

Trends and Patterns in the Periodic Table

(20 CLC Points)

Part 1: Elements in the same Group

Use the chart below to determine what Group on the Periodic Table you are to research:

Last Name Starts with..	Column Group #	First Element in Column
A - F	I	H
G - L	II	Be
M - Q	III	B
R - U	VI	O
V - Z	VII	F

Use an internet periodic table website such as Chemicool.com as a reference to research the first 5 elements in your column and answer the following questions. As you research, write down and define at least 6 new vocabulary words in the chart on question # 14.

1. Observe the physical and chemical properties of your 5 assigned elements (state, melting pt, appearance & characteristics, ionic charge (*Max oxidation number*), how/who it reacts with, metal/nonmetal, density, electron configuration, etc). **Use the table below to take notes.**

Element	Notes

2. What do you notice that is similar among all elements in this column?
3. Do you see any trends or patterns in how properties change as you move down the column? Explain.
4. What do you notice that is different about each element in this column?
5. Use *Graphical Analysis* to plot a graph comparing the atomic radius with the row numbers (put this on x axis) for each element in your column. Your graph should contain all required graph items (print 1 copy and attach to this worksheet). Do you notice any general pattern? If yes, what is the pattern?
6. Propose an explanation for the above pattern.

Part 2: Elements in the same Period

Use the table below to determine your assigned row on the periodic table

Last Name Starts with...	Row #	Elements to Research
A - F	2	Li, Be, B, C, N, O, F
G - L	3	Na, Mg, Al, Si, P, S, Cl
M - Q	4	K, Ca, Ga, Ge, As, Se, Br
R - U	5	Rb, Sr, In, Sn, Sb, Te, I
V - Z	6	Cs, Ba, Tl, Pb, Bi, Po, At

7. Observe the physical and chemical properties of your assigned element. (state, melting pt, appearance & characteristics, ionic charge (*Max oxidation number*), how/who it reacts with, metal/nonmetal, electron configuration, etc). **Use the table below to take notes.**

Element	Notes

8. What do you notice that is similar about each element in this row ?

9. What do you notice that is different about each element in this row ?

10. Do you see any trends or patterns in how properties change as you move across your assigned row? Explain.

11. Use *Graphical Analysis* to plot a graph comparing the atomic radius with the column numbers for each element in your row.

Graph should contain all required graph items (print 1 copy and attach to this worksheet).

Is there a general pattern ? If yes, what is the pattern ? Is it followed perfectly?

12. Propose an explanation for the above pattern.

Part 3: Drawing Conclusions

13. In looking at your overall comparisons, support or refute the following statement. Be sure to support your answer.

“Elements in the same row are more similar in physical and chemical properties to each other than elements in the same column”

14. New Vocabulary -- Identify at least 6 new vocabulary words that you ran across in your research and complete the chart

New Term	Definition (in your own words)	How was it used where you saw it?
Metalloid	A metalloid is an element that has some properties of a metal and some properties of a nonmetal.	This word was used to describe the characteristics of silicon. Silicon is not classified as either a metal or a nonmetal because it has some properties of both.