

# Element Address Book

Read how the periodic table organizes each element.

**PS.4** "The student will investigate and understand that the periodic table is a model used to organize elements based on their atomic structure. Key uses include symbols, atomic numbers, atomic mass, chemical groups (families)..."

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## 1 READ AND MARK \_\_\_\_\_ Read it twice

**YOUR JOB** In paragraph 3, circle the three sentences that tell where metals, nonmetals, and metalloids are located on the table. Label the sentences M, NM, and ML to show which classification each sentence describes.

### A Map for Elements

- ① Each square on the periodic table is an element's information card. The large letter or letters are the chemical symbol, a short code used worldwide, while the atomic number tells how many protons are in one atom of that element. Atomic mass is a decimal value that estimates the average mass of the element's atoms. For example, carbon has the symbol C, atomic number 6, and an atomic mass of about 12.01 atomic mass units.
- ② Reading across a horizontal row shows a period. Elements in a period have their electrons arranged in the same number of occupied energy levels. Reading down a vertical column shows a chemical group, also called a family. Elements in the same group often react in similar ways because their outer electrons are arranged similarly. Group 1 includes reactive metals such as sodium, while group 18 contains gases that rarely react with other substances under normal conditions.
- ③ The table also sorts elements into metals, metalloids, and nonmetals. Most metals lie on the left side and center, and they usually conduct heat and electricity well. Nonmetals are mostly on the right side, although hydrogen is a nonmetal placed at the top left. Metalloids border a zigzag boundary between metals and nonmetals and have mixed properties. Silicon is a metalloid used in computer chips, and chlorine is a nonmetal in many compounds on Earth.

## 2 ANSWER WITH EVIDENCE Use the passage

1 What are carbon's chemical symbol, atomic number, and atomic mass?

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2 What does an element's atomic number tell you?

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3 How is a period different from a chemical group or family?

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4 Where are metals, nonmetals, and metalloids generally located on the periodic table?

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## 3 YOUR TURN Your own words

Use a periodic table to complete the table with one metal, one metalloid, and one nonmetal. Include each element's symbol, atomic number, atomic mass, one group or period number, and classification.

| ELEMENT NAME | SYMBOL AND ATOMIC NUMBER | ATOMIC MASS | GROUP OR PERIOD | CLASSIFICATION |
|--------------|--------------------------|-------------|-----------------|----------------|
|              |                          |             |                 |                |
|              |                          |             |                 |                |
|              |                          |             |                 |                |

**PART 1 • READ AND MARK**

In paragraph 3, circle the three sentences that tell where metals, nonmetals, and metalloids are located on the table. Label the sentences M, NM, and ML to show which classification each sentence describes. Accept any marking that follows this job and points at the right text.

**PART 2 • ANSWERS**

| # | QUESTION                                                                             | ANSWER                                                                                                                                                                                                |
|---|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | What are carbon's chemical symbol, atomic number, and atomic mass?                   | <b>C; 6; about 12.01 atomic mass units.</b>                                                                                                                                                           |
| 2 | What does an element's atomic number tell you?                                       | <b>It tells how many protons are in one atom of the element.</b>                                                                                                                                      |
| 3 | How is a period different from a chemical group or family?                           | <b>A period is a horizontal row. A chemical group, or family, is a vertical column.</b>                                                                                                               |
| 4 | Where are metals, nonmetals, and metalloids generally located on the periodic table? | <b>Metals are mostly on the left side and center. Nonmetals are mostly on the right side, except hydrogen is at the top left. Metalloids border the zigzag boundary between metals and nonmetals.</b> |

**PART 3 • YOUR TURN (SAMPLE ANSWER)**

| ELEMENT NAME | SYMBOL AND ATOMIC NUMBER | ATOMIC MASS | GROUP OR PERIOD | CLASSIFICATION |
|--------------|--------------------------|-------------|-----------------|----------------|
| Magnesium    | Mg, 12                   | 24.305      | Group 2         | Metal          |
| Germanium    | Ge, 32                   | 72.630      | Group 14        | Metalloid      |
| Oxygen       | O, 8                     | 15.999      | Group 16        | Nonmetal       |

Accept accurate information from a current periodic table, including atomic masses rounded reasonably. The three entries must include one metal, one metalloid, and one nonmetal.