3. Look at the graph of the first ionization energies and answer the following questions:

   a) What kinds of patterns do you see? How could you quickly relate the shape of the graph to someone who had not seen it? If you were given a piece of blank paper and only five seconds, how would you sketch the pattern of ionization energies?

   b) Where are the ionization energies the largest? The smallest?

   c) What happens to the ionization energies as the atomic number increases?

   d) Group the elements by their ionization energies into four consecutive "periods." List the range of atomic numbers in each group.

   e) Is there any interruption in the general trend of ionization energies as the atomic number increases for a "period"? If so, describe it.

4. Look at the second colored graph line you drew.

   a) Describe how the two graphs are alike and/or different. Do you see similarities between the two graphs?

5. If a large amount of energy is needed to remove an electron from an atom, the arrangement of electrons in that atom is considered to be especially stable. Thus, a high first ionization energy means that a lot of energy must be supplied to remove an electron from an atom and that the electron arrangement in that atom is especially stable. Any element that has a larger first ionization energy than its neighboring elements has an electron arrangement in its atoms that is more stable than its neighboring elements.

   a) Which element in the first period (atomic numbers 1 and 2) has the most stable arrangements of electrons in its atoms? (Remember, you are looking for elements that have larger ionization energies than their neighbors. In reality, you are looking for peaks in your graph, not just those elements with higher values.)