} Repeats, controlling the LED
digitalWrite(Pin_Number, HIGH); Turns LED on
delay(1000); Waits for 1 second
digitalWrite(Pin_Number, LOW); Turns LED off
delay(1000); Waits again

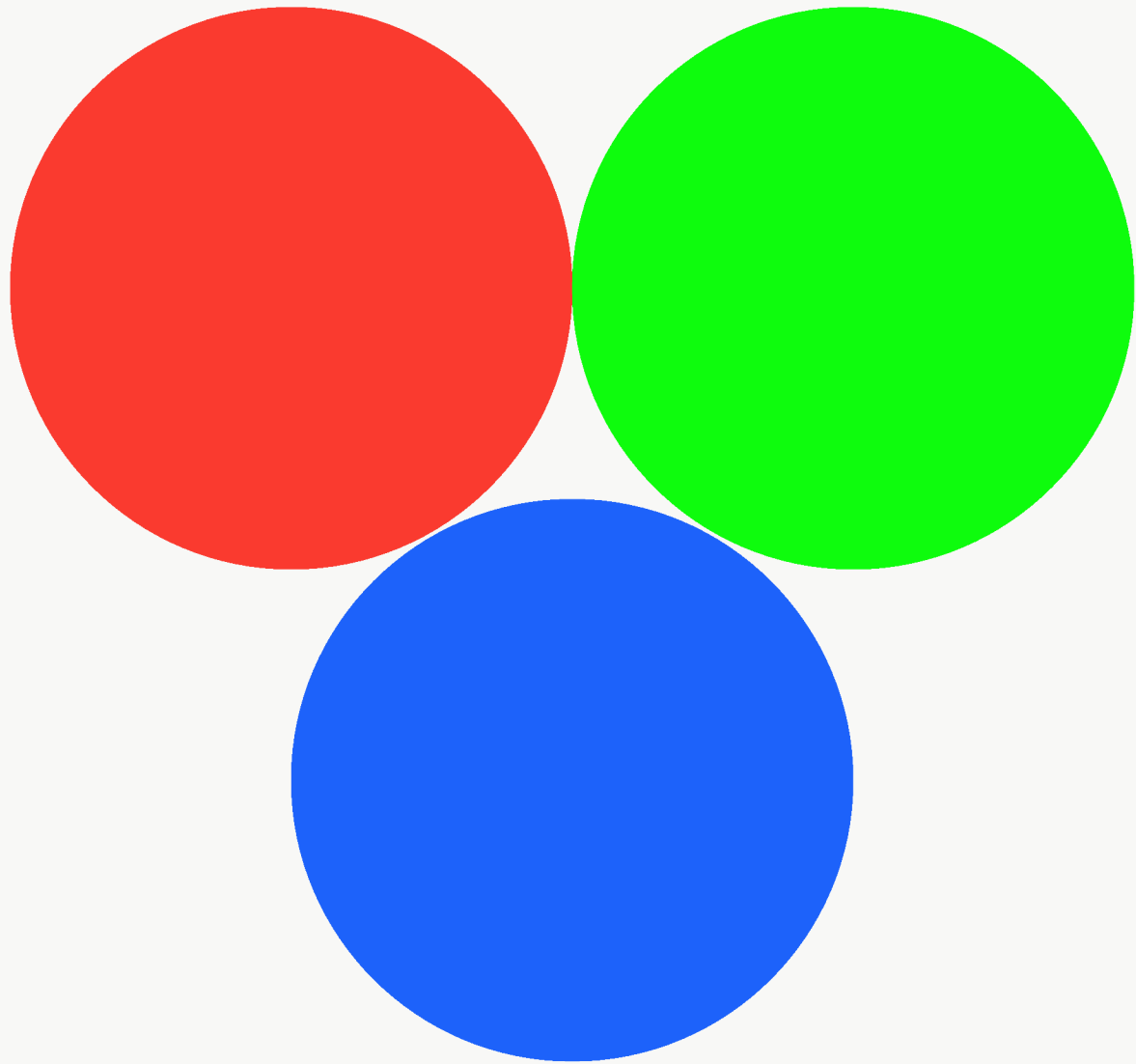
CODING CHALLENGE

Modify the delay time to make the
LED blink faster/slower.

Arduino Experiment 2: RGB LED



WHAT IS RGB?



These three colors combine to create other colors by adjusting their intensity.

- **Red: R**
- **Green: G**
- **Blue: B**

- **"WHAT IS AN RGB LED?"**

RGB LEDs are special lights that can emit different colors by adjusting the brightness of each individual LED (red, green, blue).

