**Unit 1 Study Guide**

Chemistry Fundamentals

* + Quantitative vs. Qualitative
  + Significant Figures
  + Accuracy vs. Precision
  + Rounding
  + Dimensional Analysis
  + Metric Conversions
  + Temperature Conversions
  + Scientific Notation

Stoichiometry

* Balancing Equations
* Percent Composition
* Empirical Formula
* Molar Mass
* Combustion

Matter

* + - Physical Properties and Changes
    - Chemical Properties and Changes
    - Particle View – states of matter
    - Density
    - Elements vs. Compounds
    - Pure Substances vs. Mixtures
    - Law of Conservation of Mass
    - Law of Definite Proportions
    - Isotopes

Separation Techniques

* + Chromatography
  + Distillation
  + Filtration
  + Decanting
  + Evaporation

Models, Quantum Theory and Modern Atomic Theory

* + Electromagnetic Spectrum
  + Wavelength
  + Photon (quantum)
  + Frequency
  + Diffraction
  + Photoelectric Effect
  + Orbitals – s, p, d, f
  + Scientists
    - Ernest Rutherford
    - Niels Bohr
    - J. J. Thomson
    - John Dalton
    - Albert Einstein
  + Techniques
    - PES
    - Mass Spectrometry
    - Spectrophotometry
    - Emission Spectroscopy
    - Flame Tests – Li, Na, K, Sr, Ba, Cu
  + Models
    - Plum pudding
    - Quantum Mechanical

Periodic Table

* + Scientists
    - Dmitri Mendeleev
    - Henry Moseley
  + Arrangement
    - Periods
    - Groups / families
    - Metals / non-metals / metalloids
    - Atomic Mass
    - Atomic Number (Z)
  + Electron Configurations, Orbital Notation, Noble Gas Notation
  + Periodic Law
  + Coulomb’s Law
  + Shielding
  + Effective Nuclear Charge (Zeff)
  + Aufbau Principle
  + Hund’s Rule
  + Pauli Exclusion Principle
  + Paramagnetic vs. diamagnetic
  + Trends and Periodicity
    - Electronegativity
    - Electron Affinity
    - Ionic Radius
    - Atomic Radius
    - Ionization Energy
    - Metallic Character