Regents Chemistry: Mr. Palermo

Practice Packet Unit: 5 Periodic Table

Name

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Student ID

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Credit Key (0509)

Vocabulary: _____
Intro to PT: _____
Lesson 1: _____
Lesson 2: _____
Lesson 3: _____
Lesson 4: _____
Lesson 5: _____
Review: _____

VOCABULARY

For each word, provide a short but specific definition from YOUR OWN BRAIN! No boring textbook definitions. Write something to help you remember the word. Explain the word as if you were explaining it to an elementary school student. Give an example if you can. Don't use the words given in your definition!

Periodic Law: _____

Period: _____

Group: _____

Metal:_____

Nonmetal: _____

Metalloid/semimetal: _____

Alkali metal: _____

Alkaline earth metal: _____

Transition metal: _____

Halogen: _____

Noble gas: _____

Octet: _____

Atomic radius: _____

Ionic radius: _____

Ionization energy: _____

Electronegativity: _____

Introduction to the Periodic Table:

Color Coding Activity

The Periodic Table is a list of all the known elements. It is organized by increasing atomic number. There are two main groups on the periodic table: metals and nonmetals. The left side of the table contains elements with the greatest metallic properties. As you move from the left to the right, the elements become less metallic with the far right side of the table consisting of nonmetals. A small group of elements, whose members touch the zigzag line, are called metalloids because they have both metallic and nonmetallic properties. Identify the *zig zag* line and make it more bold using a black crayon.

The table is also arranged in vertical columns called "groups" or "families" and horizontal rows called "periods." Each arrangement is significant. The elements in each vertical column or group have similar properties. There are a number of major groups with similar properties. They are as follows:

Hydrogen: This element does not match the properties of any other group so it stands alone. It is placed above group 1 but it is not part of that group. It is a very reactive, colorless, odorless gas at room temperature. (1 outer level electron) Outline Hydrogen in red.

Group 1: Alkali Metals – These metals are extremely reactive and are never found in nature in their pure form. They are silver colored and shiny. Their density is extremely low so that they are soft enough to be cut with a knife. (1 outer level electron) Color the alkali metals in red.

Group 2: Alkaline-earth Metals – Slightly less reactive than alkali metals. They are silver colored and more dense than alkali metals. (2 outer level electrons) Color the alkaline earth metals in orange.

Groups 3 – 12: Transition Metals – These metals have a moderate range of reactivity and a wide range of properties. In general, they are shiny and good conductors of heat and electricity. They also have higher densities and melting points than groups 1 & 2. (1 or 2 outer level electrons) Color the transition metals in pink.

Lanthanides and Actinides: These are also transition metals that were taken out and placed at the bottom of the table so the table wouldn't be so wide. The elements in each of these two periods share many properties. The lanthanides are shiny and reactive. The actinides are all radioactive and are therefore unstable. Elements 95 through 103 do not exist in nature but have been manufactured in the lab. Color the lanthanides and actinides brown.

Group 13: Contains one metalloid and 4 metals. Reactive. Aluminum is in this group. It is also the most abundant metal in the earth's crust. (3 outer level electrons) Color group 13 yellow.

Group 14: Contains on nonmetal, two metalloids, and two metals. Varied reactivity. (4 outer level electrons) Color group 14 light green.
Group 15: Contains two nonmetals, two metalloids, and one metal. Varied reactivity. (5 outer level electrons) Color group 15 dark green.

