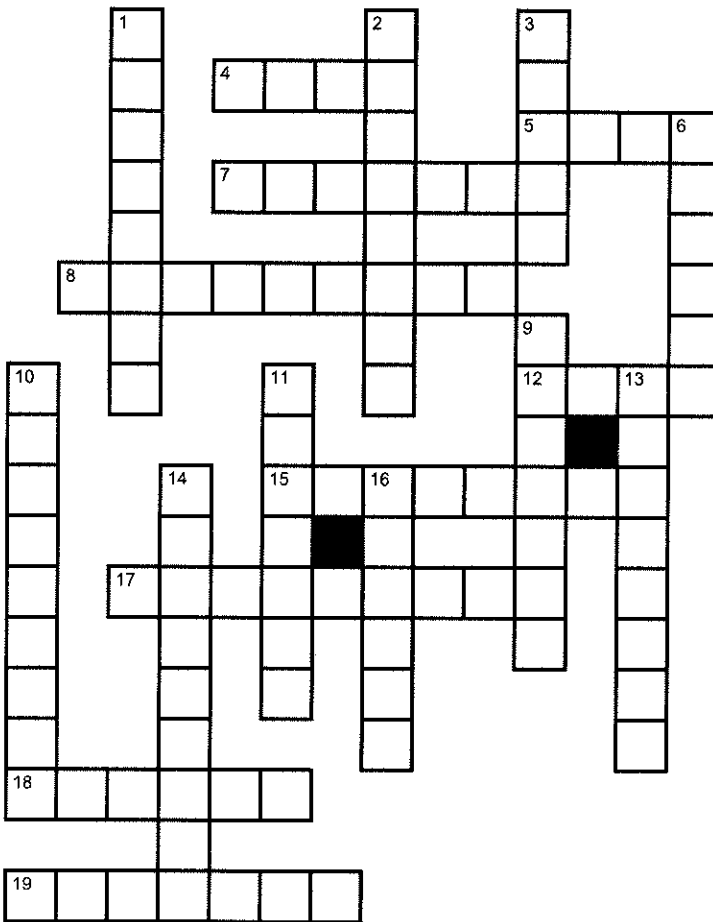


Electric Circuits Crossword



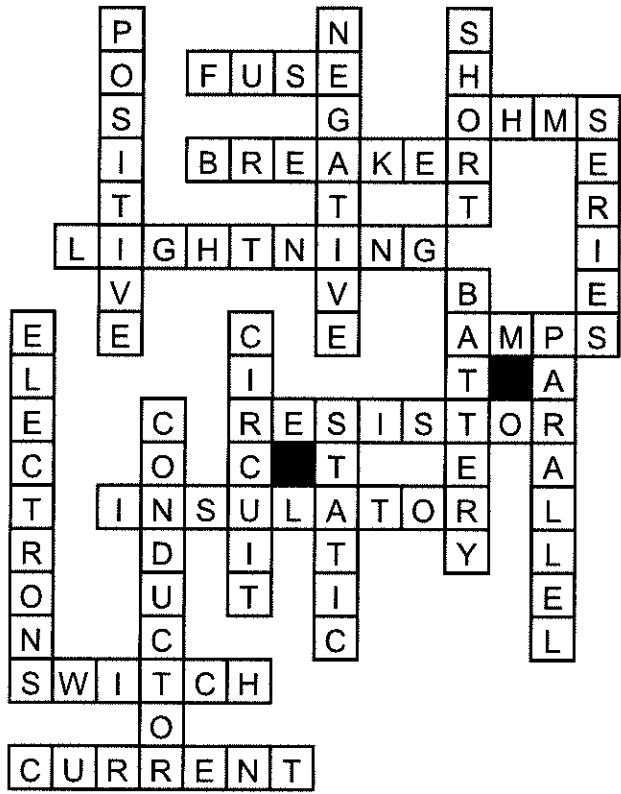
Across

- 4 A safety device that break a circuit when too much current is flowing. (4) *fuse*
- 5 The unit that resistance is measured in. (4) *Ohms Ω*
- 7 A switch that open a circuit when too much current is flowing. (7) *breaker*
- 8 An electric discharge from the sky to the ground during a storm. (9) *lightning*
- 12 The unit that current is measured in (for short). (4) *amps*
- 15 A device that resists the flow of electricity in a circuit. (8) *resistor*
- 17 A material that doesn't conduct electricity well. (9) *insulator*
- 18 A device that will open or close a circuit. (6) *Switch*
- 19 The flow of electrons through a material is called electric current. (7)

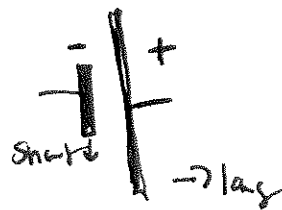
Down

- 1 The charge on a proton. (8) *positive*
- 2 The charge on an electron. (8) *negative*
- 3 A type of circuit where current by passes most resistance and large, dangerous currents flow. (5) *short*
- 6 A circuit with only one path through which electrons flow. (6) *series*
- 9 A voltage supply used in flashlights and many toys. (7) *battery*
- 10 Electricity is the movement of electrons through a conductor. (9)
- 11 A path through which electric current flows. (7) *circuit*
- 13 A circuit with more than one path through which electrons can flow. (8) *parallel*
- 14 A material that conducts electricity will. (9) *conductor*
- 16 Kind of electricity resulting from a build up of charged particles. (6) *Static electricity*





Battery



Charge problems

1 Complete the following sentences using words from the list below.

equal negative opposite positive zero

- a) A proton has charge. (+)
- b) A neutron has charge. zero
- c) An electron has charge. (-)
- d) A proton and an electron have ..equal and ...opposite charge. *

2 Complete the following sentences using words from the list below.

electron(s) ion(s) neutron(s) nucleus (nuclei) proton(s)

- * a) Every atom contains a ..~~protons~~^{nucleus}... which is positively charged.
- e) The nucleus of an atom is composed of ...~~electrons~~^{protons}... and~~neutrons~~^{neutrons}
- f) The ~~electrons~~.. in an atom move about in the space surrounding the nucleus.
