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Science 9  
 Chemistry

## Chemistry Unit Review

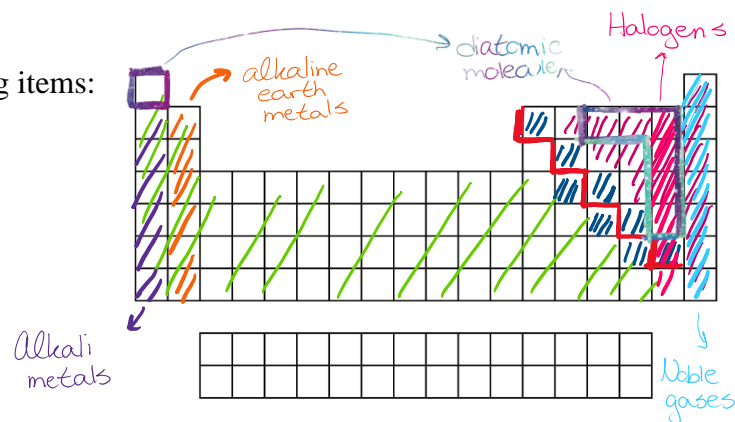
1. Draw the Bohr or Lewis diagram for the following atoms/ions. Be sure to include the number of protons and the number of neutrons in the middle of your diagram.

Element	Bohr Model	Element	Lewis Model
Lithium atom		Phosphorus atom	
Chlorine Ion		Chlorine ion	
MgF <sub>2</sub>		NH <sub>3</sub>	
H <sub>2</sub> O		CH <sub>4</sub>	

1. Periodic Table:

On the blank periodic table, label/colour the following items:

- Metals ●
- Non-metals ●
- Metalloids ●
- Alkali metals ●
- Alkaline earth metals ●
- Halogens ●
- Noble gases ●
- Diatomic Molecules ●

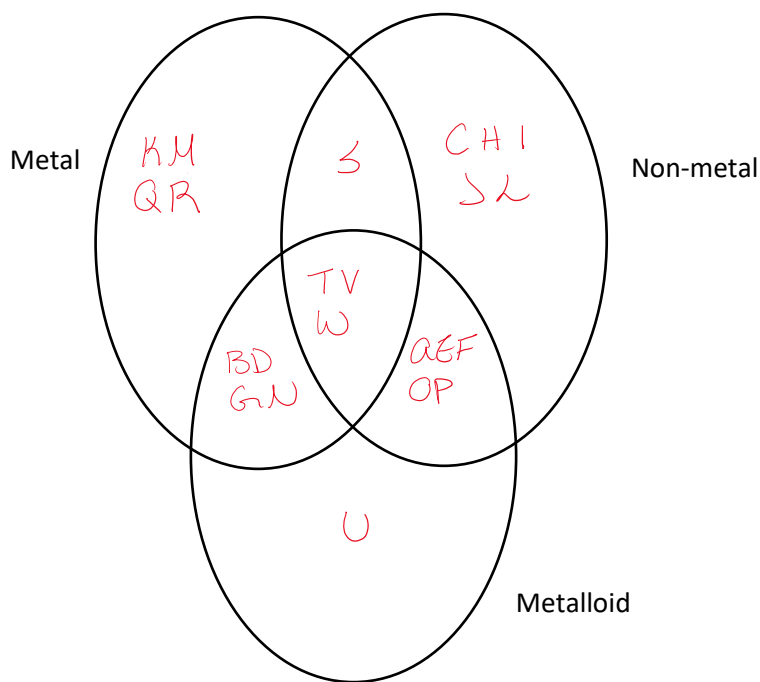


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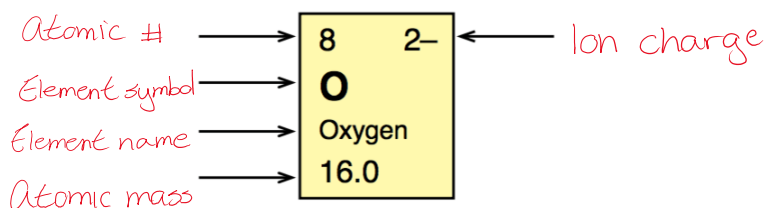
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2. Complete the following Venn diagram:

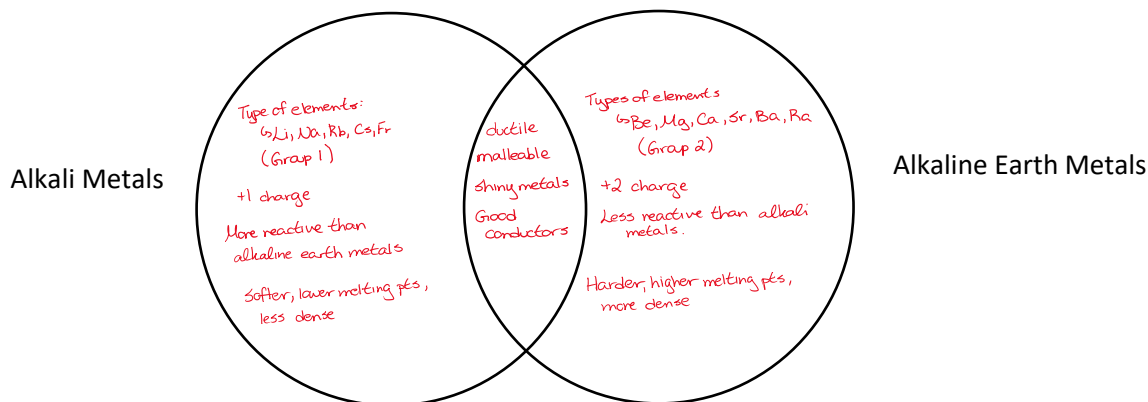
- a.) Brittle
- b.) Ductile
- c.) Not shiny
- d.) Malleable
- e.) Not ductile
- f.) Not malleable
- g.) Shiny and smooth
- h.) Dull-looking solids
- i.) Including halogens
- j.) Include noble gases
- k.) Includes alkali metals
- l.) Gases at room temperature
- m.) Includes alkaline-earth metals
- n.) Mostly solids at room temperature
- o.) Poor conductors of electric current
- p.) Poor conductors of thermal energy
- q.) Good conductors of electric current
- r.) Good conductors of thermal energy
- s.) Some elements are liquids at room temperature
- t.) Has an atomic mass and a distinct atomic number
- u.) Have physical and chemical properties of both metals and non-metals
- v.) Can react with other elements to form compounds (except most noble gases)
- w.) Elements that are made of atoms consisting of protons, electrons and neutrons