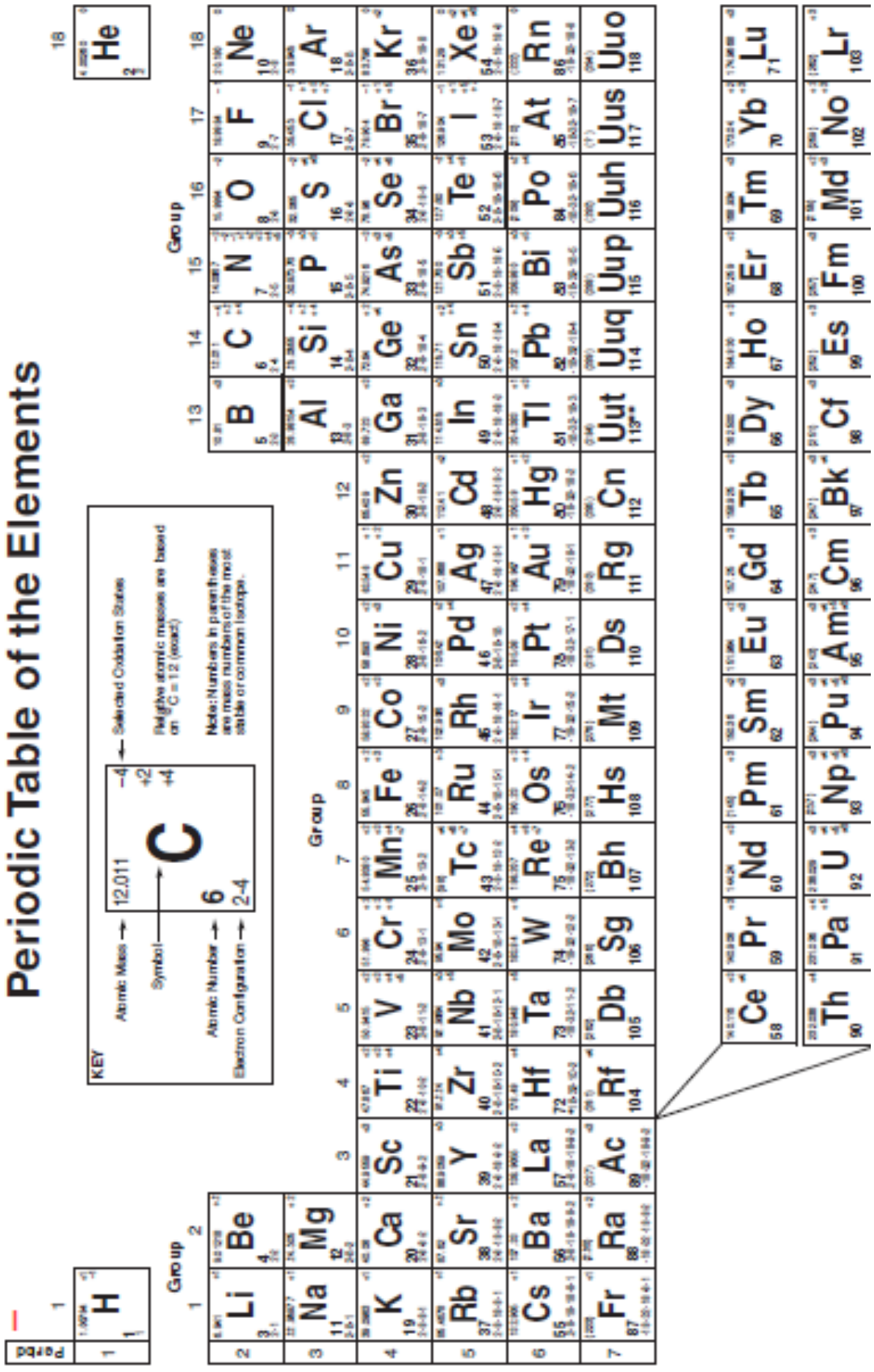
Group 16: Contains three nonmetals, one metalloid, and one metal. Reactive group. (6 outer level electrons) Color group 16 light blue.
Group 17: Halogens – All nonmetals. Very reactive. Poor conductors of heat and electricity. Tend to form salts with metals. Ex. NaCl: sodium chloride also known as "table salt". (7 outer level electrons) Color group 17 dark blue.
Group 18: Noble Gases – Unreactive nonmetals. All are colorless, odorless gases at room temperature. All found in earth's atmosphere in small amounts. (8 outer level electrons) Color group 18 Purple.

Analysis:

1. The vertical columns on the periodic table are called _____.
2. The horizontal rows on the periodic table are called _____.
3. Most of the elements in the periodic table are classified as _____.
4. The elements that touch the zigzag line are classified as _____.
5. The elements in the far upper right corner are classified as_____.
6. Elements in the first group have one outer shell electron and are extremely reactive. They are called

7. Elements in the second group have 2 outer shell electrons and are also very reactive. They are called

8. Elements in groups 3 through 12 have many useful properties and are called _____.
9. Elements in group 17 are known as "salt formers". They are called _____.
10. Elements in group 18 are very unreactive. They are said to be "inert". We call these the _____.
11. The elements at the bottom of the table were pulled out to keep the table from becoming too long. The first period at the bottom called the _____.
12. The second period at the bottom of the table is called the _____.


