

# Chapter 2 Chemical Context of Life

## Objectives

### Elements and Compounds

1. Distinguish between an element and a compound.
2. Identify the four elements that make up 96% of living matter.
3. Define the term **trace element** and give an example.

### Atoms and Molecules

4. Draw and label a simplified model of an atom. Explain how this model simplifies our understanding of atomic structure.
5. Distinguish between each of the following pairs of terms:
  - a. neutron and proton
  - b. atomic number and mass number
  - c. atomic weight and mass number
6. Explain how the atomic number and mass number of an atom can be used to determine the number of neutrons.
7. Explain how two isotopes of an element are similar. Explain how they are different.
8. Describe two biological applications that use radioactive isotopes.
9. Define the terms **energy** and **potential energy**. Explain why electrons in the first electron shell have less potential energy than electrons in higher electron shells.
10. Distinguish among nonpolar covalent, polar covalent and ionic bonds.
11. Explain why strong covalent bonds and weak bonds are both essential in living organisms.
12. Distinguish between hydrogen bonds and van der Waals interactions.
13. Give an example that illustrates how a molecule's shape can determine its

biological function.

14. Explain what is meant by a chemical equilibrium.

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