Chapter 1: Intro to Science

1.1 What Is Science

science: a way of learning about the natural world by gathering info.

Scientists use the skills of:

1. Observing: using one or more of your senses to gather info
    a. Qualitative: descriptions that don't involve numbers or measurements.
    b. Quantitative: measurements or numbers

2. Inferring: based on reasoning from what you already know; used to explain your observations.

3. Predicting: making a forecast of the ***future*** based on past experiences.

3 main branches of sciences:

1. Life Science: the study of the natural world (plants and animals, etc.)

2. Earth Science: the study of Earth and space

3. Physical science: the study of matter and energy and the changes they undergo.

    Matter: anything that has mass and takes up space.
    Energy: the ability to do work or produce a change.

    a. Chemistry: the study of the properties of matter and how matter changes.

    b. Physics: the study of matter and energy and how they interact.

1.3 Safety

Follow teacher directions, written and verbal. Inform the teacher if something happens. Common sense stuff like, tie long hair back, roll up sleeves, use the proper safety equipment to pick up hot items, be careful using sharp instruments, wear protective eye glasses when needed, know where safety equipment is located, never point sharp or hot objects towards anyone else, etc.

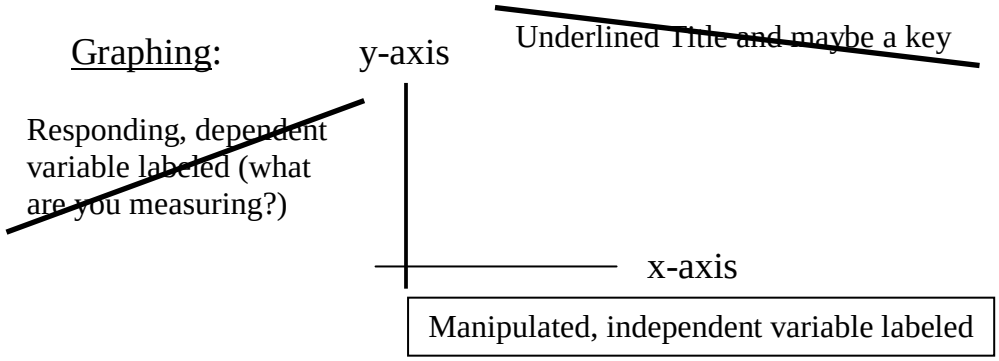
1.2 Scientific Inquiry

Scientific inquiry: process that scientists use to solve problems or learn about the world.

The six steps to the scientific inquiry are:

1. pose question: a question we can answer by making observations.
2. develop hypothesis: possible answer to a scientific question. Can not be a fact and must be testable.
3. design an experiment: make a procedure to test the hypothesis.
   a. Variable: factors that change during the experiment.
      i. Manipulative (independent): variable we change on purpose.
      ii. Responding (dependent): variable that is expected to change because of the manipulated variable.
   b. controlled experiment: an investigation in which all variables **but one** stays the same.
      i. Control group: normal group
      ii. Experimental group: group that contains the manipulated variable
      iii. Constants: factors that remain the same
4. collect & interpret data: gather info in an organized manner and analyze. (Journals, data tables and graphs)

Graphing:



5. draw conclusions: write an explanation for your data to see if it supports your hypothesis.
6. communicate: share ideas in writing or speaking.

Scientific model: a visual aid to help understand an object or process.

Scientific law: a statement that describes what scientists expect every time under the same conditions **but does not try to explain it.** Also, a rule of nature.

Scientific theory: a well tested idea that tries to **explain** observations and can be proven wrong.

model—picture, diagram, computer image, or representation of an object or process (solar system)