Periodic Table of the Elements
KEY
Atomic Mass
Symbol
Atomic Number
Electron Configuration
12.011
C
6
2-4
Selected Oxidation States
−4
+2
+4
Relative atomic masses are based on ¹²C = 12 (exact)
Note: Numbers in parentheses are mass numbers of the most stable or common isotope.
Group
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
Period
1
2
3
4
5
6
7
H
He
Li
Be
B
C
N
O
F
Ne
Na
Mg
Al
Si
P
S
Cl
Ar
K
Ca
Sc
Ti
V
Cr
Mn
Fe
Co
Ni
Cu
Zn
Ga
Ge
As
Se
Br
Kr
Rb
Sr
Y
Zr
Nb
Mo
Tc
Ru
Rh
Pd
Ag
Cd
In
Sn
Sb
Te
I
Xe
Cs
Ba
La
Hf
Ta
W
Re
Os
Ir
Pt
Au
Hg
Tl
Pb
Bi
Po
At
Rn
Fr
Ra
Ac
Rf
Db
Sg
Bh
Hs
Mt
Ds
Rg
Cn
Uut
Uuq
Uup
Uuh
Uus
Uuo
Ce
Pr
Nd
Pm
Sm
Eu
Gd
Tb
Dy
Ho
Er
Tm
Yb
Lu
Th
Pa
U
Np
Pu
Am
Cm
Bk
Cf
Es
Fm
Md
No
Lr

Inquiry Activity 1: Introduction to Periods and Groups

Look at the periodic table of elements.

1. Periods represent the (vertical/horizontal) rows on the table.
2. Draw Bohr diagrams for Carbon, Boron and Oxygen, all in period 2.

3. Based on your diagrams in question 2, elements in the same period have the same # of _____.
4. Groups represent the (vertical/horizontal) columns on the table.
5. Draw Bohr diagrams for Lithium, Sodium, and Potassium (all in group 1).

6. Based upon your diagrams in question 5, elements in the same group have the same # of _____.

RULES: Group 1 are known as Alkali Metals. Group 2 are Alkaline earth metals. Groups 3-12 are Transition metals. Group 17 are Halogens. Group 18 are Noble gases. All other groups do not have names.

Element	# of Valence electrons	# of energy levels	Group Name	Lewis Diagram	Element	# of Valence electrons	# of energy levels	Group Name	Lewis Diagram
Li					**Na**				
Mg					**Ca**				
Al					**Ga**				
Ge					**Sn**				
N					**P**				
Se					**Te**				
Cl					**I**				
Kr					**Rn**				

Periods and Groups Summary

www.mrpalermo.com

Practice Packet: Unit 5 Periodic Table

Look at the periodic table of elements.

1. How many periods are on the periodic table of elements?

2. What do elements in the same period have in common?

3. Write out Lewis dot diagrams for any three elements in group 18.

4. What do elements in the same group have in common?

Periodic Trends

5. Look up the atomic radius for Na and Cl (period 3 elements) on Table S.

   Na =_____ Cl= _____

   What is the trend in atomic radius going across a period? (increasing/decreasing)

6. Look up the atomic radius for Be and Ba (group 2 elements) on Table S.

   Be =_____

   Ba= _____

   What is the trend in atomic radius going down a group? (increasing/decreasing)

7. Why do you think the trend in question 6 exists?

LESSON 1: DEVELOPMENT OF THE PERIODIC TABLE

Objective:

- ***Explain how the periodic table was developed***
- ***Identify the differences between periods and groups***

1. Who initially developed the periodic Table? How was it organized?

2. In what order are the elements on the periodic table arranged today?

3. What do the groups have in common?

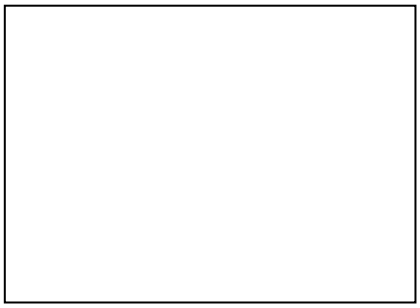
4. What do the periods have in common?

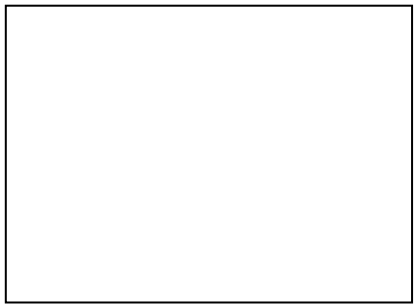
5. Explain how the number of valence electrons affects the reactivity of elements?

6. Which metals are most reactive and why?

7. Which nonmetals are most reactive and why?

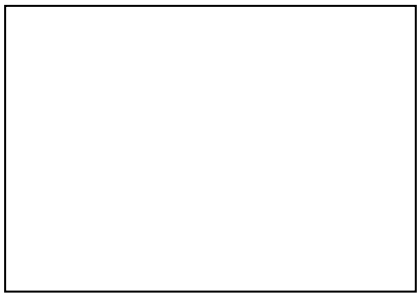
8. Draw the Bohr diagrams for Neon and Helium and explain why they are unreactive (do not bond):

