

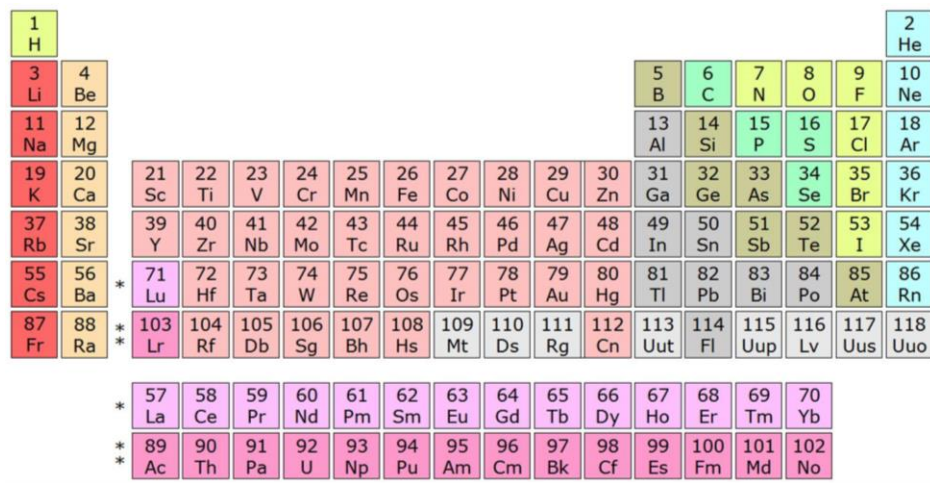
Name: _____

Period: _____

Unit 4A: The Periodic Table Guided Notes

Ions

- Use the following periodic table to label the number of valence electrons and charges by families.



Cations	Anions
<ul style="list-style-type: none"> Have a _____ charge Formed by the _____ of electrons _____ from cations Silver always has a charge of _____ Zinc and Cadmium always have a charge of _____ 	<ul style="list-style-type: none"> Have a _____ charge Formed by _____ electrons _____ from anions _____ never form a charge

- _____ are electrons in the outermost shell
- The _____ is a chemical rule of thumb that states that atoms of main-group elements tend to combine in such a way that each atom has eight electrons in its valence shell, giving it the same electronic configuration as a noble gas.
 - Exception: _____ and _____ only need a duet (_____ valence electrons)
- Valence electrons are _____, _____, or _____ in order to achieve an octet
- _____ are an atom with an overall charge consisting of one element
- _____ are a group of elements with an overall charge. Polyatomic ions act as one single unit.
- Common polyatomic ions are listed on the back of your periodic table

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Diatomic Molecules

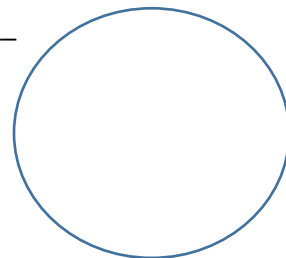
- _____ are 2 atoms of the same element chemically bonded together
- List the 7 Diatomic molecules:
- How can you remember the diatomic molecules?

Counting Atoms

- If there is no numbers by the symbol of the element, assume only one
 - Na _____
 - MgO _____
- A _____ is a number written at the _____ corner of the chemical symbol. If there is more than one, then a number is used.
 - H₂ _____
 - Li₂O _____
- A subscript _____ a multiples all the elements inside the parenthesis.
 - Mg₃(PO₄)₂ _____
- A _____ is a number written _____ of a chemical symbol or in front of a chemical formula which indicates the number of atoms or molecules of the substance.
 - 3 C _____
 - 2 H₂O _____
- Practice:
 - 1) NaCO₃
 - 2) Ca₃(PO₄)₂
 - 3) K₂CrO₄
 - 4) 3 BaCl₂
 - 5) NH₄C₂H₃O₂
 - 6) 4 Al₂(CO₃)₃
 - 7) Pb(NO₃)₂
 - 8) 2 (NH₄)₂Cr₂O₇

Atomic Radius

- Atomic Radius is defined _____ the distance between _____ of atoms bonded together (draw this)
- The radius _____ going across a row and _____ down a column.
- Where is the element with the largest atomic radius located? What element is it?
- Why are atoms larger going down a group?
- Why do atoms get smaller going to from left to right across the row?



Name: _____

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- Practice- Atomic Radius
 - Which of the following has the largest atomic radius?
 - 1) Cobalt or Nickel
 - 2) Phosphorous or Nitrogen
 - 3) Potassium or Oxygen
 - List the following in order of *increasing* atomic radius.
 - 4) Fluorine, gallium, and carbon
 - 5) Barium, iodine, and gold
 - List the following in order of *decreasing* atomic radius.
 - 6) Aluminum, Sulfur, and sodium

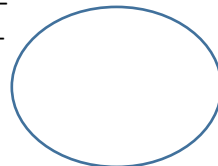
Ionic Radius

- Radius of the atom once it becomes an ion
- A _____ has a smaller radius than its atom
- An _____ has a larger radius than its atom
- Practice- Ionic Radius
 - Which of the following has a larger radius?
 - 1) Calcium atom or calcium ion?
 - 2) Manganese atom or manganese ion?
 - 3) Selenium atom or selenium ion?
 - 4) Chlorine atom or chlorine ion?

