

Name: _____

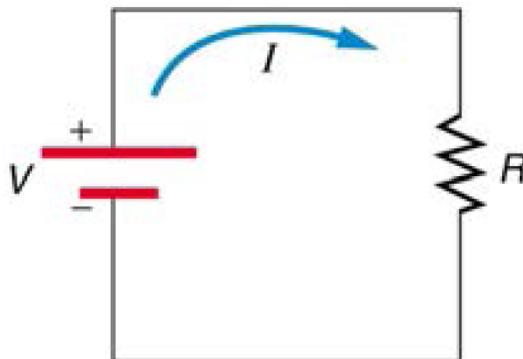
Name: _____

Notes - 20.2 Ohm's Law: Resistance and Simple Circuits

1. What drives current? We can think of various devices—such as batteries, generators, wall outlets, and so on—which are necessary to maintain a current. All such devices create a _____ difference and are loosely referred to as voltage sources. When a voltage source is connected to a conductor, it applies a potential difference V that creates an _____, which in turn exerts an _____ on the charges, causing a _____ to flow.
2. The current that flows through most substances is directly proportional to the _____ applied to it. This is known as _____ Law.



3. Write the equation for Ohm's Law:
4. The units for resistance are _____.
- 5.



6. What is the resistance of an automobile headlight through which 2.50 A flows when 12.0 V is applied to it?
 7. Resistances range over many orders of magnitude. Some ceramic insulators, such as those used to support power lines, have resistances of $10^{12} \Omega$ or more. A dry person may have a hand-to-foot resistance of $10^5 \Omega$, whereas the resistance of the human heart is about $10^3 \Omega$. A meter-long piece of large-diameter copper wire may have a resistance of _____, and superconductors have _____ resistance at all.
-

Practice - 20.2 Ohm's Law: Resistance and Simple Circuits

2. What current flows through the bulb of a 3.00-V flashlight when its hot resistance is 3.60Ω ?
3. Calculate the effective resistance of a pocket calculator that has a 1.35-V battery and through which 0.200 mA flows.
4. What is the effective resistance of a car's starter motor when 150 A flows through it as the car battery applies 11.0 V to the motor?
5. How many volts are supplied to operate an indicator light on a DVD player that has a resistance of 140Ω , given that 25.0 mA passes through it?
7. A power transmission line is hung from metal towers with glass insulators having a resistance of $1.00 \times 10^9 \Omega$. What current flows through the insulator if the voltage is 200 kV? (Some high-voltage lines are DC.)

Solutions:

2. 0.833 A 3. $6.75 \times 10^3 \Omega$ 4. $7.33 \times 10^{-2} \Omega$ 5. 3.50 V 7. $2.00 \times 10^{-4} \text{ A}$