

Atoms and Bonding: *Guided Reading and Study*

Atoms, Bonding, and the Periodic Table

This section explains how the reactivity of elements is related to the number of electrons in the highest energy level. It also describes what the periodic table can tell you about atoms and the properties of elements.

Valence Electrons and Bonding (pg. 150- 151)

- _____ are those electrons that are held most loosely in an atom.
- Is the following sentence true or false? The number of valence electrons in an atom of an element determines the ways in which the atom can bond. _____
- Identify each element and the number of valence electrons it has.

a. _____ b. _____ c. _____

- Circle the letter of each sentence that is true about valence electrons and chemical bonding.
 - Most atoms are less stable when they have eight valence electrons.
 - Atoms with eight valence electrons easily form compounds.
 - Having eight valence electrons makes atoms very reactive.
 - Atoms with eight valence electrons are less likely to form chemical bonds than atoms with fewer valence electrons.
- Is the following sentence true or false? When atoms bond, new substances are formed. _____

How the Periodic Table Works (pg. 152- 156)

- How is the periodic table organized? _____

- What is a row of elements across the periodic table called? _____
- Describe how atomic number changes across a period of elements. _____

- What is the greatest number of valence electrons an atom can have? _____
- Describe the repeating pattern that occurs from left to right. _____
- What are elements in the same column of the periodic table called? _____
- Elements within a group always have the same number of _____

13. Complete the table about groups of elements in the periodic table.

Group #	Group Name	# of valence electrons	Reactivity (high/low)
1	a.	1	b.
17	c.	7	d.
18	e.	8	f.

14. How many valence electrons do all nonmetals have? _____

15. Describe two ways that nonmetals can combine with other elements.

16. How do metalloids differ from metals? _____

17. Is the following sentence true or false? Hydrogen is considered to be a metal. _____

Atoms, Bonding, and the Periodic Table: *Review and Reinforce*

Understanding Main Ideas

Use the diagrams to answer questions 1–5 in the spaces provided.

1. What is the atomic number of the element represented by the diagrams? _____

2. How many protons does the element have? _____

3. How many valence electrons does the element have? _____

4. Is the element reactive or stable? How do you know? _____

5. Is the element a metal or nonmetal? _____

Building Vocabulary

Fill in the blank to complete each statement.

6. An atom's _____ are those electrons that are in the highest energy level.

7. The force of attraction that holds two atoms together is called a(n) _____.

8. Each element is represented in the periodic table by a(n) _____.

9. The number of protons in the nucleus of an atom is called the _____.

10. A row of elements across the periodic table is a(n) _____.

11. Elements in the same column of the periodic table are called a(n) _____.