**Discovering Periodic Trends by Graphing** 

**Creating the graph: Atomic Radius vs Atomic Number**

1. Atomic number is the independent variable and will go on the x-axis, evenly spaced out 1 -20
2. Atomic radius is the dependent variable and goes on the y-axis. Find the smallest and the highest radius and evenly space out a range. For example, if the lowest is 13 and the highest is 214, then I would start at 10 and go up by 10 until I get to 220.
3. For each radius, put a dot on the proper location in the graph. Lightly label each dot with the element’s symbol.
4. Connect the dots.

**Creating the graph: Ionization Energy vs. Atomic Number**

1. Atomic number is the independent variable and will go on the x-axis, evenly spaced out 1 -20
2. Ionization energy is the dependent variable and goes on the y-axis. Find the smallest and the highest ionization energy and evenly space out a range. For example, if the lowest is 406 and the highest is 2360, then I would start at 400 and go up by 50 until I get to 2400.
3. For each radius, put a dot on the proper location in the graph. Lightly label each dot with the element’s symbol.
4. Connect the dots.

**Analyzing the trends in the graph.**

For both graphs:

1. Find the elements: Li, Na, and K. These elements are all in the same group, the alkali metals.
   1. What do you notice as you move on the graph from Li to Na to K? Does the atomic radius (ionization energy) increase or decrease?
   2. What can you say for the trend down the group for
      1. atomic radius?
      2. ionization energy?
   3. Does the same trend occur in the alkaline earth metals group? Check out the elements: Be, Mg, and Ca.
2. Find the elements: Li, Be, B, C, N, O, F, and Ne. These elements are all in the 2nd period.
   1. What do you notice as you move on the graph from one element to the next? Does the atomic radius (ionization energy) increase or decrease?
      1. What can you say for the trend from left to right across a period for:
         1. atomic radius?
         2. ionization energy?
   2. Does the same trend occur in the 3rd period on the periodic table? Check out the elements: Na, Mg, Al, Si, P, S, Cl, and Ar.