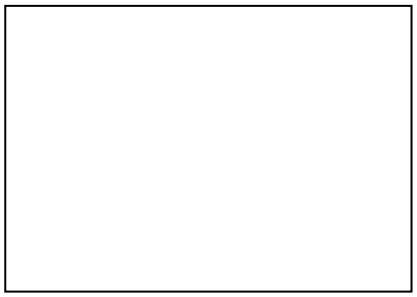




_____
_____
_____
_____
_____

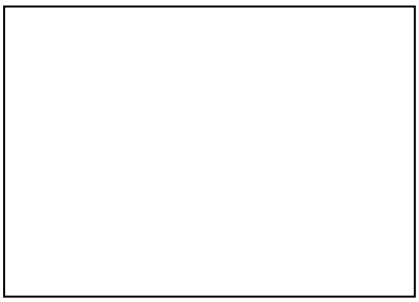
9. Draw the Bohr diagrams for Sodium and Calcium and state whether **metals** gain or lose electrons when forming ions:

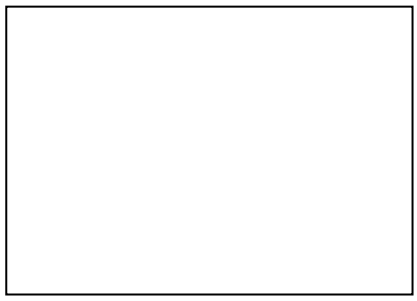




_____
_____
_____
_____
_____

10. Draw the Bohr diagrams for Fluorine and Sulfur and state whether **metals** gain or lose electrons when forming ions:





_____
_____
_____
_____
_____

REGENTS PRACTICE

1. In terms of valence electrons, why do Na and Li have similar properties?

2. What two elements have similar reactivity and why? Ca, Sr, Ti, Zr.

3. If sodium reacts with water, would you expect potassium to react with water as well? Why or why not.

4. Which elements have the most similar chemical properties?
   A) K and Na C) K and Cl
   B) K and Ca D) K and S

ASSESS YOURSELF ON THIS LESSON:

If you missed any regents practice questions you should see me for extra help and/or re-watch the lesson video assignment

INQUIRY ACTIVITY 2: PROPERTIES OF METALS, NONMETALS AND METALLOIDS

Fill in the table as you observe the substances at each lab station. Once you are finished with one substance you may move on to the next.

	Luster		**Electrical Conductivity**		**Brittle** *(breaks apart when you hit it)*		**Other Observations/Information** *(write down anything that you see or is given to you)*	**Metal or Non Metal** *(complete this column after reading the questions below)*
	Shiny	Dull	Yes	No	Yes	No		
1								
2								
3								
4								
5								
6								
7								

1. Now that you have observed the properties of various substances we are going to classify them. Metals have the following properties below. Based upon the properties of metals, check off all of the substances that are metals in your data table.
    - *Lustrous (shiny)*
    - *Excellent conductors of heat and electricity*
    - *Malleable not brittle. (Malleable is defined as capable of being shaped or formed, as by hammering or pressure without breaking.)*

2. Nonmetals have the following properties below. Based upon the properties of nonmetals, check off all of the substances that are nonmetals in your data table.
    - *Dull not lustrous (shiny)*
    - *Poor conductors of heat and electricity*
    - *Brittle. (Brittle is defined as likely to break, snap, or crack, as when subjected to hammering or pressure).*

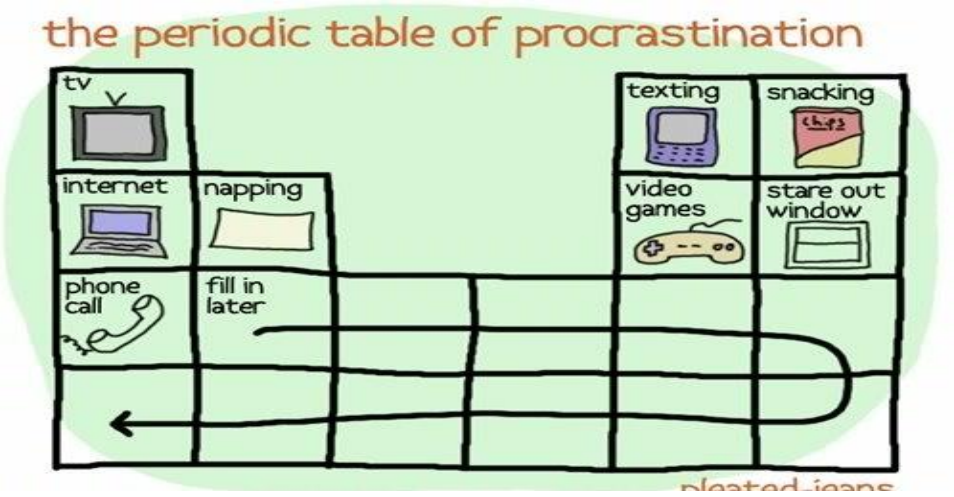
3. Metalloids or semimetals have properties of both metals and nonmetals. Check off all of the substances that are metalloids in your data table.

