## Ch. 1: The Chemical World

Learning Outcomes: By the end of this chapter you should be able to:
(1) Identify the steps of the Scientific Method. (1.3)
(2) Identify and be able to interpret a two-variable graph. (1.4)

## Equations and Constants

None

## (1) The Scientific Method

The Scientific Method has been developed to give scientists a systematic way to organize and study the physical world.

- In your own words, describe each term:
- Observation:
- Hypothesis:
- Experiments:
- Scientific Law:
- Theory:
- What is the difference between a hypothesis and scientific law?
- What is the difference between scientific law and theory?
- Diagram the flow of the Scientific Method. Use boxes to indicate steps and arrows to indicate how they are connected.


## ChemV20, Elementary Chemistry

Antoine Lavosier studied the process of combustion in the $18^{\text {th }}$ century.

- Identify the (1) observation, (2) hypothesis, (3) scientific law, and (4) theory developed to explain the process of combustion.


## (2) Graphing

A graph is a diagram of two (usually) variables to show their relation.

- The independent variable is plotted on the $\qquad$ -axis and is defined as:
- The dependent variable is plotted on the $\qquad$ -axis and is defined as:

The slope of the trendline identifies the relationship between the two variables.

- A positive slope means the variables are (directly/inversely) related and looks like:
- A negative slope means the variables are (directly/inversely) related and looks like:

Ex. 1) A scientist recorded heated a substance and then recorded the temperature at over time. Identify the (1) independent variable, (2) dependent variable, and then (3) sketch your own graph from the data below.

| Time (sec) | Temperature ( ${ }^{\circ} \mathbf{C}$ ) |
| :---: | :---: |
| 0 | 105.2 |
| 60 | 84.5 |
| 120 | 62.3 |
| 180 | 30.9 |

