**Periodic Trends** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Periodic trends are properties that \_\_\_\_\_\_\_ or \_\_\_\_\_\_\_ going across a period or up or down a group.

2. Below do a rough sketch of the Periodic Table. Sketch in whether the following increase or decrease going across a period, left to right or going up a group: electronegativity, atomic radius, ionization energy.

**Concepts:**

1. What is atomic radius? What trend in atomic radius occurs down a group on the periodic table? What causes this trend?
2. What is ionization energy? What trend in ionization energy occurs across a period on the periodic table? What causes this trend?
3. What is electronegativity? What trend in atomic radius occurs down a group on the periodic table? What causes this trend?
4. Why do elements in the same family generally have similar properties?

5. Explain the relationship between…

a) the size of a positive ion and its atom. Why?

b) the size of a negative ion and its atom. Why?

**Practice: Use the Periodic Table and your knowledge of periodic trends to answer the following:**

1. Which atom in each pair has the **larger** atomic radius:

a) O or C b) Be or Ba

2. Which atom in each pair has the **smaller** ionization energy:

a) Na or Al b) N or P

3. Which atom in each pair has the **larger** electonegativity:

a) Al or Si b) Na or K c) O or P

4. Which is bigger: the S-atom or the S2- ion? \_\_\_\_\_

the Mg-atom or the Mg2+ ion?\_\_\_\_\_

5. Consider atoms of the following, which are located as shown in the Periodic Table:

a) Which has the **highest** electronegativity? \_\_\_\_\_\_\_

16S 17Cl

34Se 35Br

b) Which has the **highest** ionization energy? \_\_\_\_\_\_\_

c) Which has the **smallest** atomic radius? \_\_\_\_\_\_\_

6. Rank the following elements by increasing atomic radius: C, Al, O, K.

7. Rank the following elements by increasing electronegativity: S, O, Ne, Al.

8. Circle the atom in each pair that has the largest atomic radius.

* 1. Al or B
  2. Na or Al
  3. S or O
  4. O or F
  5. Br or Cl
  6. Mg or Ca

9. Circle the atom in each pair that has the greater ionization energy.

* 1. Li or Be
  2. Ca or Ba
  3. Na or K
  4. P or Ar
  5. Cl or Si
  6. Li or K

10. Circle the atom in each pair that has the greater electronegativity.

* 1. Ca or Ga
  2. Br or As
  3. Li or O
  4. Ba or Sr
  5. Cl or S
  6. O or S