

Building a tri-color light.

Teachers Workshop October 22th 2010,

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Light Emitting Diodes - LEDs

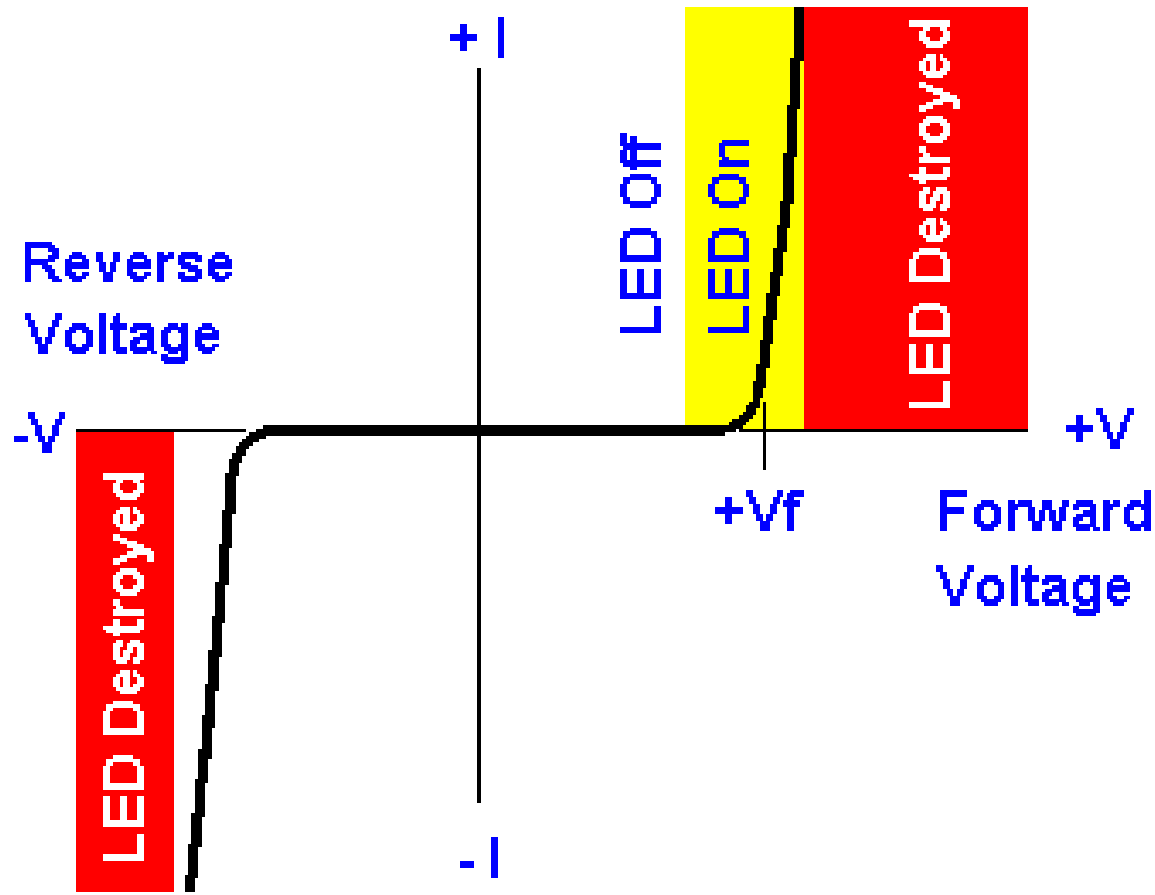
- What are they
- Efficiency up to 115 lm/W compared to 15 lm/W for incandescent bulb and 100 lm/W for fluorescent lights. Notice the importance of directionality in comparison.
- Examples
- Future of illumination?

