Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading B

Section: Arranging the Elements (pp. 194–201)

1. Why do you think scientists might have been frustrated by the organization of the elements in the early 1860s?

In the early 1860's scientist did not notice any pattern to the atomic mass numbers and the chemical properties.
Scientist only knew that some were gases, some were metals, and some were nonmetals, some were metalloids.
They only organized the elements according to chemical properties.
They thought that the mass had nothing to do with their properties.

DISCOVERING A PATTERN

d.

2. Which arrangement of elements did Mendeleev find produced a repeating pattern of properties?

- **a.** elements in order of increasing density
- **b.** elements in order of increasing melting point
- **c.** elements in order of increasing shine
- **d.** elements in order of increasing atomic mass

3. A word describing something that occurs or repeats at regular intervals is periodic.

4. Mendeleev's table, which shows elements' properties following a pattern that repeats every seven elements, is called the periodic table of the elements.

5. How was it possible that Mendeleev was able to predict the properties of elements that no one knew about?

He knew from playing solitaire (an organizing card game) that he could organize elements into groups (columns would have the same chemical properties). In doing so, he noticed repeating patterns he called periods were the horizontal increase in atomic mass. A new or missing element would belong to a group (column) and share the column's properties.

CHANGING THE ARRANGEMENT

d. **6.** How did Moseley solve the problem of the elements that did not fit the pattern according to their properties?

a. He rearranged the elements by atomic mass.
b. He discovered protons, neutrons, and electrons.
c. He discovered the periodic table of elements.
d. He determined the elements' atomic numbers and then arranged them by atomic number.

a. **7.** In what order are elements arranged horizontally on the periodic table?

a. in order of increasing atomic number
b. in order of decreasing atomic number
c. in order of increasing density
d. in order of decreasing density

PERIODIC TABLE OF THE ELEMENTS

c. **8.** Which information is NOT included in each square of the periodic table in your text?

a. atomic number
b. chemical symbol
c. melting point
d. atomic mass

9. How can you tell on the periodic table that carbon is a solid at room temperature?

The color of the chemical symbol is magenta, according the key on pg.196, any symbol in the color magenta is a solid at room temperature.

THE PERIODIC TABLE AND CLASSES OF ELEMENTS

10. Elements are classified as metals, nonmetals, or metalloids, according to their background square color

11. The number of valence electrons in the outer energy level of an atom helps determine which category an element belongs in.

12. How can the zigzag line on the periodic table help you recognize the elements?

Metals are found on the left side of the zig zag line
Nonmetals are found on the right side of it.

13. Most elements are metals, which can be found to the left of the zigzag line on the periodic table.

14. Most metals are solid at room temperature.

15. What metal is a liquid at room temperature?

Hg = mercury

16. What elements are found to the right of the zigzag line on the periodic table?

nonmetals

17. Semimetals, also called metalloids, are the elements that border the zigzag line on the periodic table.

DECODING THE PERIODIC TABLE

18. Some elements, such as Einstienium, are named after scientists. Others, such as Californium, are named after places.

19. For most elements, the Chemical symbol has one or two letters, with the first letter always capitalized.

20. Each horizontal row of elements on the periodic table is called a(n) period.

21. Each vertical column of elements on the periodic table is called a(n) group, or a(n) family.

elements in a group **22.** Which elements often have similar properties?

- **a.** elements in a period
- **b.** elements in a group
- **c.** elements named after places
- **d.** elements in a horizontal row

across each period **23.** The physical and chemical properties of the elements change

- **a.** within a group.
- **b.** within a family.
- **c.** across each period.
- **d.** across each group.

24. The periodic law states that the repeating chemical and physical properties of elements change periodically with the atomic numbers of the elements.