

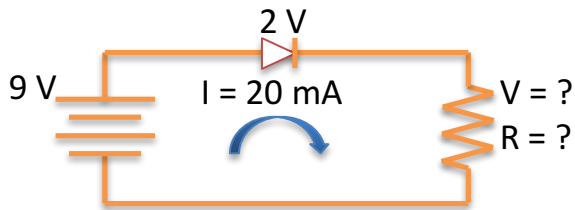
Engineering Principles
Electrical Engineering Unit
Worksheet 4.2.1

Name _____

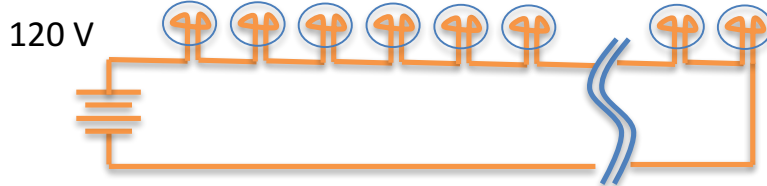
Date _____ Period _____

1. A current of 60 mA is usually fatal to humans.
 - 1.1. What resistance as measured between your left and right hands will result in this current if you grab both terminals of a 12 Volt car battery?
 - 1.2. What if the voltage were 120 Volts?
 - 1.3. At 10 mA muscles are paralyzed making it so you cannot let go of an electric wire. What resistance does this happen at in a 120 Volt circuit?

2. A light-emitting diode (LED) requires 20 mA to run at full brightness. The voltage drop across the diode is 2.0 Volts. It is connected to a 9 Volt battery. What resistor should be used for this circuit?



3. Christmas tree bulbs are often connected in series, as shown.
 - 3.1. What is the voltage drop across each bulb if there are 50 bulbs on the string?



- 3.2. Why do they all go out if one burns out?
4. A light bulb is rated for 60 Watts at 120 Volts.
 - 4.1. What is the current in the bulb?
 - 4.2. What is its resistance?
5. The room mothers for the Engineering class decide to make us waffles as a treat for our class. They each bring their waffle irons, which are rated at 1000 Watts at 120 V.
 - 5.1. How much current does one waffle iron require?
 - 5.2. If there are 6 waffle irons, how many 20 Amp circuits will we need in order to not blow any circuit breakers?

Developed through a partnership between the University of Utah College of Engineering and Granite School District