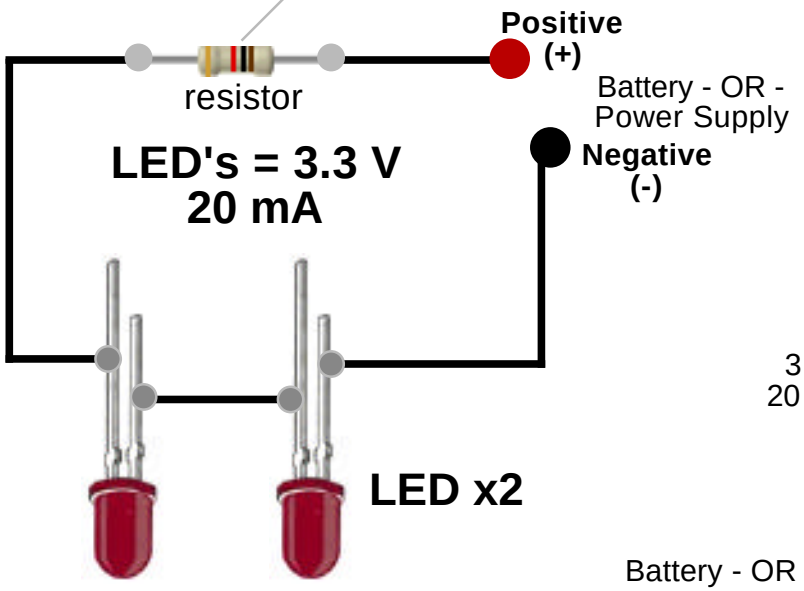
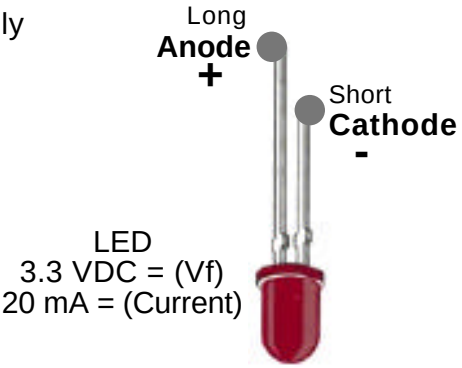
LED's Series / Parallel Setup