- **Example: "By turning on all three LEDs (R, G, and B) at different intensities, we can create millions of colors."**



- # HOW RGB LEDs WORK WITH ARDUINO"

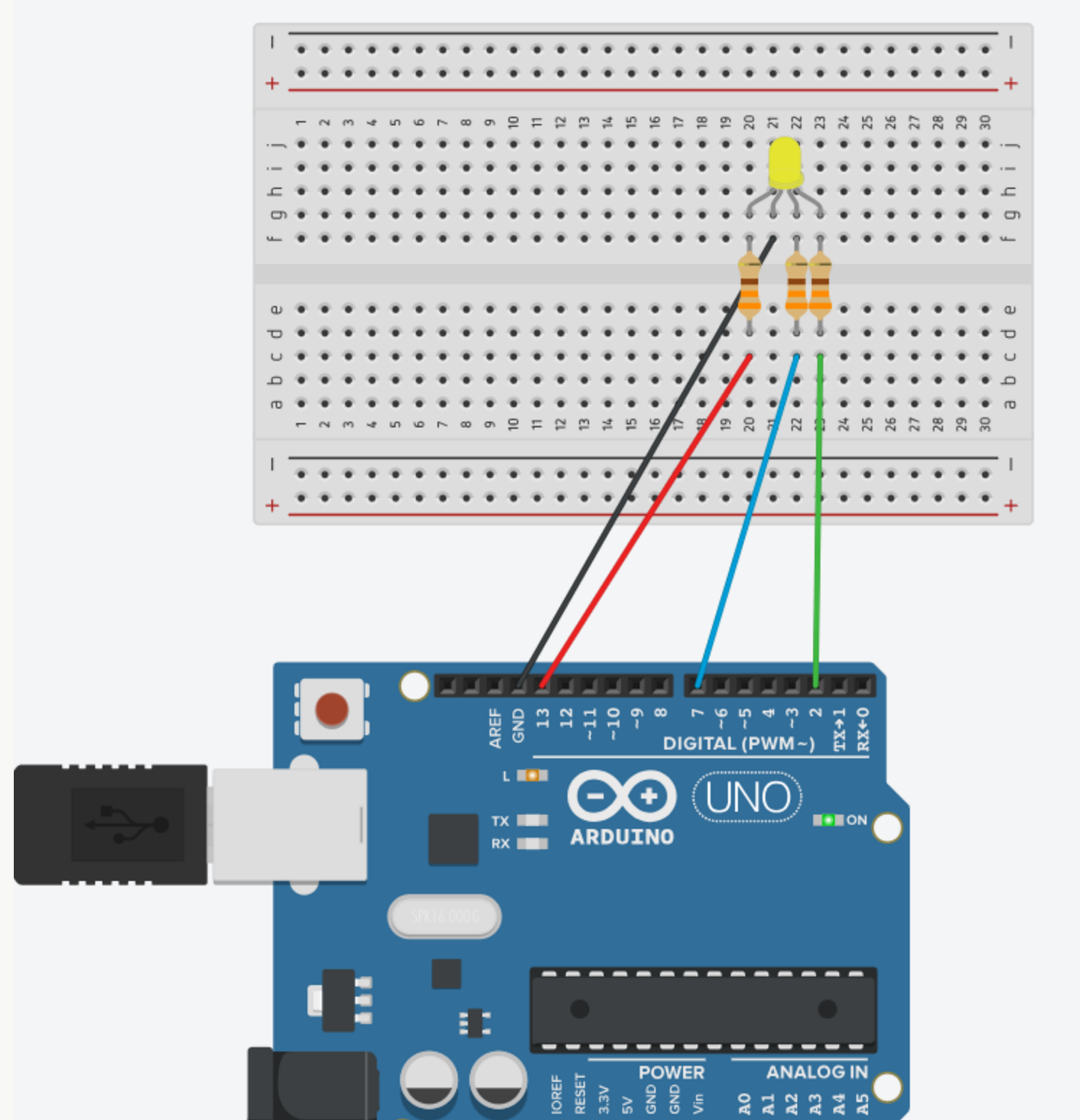
RGB LEDs have 4 pins:

Common Cathode (Ground), Red Pin, Green Pin and Blue Pin

- **"Each pin can be controlled by the Arduino to adjust the brightness of the color."**



THE CIRCUIT



CODE PART

```
void setup()
{
  pinMode(2, OUTPUT);
  pinMode(7, OUTPUT);
  pinMode(13, OUTPUT);
}
```

