

## Chemistry

1. Study of matter and the transformations it can make
  - a. Physical and chemical
  - b. Research
    - i. Basic=pure science
    - ii. Applied=technology to make new things or fix problems
2. Submicroscopic world
  - a. Made of atoms
  - b. Linked together to make molecules= bonded
3. States of matter, or phase of matter
  - a. Solid, liquid, gas
  - b. Depend on the relationship of the molecules to one another
    - i. Solid: rigid fixed location
    - ii. Liquid: slip past one another
    - iii. Gas: are not connected—gases have high kinetic energy
4. Properties of substances
  - a. Phase, color, reflectance, odor, density, texture, etc.
  - b. Change of properties may be physical change or chemical change
    - i. Physical: water to ice to water
      1. dependant upon conditions,
      2. reversible with return to original conditions
    - ii. Chemical: methane to carbon dioxide and water
      1. reconfigures the bonds between atoms,
      2. new substances made with different properties
5. Substances: basic building block that has properties are molecules
  - a. Elements
    - i. Single Atoms or molecules of a single type of atom
    - ii. Gold Au, lithium Li, Oxygen O<sub>2</sub>, Nitrogen N<sub>2</sub>
  - b. Compounds
    - i. More than one type of atom bonded together
    - ii. Chemical formula
      1. subscripts to designate how many of each type
      2. subscript 1 is omitted
    - iii. properties are very different from the elements it is composed of
  - c. naming compounds
    - i. start with the element further to the left on the periodic table
    - ii. then state the compound to the right, lopping off its suffix and adding the suffix *-ide*
    - iii. if more than one substance exists, composed of the same elements but in different ratios, prefixes before the element are used in the compound name to designate how many atoms of that element are present in the compound
      1. mon(o)
      2. di
      3. tri
      4. tetra
      5. penta
    - iv. example: carbon dioxide CO<sub>2</sub> and carbon monoxide is CO