Unit One – Scientific Thinking and Connections in Biology

1.1- What is Science?

- Science is NOT just a collection of facts, concepts and useful ideas, but _____

  _____

- Reliable knowledge is knowledge that has a

  _____

  _____

  _____

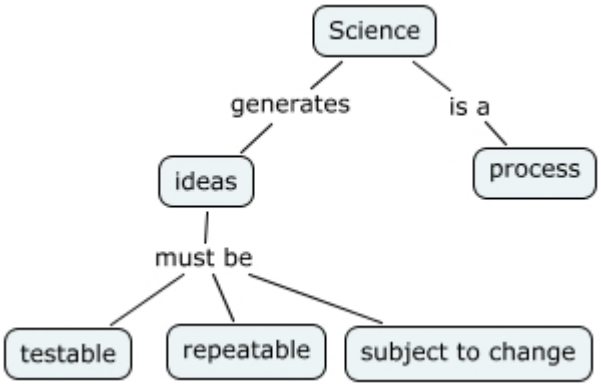
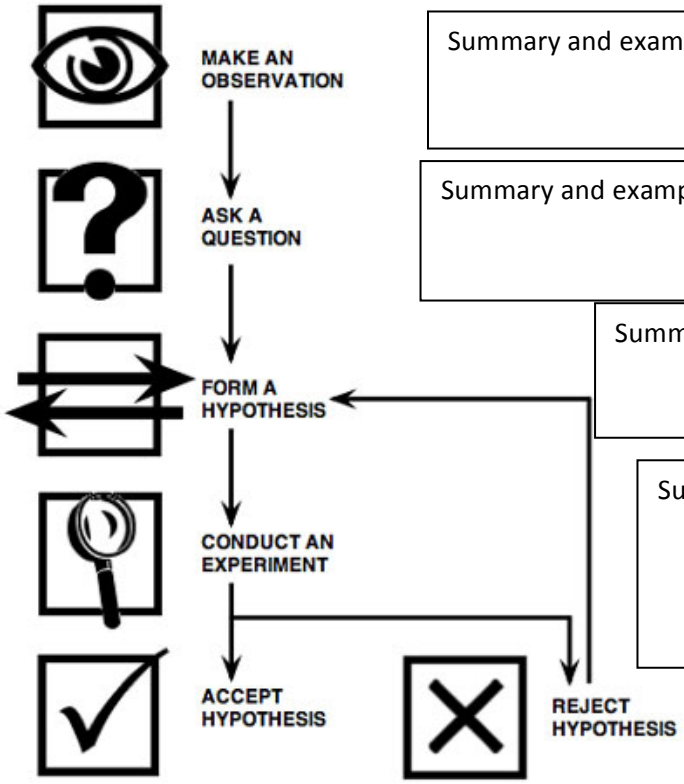


Figure 1.1a http://skat.ihmc.us/rid=1M92XK1NB-PLMNTV-21CB/Science.cmap?rid=1M92XK1NB-PLMNTV-

- There are three critical components to reliable scientific/critical thinking.
  - The use of _____ – evidence you can experience (see, hear, etc) and that can be _____, versus circumstantial evidence, testimonial evidence and authoritarian evidence
  - The practice of logical reasoning – requires careful analysis of evidence before:
    - _____ reasoning – _____ based on evidence
    - _____reasoning – _____ on conclusions
  - _____ – constant questioning of the source and reliability of your beliefs and conclusions, _____ _____(Schafersman, 1997).



Summary and example:

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Figure 1.1b http://static.ddmcdn.com/gif/scientific-method-17.jpg

- The Scientific Method collects data using the critical analysis traits that scientists

