

Electronics 9

BREADBOARDING ANSWER BOOKLET

Name

Directions:

Go to the Mark R. Isfeld Maker Website (<http://makerspace.isfeldschool.com/electronics-robotics-9/>) and complete each Beginning Breadboard lab one at a time. Once the breadboarded circuit is working, the wires are **FLAT** and **HORIZONTAL/VERTICAL** answer the questions below that pertain to that lab, then take **BOTH** the breadboard **AND** the booklet to the teacher and have it marked!

Marking:

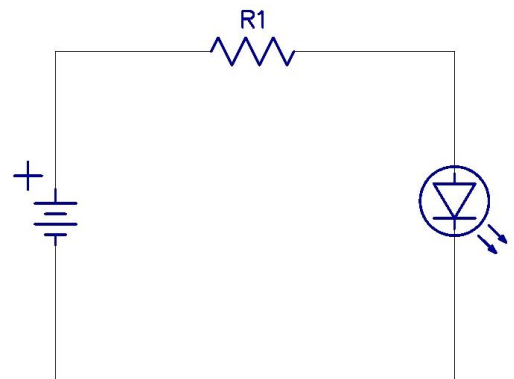
Marks are taken off for;

Messy breadboarding (wires not flat, straight and/or horizontal/vertical)
Incorrect parts placement (wrong order)
Incorrect answers

Lab #1 - How a resistor works

Answers:

- a) The dimmer the LED, the _____ the value of the resistor.
- b) The brighter the LED, the _____ the value of the resistor.
- c) The lower the voltage, the _____ the LED.
- d) The brighter the LED, the _____ the current flow.

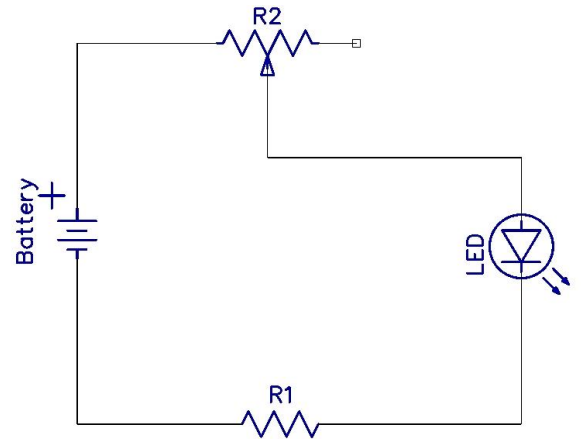


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Lab #2 - Potentiometer

Answers

- A potentiometer is a variable _____.
- By adjusting the potentiometer from one end to another, the brightness of the LED _____.
- When the potentiometer is at 0 ohms, the LED is _____.
- When the potentiometer is at 100K ohms, the LED is _____.
- As you adjust the potentiometer from 0 ohms to 100K ohms, the _____ changes causing the LED to get _____.

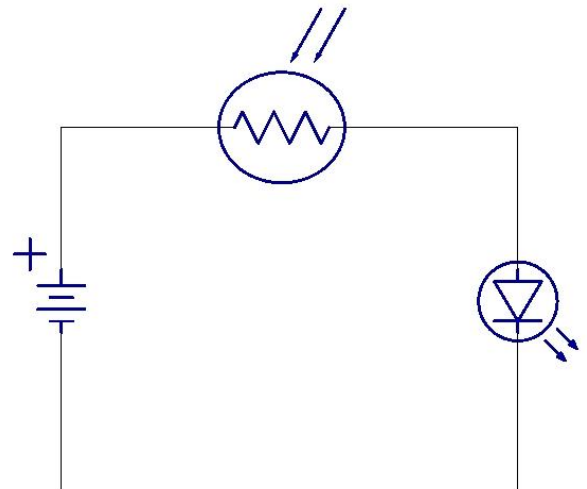


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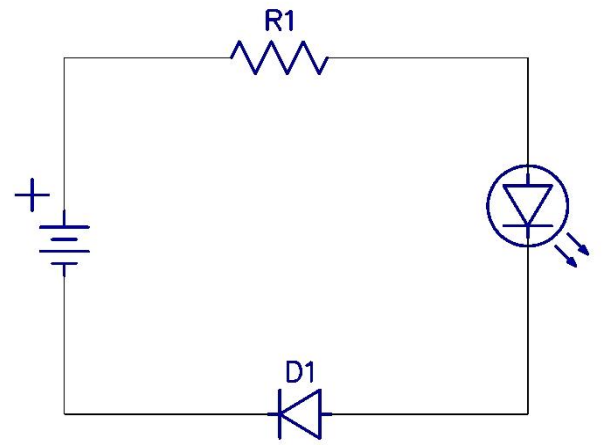
Lab #3 - Photocell

Answers

- When you put your hand over the Photocell the LED gets _____.
- The more light that strikes the Photocell, the _____ the LED gets.
- The less light that strikes the Photocell, the _____ the LED gets.
- The less light that strikes the Photocell means the resistance of the Photocell _____ which causes the LED to get _____.
- The more light that strikes the Photocell means that the resistance in the circuit _____ which causes the LED to get _____.



