Chapter 5   The Periodic Table

Section 5.1 Organizing the Elements
(pages 126–129)

This section explains how Mendeleev organized elements into a periodic table. It also discusses the predictions he made about undiscovered elements and how the discovery of those elements supported his version of the table of the table.

Reading Strategy (page 126)

Identifying Main Ideas As you read, complete the table by identifying the main idea for each topic. For more information on this reading strategy, see the Reading and Study Skills in the Skills and Reference Handbook at the end of your textbook.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Main Idea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mendeleev’s proposal</td>
<td></td>
</tr>
<tr>
<td>Mendeleev’s prediction</td>
<td></td>
</tr>
<tr>
<td>Evidence supporting Mendeleev’s table</td>
<td></td>
</tr>
</tbody>
</table>

The Search for Order (page 126)

1. Is the following sentence true or false? The first elements to be identified were mainly gases. ________________
2. As the number of known elements grew, so did the need to organize them into groups based on their ________________.
3. Circle the letter of each category that the French chemist Antoine Lavoisier used to classify elements.
   a. gases   b. metals
   c. liquids  d. nonmetals

Mendeleev’s Periodic Table (pages 127–129)

4. Is the following sentence true or false? Mendeleev needed to organize information about 63 elements. ________________
5. Mendeleev’s strategy for classifying elements was modeled on a(n) ________________.
6. Circle the letter of each type of information Mendeleev knew about each element.
   a. name
   b. number of protons
   c. relative mass
   d. properties
7. Mendeleev arranged the elements into rows in order of ___________ so that elements with similar properties were in the same column.

8. Is the following sentence true or false? A periodic table is an arrangement of elements in columns, based on a set of properties that repeat from row to row. ___________

9. Mendeleev published the table above in 1872. Why did Mendeleev leave some locations in his periodic table blank? __________________________________________________________________________

10. Circle the letters of two elements that have similar properties.
    a. zinc (Zn)
    b. chlorine (Cl)
    c. nitrogen (N)
    d. bromine (Br)

11. How did Mendeleev decide where to place arsenic (As) and selenium (Se)? __________________________________________________________________________

12. Is the following sentence true or false? Mendeleev was the first scientist to arrange elements in a periodic table. ___________

13. Describe a test for the correctness of a scientific model. __________________________________________________________________________

14. Mendeleev used the ___________ located near the spaces in his table to predict properties for undiscovered elements.

15. The close match between Mendeleev’s predictions and the actual properties of new elements showed __________________________________________________________________________

16. Circle the letter of each element that was discovered after Mendeleev published his periodic table that supported Mendeleev’s predictions and provided evidence validating the table.
    a. gallium
    b. scandium
    c. germanium
    d. aluminum

9. ___________________________  Class ___________________  Date _____________