-- Electric Current -

1. Why do charges flow through a conductor?
2. How long will the charges continue to flow?

3. What is electric current?
4. What is electric current measured in?
5. How many electrons pass a given point with a current of 5 amperes?
6. If charges are moving through the wire, why doesn't the wire have a net electric charge?

7. What does it mean to say that "charges flow **through** a circuit and voltage is applied **across** a circuit"? Why is it wrong to say it the other way?

8. The amount of charge that flows in a circuit depends on the _____.
9. What four things determine the resistance of a wire?
10. How does length of wire effect resistance?
11. How does thickness of the wire effect resistance?
12. What is resistance measured in?

13. What is Ohm's Law?

14. What causes electric shock in the human body?
15. Why are birds sitting on electrical wires not electrocuted?
16. What is the purpose of the 3rd prong on electrical plugs?

17. What is direct current?
18. What produces DC current?
19. What is alternating current and what produces AC current?
20. What is the frequency of AC current and the voltage used for standard wiring in the US?
21. What is the primary use of electric current, whether DC or AC?

22. What is the purpose of diodes? How do they work?

23. What is the source of electrons in a circuit?
24. What does that energy that electric companies sell us do to the current?

25. What is electric power? What are the units for power?
26. What is a kilowatt-hour?

1. What is the current if 29 coulombs of charge pass through a point in a wire in 4.0 seconds?

2. A charge of 225 C moves through a light bulb when the current is 539 mA. How long has the bulb been on?

3. A DC circuit has a 6.8 A of current flowing through it. How many electrons pass by the point in each second?

4. Mr. Hinsley's truck has a starter motor that draws 55.0 A. How much charge flows if the motor runs for 0.75 seconds?

5. Mr. Robbins has an electric toque to keep his head warm. His electric toque has a 95.0 ohm heating element that is powered by a 9.0 V battery. How much current warms his head?

6. How much current passes through a person whose resistance is 100000. ohms and to whom 120.0 V is applied? What if the person is soaking wet and their resistance is lowered to 1000. Ohms?

7. What is the resistance of a clothes iron that draws 8.0 A of current when connected to 120.0 V?

8. How much energy is expended in lighting a 50.0 W bulb for 45 minutes?

9. An electric motor is connected to 120.0 V and draws 15.0 A of current. What power is being consumed? How much energy does the motor use in 9.0 hours of usage?

10. What current flows in a 75 W bulb in a 120.0 V circuit? What is the resistance of the filament? If the power utility rate is 13 cents per kilowatt hour, how much would it cost to leave the bulb on continuously for a week?

11. Ms. Harper has a bicycle that is hooked up to a generator. She makes her son, Ben, pedal to power her hair dryer. He can generate 125 W. How long does Ben have to pedal in order to provide enough energy for Ms. Harper to operate her 1550 W hair dryer for 12 minutes?

12. Some motorcycle vests have an electric heating element that plugs into the motorcycle battery. If the motorcycle battery has a voltage of 12 V and the vest is rated at 36 W, what is the current in the vest? What is the resistance?

13. The current in an electric motor is 5.0 A when a voltage of 36 V is applied. How much power is dissipated in the motor? What is the resistance of the motor? How many joules of energy pass through the motor in 20 seconds?

14. You have an electric bicycle that with you on it, has a mass of 100.0 kg. You want to accelerate the bike from rest to 8.0 m/s. How much work must the motor do to accelerate the bike? If the bike has a 24 V battery, how much charge must pass through the motor? (Assume the motor is 100% efficient.)