

Circuit #3 RGB LEDs

1.

This LED has three inputs and three outputs. What other circuits have three inputs? Three outputs? Provide an example of each.

Does the RGB LED work?

Great. Hint for questions below: if you're really stuck add a button to your circuit that uses `Serial.println()` to print RGB values when you press it.

Connect a multimeter to each line that is connected to a RedBoard pin. Notice how the voltage changes while you use the sensor or interface coupled with each pin.

2.

What should the voltage values for each pin be to make the RGB LED as red as it can get?

Pin 11 V = ____ v Pin 10 V = ____ v Pin 9 V = ____ v

3.

What should the voltage values for each pin be to make the RGB LED as yellow as it can get?

Pin 11 V = ____ v Pin 10 V = ____ v Pin 9 V = ____ v

4.

What should the voltage values for each pin be to make the RGB LED as white as it can get, but at 1/2 intensity?

Pin 11 V = ____ v Pin 10 V = ____ v Pin 9 V = ____ v

5.

Given that there are 256 (0 – 255) different intensity values for each color in an RGB LED, how many different colors can an RGB LED emit? Show your work.

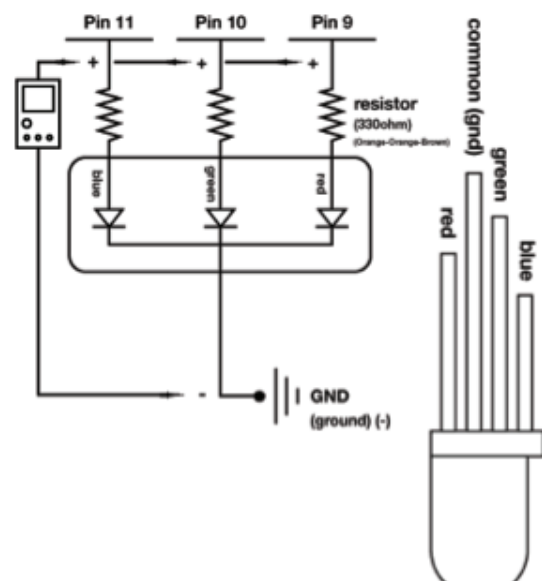
6.

How many different colors can a RGBY LED emit?

7.

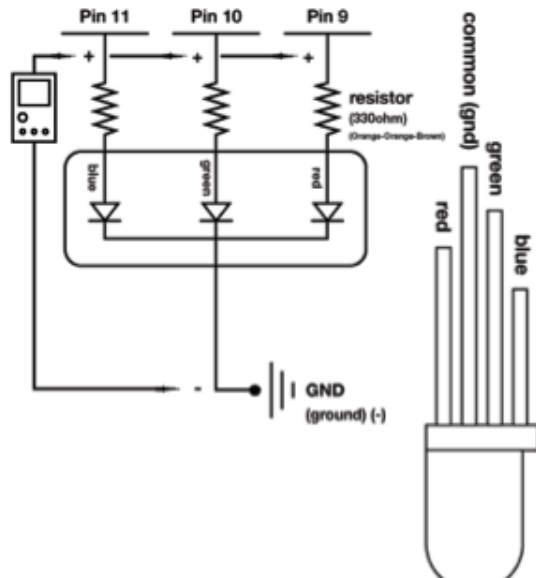
Why are there 256 LED intensities, and not 300?

Circuit:



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Circuit:



8.

Light is a small part of a big group of electromagnetic fields called the Electromagnetic Spectrum. Name at least three other electromagnetic fields and state if their frequencies are higher or lower than light.

9.

Who discovered the theory of Electromagnetic Spectrum? Who expanded it beyond light?

10.

Upload Circ12BExpansion to your Arduino and add a piezo element to digital pin # 1. Change the code so you don't go crazy listening to "Twinkle, Twinkle Little Star". Explain how you could add another RGB LED so it also changes color depending on the note your piezo plays, but with different code so it displays a different color.

11.

Other than Red, Green and Blue, what else could RGB stand for? Example: Roasted Gooney Baloney, Random Gargantuan Baboons, Rappers Got Beef, or Robot Guild Butlers. List at least three.