- g) An uncharged atom has equal numbers of ...~~protons~~ and ...~~electrons~~
- h) A charged atom is called an ...~~ion~~.....
- i) An uncharged atom becomes charged as a result of transferring ~~electrons~~ to or from it.

3 In an experiment, an insulator becomes negatively charged when it is rubbed with a dry cloth.

- a) In terms of electron transfer, explain why the insulator becomes negatively charged.

electrons are added

j) Explain why the insulator does not lose its charge. → discuss

↓
does NOT allow e^- to
flow easily

4 A positively charged object, X, and another charged object, Y, repel each other.

- a) What is the type of charge on Y?

(+) (like charges repel)

- k) Y is removed and a negatively charged object, Z, is brought near to X. State whether X and Z attract or repel each other.

yes, opposite charges attract.

Review Guide

Name: _____

** I will ask examples of conductors and insulators*

Multiple Choices

- B Of the following materials which would be the best choice for insulating copper wire?
 a. Aluminum foil
 b. Salt water
 c. glass
 d. silicon
- _____ If you have an electrical circuit made of copper, which material below would make a good heating element?
 a. Pure water
 b. Glass
 c. silver
 d. iron
- B Which of the following is not a voltage source?
 a. Battery
 b. Gasoline
 c. solar cell
 d. generator
- D A static discharge differs from an electric current in that a static discharge _____.
 a. Involves the movement of ions as well as electrons
 b. Is a flow of electrons
 c. Lasts for only a fraction of a second
 d. Results because a force is exerted on the electrons
- C A material through which electrons **DO NOT** easily flow is a (n) _____.
 a. Conductor
 b. Fuse
 c. insulator
 d. transformer
- _____ If the leaves of an electroscope spread apart, it indicates that _____.
 e. The leaves of the electroscope are neutral
 f. The leaves of the electroscope have received a charge
 g. No charge is moving through the electroscope
 h. There is static electricity in the electroscope
- D Lighting is _____.
 a. A build up of neutrons
 b. Harmless
 c. a high-voltage electric current
 d. a large discharge of static electricity
- D In the equation for Ohm's law, what does "I" represent?
 a. impedance
 b. resistance
 c. impulse
 d. current

