Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading B

Section: Grouping the Elements (pp. 202–209)

the same valence electron #

1. What gives elements in a family or group similar properties?
- **a.** the same atomic mass
- **b.** the same number of protons in their nuclei
- **c.** the same number of electrons in their outer energy level
- **d.** the same number of neutrons

d.

2. What makes elements reactive at the atomic level?
- **a.** Their atoms have the same number of neutrons.
- **b.** Their atoms have the same number of protons.
- **c.** Their atoms have the same number of electrons.
- **d.** Their atoms take, give, or share electrons with other atoms.

GROUP 1: ALKALI METALS

b.

3. Which of the following is NOT true of alkali metals?
- **a.** They can be cut with a knife.
- **b.** They are usually stored in water.
- **c.** They are the most reactive of all the metals.
- **d.** They can easily give away their outer-level electron.

4. Elements in Group 1 of the periodic table are called alkali metals.

GROUP 2: ALKALINE-EARTH METALS

5. Atoms of Alkaline-Earth metals have two outer-level electrons.

6. What are two products made from calcium compounds?

Old school chalk is made of calcium carbonate

Marble is metamorphic limestone (also calcium carbonate)

7. In what way does calcium help you?

Bones and teeth are made of calcium.
Calcium ions help your muscles contract.

8. Name three alkaline-earth metals besides calcium.

Be - Beryllium
Mg - Magnesium
Sr - Strontium

GROUPS 3–12: TRANSITION METALS

b. **9.** Which of the following characteristics does NOT describe transition metals?

a. They are good conductors of thermal energy.
b. They are more reactive than alkali and alkaline-earth metals.
c. They have one or two electrons in the outer energy level.
d. They are denser than elements in Groups 1 and 2.

10. Metals that are less reactive than alkali metals and alkaline-earth metals are called transition metals.

11. The two rows of transition metals that are placed at the bottom of the periodic table to save space are called the Lanthinides and the Actinides.

12. How is mercury different from other transition metals?

Mercury is a liquid at room temperature.

GROUP 13: BORON GROUP

13. The most common element from Group 13 and the most abundant metal in Earth's crust is aluminum.

14. What are some of the uses of aluminum?

It is a lightweight non-corrosive metal, Very good for building airplanes. soda cans, bicycles. Aluminum foil, cooking.

GROUP 14: CARBON GROUP

15. What are three compounds of carbon that are necessary for living things on Earth?

Sugar C6H12O6
Carbon Dioxide, CO2
Proteins and fats and nucleic acids

16. The metalloids Silicon and Germanium, both in Group 14, are used to make computer chips.

17. The hardest material known is Diamond (a form of pure carbon)

18. What are some of the uses of diamond?

as a jewel because it is sparkly and as a cutting tool, for hard surfaces like cement.

19. What form of carbon is used as a pigment in paints and crayons?

Soot, it is like condensed ashes.

GROUP 15: NITROGEN GROUP

20. Nitrogen is a(n) gas at room temperature.

21. Each element in the nitrogen group has 5 electrons in the outer level.

22. Nitrogen from the air can react with what element to make ammonia for fertilizer?

hydrogen NH3 is ammonia

GROUP 16: OXYGEN GROUP

23. How is oxygen different from the other four elements in Group 16?

Oxygen is a gas at room temperature and is necessary for things to burn.

24. The element Sulfur can be found as a yellow solid in nature and is used to make sulfuric acid.

25. Why is oxygen important?

Oxygen is necessary to react with anything combustible to allow for it to burn.
Even life needs oxygen to burn sugar in cells.

GROUP 17: HALOGENS

26. The atoms of Halogens need to gain only one electron to have a complete outer level.

27. What important use do the halogens iodine and chlorine have in common?

Chlorine is used to treat water to kill the bacteria in it like swimming pools, Iodine is mixed with alcohol to in hospitals to kill the bacteria in wounds.

28. Halogens combine with most metals to form a salt, such as sodium chloride.

GROUP 18: NOBLE GASES

c. **29.** Which of the following statements about noble gases is NOT true?

- **a.** They are colorless and odorless at room temperature.
- **b.** They have a complete set of electrons in their outer energy level.
- **c.** They normally react with other elements.
- **d.** All of them are found in Earth's atmosphere in small amounts.

30. Noble gases were first called inert gases because scientists thought they would not react at all.

31. The atoms of Noble gases have a full set of electrons in their outer level.

32. The low density of helium makes blimps and weather balloons float.

HYDROGEN

d. **33.** Which of the following statements about hydrogen is NOT true?

- **a.** It is useful as rocket fuel.
- **b.** It is the most abundant element in the universe.
- **c.** Its physical properties are closer to those of nonmetals than to those of metals.
- **d.** It has two electrons in its outer energy level.