

## Trends of the Periodic Table

Name \_\_\_\_\_

Period \_\_\_\_\_

1. Gregor Mendeleev's Periodic Law states "The physical and chemical properties of elements are periodic functions of their atomic masses". Look over your arrangement of your cards in the "Create a Periodic Table Activity". Describe in your own words what the term "periodic function" means.
2. Some of the properties listed on each card are periodic properties, others are not. Describe one property of the PT that is periodic and one property that is not periodic.
3. The elements in the modern periodic table are arranged in order of increasing atomic number, instead of increasing atomic mass. Why didn't Mendeleev use atomic number to arrange the elements?
4. Refer to the Element Card Arrangement Handout. This shows one possible way to arrange the elements of the PT. Identify each of the elements on the handout with its atomic number and chemical symbol.
5. For each of the elements on the Elements Card Arrangement Handout, list its symbol, melting point, its chloride and its oxide.

Use the Elements Card Arrangement Handout to create the following graphs. Each graph must be at least  $\frac{1}{2}$  page or larger. Use both sides of graph paper. Title each graph with the characteristic you are analyzing. Graph the 1<sup>st</sup> 36 elements on the PT for each characteristic. The x axis should be labeled with atomic number/# of protons. To find the increments for the y axis, find your lowest and highest values for that characteristic. Label the bottom of the y axis with the lowest value, the top with the highest value. Divide the highest value in half. Put that value half way up the Yaxis. Label the increments in between in regular intervals. At the bottom of each graph write a statement stating the main point the graph illustrates.

6. atomic radii; # of p+ by atomic radius in pm.
7. ionization energy; # of p+ by energy in kilojoules/mole (kJ/mol).
8. electronegativity; # of p+ by electronegativity values.

There are certain trends in the properties of the elements, both within a column (from top to bottom) and across a period (from left to right) in the PT. Label the blank PT below with the following characteristics.

9. Label the groups with their numbers. Label the periods with their numbers.
10. Draw 3 arrows across the top with the arrows pointing to the right end of the PT. Label one atomic radius, the second arrow ionization energy and the third one electronegativity. On the arrow, write "increases" or "decreases" to describe how the property changes
11. Draw 3 arrows along the left of the PT pointing down a group. Label and write on each arrow as described in part 7a.
12. Use a pencil to shade in the metals. Be very accurate as to where the metals begin and end. Put "X's" in the places where the nonmetals are. Put "O's" in the places where the metalloids are.
13. Use a yellow highlighter to show a period. Use a pink highlighter to show a group.
14. Use a pencil to draw in the following group locations; a) stars; alkali metals. b) happy faces; alkaline earth metals. c) triangles; halogens d) check marks; transition metals e) figure 8's; noble gases.
15. LIGHTY shade with a colored pencil; s block elements, pink, p block elements, light blue, d block elements yellow, f block elements light green.
16. Use brackets and a label to indicate the location of the main group elements.