LED's in Series

Battery - OR - Power Supply

12 VDC = 470 Ohm Resistor
9V DC = 330 Ohm Resistor
5V DC = Not Enough Voltage

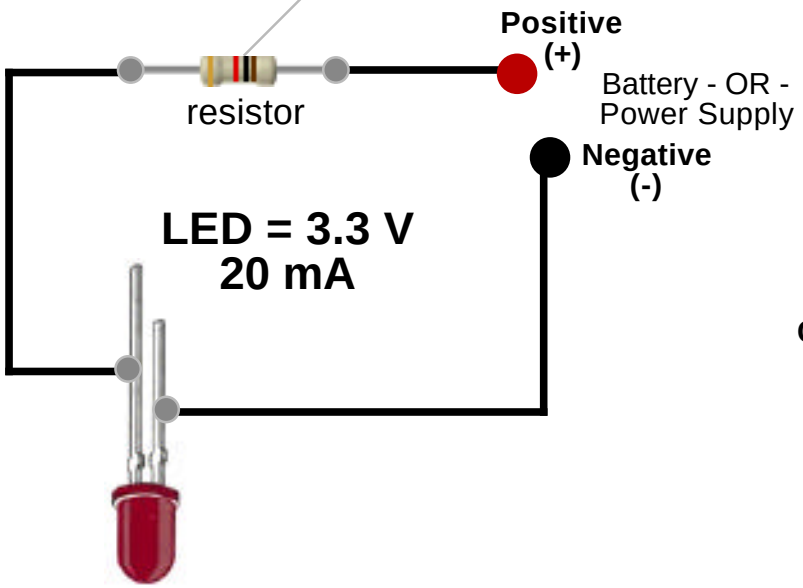


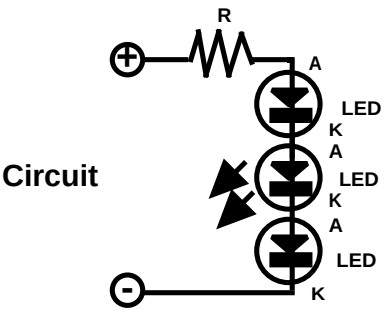


Single LED

Battery - OR - Power Supply

12 VDC = 330 Ohm Resistor
9V DC = 150 Ohm Resistor
5-6 V DC = 100 Ohm Resistor



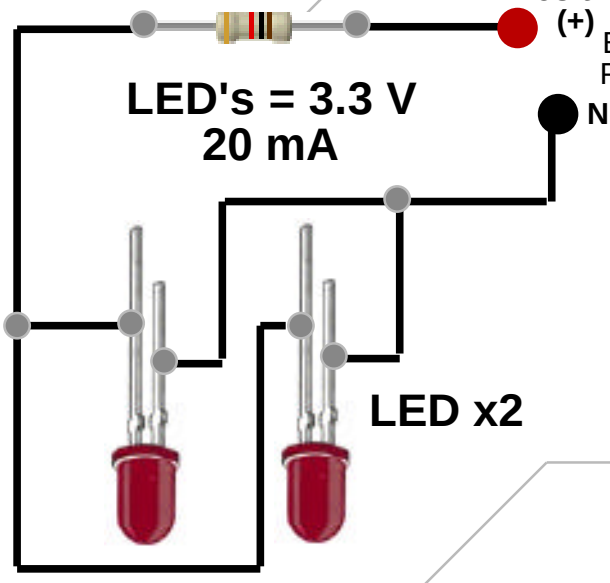


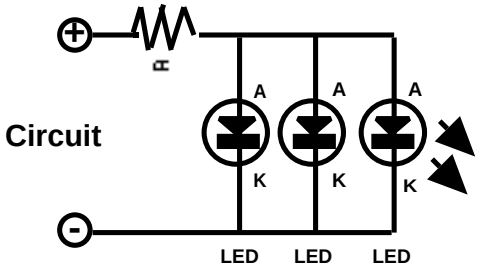
LED's Series / Parallel Setup

LED's in Parallel

Battery - OR - Power Supply

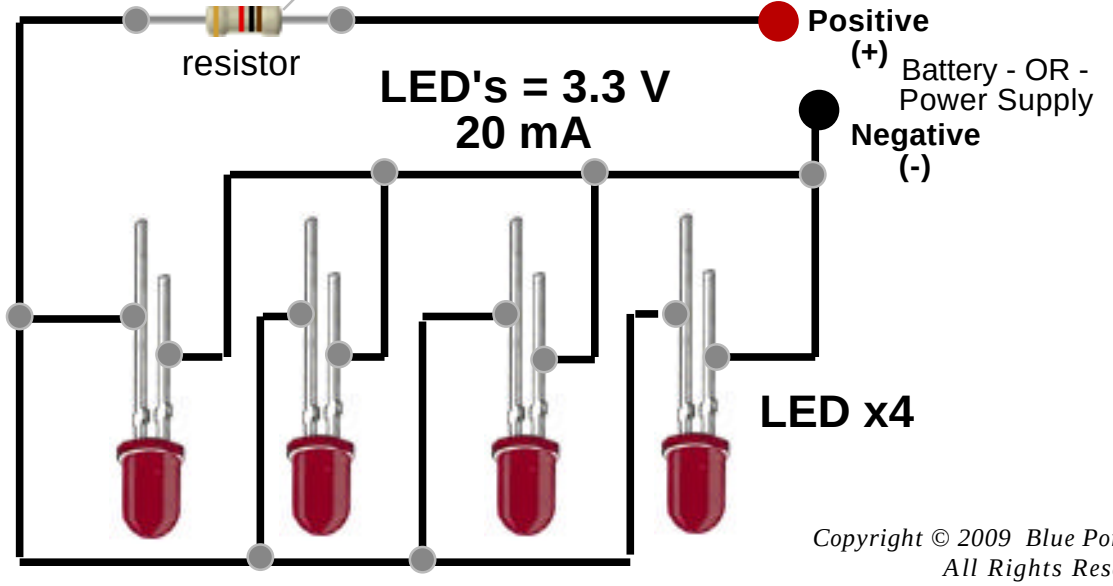
12 VDC = 220 Ohm Resistor
9V DC = 150 Ohm Resistor
6V DC = 68 Ohm Resistor
5V DC = 47 Ohm Resistor





Battery - OR - Power Supply

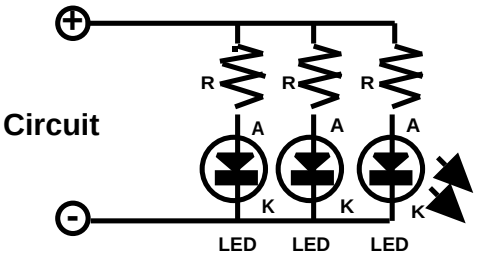
24 VDC = 270 Ohm Resistor
12 VDC = 120 Ohm Resistor
9V DC = 82 Ohm Resistor
6V DC = 68 Ohm Resistor
5V DC = 22 Ohm Resistor
4V DC = 10 Ohm Resistor