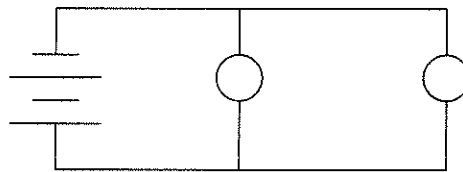
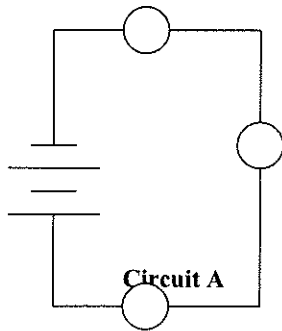
do not ask

Conductors
 most metals
 - copper
 - Aluminum
 - Silver
 - gold.

Insulators
 - Rubber
 - Plastic
 - glass
 - Wood
 - air

Completion

Figure 7-1



Circuit A

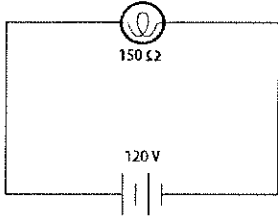
Circuit B

- In Figure 7-1, circuit A is wired in series.
- In Figure 7-1, circuit B is wired in parallel.
- In Figure 7-1, circuit B represents the way homes are usually wired so that when one part of the circuit is interrupted the entire circuit is not broken.
- In Figure 7-1, circuit A is the type of circuit that causes an entire string of decorative lights to go out when one of the bulbs burns out.

Completion

Measurement	Unit	Symbol
13. Resistance	Ohm	Ω
14. Electrical power	Watts	P
15. Voltage difference	Volts	V
16. Current	Amperes	I

40. What is the current flowing through this circuit?



150 Ω
120 V

$$I = \frac{V}{R}$$

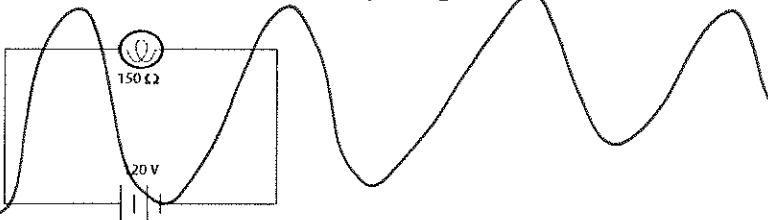
$$\begin{array}{r} 415 \\ \times 8 \\ \hline 120 \end{array}$$

$$I = \frac{120V}{150\Omega}$$

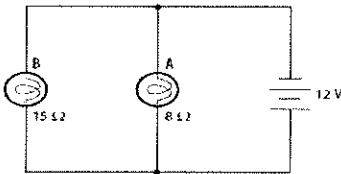
$$I = 0.8 \text{ amps}$$

$$\begin{array}{r} 8 \\ 150 \overline{) 1200} \\ \underline{1200} \\ 0 \end{array}$$