RGB elements in every day life

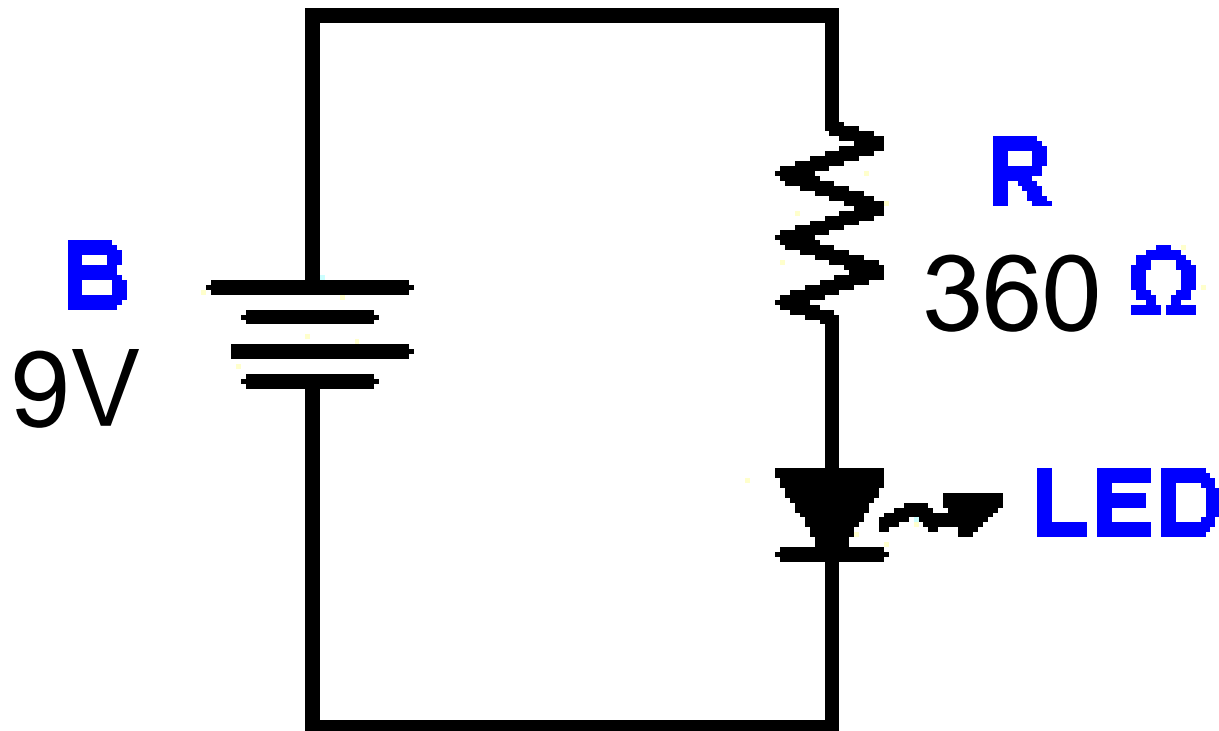
We can create almost any color by mixing from red, green and blue (RGB)

- Examples of RGB elements – emitters, filters and sensors
 - TV
 - Monitor
 - Projector
 - LCD screen
- RGB sensors
 - eye
 - electronic ones: in digital camera, video camera spectrum analyzer

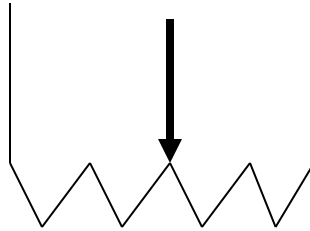
- LEDs
 - voltage –current characteristics,



- Light Emitting Diodes LEDs
 - example circuit
 - In principle we need a current source, very often IC

