Name _____ Date _____ Class _____

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.

Use Target Reading Skills

After you read this section, reread the paragraphs that contain definitions of Key Terms. Use all the information you have learned to write a definition of each Key Term in your own words.

valence electrons

_____

_____

electron dot diagram

_____

_____

chemical bond

_____

_____

symbol

_____

_____

atomic number

_____

_____

period

_____

_____

group

_____

_____

family

_____

_____

noble gas

_____

_____

halogen

_____

_____

alkali metal

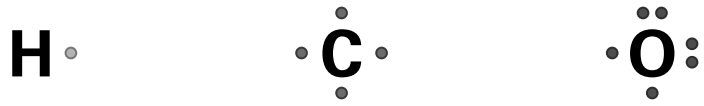
_____

_____

Atoms, Bonding, and the Periodic Table *(continued)*

Valence Electrons and Bonding

1. _____ are those electrons that are held most loosely in an atom.
2. 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. _____
3. Identify each element and the number of valence electrons it has.



a. _____ b. _____ c. _____

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

The Periodic Table

6. How are elements represented in the periodic table?

_____

_____

7. The _____ of an element is the number of protons in the nucleus of an atom.
8. What is a row of elements across the periodic table called?

_____

9. Describe how atomic number changes across a period of elements.

_____

_____

10. What are elements in the same column of the periodic table called?

_____

11. Elements within a group always have the same number of _____.

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

Group Number	Group Name	Number of Valence Electrons	Reactivity (High/Low)
1	**a.**	1	**b.**
17	**c.**	7	**d.**
18	**e.**	8	**f.**

13. How many valence electrons do all nonmetals have?

_____

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

_____

_____

_____

_____

15. How do metalloids differ from metals?

_____

_____

_____

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