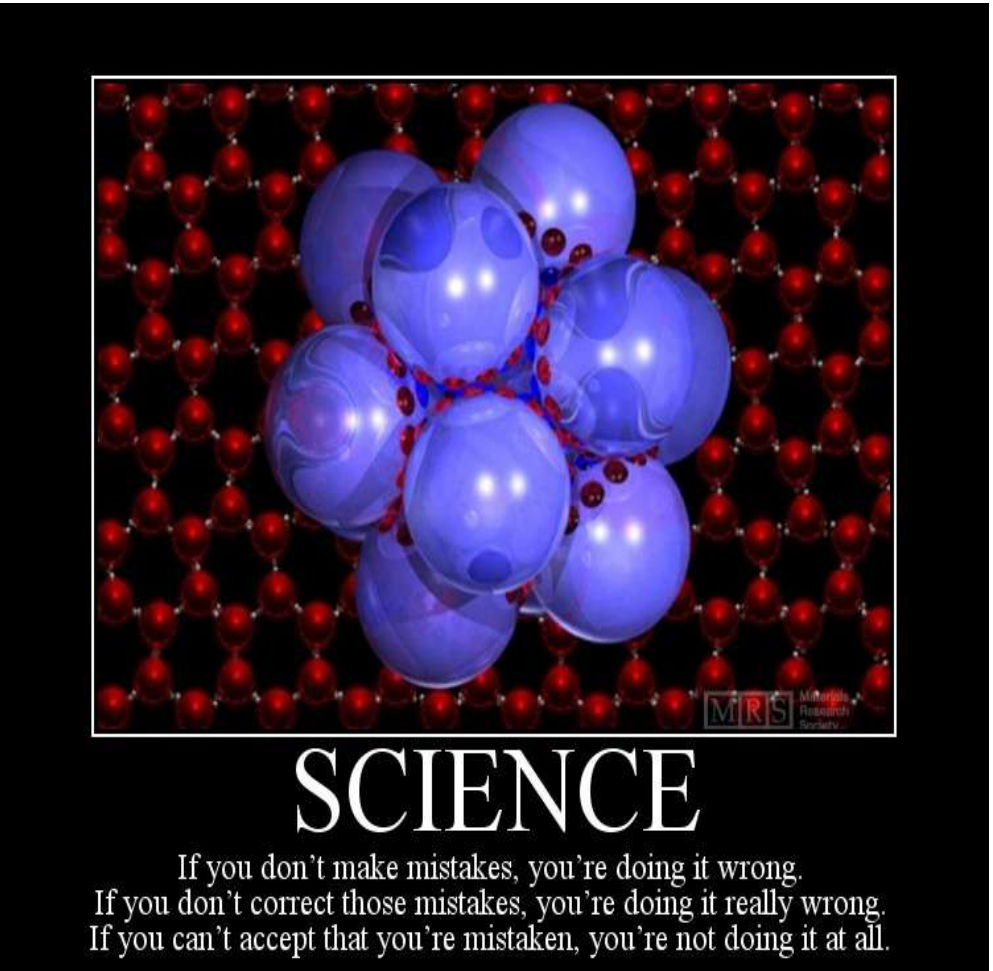
Ch 1 The Science of Biology

1.1 What is Science
1.2 How Scientist Work
1.3 Studying Life
1.4 Tools and Procedures

Ch 1.1 What is Science?

