WLHS / Chem / Monson

Name_____
Date_____Per_____

# CHAPTER 6 READING GUIDE: The Periodic Table and Periodic Trends

## 6.1 - Organizing the Elements (p. 160-166)

1) Study Figure 6.2 on page 161. What criteria did Mendeleev use in placing elements into rows on his table?_____

_____

2) In this table, which 2 elements are in the same horizontal row as fluorine and chlorine?

_____ & _____

3) How are elements arranged in the modern periodic table?_____

_____

4) What are horizontal rows called?_____How many are there?_____

5) How many elements are in:

period 1:_____ period 2:_____ period 3:_____ period 4:_____

6) Summarize the periodic law:_____

_____

7) As a result of the arrangement of elements into periods, what can we say about elements that end up in the same vertical column?_____

8) Complete the chart below summarizing the 3 broad classes of elements.

| **Category:** | **Where on table?** | **Properties?** | **Examples (3 each)** |
|---|---|---|---|
| Metals | | | |
| Nonmetals | | | |
| Metalloids | | | |

## 6.2 - Classifying the Elements (p. 167-173)

9) What chemical properties do the noble gases share and how does this relate to their electron configuration?

10) For each element tell which period and group the element is in, identify the element, and state whether it is a metal, nonmetal, or metalloid.

| Element | Period | Group | Identity | Metal, nonmetal, metalloid? |
|---|---|---|---|---|
| #34 | | | | |
| #40 | | | | |
| #14 | | | | |
| #56 | | | | |
| #18 | | | | |
| #4 | | | | |
| #82 | | | | |
| #37 | | | | |

11) Classify the following as metals, nonmetals or metalloids:

A) manganese:_____ D) nitrogen:_____

B) arsenic:_____ E) niobium:_____

C) carbon:_____ F) radium:_____

12) Iodine is used in many commercial chemicals and dyes. To what family does it belong? What are the other members of this family? How many electrons are in the outermost energy level (valence electrons)?

## 6.3 – Periodic Trends (p. 174-183)

13) Explain WHY as you go down the periodic table, within a group, atomic radius increases.

14) Explain why Cl (#17) is smaller then S (#16) considering it has one more proton than sulfur.

15) Arrange these elements in order of **DECREASING** atomic size:

A) S, Cl, Al, Na, Si, Mg, Ar, P:_____

B) Sb, Sr, Te, I, In, Xe, Rb:_____

C) Se, Po, O, S, Te:_____

D) Cs, Na, Li, H, Fr, Rb, K:_____

16) Which element in each pair has the greater atomic radius (size)?

A) SODIUM or LITHIUM

B) CARBON or GERMANIUM

C) BROMINE or FLUORINE

D) STRONTUIM or MAGNESIUM

E) SELENIUM or OXYGEN

F) BISMUTH or THALLIUM

17) What is a **CATION**?_____

How does a **CATION** form?_____

18) What is an **ANION**?_____

How does an **ANION** form?_____

19) Define **IONIZATION ENERGY** and describe its trend on the periodic table. (what happens and WHY?)

20) Which element in each pair has the **LARGER** ionization energy? (circle)

A) BORON or NITROGEN

B) FLUORINE or CHLORINE

C) BARIUM or CALCIUM

D) ALUMINUM or SODIUM

E) CARBON or SILICON

F) CHROMIUM or COBALT

21) How does the radius / size of a typical **ANION** compare with the radius / size of its corresponding neutral atom? **EXPLAIN why** this trend is observed.

22) Arrange the following elements in order of **INCREASING** ionization energy:

A) Ba, Be, Mg, Ca, Sr:_____

B) Bi, Pb, Cs, At, Ba:_____

C) Na, P, Al, Cl, Mg, S:_____

D) Rb, Na, K, Cs, Li:_____

E) Te, S, O, Po, Se:_____

23) Define **ELECTRONEGATIVITY** and describe its trend on the periodic table. (what happens and WHY?)