Name: _____ *Date:* _____

Unit 7 - Topic 4

Trends in the Periodic Table

Answer the following questions using your Reference Tables, and your book.

General Trends

1. What happens to the number of valence electrons as you go down a group on the periodic table?

2. What happens to the number of valence electrons as you go from left to right across a period?

3. What happens to the number of energy levels as you go down a group on the periodic table?

4. What happens to the number of energy levels as you go from left to right across a period?

5. Draw lewis structures for the Na atom and the Cl atom.

6. Draw lewis structures for the Na ion and the Cl ion.

7. What scientist created the first periodic table, which arranged the elements according to their atomic masses?

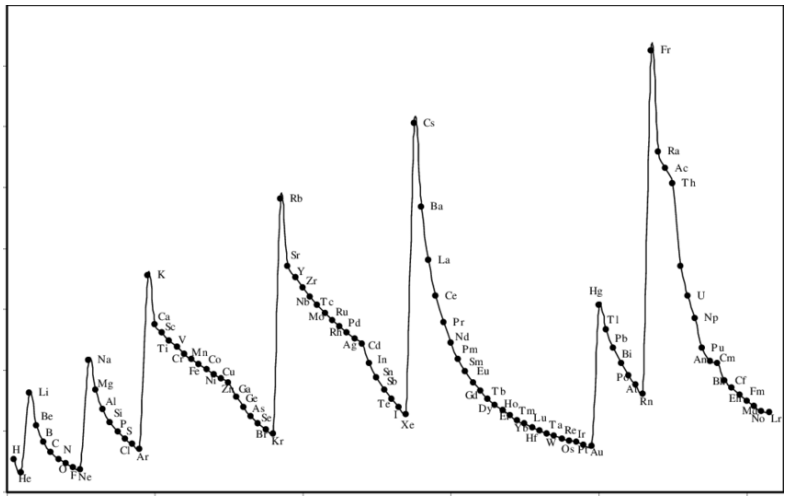
Name: _____ *Date:* _____

Atomic Radius

1. Define atomic radius:

2. What is the unit used for atomic radius? _____ How many of these are in a meter? _____

3. Where in your reference tables can you find information about an element's atomic radius?



4. Look at the graph above. Compare it to the periodic table. What do you notice about the location on the periodic table of the elements that represent the high points?

5. What do you notice about the location on the periodic table of the elements that represent the low points?

6. Look up the elements on the graph that make up period 3 of the periodic table. What do you notice about atomic radius as you move from left to right across a period?

7. Explain, in terms of atomic structure and forces, why atomic radius decreases from left to right across a period.

State the Trend

ATOMIC RADIUS _____ as you go down a group and

_____ as you go from left to right across a period.

Name: _____ *Date:* _____

Reactivity

1. When METALS react, they (gain / lose) electrons.
2. Look at Group 1 on the Periodic Table, the Alkali Metals.
   a) What is similar about their atomic structure? _____
   b) Why does Hydrogen fit into this group? _____
   c) Why does Hydrogen NOT fit into this group? _____
   d) Which metal is the most reactive of the group (loses electrons most easily)? Why? _____
   _____
   e) Group 2, the Alkaline Earth Metals, follow similar trends. Which element is more reactive, barium or magnesium? _____
3. When NON-METALS react, they (gain / lose) electrons.
4. Look at Group 17 on the Periodic Table, the Halogens.
   a) what is similar about their atomic structure? _____
   b) Which non-metal is the most reactive of the group (gains electrons most easily)? Why? _____
   _____
   c) State the relationship between reactivity and size for non-metals. _____
   _____
5. Group 18, the NOBLE GASES, are not reactive at all. Why? _____
   _____

State the Trend

For METALS, REACTIVITY _____ as you down a group. For NON-METALS, REACTIVITY _____ as you down a group.

Name: _____ *Date:* _____

Electronegativity

Using your Reference Tables or your textbook to answer the following questions about electronegativity.

1. Define electronegativity: _____
   _____
   _____
2. Why would an atom want to gain electrons? _____
3. When looking at the elements in the same period, from which group does the element come from that has the highest electronegativity value in every case? _____ The lowest? _____
4. Which has higher electronegativity, metals or non-metals? Why? _____
   _____
   _____
5. What is the electronegativity trend from top to bottom in the same group?
   _____
6. What is the electronegativity trend from left to right across a period?
   _____
7. Based on the definition of electronegativity, why don't the nobel gases have any electronegativity values? _____
   _____
8. Which element has the highest electronegativity of all? Why? _____
   _____

State the Trend

ELECTRONEGATIVITY _____ as you go down a group and

_____ as you go from left to right across a period.

Name: _____ *Date:* _____

Ionization Energy

Using your Reference Tables or your textbook to answer the following questions about ionization energy.

1. Define ionization energy: _____
   _____
2. Why is it easier to remove an electron from Na than it is from Cl? _____
   _____
3. Why is ionization energy related to, but not the same as, electronegativity?
   _____
   _____
4. Describe the trend in ionization energy as you go left to right across a period.
   _____
   _____
5. Describe the trend in ionization energy as you go down a group. _____
   _____
6. Why do noble gases have the highest ionization energy values? _____
   _____
7. Why do metals have low ionization energy values? _____
   _____
8. Why do nonmetals have high ionization energy values? _____
   _____

State the Trend

IONIZATION ENERGY _____ as you go down a group and

_____ as you go from left to right across a period.