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Lab #4 - Diode

Answers

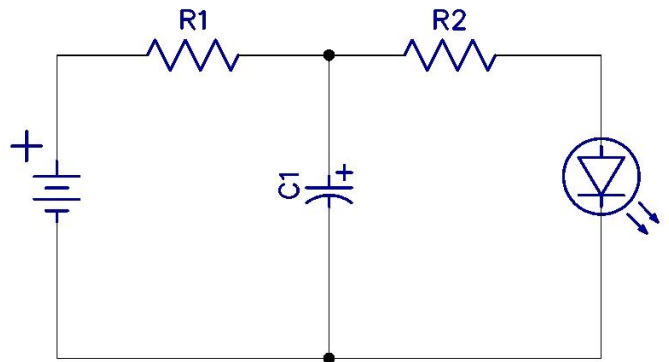
- a) A diode allows current to flow through it in only _____ direction.
- b) A diode has two ends, the _____ and the _____.
- c) When the _____ is connected to negative, the LED will light up.
- d) If the _____ is connected to negative, the LED will NOT light up.

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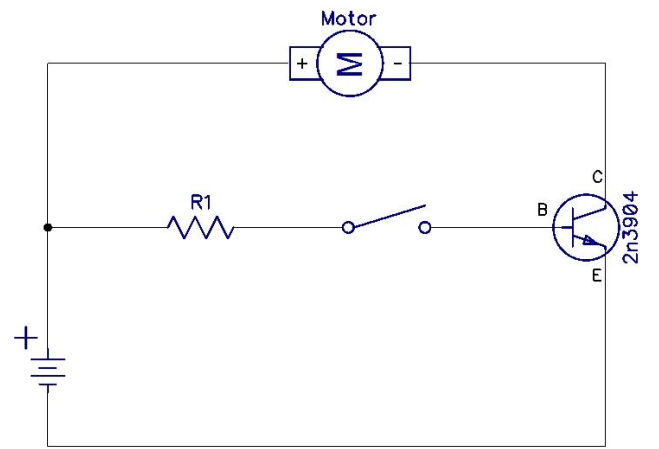
Lab #5 - Capacitors

Answers

- a) A capacitor stores _____.
- b) Once you disconnect the power to the circuit, the LED will _____ for a while because of the stored electrical energy in the capacitor.
- c) The greater the value of the capacitor, the _____ the LED will stay on.
- d) When current flows through the circuit, what is happening to the capacitor?



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Lab #6 - Transistors

Answers

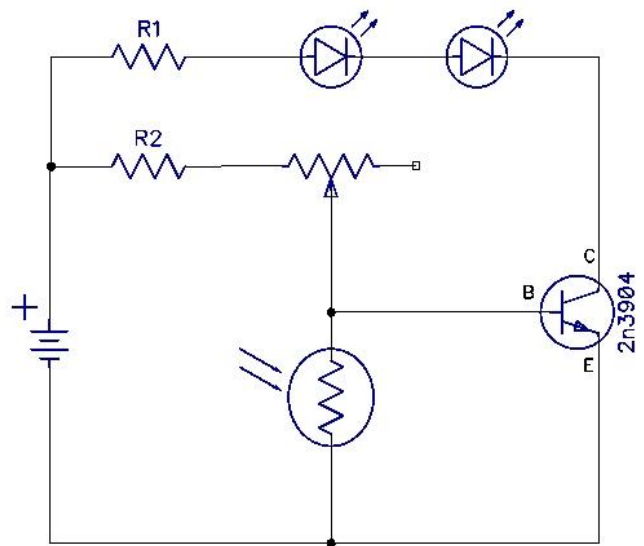
- a) A transistor has three legs, the _____, _____ and _____
- b) A transistor works as a _____ amplifier.
- c) The transistor uses a small _____ current to control a larger _____ current.
- d) The larger the value of R1, the _____ the speed of the motor

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Lab #7 – Automatic Nightlight

Answers

- a) When the light hits the photocell the LED's are _____.
- b) The less light on the photocell, the _____ the LED's are.
- c) The LED's are connected to the _____ of the transistor.
- d) The potentiometer is used to adjust the _____ of the device.