41. What is the power consumed by the light bulb in this circuit?

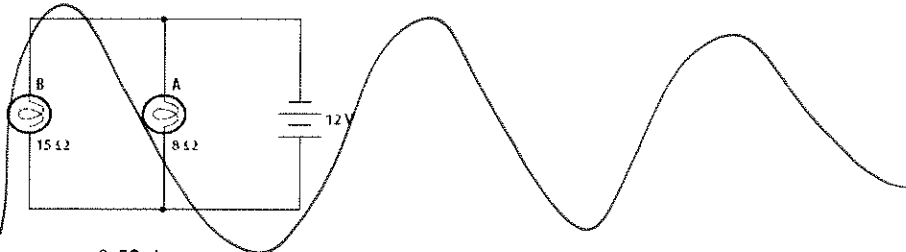


42. The illustration shows a C.



- a. broken circuit
- b. open circuit
- c. parallel circuit
- d. series circuit

43. The total current flow in this circuit is _____.



- a. 0.52 A
- b. 0.96 A
- c. A
- d. 1.9 A

Part I. Solve all of the following problems using Ohm's Law and your Power Equation

23. A circuit has a resistance of 5Ω . What voltage difference will cause a current of 2.5 A to flow in the circuit?

Formula	Set Up & Solve	Answer
$V = IR$ $V = IR$ $V = (5\Omega)(2.5\text{A})$	$\begin{array}{r} 2.5 \\ \times 5 \\ \hline 12.5 \\ \text{V} \end{array}$	12.5 volts

24. The circuit in an appliance is 8 A and the voltage difference is 120 V . How much power is being supplied to the appliance?

Formula	Set Up & Solve	Answer

25. What is the current into a microwave oven that requires 500 W of power if the voltage difference is 120 V ?

Formula	Set Up & Solve	Answer

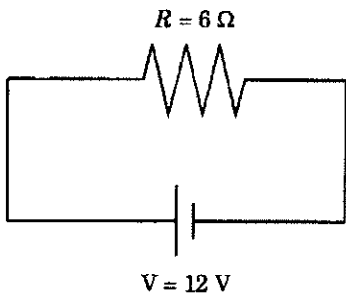
26. What is the voltage in a dryer if the dryer uses 4200 W of power when plugged into a 22.0-A wall outlet?

Formula	Set Up & Solve	Answer

27. What is the current in a toaster if the toaster uses 7500 W of power when plugged into a 110-V wall outlet?

Formula	Set Up & Solve	Answer

28. This diagram represents a closed circuit. How much current flows through this circuit?



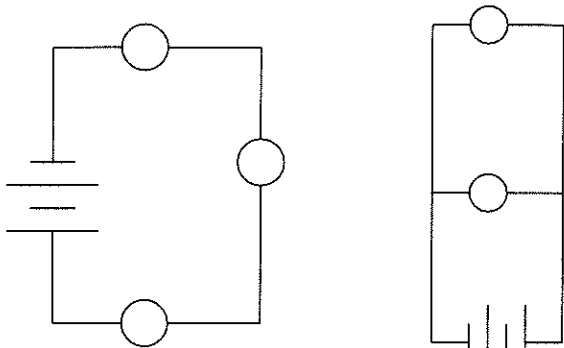
$$I = \frac{V}{R}$$

$$I = \frac{12\text{ V}}{6\Omega}$$

$I = 2\text{ amps}$

Part II. Answer the following questions about Circuits

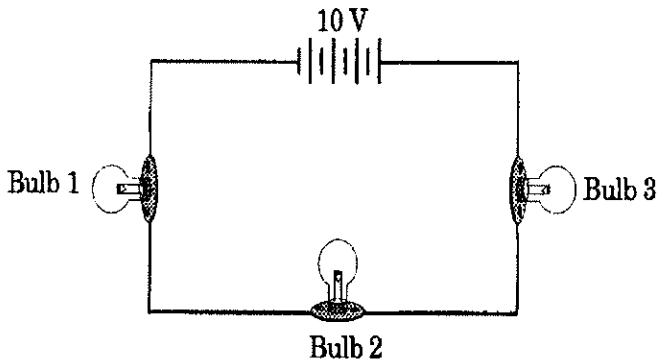
38. A path that allows only one route for an electric current is called a series



