

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 _____.

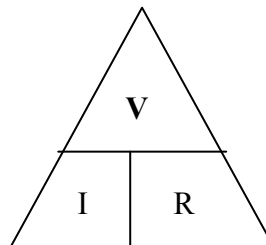
24. a. State Ohm's Law in a mathematical equation. _____

b. What do the following variables represent?

I = _____

V = _____

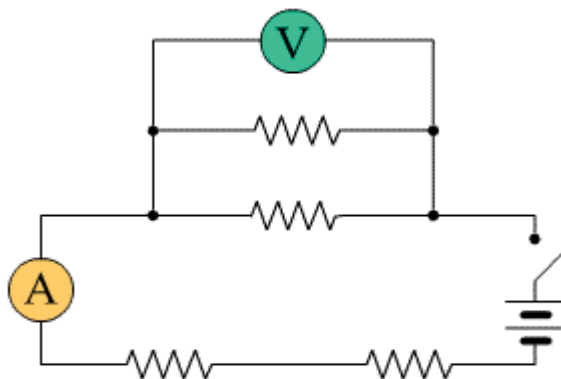
R = _____





25. Using the equation, $I = V / R$, describe the following:
- If the voltage is increased what will happen to the current? _____
 - If the resistance is increased what will happen to the current? _____
26. Using the second equation, $V = I \cdot R$, describe the following:
- 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:
- If the voltage is increased what will happen to the resistance? _____
 - 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.
