

# Chemistry Overview

## Nanoscale

### Atoms

**matter** - atoms (p,n,e); elements; groups; electronegativity

**energy** - heat, electromagnetic radiation, energy levels/orbitals

### Molecules

- atoms combine in specific ways to fill s and p subshells (octet rule)
- atoms of molecules will rearrange to reach lowest energy
- ionic bonds
- covalent bonds (overlap of orbitals; sharing of valence electrons)

Prediction? Link? Proof?



Observe, Measure  
Hypothesis, Experiment, Theory

## Macroscale

### Phases

**solid, liquid, gas** (thermal energy vs forces of attraction)

**P, V, T**

**heat**

**size, shape, polarity**

### Physical properties

density, melting point, boiling point, solubility

### Chemical properties

thermodynamics, equilibrium, acid/base, solutions,  
electrochemistry, kinetics