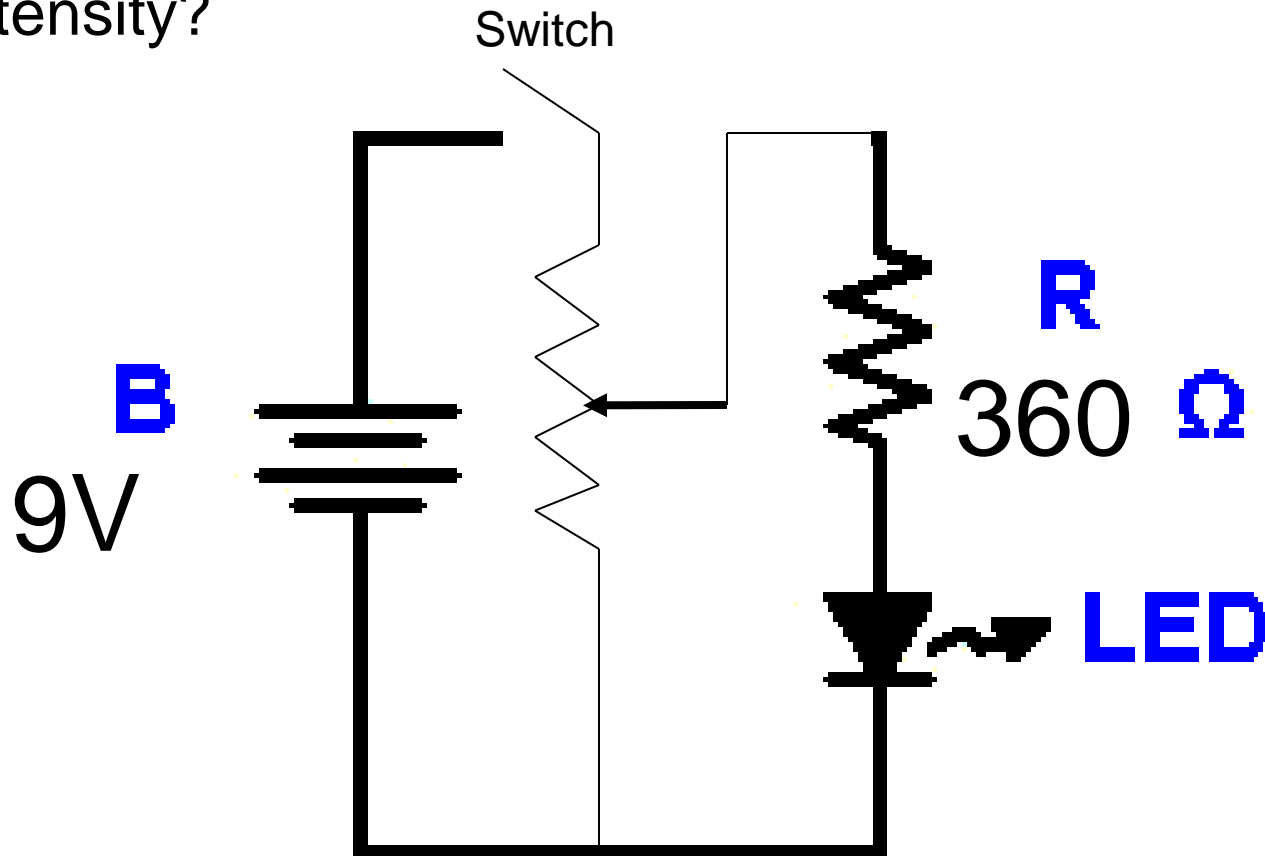


- Potentiometers 1k Ω

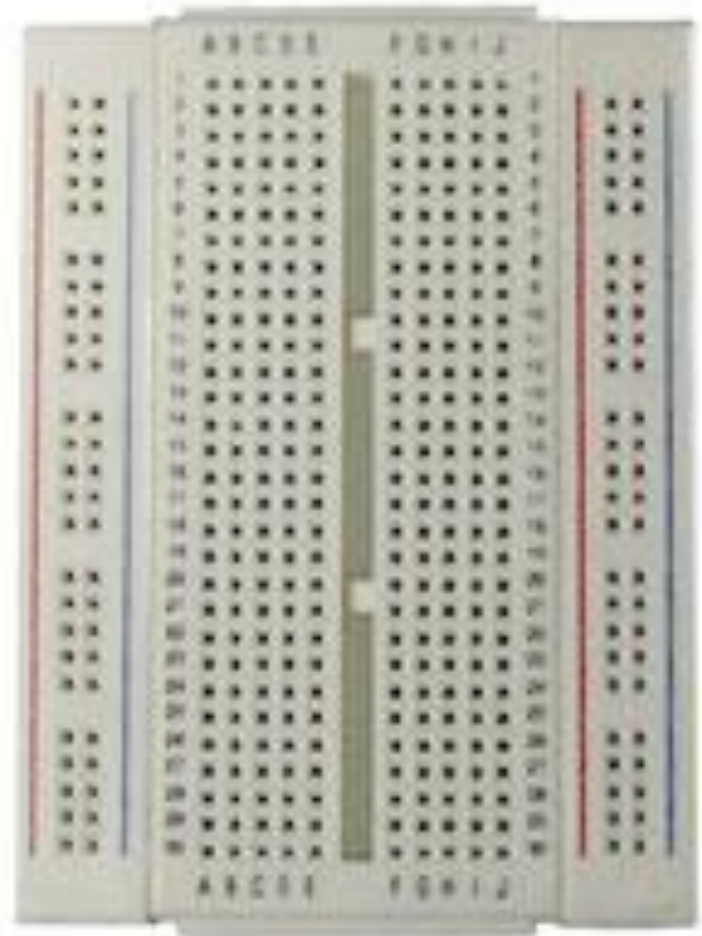


- Light Emitting Diodes LEDs

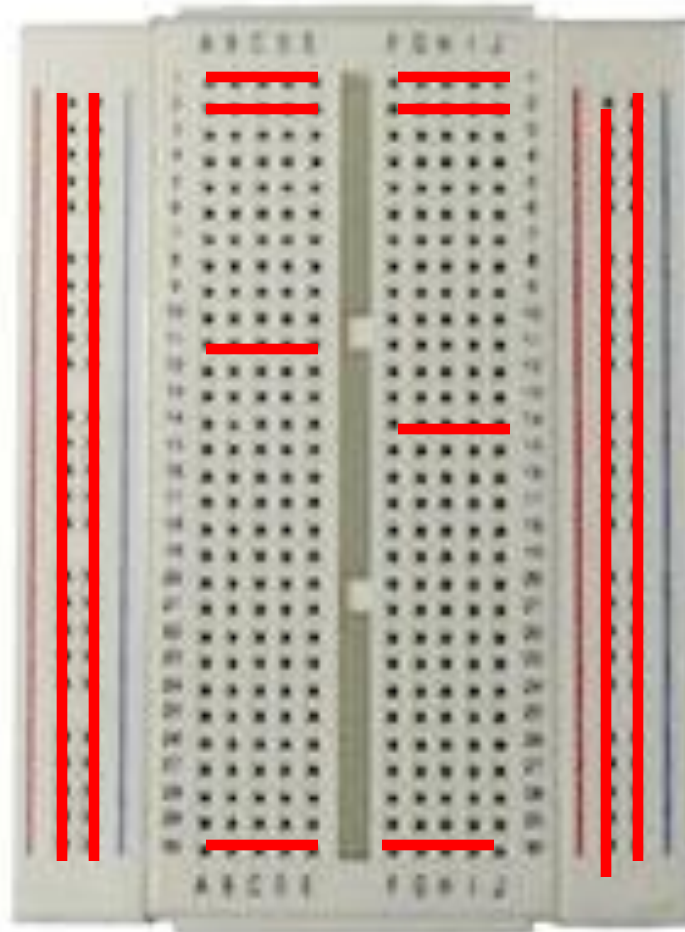
Example circuit. What if we want to control the light intensity?