4. Using your periodic table, do metals for positive or negative ions? Nonmetals?

5. Create a table of properties of metals and nonmetals based upon the information above.

Properties of Metals	Properties of Nonmetals

6. Ductile is the ability of a substance to be hammered thin and pulled or drawn out into wire. Which type of substance (metal or nonmetal) do you think has this property and why?



LESSON 2: CATEGORIES & PROPERTIES OF ELEMENTS

Objective:

- ***Differentiate between the different groups of elements***
- ***Identify the properties specific to each category of element***

1. Check all the boxes that describe the element. *The first one has been done for you*

	Check one of the following:			**Only check if appropriate:** *leave blank if none apply*					**Only check if appropriate:**	
	Metal	**Metalloid**	**Nonmetal**	**Alkaline Metal**	**Alkaline Earth Metal**	**Transition metal**	**Halogen**	**Noble gas**	**Only Monatomic**	**Diatomic**
Rn			x					x	x	
Sb										
Sr										
P										
Pt										
Cs										
S										
Fe										
Br										
Ar										
H										
Si										
B										
F										
He										
Se										
Zn										
Ra										

2. Write in the space, “Group 1 metals”, “Group 2 metals”, “transition metals”, “halogens”, or “noble gases” to indicate which group each statement is describing.

a.		Can form Colored solutions
b.		Full valence shell
c.		Most active metals
d.		Most active nonmetals
e.		Monatomic gases
f.		Diatomic elements
g.		Stable and unreactive
h.		7 valence electrons
i.		2 valence electrons
j.		Form ions with a +1 charge

3. Write in the space, “metals”, “metalloids”, or “nonmetals” to indicate which type of element each statement is describing.

a.		Located on the left side of the Periodic Table
b.		Located on the right side of the Periodic Table
c.		Solids are brittle
d.		Majority of the elements
e.		Gain electrons to form negative ions
f.		Located along the “staircase”
g.		Have luster
h.		Malleable
i.		Lose electrons to form positive ions
j.		Ductile
k.		Excellent conductors of heat & electricity
l.		Poor electrical & heat conductors
m.		Ions are larger than their atoms
n.		Ions are smaller than their atoms

REGENTS PRACTICE

1. Which three groups of the Periodic Table contain the most elements classified as metalloids (semimetals)?
   A) 1, 2, and 13 B) 2, 13, and 14
   C) 14, 15, and 16 D) 16, 17, and 18

2. The metalloids that are included in Group 15 are antimony and
   A) N B) P C) As D) Bi

3. Which element is a member of the halogen family?
   A) K B) B C) I D) S

4. Which represents the electron configuration of a metalloid?
   A) 2-3 B) 2-5 C) 2-8-5 D) 2-8-6

5. An atom of an element contains 20 protons, 20 neutrons, and 20 electrons. This element is in Group
   A) 1 B) 2 C) 4 D) 18

7. Which sequence of atomic numbers represents elements which have similar chemical properties?
   A) 19, 23, 30, 36 B) 9, 16, 33, 50
   C) 3, 12, 21, 40 D) 4, 20, 38, 88

8. Alkali metals, alkaline earth metals, and halogens are elements found respectively in Groups
   A) 1, 2, and 18 B) 2, 13, and 17
   C) 1, 2, and 14 D) 1, 2, and 17

9. Which group contains elements composed of diatomic molecules at STP?
   A) 11 B) 2 C) 7 D) 17

10. On the Periodic Table, an element classified as a semimetal (metalloid) can be found in
    A) Period 6, Group 15 B) Period 2, Group 14
    C) Period 3, Group 16 D) Period 4, Group 15

11. Atoms of metallic elements tend to
    A) gain electrons and form negative ions
    B) gain electrons and form positive ions
    C) lose electrons and form negative ions
    D) lose electrons and form positive ions

12. Which element is considered malleable?
    A) gold B) hydrogen
    C) sulfur D) radon

13. Which element is malleable and conducts electricity?
    A) iron B) iodine
    C) sulfur D) phosphorus

14. Which element is malleable and ductile?
    A) S B) Si C) Ge D) Au

15. Which element is brittle and does *not* conduct heat or electricity?
    A) S(s) B) Mg(s) C) Al(s) D) K(s)

16. Which element is an active nonmetal?
    A) Neon B) oxygen C) zinc D) chromium

17. Which characteristics describe most solid nonmetals?
    A) They are malleable and have metallic luster.
    B) They are malleable and lack metallic luster.
    C) They are brittle and have metallic luster.
    D) They are brittle and lack metallic luster.