3. Label the following diagram with the appropriate terms:



4. Compare and contrast alkali metals and alkaline earth metals. Brainstorm at least 4 differences and 4 similarities between the two families.



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5. The columns on the periodic table are called: *Groups/families*

6. The rows on the periodic table are called: *Periods*

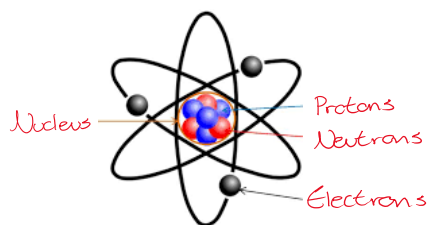
7. List and describe two periodic trends:

a. *Atomic Size* → move down a group, atomic size gets larger (more shells)

8. List the three subatomic particles and their accompanying charges:

*Protons = + Neutrons = 0 Electrons = -*

9. Label the following diagram:



10. Most of the volume from an atom comes from:

*Electrons*

11. Most of the mass from an atom comes from:

*Nucleus (protons + neutrons)*

12. What is a valence shell?

*Outermost energy shell of an atom*

13. How many electrons are able to occupy in...

- a. The first shell? *2*
- b. The second shell? *8*
- c. The third shell? *8*
- d. The fourth shell? *18*

14. All atoms in the same period will have the same number of *energy shells*.

15. All atoms in the same group/family will have the same number of *valence electrons*.

16. Why are Noble Gases stable? *Their valence shells are completely full.*

17. Why do elements tend to lose or gain electrons and become ions?

*In order to achieve a full valence shell.*

18. Describe how ionic compounds are formed based on their valence electrons.

*Metals will give away their valence electrons to non-metals.  
Metals become positive ions (lost electrons) & non-metals become negative ions (gained electrons).*

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19. Describe how covalent compounds are formed based on their valence electrons.

*Non-metals will share their valence electrons with each other to gain a full shell.*

20. Naming ionic and covalent compounds:

Write formulas for the following compounds and classify as ionic (I) or covalent (C):

a. Lithium chloride	<u>LiCl</u>	<u>I</u>
b. Silver nitrate	<u>AgNO<sub>3</sub></u>	<u>I</u>
c. Zinc hydroxide	<u>Zn(OH)<sub>2</sub></u>	<u>I</u>
d. Carbon disulfide	<u>CS<sub>2</sub></u>	<u>C</u>
e. Iron (III) phosphate	<u>FePO<sub>4</sub></u>	<u>I</u>
f. Copper (I) iodide	<u>CuI</u>	<u>I</u>
g. Tin (IV) fluoride	<u>SnF<sub>4</sub></u>	<u>I</u>
h. Barium dichromate	<u>BaCr<sub>2</sub>O<sub>7</sub></u>	<u>I</u>
i. Beryllium nitrite	<u>Be(NO<sub>2</sub>)<sub>2</sub></u>	<u>I</u>
j. Sulfur trioxide	<u>SO<sub>3</sub></u>	<u>C</u>
k. Boron trichloride	<u>BCl<sub>3</sub></u>	<u>C</u>
l. Dibromine pentoxide	<u>Br<sub>2</sub>O<sub>5</sub></u>	<u>C</u>
m. Strontium sulfide	<u>SrS</u>	<u>I</u>
n. Tin (II) iodide	<u>SnI<sub>2</sub></u>	<u>I</u>
o. NaClO <sub>4</sub>	<u>Sodium perchlorate</u>	<u>I</u>
p. P <sub>2</sub> O <sub>3</sub>	<u>diphosphorus trioxide</u>	<u>C</u>
q. Li <sub>3</sub> P	<u>Lithium phosphide</u>	<u>I</u>
r. FeS	<u>Iron (II) sulphide</u>	<u>I</u>
s. MgBr <sub>2</sub>	<u>Magnesium Bromide</u>	<u>I</u>
t. PbCrO <sub>4</sub>	<u>lead (II) chromate</u>	<u>I</u>
u. ZnSO <sub>4</sub>	<u>Zinc sulphate</u>	<u>I</u>
v. K <sub>2</sub> CO <sub>3</sub>	<u>Potassium carbonate</u>	<u>I</u>
w. Cl <sub>2</sub> S <sub>5</sub>	<u>dichlorine pentasulphide</u>	<u>C</u>
x. Al <sub>2</sub> O <sub>3</sub>	<u>Aluminium oxide</u>	<u>I</u>
y. NF <sub>3</sub>	<u>nitrogen trifluoride</u>	<u>C</u>
z. Cu(NO <sub>3</sub> ) <sub>2</sub>	<u>Copper (II) nitrate</u>	<u>I</u>
aa. Cu(NO <sub>3</sub> ) <sub>2</sub>	<u>Copper (II) nitrate</u>	<u>I</u>