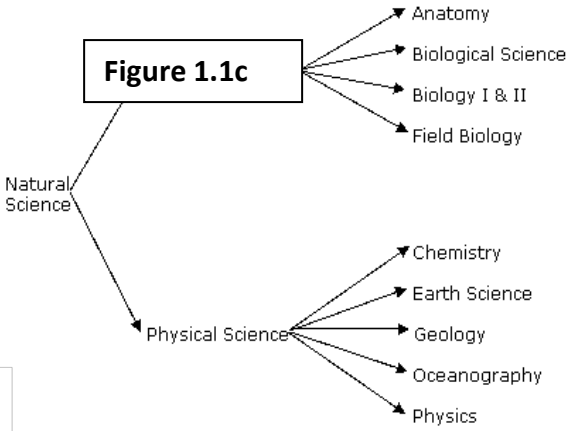


Figure 1.1c

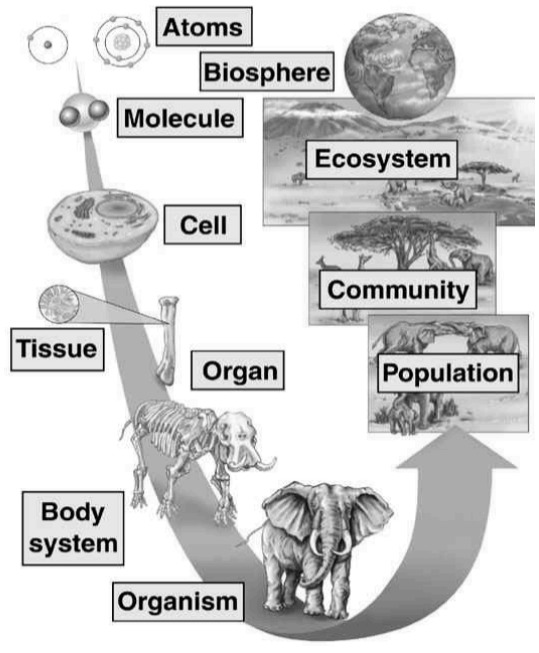
http://www.spcollege.edu/tsc/images/natural_science.g

What Does Biology Study?

- Science is divided into disciplines that examine different components of the natural world.
  - _____
  - _____
  - Some organisms are_____and consist of tissues, organs and organ systems.
  - In order to understand cells, we need to know what they are made of, **EVERYTHING**, living or non-living is made of _____.
  - The smallest unit of matter is_____. Multiple atoms are held together by _____ to form both small and large _____.
  - The matter in the universe is arranged in repeating units that give each set of matter unique characteristics.

Figure 1.1d

http://www.ux1.eiu.edu/~cfruf/images/bio3002/els_le2.jpg



Levels of Organization All matter is composed of atoms of elements. Important elements to life include _____. The essential elements are abbreviated as _____.

- These elements bond together by sharing electrons to form molecules.
  - Molecules can be grouped as_____ _____. The most important inorganic molecule is water.
  - All life is carbon-based and there are _____ _____ _____

Summary:

1.2- STERNGRR the 8 functions of living things

- Living organisms share many characteristics such as having enzymes. These characteristics can be described in many ways, but one method is to list _____ _____.
    - _____ ; organisms **build body structures** like hair and nails
    - _____; organisms **move things within their body**, like using blood
    - _____; organisms **get rid of** solid, liquid and gas **waste**
    - _____; organisms **control** their body temperature
    - _____; organisms either **make or consume food**
    - _____; multicellular organisms **get bigger and change in a variety of ways**
    - _____; organisms all need to **break down carbs to get energy** in the form of ATP, often using oxygen
    - _____; organisms **make offspring**, either asexually or sexually

- Together ALL these **STERNGRR** reactions and internal processes make up every organism's metabolism. Every living thing will perform all 8 processes. Organisms also regulate their internal conditions in a process known as homeostasis.

Summary:

1.3 - The Six Kingdoms Overview - Living organisms share many characteristics, but they come in many different forms. Organisms can be grouped or classified into 6 main kingdoms based on their similarities and differences.

- _____- a kingdom of _____ organism known as _____ (have no nucleus). These are the main bacteria you hear of like Staph, Strep and Salmonella that commonly come in contact with you.
- _____ – (aka extremophiles) are a kingdom of simple ___-_____unicellular organisms that live in _____environments. They are even found living in the Dead Sea!
- _____– a kingdom of complex _____cells with a nucleus, but some are unicellular, some are _____. These include algae and brain-eating amoebas! These unicellular organisms often have many **adaptations** such as eyespots, cilia and flagella to help them survive.
- _____- a kingdom of _____, multicellular organisms that are _____ (make their own food). They are divided into 4 main groups within this kingdom.
- _____- kingdom of eukaryotic organisms that _____ extracellularly. These include mushrooms, molds and yeasts.
- _____– a kingdom of _____organisms that _____

- Some don't fit…. _____!!! These organisms don't have cells and don't perform any of the life functions on their own. In order to survive, _____ _____

Summary: