Puzzle 1
Illuminate the LED without blowing it up!

Plug wires between the '+' power rail and the longest pin of the LED. The common anode supplies high voltage to all 3 colors.

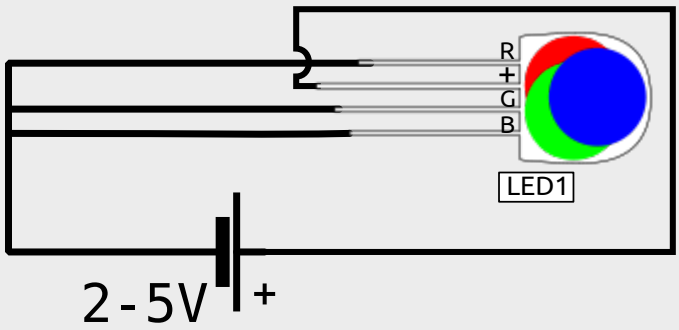
Plug wires from each color to the '-' power rail to give a path for electrons to flow from 'GND'

Don't supply full power yet !

Using an adjustable power supply, slowly increase the voltage to around 2 or 3 volts to find out which color takes the least amount of power to illuminate. Any more will burn it out!

Unplug that color and turn the voltage up to 5 to see how much voltage it takes other colors to illuminate.

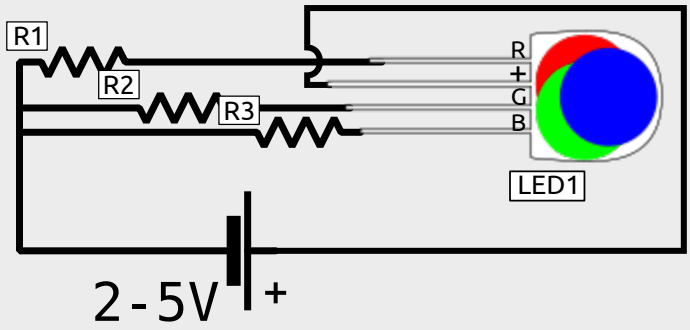
Use your multimeters to confirm !



LED1	Common Anode RGB LED

In order to illuminate 3 colors from the same power source, we can connect 'Resistors' of different values -- each resistor is made to give the flow of electrons a certain amount of extra work to do before flowing through, and is symbolized on the schematic with: ⏦

Using a value of '220 ohms' will protect the color that needs the least amount of energy, while a lower resistance allows enough power to get to the other colors to shine bright.



Schematics often use shorthand names to refer to each component to save space in the crowded diagram. Usually a 'key' is provided to tell you what value corresponds to each part

LED1	Common Anode RGB LED
R1	220Ω
R2	100Ω
R3	100Ω

A breadboard is designed to make it easier to try different combinations of parts without having to solder any wires together.

Each row, 1-30, has a small piece of metal underneath the holes. One connecting groups of 'a-b-c-d-e', and another connecting 'f-g-h-i-j'. You can bridge these sections with chips, resistors, and LEDs and have different amount of power on each side of the gap.

Outside of this middle-prototyping-area you get two 'power rails': supply power to + and - here and you'll never run out of places to connect to it.