RGB LED

Objective: SWBAT create a digital display using an Arduino and a RGB LED.

Materials:

- Arduino Board
- RGB LED
- 3 220 Ohm Resistors
- Jumper Wires
- USB Cable
- Goggles
- Computer with Arduino Software Installed

Preparation:

- Ensure that you have a computer with the Arduino software downloaded. See the 'Introduction to Arduino' section (pages 28-29) for more information on how to do this.
- Review safety procedures with students before beginning this activity.

What to do:

1) **Place RGB LED:** Place the four-pronged RBG LED onto your breadboard as shown.
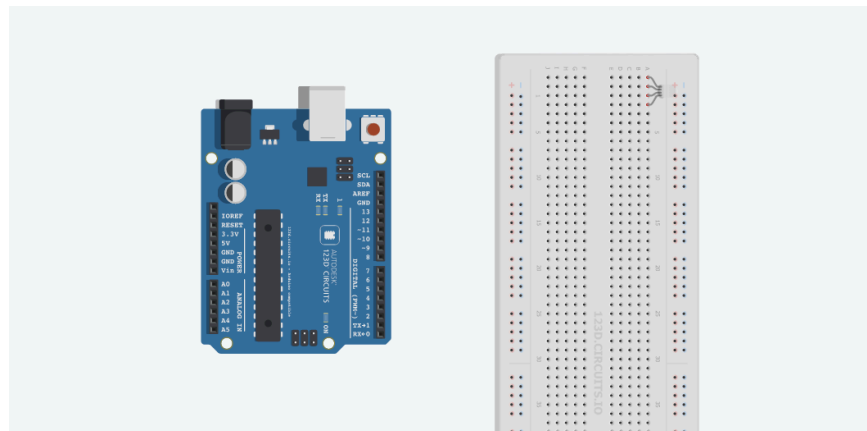
2) **Place Resistors:** Place the 3 220-Ohm Resistors on the breadboard as shown below.
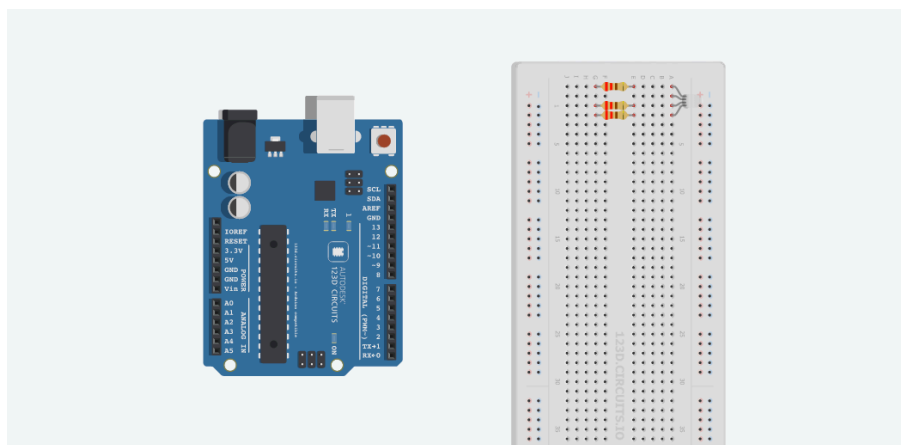
3) **Connect Wires:** Connect three of the jumper wires from the rows with resistors to pins 9, 10 and 11. Then, connect a wire for the second row to the ground port of your Arduino. See below picture for more detailed information.
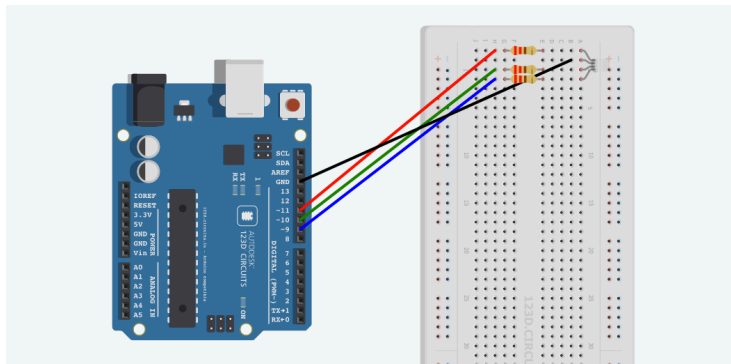
4) **Upload the Code:** Connect your Arduino board to your computer and upload the following code to your device. See the 'Introduction to the Arduino' section (pages 28-29) for more information on how to do this. (This code is also contained on the flash drive included in your kit.)

rgb.led.ino

```
/*
Adafruit Arduino - Lesson 3. RGB LED
*/
int redPin = 11;
int greenPin = 10;
int bluePin = 9;
//uncomment this line if using a Common Anode LED
//#define COMMON_ANODE
void setup()
{
 pinMode(redPin, OUTPUT);
 pinMode(greenPin, OUTPUT);
 pinMode(bluePin, OUTPUT);
}
void loop()
{
 setColor(255, 0, 0); // red
 delay(1000);
 setColor(0, 255, 0); // green
 delay(1000);
 setColor(0, 0, 255); // blue
 delay(1000);
 setColor(255, 255, 0); // yellow
 delay(1000);
 setColor(80, 0, 80); // purple
 delay(1000);
 setColor(0, 255, 255); // aqua
 delay(1000);
}
void setColor(int red, int green, int blue)
{
 #ifdef COMMON_ANODE
  red = 255 - red;
  green = 255 - green;blue = 255 - blue;
 #endif
 analogWrite(redPin, red);
 analogWrite(greenPin, green);
 analogWrite(bluePin, blue);
}
```

Note: Any line starting with // is a comment and does not affect the code.

5) **Observe your Finished Project:** Once the code is uploaded you will see the LED flash the indicated colors.

Extra Challenge: Have students research RGB colors and then program their Arduino and RGB LED to display even more colors!

Source: Thanks to https://learn.adafruit.com/for this project idea.