

**Atoms and Bonding** ▪ *Guided Reading and Study*

## Elements and Atoms

*This section describes elements and atoms. It also explains how atomic theory developed and changed.*

### Use Target Reading Skills

*As you read the section, complete the outline about elements and atoms. Use the red headings for the main ideas and the blue headings for the supporting ideas.*

Elements and Atoms
<p><b>I.</b> The building blocks of matter</p> <p style="padding-left: 20px;"><b>A.</b> Elements, compounds, and mixtures</p> <p style="padding-left: 20px;"><b>B.</b></p> <p><b>II.</b> Atomic theory and models</p> <p style="padding-left: 20px;"><b>A.</b></p> <p style="padding-left: 20px;"><b>B.</b></p>

Atoms and Bonding

### The Building Blocks of Matter

1. The simplest pure substances are called \_\_\_\_\_ .
2. Why are elements often called the building blocks of matter?

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3. Complete the table about combinations of elements.

Type of Combination	What Is Combined?	Combined Chemically (Yes/No)
Compound	<b>a.</b>	Yes
<b>b.</b>	Elements, compounds, or both	<b>c.</b>

4. Is the following sentence true or false? Sodium chloride is an example of a compound. \_\_\_\_\_

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**Elements and Atoms** *(continued)*

5. Circle the letter of each choice that is an example of a mixture.
- a. air
  - b. soil
  - c. gasoline
  - d. oxygen
6. The smallest particle of an element is a(n) \_\_\_\_\_.

**Atomic Theory and Models**

7. Why do scientists use models to help them understand atoms?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

8. Circle the letter of each sentence that is part of John Dalton's atomic theory.
- a. All elements are composed of atoms.
  - b. No two atoms of the same element are exactly alike.
  - c. An atom of one element cannot be changed into an atom of a different element.
  - d. Atoms cannot be created or destroyed in any chemical changes.
9. Is the following sentence true or false? With only a few changes, Dalton's atomic theory is still accepted today. \_\_\_\_\_
10. Who described the atom as negative charges scattered through a ball of positive charge? \_\_\_\_\_
11. What experiment convinced Ernest Rutherford that the atom has a small, positively charged nucleus? \_\_\_\_\_
12. The term Rutherford gave to the positively charged particles in the nucleus of an atom was \_\_\_\_\_.
13. The atomic model of \_\_\_\_\_ resembled planets orbiting the sun.
14. A region around the nucleus in which electrons of the same energy are likely to be found is called a(n) \_\_\_\_\_.
15. What particle did Chadwick discover in 1932 that was hard to detect because it had no electrical charge? \_\_\_\_\_
16. Is the following sentence true or false? Since the 1930s, the model of the atom has changed a great deal. \_\_\_\_\_
17. Circle the letter of each sentence that we now know to be true about atoms.
- a. Most of the mass of atoms is due to electrons.
  - b. Atoms have no overall electrical charge.
  - c. Atoms of different elements have the same number of protons.
  - d. Most of the volume of atoms consists of protons and neutrons.