Using the web sites provided, answer the following questions. This web quest should broaden your knowledge and understanding of the basics of electricity and series and parallel circuits.

Historical Background

http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/electricityintro.htm

- 1. a. The first recorded references to static electricity and lightning were made over 2,500 years ago by ______.
 - b. Describe the first experiment with static electricity.
- 2. In 1600, Dr. William Gilbert coined the term "*electrica*," a word that gave rise to our word electricity. What does this term "*electrica*" describe?

Basics of Electricity

http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/valenceshell.htm

3. What is the difference between a conductor and an insulator in terms of electrons?

http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/conductorsinsulators.htm

- 4. a. Name four metallic conductors.
 - b. Which metallic conductor of the four is the best conductor?
- 5. Name five common materials that are insulators.

http	://www.ndt-ed.org	g/EducationResources/Hi	ghSchool/Electricity	y/electricalcurrent.htm

- 6. The movement of electrons between atoms is called an ______.
- 7. The energy produced as a result of this flow of electrons from atom to atom is called ______.

http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/amperage.htm 8. What unit measures the flow of electrons?

9. How is an amp defined?

11. Name the instrument used to measure the amount of amps flowing in an electrical circuit.

http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/voltage.htm

- 12. What is the force that causes electrons to move in an electrical circuit?
- 13. Name 3 sources of EMF. 14. What happens to the electron flow within a conductor if the EMF or voltage source is removed? 15. What unit used to measure EMF? http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/resistance.htm 17 What is resistance? 18. In what units is resistance measured? 20. State one example when resistance is desirable. 21. State one example when resistance is undesirable. 22. What components are placed in an electrical circuit to control the amount of resistance in circuit? http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/ohmslaw.htm 23. In 1827, George Ohm developed a mathematical relationship between voltage, current, and resistance called ______. 24. a. State Ohm's Law in a mathematical equation. b. What do the following variables represent? I = _____ V V = _____ I R R = _____

25. Using the equation, I = V / R, describe the following:

a. If the voltage is increased what will happen to the current?
b. If the resistance is increased what will happen to the current?

26. Using the second equation, V = I • R, describe the following:

a. If either the current or the resistance is increased in the circuit, what will happen to the voltage?

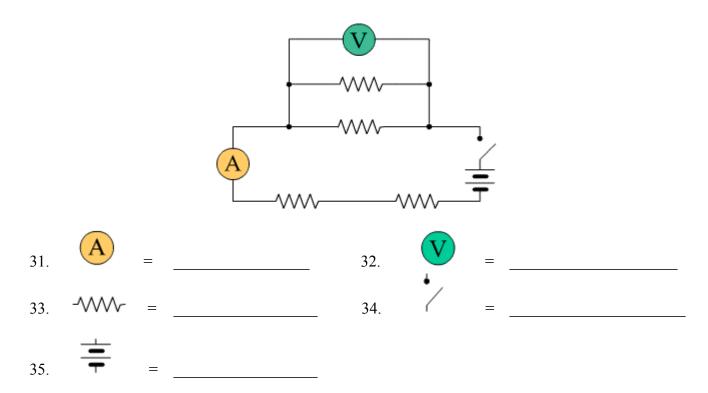
27. Using the third equation, R = V / I, describe the following:

a. If the voltage is increased what will happen to the resistance?

28. What is the symbol of an ohm?

http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/circuitdiagrams.htm

Below is a circuit diagram, list what each part of the diagram represents. Answers are placed on the spaces below.



Other useful symbols used in electrical circuit diagrams:



http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/seriescircuit.htm 40. Build the series circuit at this web site.

40 11	71		1 1	•			0
42. V	/hat is	sa	load	1n	а	circuit	17

43. What is a short circuit?

44. What is used in an electrical circuit to prevent a short circuit?

45. Build the series circuit with resistors at this web site.

<u>http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/parallelcircuit.htm</u> 46. **Build the parallel circuit at this web site.**

47. Describe a parallel circuit.

48. Build the parallel circuit with a voltmeter at this web site.

49. How is the ammeter always placed in a circuit?

50. How is the voltmeter always placed in a circuit?

<u>http://www.ndt-ed.org/EducationResources/HighSchool/Electricity/seriesparallel.htm</u> 51. Build the series / parallel circuit at this web site.

52. List the components that are connected in series from the circuit you just constructed.

53. List the components that are in parallel from the circuit you just constructed.