NAMES _____ DATE _____ PERIOD ____

Graphing Periodic Trends Activity

Purpose: The purpose of this activity is to investigate and understand by graphing the periodic trends in atomic radius, melting point, ionization energy, and electronegativity

Procedure: Using Microsoft Excel, create an x-y scatter plot with atomic number on the ***x*** axis and your assigned trend on the ***y*** axis. Each member of your group will complete one graph, and then you will answer the questions as a group next class.

Graphs:

1. Atomic Number vs. Atomic Radius Partner: _____
2. Atomic Number vs. Melting Point Partner: _____
3. Atomic Number vs. Ionization Energy Partner: _____
4. Atomic Number vs. Electronegativity Partner: _____

Analysis:

1. Label your graphs with the element symbol underneath the atomic numbers.
2. Using your printed graph and a colored pencil, connect the data points for the Noble gas elements with a red line. This will separate the periods.
3. Using your printed graph and a colored pencil, connect the data points for the alkaline earth elements with a blue line.
4. Using your printed graph and a colored pencil, connect the data points for the halogen family elements with a green line.
5. For **each** property, use your graph to describe what happens to the property as you move from left to right across a period.
6. For **each** property, use your graph to describe what happens to the property as you move from top to bottom down a group.
7. Write the short cut electron configurations for neon and fluorine and use the configurations to explain why the first ionization energy of neon is greater than that of fluorine.
8. Write the short cut electron configurations for sulfur and sodium and use the configurations to explain why the atomic radius of sulfur is less than that of sodium.
9. Write the short cut electron configurations for lead and silicon and use the configurations to explain why the atomic radius of lead is greater than that of silicon
10. Write the short cut electron configurations for oxygen and nitrogen and use the configurations to explain why the first ionization energy of oxygen is less than that of nitrogen.
11. Write the short cut electron configurations for aluminum and chlorine and use the configurations to explain why the first ionization energy of aluminum is less than that of chlorine.
12. Is Melting Point a periodic trend? Use evidence from your graph to support your answer.
13. Using your graphs and the answers to your analysis questions, add the following to the diagram of the periodic table below.
    a. Draw a red arrow to show which direction atomic radius increases across a period.
    b. Draw another red arrow to show which direction atomic radius increases within a group.
    c. Draw a blue arrow to show which direction ionization energy increases across a period.
    d. Draw another blue arrow to show which direction ionization energy increases within a group.

NAMES _____ **DATE** _____ **PERIOD** ____

e. Draw a green arrow to show which direction electronegativity increases across a period.
f. Draw another green arrow to show which direction electronegativity increases within a group.