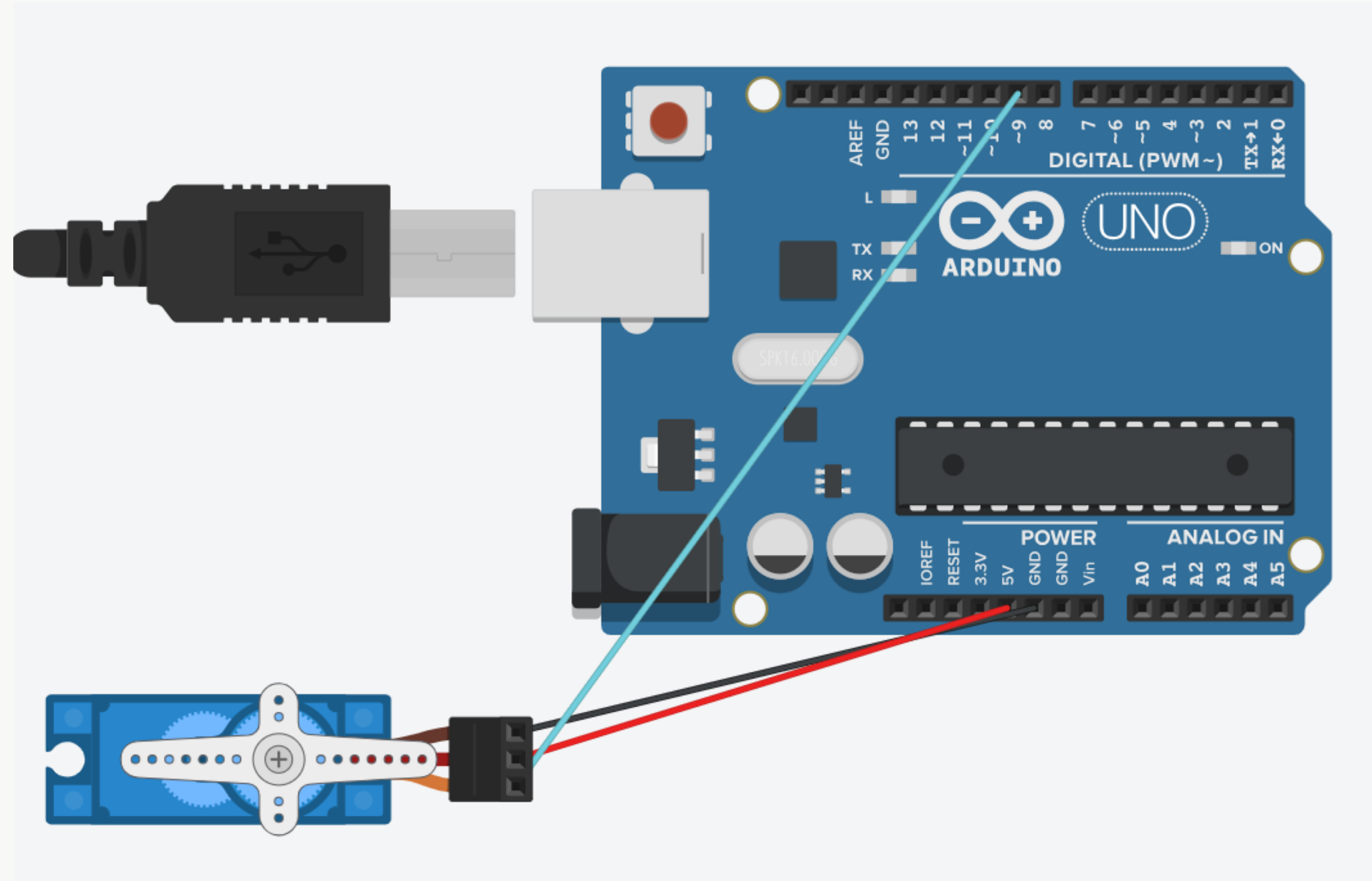
```
void loop()
{
  analogWrite(2,255);
  analogWrite(7,0);
  analogWrite(13,255);
  delay(1000);

  analogWrite(2, 0);
  analogWrite(7, 255);
  analogWrite(13, 0);
  delay(1000);

  analogWrite(2, 0);
  analogWrite(7, 0);
  analogWrite(13, 255);
  delay(1000);
}
```



Arduino Experiment 3: Servo motor



WHAT IS SERVO MOTOR?

