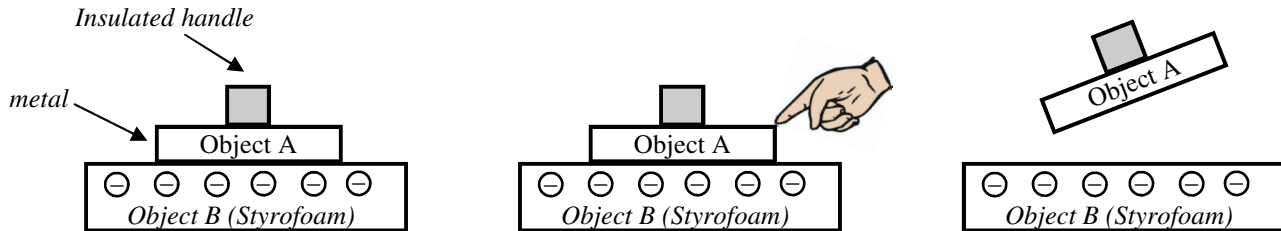


From the "Separating Charge" notes:

- Contact, induction, or polarization?
  - \_\_\_\_\_ Can only occur with conductors.
  - \_\_\_\_\_ Rubbing can cause this.
  - \_\_\_\_\_ No charges are lost or gained.
  - \_\_\_\_\_ Charges are given an alternative path to escape.
  - \_\_\_\_\_ Why a balloon sticks to a wall.
  - \_\_\_\_\_ When the rubber rod is near, but not touching the electroscope.
- A positive rod is brought close to a metal object, which is then charged by induction. Afterwards, is the metal positively or negatively charged?



- On the diagram above, Object B has been made negative by rubbing it with fur. Object A is a metal pie plate.
  - Is the metal plate a conductor or insulator?
  - Can electrons move on the metal plate?
  - Will electrons want to stay near or move away from the electrons on the Styrofoam?
  - In the first picture (left) draw where the negatives are on Object A.
  - Object A is now charged by \_\_\_\_\_.
  - Then you touch Object A while it is still touching to object B, where do the negatives go?
  - After you touched Object A, (3rd picture) will Object A have a positive or a negative charge?
  - Object A is now charged by: \_\_\_\_\_.

From the notes on Electricity 1:

- What is the charge of 1 electron?
- Is it possible to have 4.5 electrons? (Why or why not.)
- What is the charge of 14 electrons?
- A 6C charge is 15cm from an 8C charge.
  - What is the force between them?
  - If you wanted to make the force four times stronger, how would you change the distance between them?

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

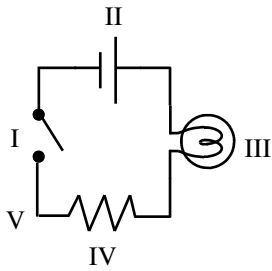
Current (in amps [A]) →  $I$  ← Voltage (in volts [V])  
 ← Resistance (in ohms [ $\Omega$ ])

*Current equals the voltage divided by the resistance.*

- Use the equation at the left to answer the following:
- A 12 volt battery pushes against a 4  $\Omega$  resistor. How much current flows thru the circuit?
  - How much resistance is in a circuit that has a 6 volt battery and 0.5 amps flowing?

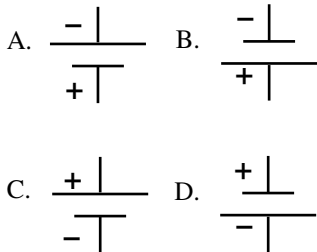
From the "Circuits and Symbols" notes:

10. Electricity flows thru \_\_\_\_\_ circuits made up of c \_\_\_\_\_. If there is a break anywhere in the circuit, it is an \_\_\_\_\_ circuit and electricity will not flow.



11. Identify the symbols on the diagram at the left (could be more than one).

- A. \_\_\_\_\_ A light bulb
- B. \_\_\_\_\_ A wire.
- C. \_\_\_\_\_ A battery
- D. \_\_\_\_\_ A switch
- E. \_\_\_\_\_ A resistor
- F. \_\_\_\_\_ Pushes electricity.
- G. \_\_\_\_\_ Resists electricity.
- H. \_\_\_\_\_ Is a low resistance path.
- I. \_\_\_\_\_ Turns electricity on and off
- J. \_\_\_\_\_ Is like a water pump.
- K. \_\_\_\_\_ Is like pinching off a hose.
- L. \_\_\_\_\_ Is just like a pipe.
- M. \_\_\_\_\_ Is like a water faucet

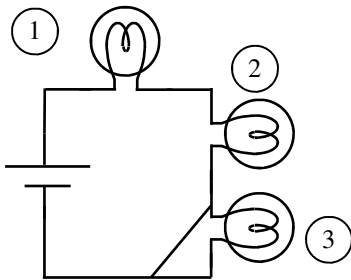


12. Which side of a battery is the positive side: the long line or the short line?  
 13. Which of the pictures at the left are correct?