18. An atom in the ground state has a stable valence electron configuration. This atom could be an atom of
    A) Al B) Cl C) Na D) Ne

19. Which element is a metalloid?
    A) Al B) Ar C) As D) Au

20. Magnesium and calcium have similar chemical properties because a magnesium atom and a calcium atom have the same
    A) atomic number
    B) mass number
    C) total number of electron shells
    D) total number of valence electrons

ASSESS YOURSELF ON THIS LESSON:

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LESSON 3: PERIODIC TRENDS (ATOMIC RADIUS)

Objective:

- ***Describe the trend in atomic radius***
- ***Explain why this trend in atomic radius exists***

https://teachchemistry.org/periodical/issues/march-2016/periodic-trends-ionization-energy-atomic-radius-ionic-radius

1. Draw the Bohr Model for Lithium and Potassium. Then look up the atomic radius and write it in the space provided.

Atomic Radius: _____ Atomic Radius: _____

2. Using the models above, what is the trend in atomic radius going down a group?

3. Why does this trend exist?

4. Draw the Bohr diagram for sodium and chlorine. Then look up the atomic radius and write it in the space provided.

Atomic Radius: _____ Atomic Radius: _____

5. What is the trend in atomic radius going across a period?

6. Why does this trend exist?

What you need to know……

Atomic Radius _____ across a period because _____

Atomic Radius _____ down a group because _____

REGENTS PRACTICE

1. An atom of which element has the largest radius?
   a. Fe b. Mg c. Si d. Zn

2. As atomic number increases within Group 15 on the Periodic Table, atomic radius
   a. decreases, only
   b. decreases, then increases
   c. increases, only
   d. increases, then decreases

3. How do the atomic radius and metallic properties of Na compare to the atomic radius and metallic properties of P?
   a. Sodium has a larger atomic radius and is more metallic.
   b. Sodium has a larger atomic radius and is less metallic.
   c. Sodium has a smaller atomic radius and is more metallic.
   d. Sodium has a smaller atomic radius and is less metallic.

4. Which list of elements from Group 2 is arranged in order of increasing radius?
   a. Be, Mg, Ca b. Ca, Mg, Be
   c. Ba, Ra, Sr d. Sr, Ra, Ba

5. The data table below shows elements *Xx, Yy,* and *Zz* from the same group on the Periodic Table.

Element	Atomic Mass (atomic mass unit)	Atomic Radius (pm)
Xx	69.7	141
Yy	114.8	?
Zz	204.4	171

What is the most likely atomic radius of element *Yy*?
a. 103 pm b. 127 pm c. 166 pm d. 185 pm

6. As the elements in Period 2 are considered in succession from left to right, there is a decrease in atomic radius with increasing atomic number. This may best be explained by the fact that the
    a. number of protons increases, the number of shells of electrons remains the same
    b. number of protons increases, and the number of shells of electrons increases
    c. number of protons decreases, the number of shells of electrons remains the same
    d. number of protons decreases, and the number of shells of electrons increases

7. Which of the following electron configurations represents the element with the smallest radius?
    a. 2-4 b. 2-5 c. 2-6 d. 2-7

8. Which electron configuration represents the atom with the largest atomic radius?
    a. 1 b. 2-1 c. 2-2 d. 2-3

9. As the elements of Group 16 are considered in order from top to bottom, the covalent radius of each successive element increases. This increase is primarily due to an increase in
    a. atomic number
    b. mass number
    c. the number of protons occupying the nucleus
    d. the number of occupied electron shells

10. An ion of which element has a larger radius than an atom of the same element?
    a. aluminum c. chlorine
    b. Magnesium d. sodium

11. An atom with the electron configuration 2-8-2 would most likely
    a. decrease in size as it forms a positive ion
    b. increase in size as it forms a positive ion
    c. decrease in size as it forms a negative ion
    d. increase in size as it forms a negative ion

12. The radius of a calcium ion is smaller than the radius of a calcium atom because the calcium ion contains the same nuclear charge and
    a. fewer protons c. more protons
    b. fewer electrons d. more electrons

13. A chloride ion *differs* from a chlorine atom in that the chloride ion has
    a. more protons c. fewer protons
    b. a larger radius d. a smaller radius

14. How does the size of a barium ion compare to the size of a barium atom?
    a. The ion is smaller because it has fewer electrons.
    b. The ion is smaller because it has more electrons.
    c. The ion is larger because it has fewer electrons.
    d. The ion is larger because it has more electrons.

