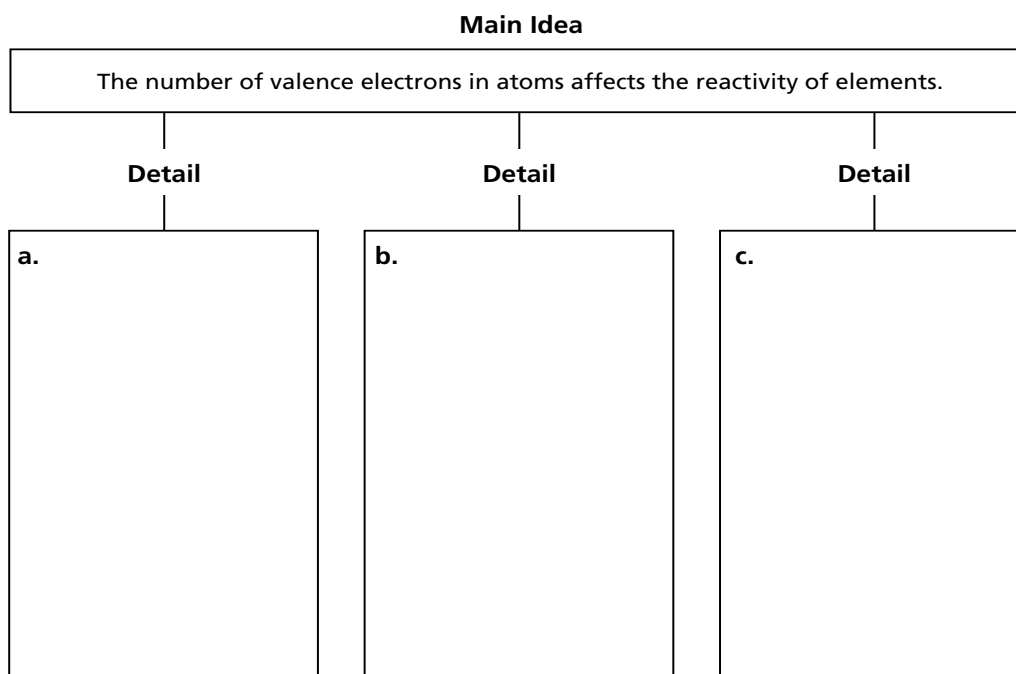


**Atoms and Bonding** ▪ *Guided Reading and Study***Atoms, Bonding, and the Periodic Table**

*This section explains how the reactivity of elements is related to the number of electrons of 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**

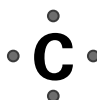
*After you read about how the periodic table works, complete the graphic organizer by writing three supporting details that give five examples of the main idea.*

**Valence Electrons and Bonding**

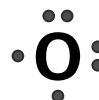
- \_\_\_\_\_ are those electrons that are held most loosely in an atom.
- Is the following sentence true or false? The number of valence electrons in an atom of an element determines the ways in which the atom can bond. \_\_\_\_\_
- Identify each element and the number of valence electrons it has.



a. \_\_\_\_\_  
\_\_\_\_\_



b. \_\_\_\_\_  
\_\_\_\_\_



c. \_\_\_\_\_  
\_\_\_\_\_

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

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

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 form bonds, electrons may be transferred or shared between atoms.  
\_\_\_\_\_

**How the Periodic Table Works**

6. How is the periodic table organized?  
\_\_\_\_\_
7. What is a row of elements across the periodic table called?  
\_\_\_\_\_
8. Describe how the number of electrons changes across a period of elements.  
\_\_\_\_\_
9. What is the greatest number of valence electrons an atom can have?  
\_\_\_\_\_
10. Describe the repeating pattern that occurs from left to right.  
\_\_\_\_\_  
\_\_\_\_\_
11. What are elements in the same column of the periodic table called?  
\_\_\_\_\_
12. Elements within a group always have the same number of  
\_\_\_\_\_.

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

13. 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.

14. When metals react with other elements, what happens to the valence electrons of the metal atoms?

\_\_\_\_\_

15. What happens to the reactivity of metals from left to right across the periodic table?

\_\_\_\_\_

16. How many valence electrons can atoms of nonmetals have?

\_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

18. Compared to metals and nonmetals, how do atoms of metalloids behave when combining with atoms of other elements?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

19. How many valence electrons does a hydrogen atom have? \_\_\_\_\_

20. Is the following sentence true or false? Hydrogen is considered to be a metal. \_\_\_\_\_