Basics of Electricity Web Quest Name _____

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/EducationResources/HighSchool/Electricity/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 _____.

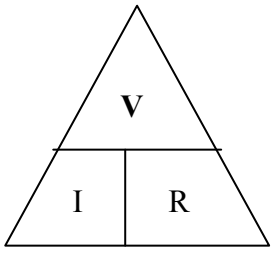
24. a. State Ohm's Law in a mathematical equation. _____

b. What do the following variables represent?

I = _____

V = _____

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? _____

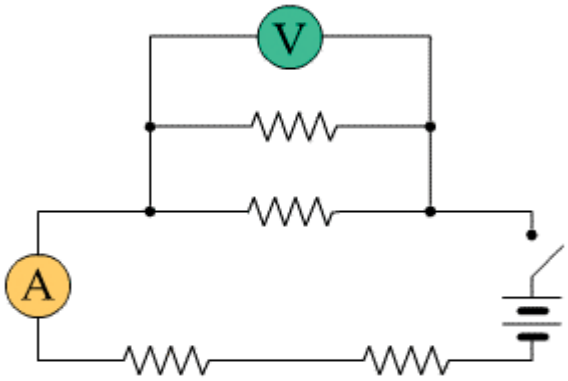
26. Using the second equation, V = I • R, describe the following:
   a. If either the current or the resistance is increased in the circuit, what will happen to the voltage? _____

27. Using the third equation, R = V / I, describe the following:
   a. If the voltage is increased what will happen to the resistance? _____

   b. If the current 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.



31.  = _____

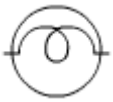
32.  = _____

33.  = _____

34.  = _____

35.  = _____

Other useful symbols used in electrical circuit diagrams:

39.  =_____

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

41. Describe a series circuit.

_____

_____

42. What is a load in a circuit?

_____

_____

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.**

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

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? _____

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

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.

_____

_____