- **A servo motor is a small, powerful motor . It is commonly used in robotics, automation systems, and remote-controlled devices.**

• **MATERIALS NEEDED:**

- **Arduino board (e.g., Arduino Uno)**
- **Servo motor**
- **Jumper wires**
- **Breadboard (optional)**



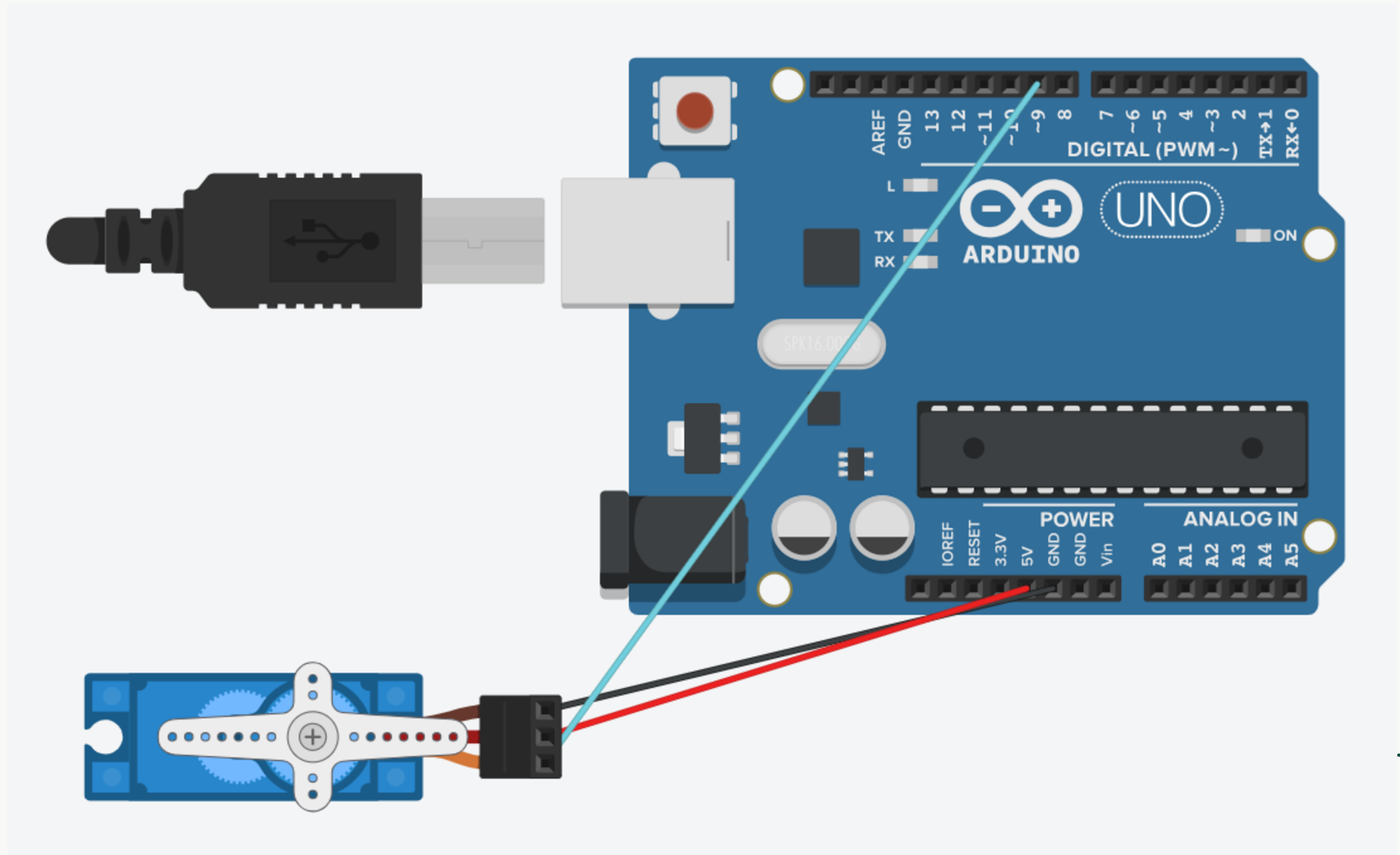
• **HOW SERVO MOTOR WORKS WITH ARDUINO"**

A servo motor has three pins:

- **Power (VCC):** Connect this to the 5V pin of the Arduino.
- **Ground (GND):** Connect this to the ground (GND) on the Arduino.
- **Control (Signal):** This connects to one of the pins on the Arduino (e.g., pin 9, pin 10).



THE CIRCUIT



CODE PART

```
void setup()
```

```
{  
  servo.attach(9);  
}
```

```
void loop()
```

```
{  
  servo.write(180);  
  delay(1000);  
}
```



**you need to include
<servo.h> library.**