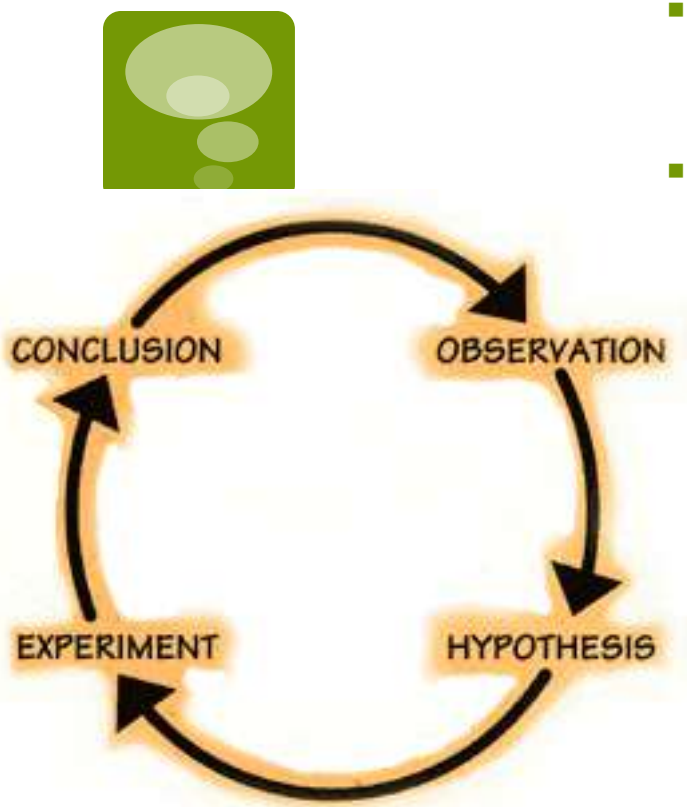


- The goal of science is to investigate and understand the natural world, to explain events in the natural world, and to use those explanations to make useful predictions
- Science is an organized way of using evidence to learn about the natural world

Ch 1.1 What is Science?

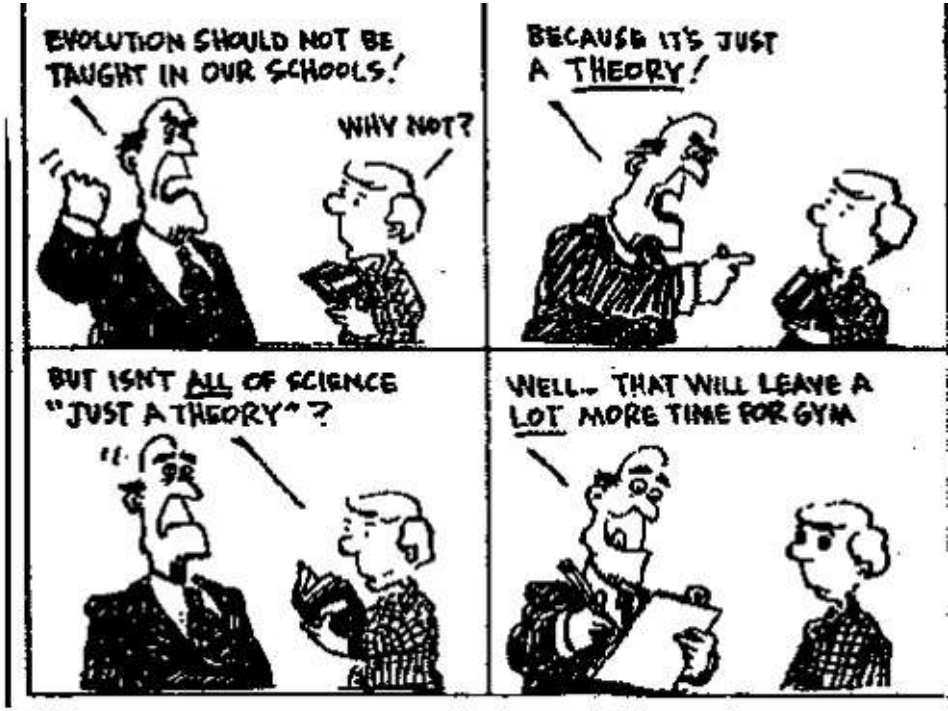
- Scientific thinking usually begins with an Observation, or gathering information
- This information that is gather is called the Data
- Scientist use the data to make an Inference or a logical interpretation of that data

A Hypothesis is a proposed scientific explanation for a set of observation



Ch 1.1 What is Science?

