AP CHEMISTRY

(Formal Lab Report not required)

Exploring Periodic Trends **Mr. Venukadasula** **Due date:**

A graphing lab activity
The objectives of this activity include graphing elemental data in order to determine what is *periodic* about the periodic table, improving your graphing skills, and making predictions about missing pieces of data based on trends exhibited by the provided data.
Please use the data and graphing grids provided in this packet. You may use your text book or another media resource for any definitions you may need.

Part I – Definitions – Please define the terms and/or answer the questions that are listed below:
1. What is a "period" on the periodic table?

2. What is a "group" or "family" on the periodic table?

3. Atomic Radius-

4. Ionization Energy-

5. Electronegativity-

Part II - Making the Graphs - You will be making 3 graphs of the data provided on the sheet labeled **Periodic Trend Data for the first 36 elements**. Please be sure to double check the following as you work:
a. Plot the data on the correct axes.
b. Double check the range of data and select an appropriate scale.
c. No hash marks or "breaks" are allowed on the axes.
d. Be sure you label the axes with names and units.
e. Be sure you put an appropriate, informative title at the top of each graph.
f. Use a ruler to connect the dots, but if a data point is missing for some reason, do not connect the dots before and after the "gap."
g. Neatly label each data point with corresponding element symbol.

Graph 1 – Atomic Radius (y) vs. Atomic Number (x)
Graph 2 – Ionization Energy (y) vs. Atomic Number (x)
Graph 3 – Electronegativity (y) vs. Atomic Number (x)

Questions and predictions for Part II of the graphing lab

1. From the first graph, predict the atomic radius of magnesium and then of iron. Use your text or another resource to look up the actual values and compare them to your predictions.

2. In the graph of atomic radius vs. atomic number what trend(s) is/are apparent?

a. Does the graph support the statement that atomic radius is a periodic property?

b. Where would you expect the next peak to appear?

3. Given your definition of ionization energy and your knowledge of atomic structure, where on the periodic table would you expect to find the highest ionization energies?

4. Using your 2nd graph, which elements have the highest ionization energies?

5. Using your 2nd graph, which elements have the lowest ionization energies?

6. Given your definition of electronegativity and your knowledge of atomic structure, where on the periodic table would you expect to find the highest electronegativity values?

7. According to your last graph, which elements have the highest electronegativities?

8. According to your last graph, which elements have the lowest electronegativities?

9. What (if any) relationship exists between atomic radius, ionization energy, and electronegativity?