

ORGANIZATION OF THE PERIODIC TABLE? (Honors Chemistry)

1. Explain how each of the following scientists contributed to the development of the periodic table:
 - a. Lavoisier:
 - b. Newlands:
 - c. Mendeleev:
 - d. Meyer:
 - e. Mosely:
2. Why were the first periodic tables arranged by atomic mass? *Mass was easily determined.*
3. What is the periodic law? *Periodic patterns exist when atoms are arranged in order of increasing atomic number.*
4. What is the name given to the energy level in which valence electrons are located? *Principal Quantum number*
5. What types of sublevels contain valence electrons? *S + P*
6. Thoroughly explain what the period and group number tell you about an atom on the periodic table.
Period: Principal Quantum Number
Group: Valence Electrons and ΣNC
7. How many electrons are lost or gained by the atoms in the following groups when they form ions?

a. Group 1A: <i>1 lost</i>	d. Group 5A: <i>3 gained</i>
b. Group 2A: <i>2 lost</i>	e. Group 6A: <i>2 gained</i>
c. Group 3A: <i>3 lost</i>	f. Group 7A: <i>1 gained</i>
8. What is the ionic charge of each atom within the following groups?

a. Group 1A: <i>1+</i>	d. Group 5A: <i>3-</i>
b. Group 2A: <i>2+</i>	e. Group 6A: <i>2-</i>
c. Group 3A: <i>3+</i>	f. Group 7A: <i>1-</i>
9. Which elements are considered metalloids? *B, Si, Ge, As, Sb, Te, At*
10. What groups are considered the representative elements? *1A - 8A*
11. What groups are considered the transition elements? *B*
12. Explain how you determine the nuclear charge for a given atom. *Proton number*

13. Compare the following:

- a. Metals
- b. Metalloids
- c. Nonmetals

14. Explain the differences between the following blocks on the periodic table:

- a. S
- b. P
- c. D
- d. F

15. What is a shielding electron?

16. How would you determine the number of shielding electrons for a given atom?

Total Electrons - Valence Electrons

17. Thoroughly explain why effective nuclear charge is important to an atom's size?

18. How would you determine the Effective Nuclear Charge for a given atom?

Nuclear Charge - Shielding Electrons

19. What is the Effective Nuclear Charge for the following atoms? (Show the work!!!)

a. Na: $11 - 10 = +1$

g. Al: *+3*

m. Sr: *+2*

b. F: *+7*

h. B: *+3*

n. Fr: *+1*

c. K: *+1*

i. Ar: *+8*

o. Ag: *+2*

d. Ca: *+2*

j. Br: *+7*

p. Zr: *+2*

e. O: *+6*

k. P: *+5*

q. Mg: *+2*

f. N: *+5*

l. Br: *+7*

r. C: *+4*

20. What 2 factors contribute to the atomic size (radius) of an atom?

a. *Energy Levels*

b. *ENC*

21. Does phosphorus or chlorine have a larger atomic radius? Explain your answer. *Phosphorus.*

Both have 3 energy levels, but chlorine has larger ENC.

22. Does sulfur or selenium have a larger atomic radius? Explain your answer. *Selenium*

Both have same ENC (+6), but sulfur has fewer energy levels.