- Science is an ongoing process- A process that involves asking questions, observing, making inferences, and testing hypothesis
- Due to Techniques, new tools, and discoveries sciences is always changing.
- A good scientist is al theories to see if



1.2 How Scientists Work

- Scientists Design an experiment by
  - Asking a Question
  - Forming a hypothesis
  - Setting up a controlled experiment
- Whenever possible, a hypothesis should be tested by an experiment in which only one variable is changed at a time-
  - This is called a Controlled Experiment
- The variable changed is called the Manipulated variable (Independent)
- The variable that is observed and that changes in response to the manipulated variable is called the Responding Variable (Dependant)

1.2 How Scientists Work

- Experiments must be repeated over and over to make the results more acceptable
- Once the results are acquired through multiple experiments with different independent scientists it will be considered a Theory
- In science, the word theory applies to a well-tested explanation that unifies a broad range of observations
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Ch 1.1 & 1.2 Questions

- Pg 7 1-6
- Pg 14 1-5
- Do questions directly after your notes and they will be graded together as a whole assignment
- Always answer in complete sentences for full credit

1-3 Studying Life

- **Living things share the following characteristics:**
- Living things are made up of units called **cells, or the smallest unit of an organism that can be considered alive**
- Living things reproduce
  - Asexual Reproduction- Single parent produces an offspring
  - Sexual Reproduction- Cells from 2 different parents unite to form the first cell of a new organism
- Living things are based on a universal genetic code
  - DNA

1-3 Studying Life

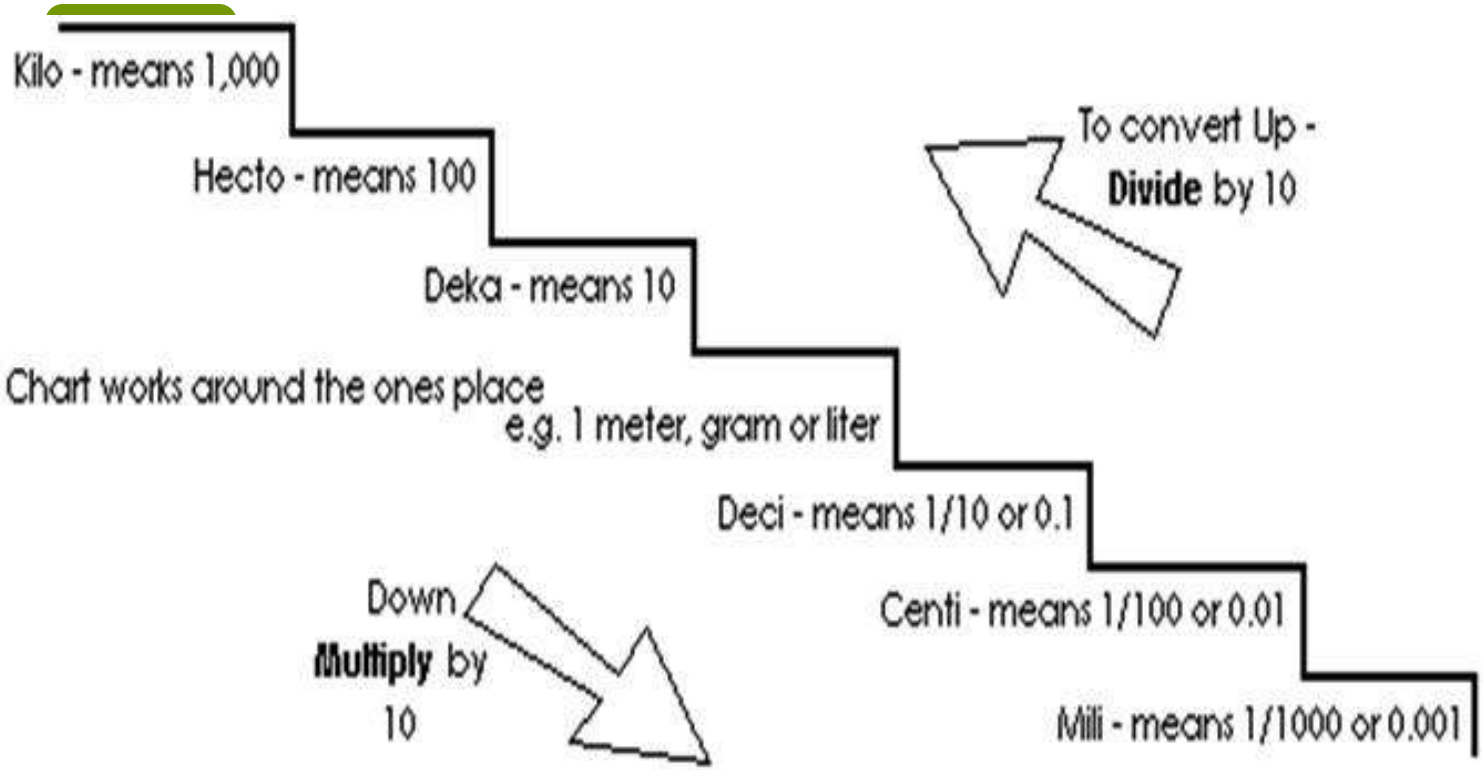
- Living things grow and develop
- Living things obtain and use material as energy
  - Chemical reactions through which an organism builds or breaks down materials is called Metabolism
- Living things respond to their environment
- Living things maintain a stable internal environment
  - Organisms detect and respond to Stimuli from their environment
- Taken as a group, living things change over time (Evolve)

