

Name: _____

OHM's Law Worksheet

Ohm's law : $V = IR$

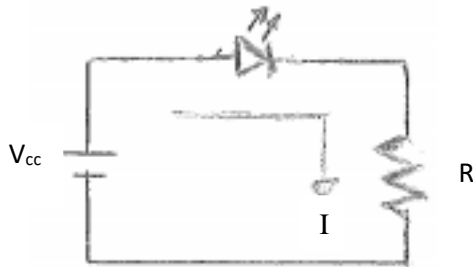
V = voltage, unit volts (V)

I = current, unit Amps (A)

R = resistance, unit Ohms (Ω)

Sample circuit for a single red LED and resistor:

Equation derived in sample calculation:



$$R = \frac{(V_{cc} - V_{LED})}{I}$$

Red LED information:

$$V_r = 2.2v$$

Current draw (I) = 20 mA

$$V_{cc} = 5v$$

$$R = ?$$

Sample Calculation:

I. Find voltage after LED:

$$V = (V_{cc} - V_{LED})$$

$$V = (5v - 2.2v)$$

$$V = 2.8v$$

II. Apply ohm's law to find resistor value:

$$R = \frac{V}{I} = \frac{2.8v}{.02 A}$$

$$R = 140\Omega$$

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Exercise:

1. Given an RGB LED with common cathode (common negative line), calculate the resistor values needed so to not blow up the LED. Treat each anode (positive line) as a single LED. Refer to the datasheet for the voltage and current of the individual RGB lines. Use the type [Typ.] column from the second table on the data sheet for V_{drop} values. Also use a V_{cc} of 5 volts.

2. What is the resistor value given the following color bands:

