RGB: A color mixing model that mixes red, green, and blue light to produce colors.

RGB LED: An LED that can be programmed to create over 16 million colors.
Materials needed to wire one RGB LED.

- Odyssey Board
- 1 dowel
- Socket block
- Wire clip (optional)
- 1 F/F wire
- 3 F/F resistor wires
  - (red, green and blue)
- RGB LED

Set up the Odyssey Board, dowel, and socket block. (Wire clip is optional.)

Your blocks may use any horizontal or vertical dowel holes. They do not have to look exactly like the ones shown.
RGB Color Model

Computers and electronic devices with screens produce colors using the RGB color model. A value from 0-255 of red, green, and blue light is mixed to produce colors. Setting the value of red, green and blue to 0 produces no light, or black. Setting each value to 255 produces white. Varying the values between 0 and 255 produces millions of colors.

Find an online RGB Explorer model like the one shown from stanford.edu and experiment to see how the red, green and blue light values combine to make shades of colors. If you create colors you really like, write down the numerical red, green and blue values. You will be able to program your RGB to duplicate the color.

The RGB LED has 4 legs: Red, Common, Green, Blue. Pay close attention to the order of the legs. The longest leg connects to ground. Although not required, it may be helpful to use a red, green, and blue wire for the red, green, and blue LED leg connections to the UNO.
Wiring the RGB LED.

1. Place 1 F/F wire for ground and 3 F/F resistor wires into a center socket in the socket block. It will be helpful to use a red, green, and blue resistor wire arranged the order shown.

2. Place the LED in the socket. Be sure to orient the LED so that the longest leg is in the black wire. This will be connected to GND.

3. Connect the resistor wire from the red leg to pin 9.

4. Connect the resistor wire from the green leg to pin 10.

5. Connect the resistor wire from the blue leg to pin 11.

6. Connect the wire from the long leg to GND.

7. Place the light diffuser on the LED.

8. Connect the USB.

Always unplug the power when changing your circuits.
Checking the RGB LED.

1. Type, paste or download the RGB Test Code into the IDE and upload to the UNO. If you wired the LED correctly, it should be red.

2. Change the value for redPin from 255 to 0 and change bluePin to 255. Upload. Now the LED should be blue.

3. Change the value for bluePin from 0 and change greenPin to 255. Upload. Now the LED should be green.

   If the colors are not correct, check your wiring.

4. Experiment with changing the values for each pin and see what happens to the LED. Try to create your favorite color.

5. Try to match color A, B and C.

![Color A](image1.png) ![Color B](image2.png) ![Color C](image3.png)

**RGB Test Code**

```cpp
int redPin = 9;
int greenPin = 10;
int bluePin = 11;

void setup() {
  pinMode(redPin, OUTPUT);
  pinMode(greenPin, OUTPUT);
  pinMode(bluePin, OUTPUT);
}

void loop() {
  analogWrite(redPin, 255);
  analogWrite(bluePin, 0);
  analogWrite(greenPin, 0);
}
```
Disco Party Rainbow Sketch

Once you have tested the RGB LED and know the wires are connected correctly, you can create many colors. By mixing two of the three colors at a time, you can create the main colors of the LED: red, blue, green, yellow, purple, white,

Use pins 9, 10, and 11