14. What is a short-circuit?

15. Why are short-circuits bad?

16. What is conventional current?



17. Use the circuit at the left to answer the following.

- A. Which of the light bulbs will not light?
- B. Why or why not?

*Check back to the formula on the front page, if you have to...*

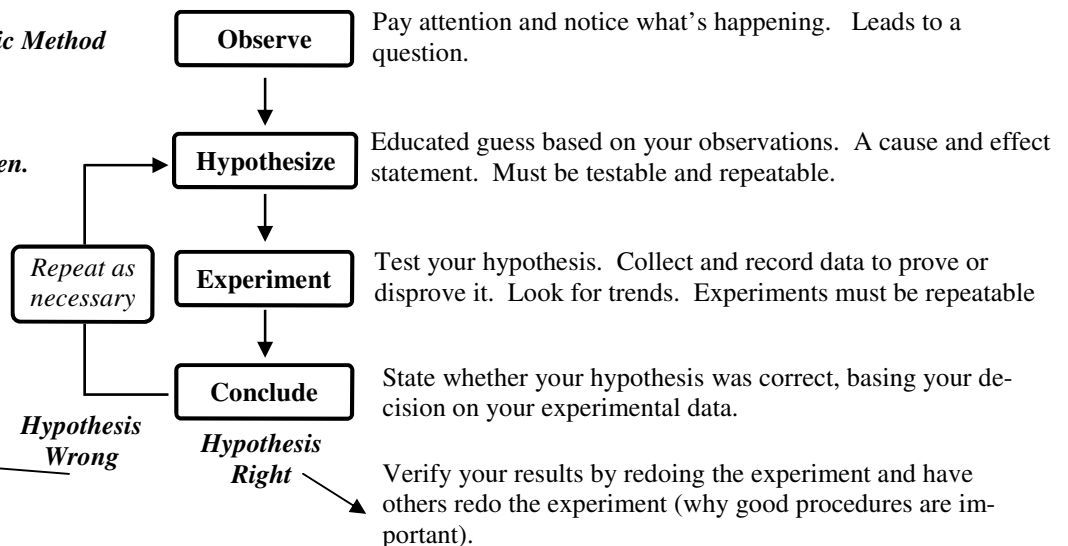
18. Give the units for the following.

- A. Current—
- B. Resistance—
- C. Voltage—

**Basic 4 Steps of the Scientific Method**

*The scientific method is always looking for "Cause and effect": what caused something to happen.*

Happens often in science and is actually good. Then your experimental data becomes part of your observation. Rethink



19. Which part of the scientific method?

- A. \_\_\_\_\_ A scientist measures the amount of acid necessary to dissolve a certain amount of magnesium.
- B. \_\_\_\_\_ You believe your car won't start because you are out of gas.
- C. \_\_\_\_\_ You notice that a ball rolls farther up a hill depending on how fast it was going.
- D. \_\_\_\_\_ You decide that adding salt to ice water allows the ice water to get colder than water alone.

20. Theory, Hypothesis, or Guess? Remember: an hypothesis comes from observations that can be tested in an experiment. A Theory is an hypothesis that has had been successfully tested so that it is considered scientific fact.

- A. \_\_\_\_\_ You think that a person is going to come late to the bus because they were late yesterday.
- B. \_\_\_\_\_ You think that some plastic water bottles may not be healthy because you can taste the plastic in the water.
- C. \_\_\_\_\_ The earth revolves around the sun. The sun does not revolve around the earth.
- D. \_\_\_\_\_ You think that adding salt to water allows it to have a higher boiling point (it boils at a higher temperature).

Liquid	Color	Burns?	Volume	Density
A	Clear	No	35 mL	1 g/mL
B	Pale Yellow	Yes	12 mL	.94 g/mL
C	Clear	No	46 mL	1 g/mL
D	Blue	Yes	88 mL	.99 g/mL

21. The data was collected about 4 unknown liquids. What can you conclude from this experiment and why?

22. Hypotheses must be testable, repeatable, and verifiable thru facts. What is wrong with the following hypotheses?

- A. A plant is happier when it is given distilled water.
  
- B. People like Milkman Mac and Cheese better than Cheesehead Mac and Cheese.