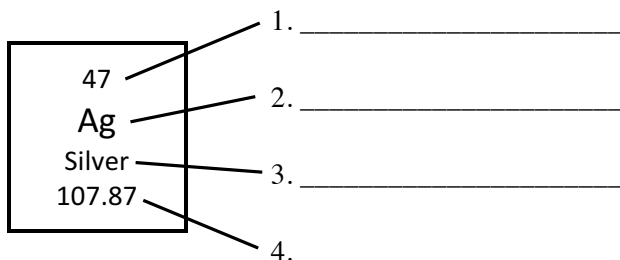


Organizing the Elements

Understanding Main Ideas

The diagram below is a square from the periodic table. Label the four facts shown about the element.



Answer the following questions in the spaces provided.

5. In what order did Mendeleev arrange the elements in the periodic table?

6. What do elements in the same column in the periodic table have in common?

7. What can you predict about an element from its position in the periodic table?

Building Vocabulary

From the list below, choose the term that best completes each sentence.

atomic mass period nuclear fusion chemical symbol
 periodic table group plasma

8. An element's _____ is its row in the periodic table
9. Mendeleev was the first to arrange elements in a(n) _____ based on their characteristics.
10. Elements in a(n) _____, or family, of the periodic table have similar characteristics.
11. A(n) _____ is an abbreviation for the name of an element and has either one or two letters.
12. The _____ of an element is the average mass of all the isotopes of that element.
13. A process in which two smaller atomic nuclei are forced together, forming a larger nucleus is _____.
14. A gas-like state of matter consisting of free electrons and atomic nuclei is _____.

Properties of a “Missing” Element

To some scientists of the early 1870’s, Dmitri Mendeleev’s periodic table of the elements was not very good. They criticized the table because it had gaps in it. Mendeleev, however, believed the gaps would someday be filled by elements that had not yet been discovered. In 1871, he predicted some of the properties of a yet-to-be-discovered element. He called it “ekasilicon.” The “missing” element was not discovered until 1886.

Imagine you are a chemist living in 1880. Study the section of the periodic table shown below as well as the accompanying table of properties. (Scientists in 1880 hadn’t learned about atomic numbers yet. They also used “bonding power” to describe the number of chemical bonds an element could form.)

	Si 28	
Ga 70	“Ekasilicon” ?	As 75
	Sn 119	

Some Properties of Selected Elements			
Element	Color	Atomic Mass	Bonding Power
Silicon	steel gray	28	4
Gallium*	gray-black	70	3
“Ekasilicon”			
Arsenic	silver to gray-black	75	3
Tin	gray-white	119	4

* One of Mendeleev’s original “missing” elements, which was discovered in 1875.

Answer the following questions.

- Which elements would you use to predict the properties of “ekasilicon”? Why?

- What color would you expect “ekasilicon” to be?

- How many chemical bonds would you expect “ekasilicon” to form?

- What atomic mass would you expect “ekasilicon” to have? Why?
