Trends Handout name

1. The periodic table has _____ groups, which run top to bottom.

2. The periodic table has _____ periods, which run left to right.

3. Elements that are chemically similar, that bond the same way, are found in the same _____

4. All elements in any one period have the same number of _____

5. The elements on the table are arranged in order of increasing _____ _____

6. The atomic number matches the number of _____ in the nucleus.

7. Because atoms are neutral, the atomic number also equals the number of negatively charged _____

8. The atomic mass minus the atomic number equals the number of _____

List the symbols of the atoms in period 2, and their atomic masses in AMU

Symbols	Li	Be	B					
Mass in AMU:								

State the period trend for atomic mass

List the symbols of the atoms in period 3, and their atomic radii in pm (picometers)

Symbols	Na	Mg	Al					
Mass in AMU:								

State the period trend
for atomic size or radius:

Atoms of group 1		Atoms of group 2		Atoms of group 17	
Symbol	Mass in AMU (u)	Symbol	Radius in picometers (pm)	Symbol	AMU (u)
					Picometers pm
Li	u	Be	pm	F	u
					pm
	u		pm		u
					pm
	u		pm		u
					pm
	u		pm		u
					pm
	u		pm		u
					pm
	u		pm		u
					pm
	u		pm		

Using this data, state the group trend for atomic mass in a complete sentence (not one word)

Using this data, state the group trend for atomic radius in a complete sentence (not one word)

Using all the data above, explain why atom radius size + mass always increases in groups.

Net nuclear charge is the "net" overall charge of just the nucleus of an atom.

All atoms are neutral because the number of positive protons always equals the same number of negative electrons.

This trend is not about the atoms, it's only the nuclei, which are all positively charged.

Group 16	Net Nuclear Charge
O	
S	
Se	
Te	

Group 2	Net Nuclear Charge
Be	
Mg	
Ca	
Sr	
Ba	

atom	Li	Be	B	C	N	O	F	Ne
Net Nuclear Charge								

State the group trend for net nuclear charge
State the period trend for net nuclear charge
Why do both of these trends exist?

Trend #4 Electronegativity	
Define Electronegativity	
Define RELATIVE SCALE	
Define ARBITRARY SCALE	
state the group trend for electronegativity	
state the period trend for electronegativity	

Do all noble gases have a zero value for electronegativity?	Which one doesn't?

Circle the element in each pair with the higher electronegativity values

Cl or Ca Sr or Ge Br or Cs

For these 3 bonds, draw dipole arrows that show which side is more negative and which is more positive.

H—Br C—Cl B—I

Define 1st Ionization Energy		Fill in this table	
		Group 15	1st Ionization Energy in kJ/mole
What is the unit for 1st Ionization Energy			

Period 5	Rb	Sr	Y	Zr	Nb	Mo	Tc
1st Ionization Energy kJ/mole							

State the Group Trend for 1st Ionization Energy

State the Period Trend for 1st Ionization Energy

Explain what 2nd ionization energy is and tell if it is greater or lesser than the 1st ionization energy (and why).

GROUP 2	ATOMIC electron configuration	Number of shells	CATION electron configuration	Number of shells
Be				
Mg				
Ca				
Sr				
Ba				
Ra				

State the group trend for CATION SIZE.

Why is this trend increasing?

	K	Ca	Sc	Ti
Electron configuration of an Atom				
Electron configuration of a Cation				

State the period trend for CATION size.

Why is this trend decreasing?

GROUP 17	Atom electron configuration	Number of shells	Anion electron configuration	Number of shells
F				
Cl				
Br				
I				

State the group trend for anion size

Why does this trend increase?

Period 2	N	O	F
Atom electron config			
Anion electron config			

Period 3	P	S	Cl
Atom electron config			
Anion electron config			

State the period trend for anion size

Why does this trend decrease?

Cation and Anion Trends continues…			
A	Circle the species that has a larger radius.	an atom	its cation
B	Circle the species that has a larger radius.	an atom	its anion
C	Cations are always notably smaller than the atoms they form from, explain why?		
D	Anions are always slightly larger than the atoms they form from, why?		

The name and symbol of the most METALLIC element is		The name and symbol of the most NONMETALLIC element is	

List the atomic numbers & symbols of ALL the nonmetal elements (one is provided, and, there are too many boxes here					5 - B	

Which is MOST METALLIC?	Y	Be	Fe
Which is NONMOST METALLIC?	N	I	O
Which is MOST METALLIC?	Au	Cr	Pb
Which is NONMOST METALLIC?	Kr	C	Cl

List all the METALLOID atomic numbers and symbols in the boxes.						
5 - B						

Define Metalloid

What about aluminum and polonium, they touch the stairs too, don't they?

Allotropes are pure forms of an element, but they are bonded differently than other pure forms of that same element. They have different physical and different chemical properties. Common examples of allotropes include CARBON and OXYGEN.

Name the 3 Carbon Allotropes	Name the 2 Oxygen Allotropes
1	1
2	2
3	

Define isotope

Group 1 metals are known as the	Group 3-12 metals are known as
Group 2 metals are known as the	The bottom 2 rows of metals are known as
Group 17 nonmetals are known as the	Group 18 nonmetals are known as the
How many protons are in manganese atoms?	What is the electron configuration for manganese?
How many neutrons are in manganese atoms?	ADD UP the electron configuration for Mn
Atoms with similar properties are found in	Atoms with the same number of shells are found in the
What is the asterisk in element 72 about?	
What is the black bar next to elements 57 and 89 about?	