Unit 1

Matter

What is Matter?

1. Matter is the "stuff" that makes up everything in the universe.

Definition

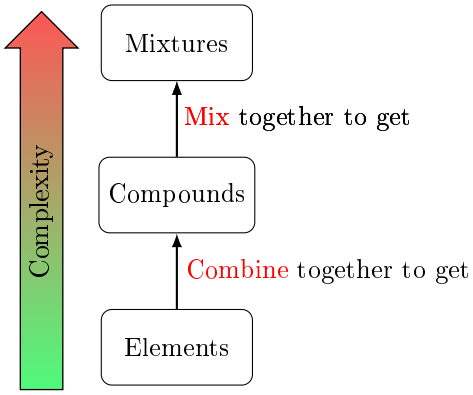
Matter - Anything that has mass and takes up space. [**a2003_matter**]

2. Properties of Matter
   (a) Each specific substance has its own combination of properties that can be used to identify the substance.
   (b) Matter can Δ it's properties. Δ means "Change"
      i. Ex. Water is a
         A. Liquid at room temperate
         B. Solid at cold temperatures
         C. Gas at high temperatures
   (c) Examples:
      i. Hardness
      ii. Texture
      iii. Flammability
      iv. Color
      v. Shape
      vi. Temperature

Definition

Chemistry - The science that studies what everything is made of and how it changes. [**a2003_chemistry**]

Kinds of Matter



3. Elements

Definition

Element - A substance that is made up of only one type of atom. [**a2003_chemical**]

(a) If you break down an element any more, then it just becomes generic *protons*, *neutrons* and *electrons*.

i. It stops behaving like that element

- Ex: If you break down Gold into protons, neutrons and electrons, it is no longer a shiny metal that conducts electricity.

(b) Each element has its own symbol

i. Usually the first 1 - 2 letters in the name

ii. Always CAPITAL lowercase if two letters long

iii. Examples

- O → Oxygen

- He → Helium
- C → Carbon
- H → Hydrogen
- Al → Aluminum
- Au → Gold

The latin word for Gold is "Aurum", so it still follows the rule, just in a different language.

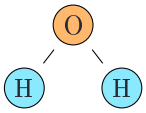
4. Compounds

Definition

Compound - A chemical compound is a substance made of two or more different elements joined together by chemical bonds in a fixed ratio. [**a2004_chemical**]

(a) Ex: Carbon Dioxide (CO_2)

(b) Ex: Water (H_2O)



Definition

Chemical Formula - A combination of symbols that show the ratio of elements in a compound. [**a2006_chemical**]

(c) Examples CO_2

5. Mixtures

Density Formulas

When Density is unknown

$$density = \frac{mass}{volume}$$

Density is measured in

$\frac{\text{g}}{\text{cm}^2}$ | $\frac{\text{g}}{\text{mL}}$

When Mass is unknown

$$mass = density \cdot volume$$

Mass is measured in

g | kg | mg

When Volume is unknown

$$volume = \frac{mass}{density}$$

Volume is measured in

L | mL | cm^2