- SOLDERLESS BREADBOARD
- Model: PB-400 from <http://www.allelectronics.com/>



- Breadboard (design board)
 - connections between the holes are shown in red
 - Use only the specified wire



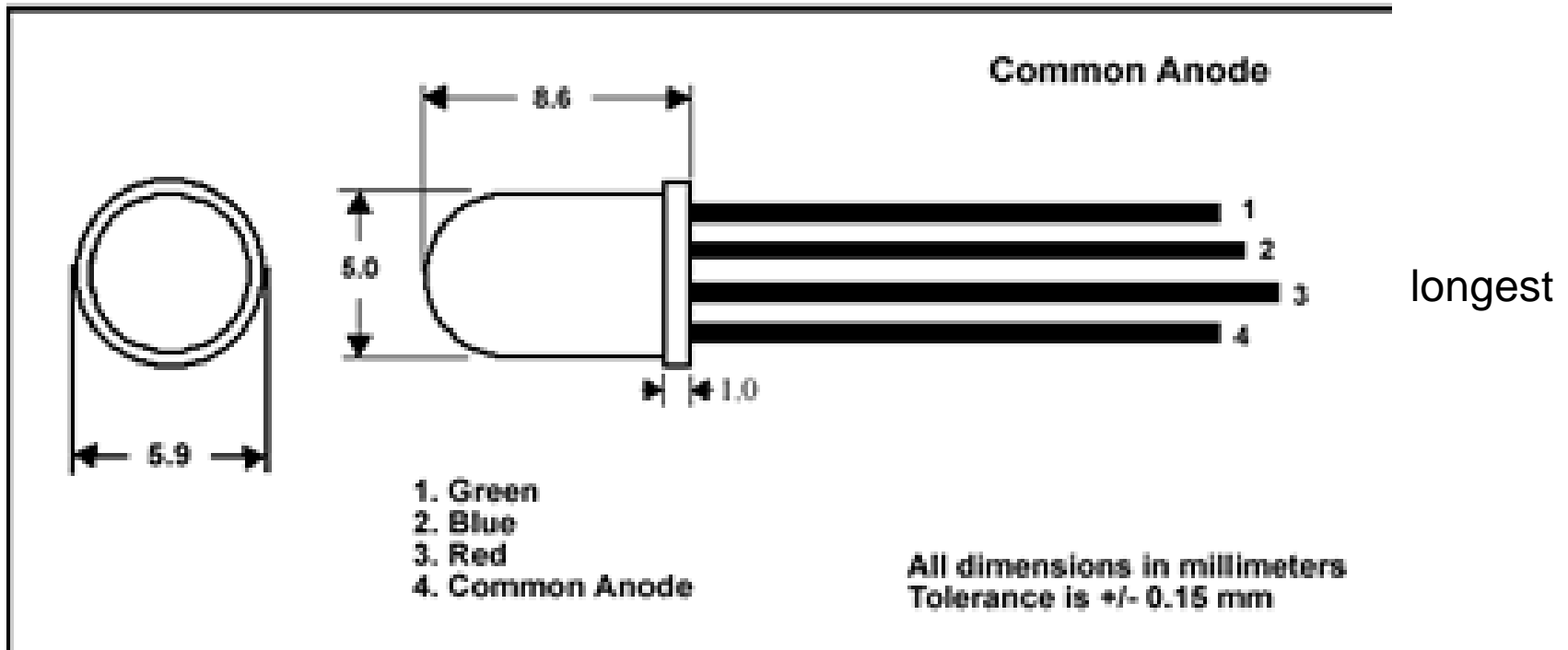
- Tri-color LEDs (RGB)