ASSESS YOURSELF ON THIS LESSON:

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LESSON 4: PERIODIC TRENDS (IONIZATION ENERGY)

Objective:

- ***Describe the trend in ionization energy***
- ***Explain why this trend exists***

1. What is ionization energy?

2. What subatomic particle is responsible for the ionization energy of an atom?

3. Which atom (Na or K) has a larger ionization energy and why?

4. Do metals typically have higher or lower ionization energies?

5. Why do nonmetals typically have higher ionization energies?

Explain the following in terms of atomic structure:

1. Cesium has a *lower* first ionization energy than rubidium.

2. Bromine has a *lower* first ionization energy than chlorine.

3. Beryllium has a *higher* first ionization energy than lithium.

4. Calcium has a *higher* first ionization energy than potassium.

What you need to know……

Ionization Energy _____ across a period because _____

Ionization Energy _____ down a group because _____

REGENTS PRACTICE

1. Which general trend is found in Period 2 on the Periodic Table as the elements are considered in order of increasing atomic number?
   a. Decreasing atomic mass
   b. increasing ionization energy
   c. increasing atomic radius

2. As the elements of Group 1 on the Periodic Table are considered in order of increasing atomic radius, the ionization energy of each successive element generally
   a. decreases c. increases
   b. remains the same

3. The amount of energy required to remove the outermost electron from a gaseous atom in the ground state is known as
   a. first ionization energy c. activation energy
   b. conductivity d. electronegativity

4. Which atom in the ground state requires the *least amount of energy to remove its valence electron?*
   a. lithium atom c. rubidium atom
   b. potassium atom d. sodium atom

5. Which element requires the *least* amount of energy to remove the most loosely held electron from its atom?
   a. bromine c. sodium
   b. calcium d. silver

6. Samples of four Group 15 elements, antimony, arsenic, bismuth, and phosphorus, are in the gaseous phase. An atom in the ground state of which element requires the *least* amount of energy to remove its most loosely held electron?
   a. As b. Bi c. P d. Sb

7. In the ground state, each atom of an element has two valence electrons. This element has a lower first ionization energy than calcium. Where is this element located on the Periodic Table?
   a. Group 1, Period 4 c. Group 2, Period 5
   b. Group 2, Period 3 d. Group 3, Period 4

8. Which electron configuration represents an element with the highest first ionization energy?
   a. 2-1 b. 2-2 c. 2-8-1 d. 2-8-2

9. What does the second ionization energy refer to?
   a. Removing two electrons at once
   b. Removing the second electron from the valence
   c. Adding an electron back to the ion

10. Which element can have the following ionization energies:

First	Second	Third	Fourth
250	500	2500	2800

   a. K b. Mg c. O d. F

11. Which element can have the following ionization energies:

First	Second	Third	Fourth
100	700	900	1000

   a. K b. Mg c. O d. F

12. Low ionization energies are most characteristic of atoms that are
   a. metals c. nonmetals
   b. metalloids d. noble gases

ASSESS YOURSELF ON THIS LESSON:

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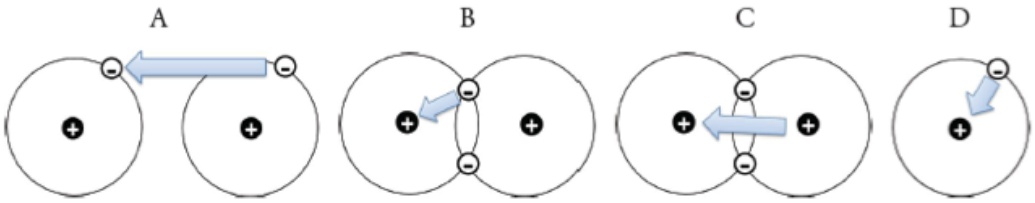
INQUIRY ACTIVITY 5: ELECTRONEGATIVITY

Period Trend:

Electronegativity is a measure of the ability of a atom's nucleus to attract electrons form a different atom within a shared (covalent) bond. A larger electronegativity value correlates to a stronger pull on the electrons in a bond. This value is only theoretical and cannot be measured in a lab setting.

1. Using the definition in the box above, select the best representation for electronegativity. Explain your choice.



2. What particle in the nucleus is responsible for attracting the electrons of another atom as described above?

3. Finish the statement: Fluorine has (more/less) protons than lithium and a (larger/smaller) electronegativity value because fluorine's nucleus has a (stronger/weaker) pull on new electrons than lithium.
4. Using table S, record the electronegativity values of Lithium and Fluorine: _____ and _____.
5. Describe the trend of electronegativity with in a period in terms of protons, electrons and energy levels.

Group Trend:

6. Magnesium has more protons than beryllium but a weaker pull on electrons. Draw Be and Mg Bohr diagrams with arrows to denote the pull of protons on electrons of a new atom. Use the diagrams to determine what other factor might make Magnesium's nucleus not pull as strong.