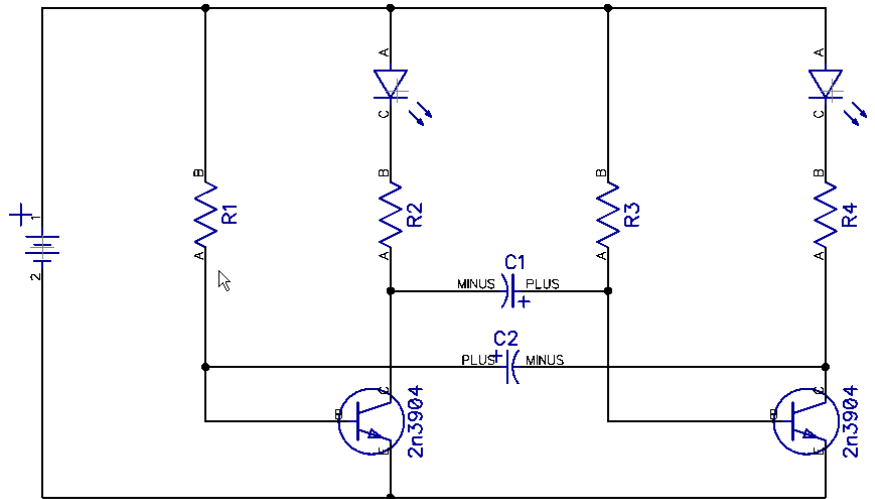


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Lab #8 – Flashing Lights

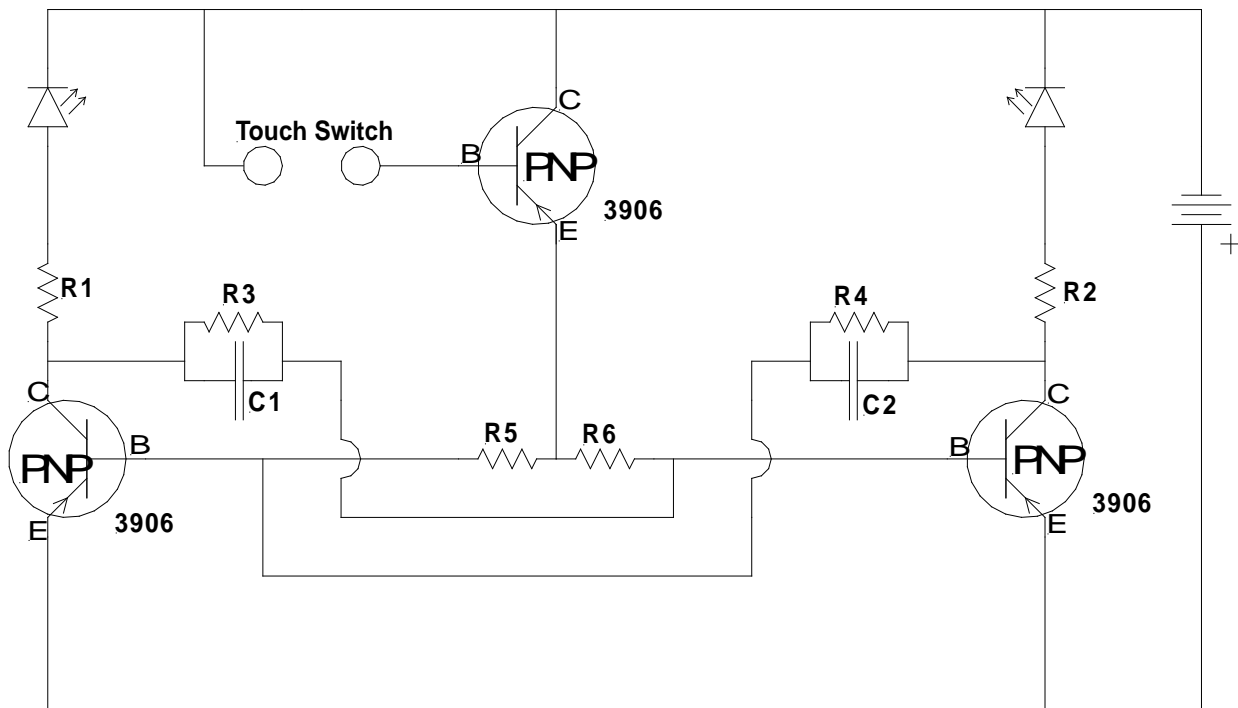
Answers

- a) When a 100uf capacitor is substituted for the 10uf capacitor, the frequency the LEDs flash will _____.
- b) If you substitute the 470 resistors with 6.8K resistors the brightness of the LEDs would _____.
- c) The cathodes of the LEDs are connected to the _____.
- d) The negative leads of the capacitors are connected to the _____ and the _____.



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BONUS Lab – Two LED Decision Maker



Mark /5