LED's Series / Parallel Setup

LED's in Parallel

* Best Setup



Battery - OR - Power Supply

24 VDC = 270 Ohm Resistor
12 VDC = 120 Ohm Resistor
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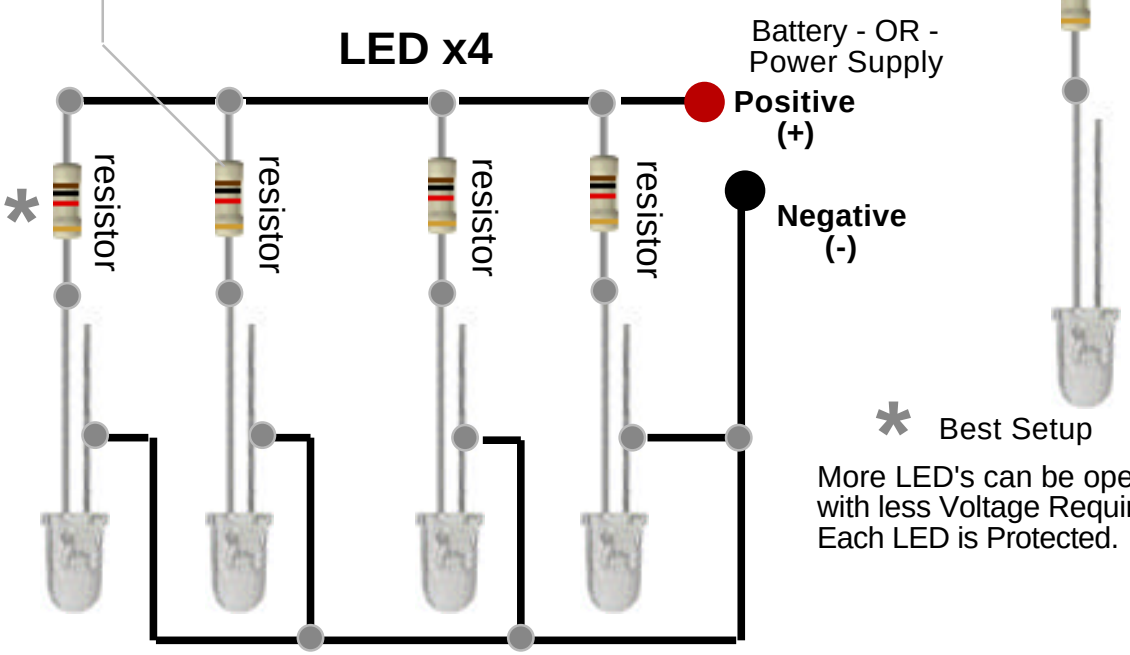


* Best Setup

More LED's can be operated with less Voltage Required. Each LED is Protected.

LED's = 3.3 V
20 mA

Blue Point Engineering Inc.

Instruction I

www.BPEsolutions.com

LED Information

Controller

LED	Voltage Drop Vf	Foward Current mA	LED Intensity Level mcd
White	3.3 Vdc	20 mA	8000 mcd
Blue	3.1 vdc	20 mA	6000 mcd
Green	3.3 vdc	20 mA	4000 mcd
Red	2.25 Vdc	20 mA	8000 mcd
Yellow	1.9 Vdc	20 mA	3000 mcd

Check with LED manufacture to determine actual Vf, mA, values

To calculate resistance. Ohms law is V=IR. Solving for R yields R=V/I
V is voltage in volts, I is current in amps, and R is resistance in Ohms.
V is the difference between the supplied voltage and the required voltage.

Since we're using milliamps instead of amps, we need a multiplication factor of 1000.
Since we're using the difference in supplied voltage and required LED voltage we need to subtract. The formula becomes R = (9 volts - LED voltage required) / (current in milliamps) * 1000
Once you've calculated the resistance, you will use the closest resistor value you can find.

Example: White LED = **3.3** Vf **30**mA Power Supply- **9**Vdc

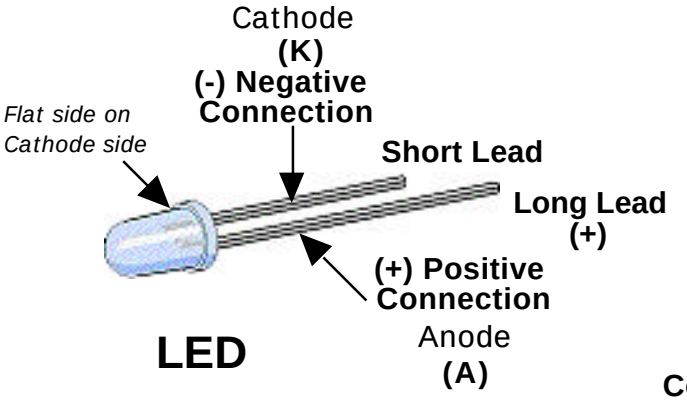
9Vdc - **3.3**Vdc / **20**mA x **1000** = **285**

Resistor Needed = **330** Ohm 1/4 Watt
(Nearest Resistor Value (330) Orange/Orange/Brown/Gold)

Calculated resistance value = 285 Ohms
Next standard 10% resistor = 330 Ohm
Power dissipated in LED = 0.114 Watts
Power dissipated in resistor = 0.19 Watts

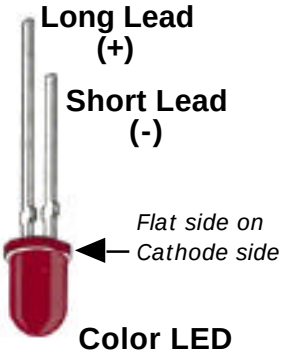
Each LED should have it's own current limiting series resistor if possible.

Resistor



LED

Clear LED
Colors- Red, Green, Blue, Yellow, White



Color LED
Colors- Red, Green, Blue, Yellow, White, Orange