

Chapter 2  
**Atoms, Ions, and Molecules: The Building Blocks of Matter**  
Learning Objectives

8.2.2020

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To satisfy the minimum requirements for this course, you should be able to:

1. Recognize and use the symbols for protons, neutrons, and electrons.
2. Recognize and define nucleon, isotope, nuclide, atomic number, mass number and atomic mass unit (amu).
3. Understand the organization of the periodic table and be able to:
  - write the symbol and charge for an atom or ion, having been given the number of protons and electrons, and perform the reverse operation
  - write the symbol for an isotope given its atomic number and mass number
  - define group (or family) and period
  - identify an element as a metal, nonmetal, or metalloid
  - identify the following groups: 1 (alkali metals); 2 (alkaline earth metals); 17 (halogens); 18 (noble gases)
4. Understand how molecular and empirical formulas are used to convey chemical information and be able to:
  - explain the differences between molecular compounds and ionic compounds
  - define cation and anion
5. Perform calculations involving the masses of atoms and molecules. Examples include:
  - understand Avogadro's number,  $N_A$ , and relate moles to particles
  - calculate atomic weight from isotope abundance, and vice versa
  - calculate the molecular mass or formula mass (in amu) and molar mass (in g/mol) of a substance from its chemical formula
  - interconvert number of molecules, number of moles, number of atoms and mass of a substance

**N.B. Section 2.6 will not be covered.**