

Elements and the Periodic Table ▪ *Guided Reading and Study*

Nonmetals and Metalloids

This section describes the properties of the elements in the periodic table that are not metals.

Use Target Reading Skills

Before you read, write what you know about nonmetals and metalloids in the top box. As you read, write what you learn in the bottom box.

| What You Know |
|-----------------------------|
| 1. Nonmetals are not shiny. |
| 2. |
| 3. |
| 4. |
| 5. |

| What You Learned |
|------------------|
| 1. |
| 2. |
| 3. |
| 4. |
| 5. |

Properties of Nonmetals

1. The elements that lack most of the properties of metals are called _____.

2. Where are the nonmetals located on the periodic table?

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3. Is the following sentence true or false? Several of the nonmetals are gases at room temperature. _____
4. Circle the letter of each sentence that is true about the physical properties of nonmetals.
 - a. Solid nonmetals are brittle.
 - b. They usually have lower densities than metals.
 - c. Most are shiny.
 - d. They are good conductors of both heat and electricity.
5. Except for the Group 18 elements, most nonmetals readily form _____.

Families of Nonmetals

6. Circle the letter of the number of electrons that an atom in the carbon family can gain, lose, or share.

| | |
|------|------|
| a. 1 | b. 4 |
| c. 5 | d. 6 |
7. All living things contain what kind of compounds?

8. Circle the letter of the number of electrons that an atom in the nitrogen family usually gains or shares.

| | |
|------|------|
| a. 2 | b. 7 |
| c. 5 | d. 3 |
9. The atmosphere is almost 80 percent _____.
10. A molecule composed of two identical atoms is called a(n) _____.
11. Circle the letter of the number of electrons that an atom in the oxygen family usually gains or shares.

| | |
|------|------|
| a. 6 | b. 7 |
| c. 5 | d. 2 |
12. Circle the letter of each sentence that is true about oxygen.
 - a. The oxygen you breathe is a diatomic molecule.
 - b. Oxygen rarely combines with other elements.
 - c. Oxygen is the most abundant element in Earth's crust.
 - d. Ozone (O₃) collects in a layer in the upper atmosphere.

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13. Circle the letter of the number of electrons that an atom in the halogen family usually gains or shares.
- a. 4
 - b. 1
 - c. 6
 - d. 3
14. Is the following sentence true or false? Uncombined halogens are dangerous to humans. _____.
15. Circle the letter of each sentence that is true about the noble gases.
- a. They exist in large amounts in the atmosphere.
 - b. They are chemically unreactive.
 - c. They readily gain, lose, or share electrons.
 - d. They are used in glowing electric lights.
16. Complete the table about families of nonmetals.

Nonmetals

| Family | Group Number | Nonmetals in Family |
|--------------------|--------------|---------------------|
| a. Carbon family | | |
| b. Nitrogen family | | |
| c. Oxygen family | | |
| d. Halogen family | | |
| e. Noble gases | | |

17. How many protons and electrons does a hydrogen atom have?

18. Why can't hydrogen be grouped in a family?

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Nonmetals and Metalloids *(continued)*

The Metalloids

19. What are metalloids?

20. What is the most common metalloid? _____

21. What is the most useful property of the metalloids?

22. What are semiconductors?