7. Using table S, record the electronegativity values of Beryllium and Magnesium: _____ and _____
8. Describe the trend of electronegativity with in a group in terms of protons, electrons and energy levels.

9. Describe why fluorine would have the highest electronegativity of all elements in terms of protons, electrons and energy levels.

10. Explain a possible reason why noble gases have no published electronegativity values based on your knowledge of noble gas properties.

LESSON 5: PERIODIC TRENDS (ELECTRONEGATIVITY)

Objective:

- ***Describe the trend in electronegativity energy***
- ***Explain why this trend exists***

1. What is electronegativity?

2. Which element has the highest electronegativity?

3. What subatomic particle is responsible for the electronegativity of an atom?

4. Which atom (Na or Cl) has a larger electronegativity and why?

5. Do metals typically have higher or electronegativity?

6. Why do nonmetals typically have higher electronegativity?

Explain the following in terms of atomic structure:

6. Cesium has a *lower* electronegativity than rubidium.

7. Bromine has a *lower* electronegativity than chlorine.

8. Beryllium has a *higher* electronegativity than lithium.

9. Calcium has a *higher* electronegativity than potassium.

What you need to know……

Electronegativity _____ across a period because _____

Electronegativity _____ down a group because _____

REGENTS PRACTICE

1. Which general trend is found in Period 3 as the elements are considered in order of increasing atomic number?
   A) increasing atomic radius
   B) increasing electronegativity
   C) decreasing atomic mass
   D) decreasing first ionization energy

2. Which statement describes the general trends in electronegativity and metallic properties as the elements in Period 2 are considered in order of increasing atomic number?
   a. Both electronegativity and metallic properties decrease.
   b. Electronegativity decreases and metallic properties increase.
   c. Electronegativity increases and metallic properties decrease.

3. Which atom has the *weakest* attraction for electrons in a chemical bond?
   A) boron B) calcium C) fluorine D) nitrogen

4. Which general trend is demonstrated by the Group 17 elements as they are considered in order from top to bottom on the Periodic Table?
   a. a decrease in atomic radius
   b. an increase in first ionization energy
   c. a decrease in electronegativity
   d. an increase in nonmetallic behavior

5. Which properties are most common in nonmetals?
   a. low ionization energy and low electronegativity
   b. low ionization energy and high electronegativity
   c. high ionization energy and low electronegativity
   d. high ionization energy and high electronegativity

6. Which element in Period 2 has the greatest tendency to form a negative ion?
   a. Lithium b. carbon c. neon d. fluorine

7. Elements that readily gain electrons tend to have
   a. high ionization energy and high electronegativity
   b. high ionization energy and low electronegativity
   c. low ionization energy and low electronegativity
   d. low ionization energy and high electronegativity

8. Element *M* has an electronegativity of less than 1.2 and reacts with bromine to form the compound MBr_2. Element *M* could be
   a. Al b. Na c. Ca d. K

9. The Group 17 element with the highest electronegativity is
   a. Fluorine b. chlorine c. bromine d. iodine

10. The ability of carbon to attract electrons is
    a. greater than nitrogen, but less than oxygen
    b. less than nitrogen, but greater than oxygen
    c. greater than that of nitrogen and oxygen
    d. less than that of nitrogen and oxygen

ASSESS YOURSELF ON THIS LESSON:

If you missed any regents practice questions you should see me for extra help and/or re-watch the lesson video assignment

REVIEW:

1. Complete the table below by checking the appropriate boxes.

	Across a Period →		Down a Group ↓	
	Increases	Decreases	Increases	Decreases
Atomic radius				
Metallic character				
Ionization energy				
Electronegativity				
Why?	**Proton Pull increases**		**# of electron shells increases**	

2. Use Table S to fill in the names and states of each element below. Check all the boxes that describe the element.

	Name	Physical Properties					Chemical Properties					
		State at STP (s, l, or g)	Brittle	Malleable /ductile	Conductor		Ionization energy		Electro-negativity		Electrons	
					Good	Poor	Low	High	Low	High	Lose	Gain
C												
Ag												
Mg												
I												
S												
Au												
Fe												
Br												
Ar												
H												
Hg												

3. Write in the space, “metals”, “metalloids”, or “nonmetals” to indicate which type of element.

b.		Located on the left side of the P.T.
b.		Located on the right side of the P.T.
c.		Solids are brittle
d.		Majority of the elements
e.		Gain electrons to form negative ions
f.		Located along the “staircase”
g.		Have luster
h.		Malleable
i.		Lose electrons to form positive ions
j.		Ductile
k.		Excellent conductors of heat & electricity
l.		Poor electrical & heat conductors
m.		Low electronegativity values
n.		Low ionization energy
o.		High ionization energy
p.		High electronegativity values
q.		Ions are larger than their atoms