Model: RL5-RGB-C TriColor LED from

<http://www.superbrightleds.com/>

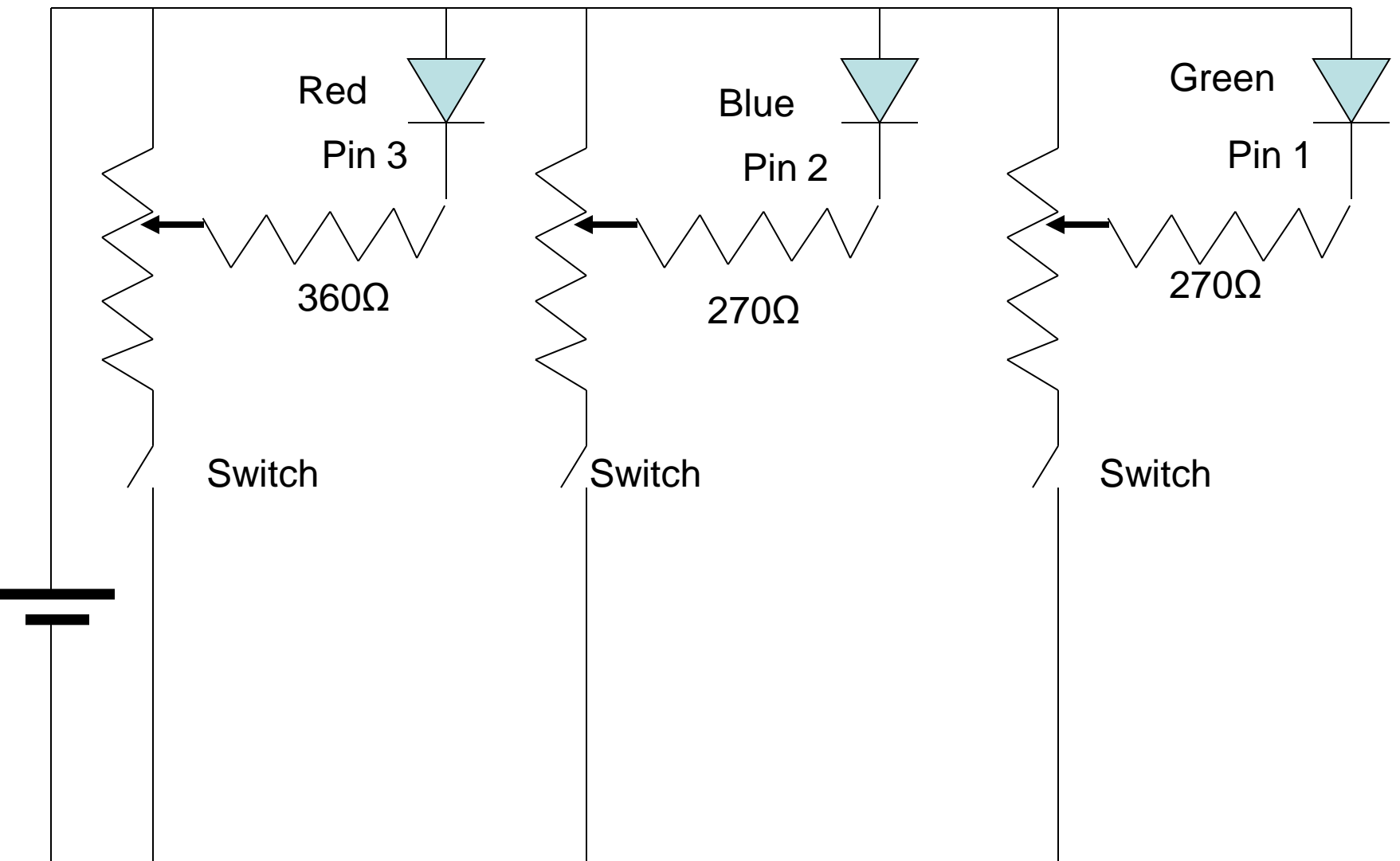
- If we want to mix color we have to control the brightness of each color component of the RGB diode individually:

- Tri-color Light Emitting Diodes LEDs
 - Pin assignment 4 pins



+9V (red)

Pin 4



Red
Pin 3

Blue
Pin 2

Green
Pin 1

360Ω

270Ω

270Ω

Switch

Switch

Switch

0V (black)

Other parts

1. Triple dip switch
2. 270 ohm resistors
3. 360 ohm resistors
4. 9V battery
5. 9V battery snap