Circuit A

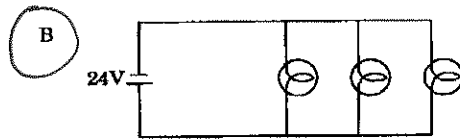
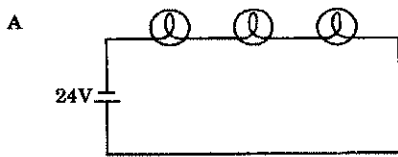
Circuit B

39. Circuit A is wired in series.
 40. Circuit B is wired in parallel.
 41. Circuit B represents the way homes are usually wired so that when one part of the circuit is interrupted the entire circuit is not broken.
 42. Circuit A is the type of circuit that causes an entire string of decorative lights to go out when one of the bulbs burns out.
 43. This diagram represents a closed circuit with three light bulbs and a 10 Volt battery. If bulb #3 burns out in the circuit, what will most likely happen?

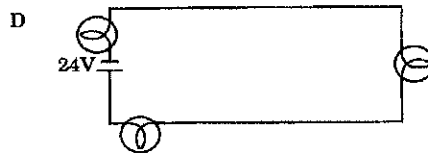
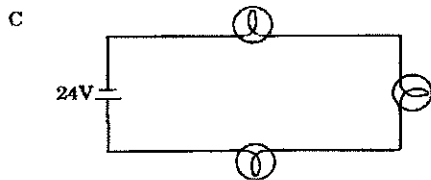


doesn't work

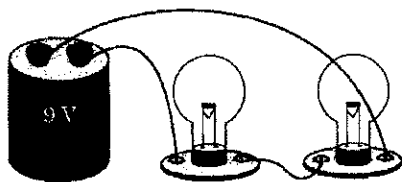
44. Which is the correct diagram for a parallel circuit with three light bulbs powered by a 24-V battery?



B

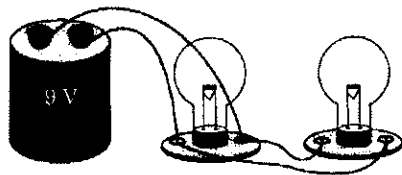


The diagrams represent two complete circuits. A 9-V battery is connected to two light bulbs as shown.



Circuit A

Series dimmer



Circuit B

Parallel brighter.

45. Which statement best describes what will happen?

- a. the light from circuit B will be dimmer because each light bulb must share its current with the other light bulb
- b. the light from circuit A will be brighter because each light bulb adds its current to the other light bulb
- c. the light from circuit B will be brighter because each light bulb has a direct path to both poles of the battery
- d. The light from Circuit A will be dimmer because each light bulb has a direct path to both poles of the battery.

47. Which best describes a circuit in series?

- a. electrons have only one path at all times
- b. current values are different at various points in the circuit.
- c. electrons may take several paths.
- d. different parts are on separate branches.

48. Which statement is true about parallel circuits?

- a. they cease to function when one part of the circuit is disconnected.
- b. they are usually called open circuits.
- c. they provide one path through which current can flow.
- d. they contain separate branches through which current can flow

49. Which of the following **DOES NOT** provide a voltage or potential difference in a circuit?

- a. wet cell
- b. electrical outlet
- c. wires
- d. dry cell or battery

50. Resistance in wires causes electrical energy to be converted into which form of energy?

- a. chemical energy
- b. nuclear energy
- d. thermal energy
- c. sound

51. One source of constant electric current is a . **B**

- a. transformer
- b. dry cell (battery)
- c. switch
- d. coulomb

52. Which of the following is a device designed to open an overloaded circuit and prevent overheating . a circuit breaker

- a. resistor
- b. magnet
- d. transformer

53. Current that does **not** reverse direction is called .

- a. alternating current
- b. a fused current
- c. circuit current
- d. direct current

54. Currents that reverse direction in a regular pattern is called .

- a. alternating current
- b. direct current
- c. circuit current
- d. magnetic current