Ionization Energy

- Ionization Energy is the energy required to _____

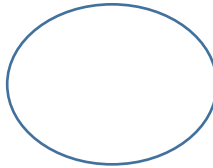
- "3 o'clock trend"
 - _____ from bottom to top
 - _____ from left to right
- Ignore _____ (they do not become ions)
- Practice- Ionization Energy
 - Which of the following has the largest Ionization Energy?
 - 1) Cobalt or Nickel
 - 2) Phosphorous or Nitrogen
 - 3) Potassium or Oxygen
 - List the following in order of *increasing* Ionization Energy.
 - 4) Fluorine, gallium, and carbon
 - 5) Barium, iodine, and gold
 - List the following in order of *decreasing* Ionization Energy.
 - 6) Aluminum, Sulfur, and sodium



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Electronegativity



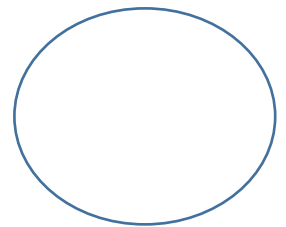
- Electronegativity is a measure of _____ of an atom for the _____ in a chemical bond.
- "3 o'clock trend"
- _____ from bottom to top
- _____ from left to right
- Ignore _____ (they do not attract ions)
- Practice- Electronegativity
- Which of the following has the largest Electronegativity?
 - 1) Cobalt or Nickel
 - 2) Phosphorous or Nitrogen
 - 3) Potassium or Oxygen
- List the following in order of *increasing* Electronegativity.
 - 4) Fluorine, gallium, and carbon
 - 5) Barium, iodine, and gold
- List the following in order of *decreasing* Electronegativity.
 - 6) Aluminum, Sulfur, and sodium

Trends

- Ionization Energy and Electronegativity have the _____ periodic trend (3 o'clock).
- The electrons of _____ atoms are _____ to the nucleus = stronger attraction = harder to pull electrons away from atom.
- Larger atoms = valence electrons are _____ = electrons are easier to steal

Metallic Characteristic and Metal Reactivity

- Metal reactivity and Metallic characteristic _____ as we move from right to left
- Metal reactivity and Metallic Characteristic _____ as we move from top to bottom
- Where is the most reactive metal located? What element is it?
- Activity Series for Metals: shows common and ranks the metals from most reactive and least reactive



Reactivity Series of Metals

	Potassium	K	(Most reactive metal)
	Sodium	Na	
	Calcium	Ca	
	Magnesium	Mg	
	Aluminium	Al	
	Zinc	Zn	
	Iron	Fe	
	Tin	Sn	
	Lead	Pb	
	[Hydrogen]	[H]	
	Copper	Cu	
	Mercury	Hg	
	Silver	Ag	
	Gold	Au	(Least reactive metal)

These metals are more reactive than hydrogen

These metals are less reactive than hydrogen

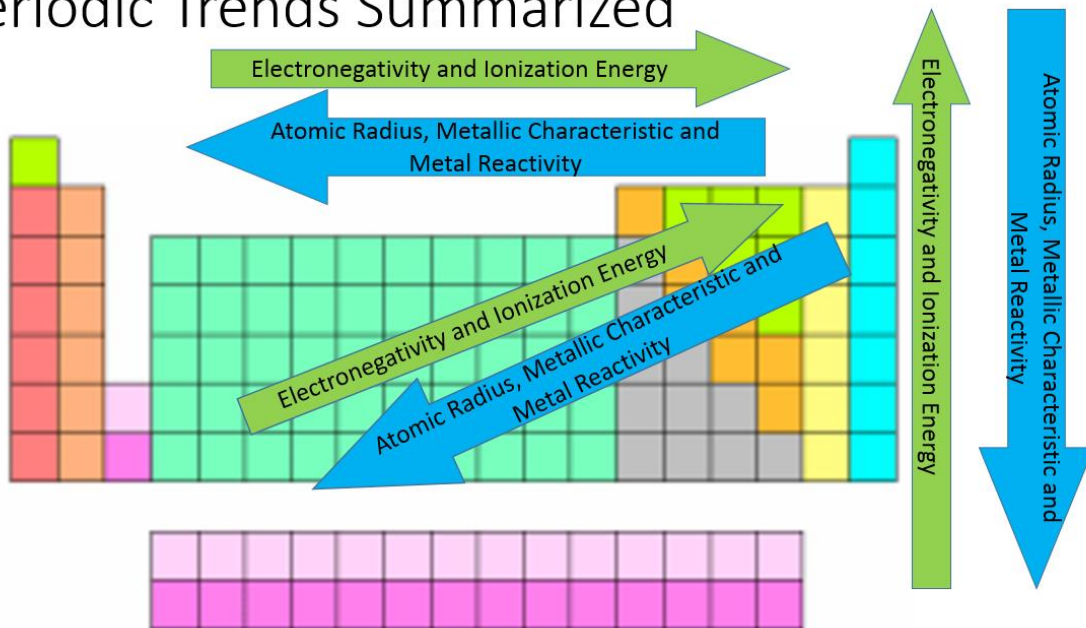
Name: _____

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- Practice- Metallic Characteristic
 - Which of the following has the most Metallic Characteristic?
 - 1) Cobalt or Nickel
 - 2) Phosphorous or Nitrogen
 - 3) Potassium or Oxygen
 - List the following in order of *increasing* Metallic Characteristic.
 - 4) Fluorine, gallium, and carbon
 - 5) Barium, iodine, and gold
 - List the following in order of *decreasing* Metallic Characteristic.
 - 6) Aluminum, Sulfur, and sodium

Summary of Trends

Periodic Trends Summarized



Trend	Period	Group
Atomic Radius		
Ionization Energy		
Electronegativity		
Metallic Characteristic and Metal Reactivity		