1-3 Studying Life

- Questions Pg 22 (1-6)
- Mon Guppy Lab & 1-4 NOTES
- Prelab- Read and start copying information you need Monday

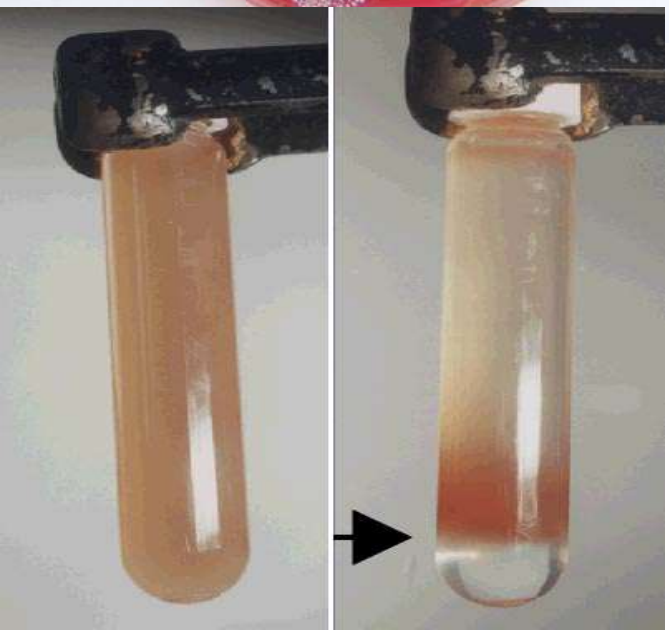
1.4 Tools and Procedures

- Most scientists use the metric system when collecting data and performing experiments
- Base Measurements
  - Length-Meters
  - Mass- Grams
  - Volume- Liters



1.4 Tools and Procedures

- Microscopes are devices that produce magnified images of structures that are too small to see with the unaided eye
- Compound light Microscopes allow light to pass through the specimen and use two lenses to form an image
- Electron Microscopes use beams of electrons and how they bounce or reflect off an item to produce an image



1.4 Tools and Procedures

- To obtain enough material to study , biologists place a single cell into a dish containing a nutrient solution and let it reproduce into a Cell Culture
- If scientists need to separate the parts of a cell the scientist will use a technique called Cell Fractionation
  - Cells are broken up in to a specialized blender then put into a centrifuge
  - The test tube is spun around until the heaviest items settle at the bottom and less dense part will rise to the top

1.4 Tools and Procedures

- Microscopes Next week
- Pg 28 (1-5) Tonight
- Guppy Lab NOW
- Review Tomorrow
- Ch 1 Quiz wed