

Chapter 1  
**Matter and Energy: An Atomic Perspective**  
Learning Objectives

8.2.2020

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

1. Explain the following basic chemical principles:
  - the differences between: (a) substances and mixtures, (b) elements and compounds, (c) heterogeneous and homogeneous mixtures, (d) atoms and molecules, (e) intensive and extensive properties, (f) molecular compounds and ionic compounds, (g) chemical and physical properties
2. Recognize and interpret chemical formulas and models, and be able to:
  - distinguish between molecular formula, structural formula and condensed structural formula.
  - recognize the atoms and bonds in ball-and-stick and space-filling models, and how they relate to structural formulas
  - recognize that a particle view of an ionic compound and the ratio of atoms is expressed in an empirical formula.
3. Use math to solve chemistry problems. Examples include being able to:
  - perform conversions between Kelvin and Celsius temperature scales
  - know the difference between accuracy and precision
  - determine the number of significant figures in a measured quantity and know how to express a measured or calculated quantity using the correct number of significant figures
  - perform calculations involving density
  - convert between units using dimensional analysis

**N.B. Section 1.9 will not be covered.**