

Name: \_\_\_\_\_ Block: \_\_\_\_\_

## Unit 3 Study Guide Worksheet

**Learning Target 1: I can explain how ionic compounds are formed, and use the periodic table to identify the number of protons and electrons in an ion.** For help, see pgs. 47-51 and also the packet on ionic naming (not taped into notebook).

1. Explain the difference between an ion and an atom (See pg. \_\_\_\_)

2. Explain how an ion is formed.

3. Explain how an ionic bond is created.

4. Fill out the table below.

Symbol	Name of ION	Protons	Electrons
--------	----------------	---------	-----------

K+1

16 18

P-3

0-2

12 10

Bromide 36

5. How do we change the name of a negative ion from the atom's name?

Name: \_\_\_\_\_ Block: \_\_\_\_\_

**Learning Target 2: I can write the formula for ionic compounds when given the name.** For help, see page 51 or the Review Worksheet on Page 80. You need to memorize these names and their charges for the test.

- Write the name of the polyatomic ions below.

- $(NO_3)^{-1}$
- $(CO_3)^{-2}$
- $(SO_4)^{-2}$
- $(PO_4)^{-3}$
- $(OH)^{-1}$
- $(NH_4)^{+1}$

**Learning Target 3: I can name ionic compounds when given the formula.** For help, see the packet on ionic naming (not taped into notebook).

- Identify if the following compounds are ionic. If so, write the name of the compounds. Use the list of polyatomic ions above if necessary.

- $CaCO_3$
- $KCl$
- $FeSO_4$
- $C_3H_8$
- $MgF_2$
- $Pb_2O_3$

**Check your work above. Are there any ions from transition the elements? Do they need polyatomic ions to show the charge?**

- Write the formula for the following compounds

6. Iron (III) chloride
7. Lithium oxide
8. Ammonium nitrate
9. Aluminum bromide

Name: \_\_\_\_\_ Block: \_\_\_\_\_

10. Magnesium sulfate

11. Aluminum Sulfide

12. Silver (I) nitrate

13. Calcium nitride

**Using the Mole to find out how much stuff we have**

**Learning Target 4: I can calculate the molar mass of a compound.** For help, see pages 70-74 and mole infographic on page 67.

12. Define molar mass.

13. Calculate the molar mass of  $\text{PbSO}_4$ .

14. Calculate the molar mass  $\text{MgBr}_2$ .

15. Calculate the molar mass of  $\text{Al}_2(\text{SO}_4)_3$

**Learning Target 5: I can use the mass of moles (groups of atoms or molecules) to find out how much of some element or compound I have.** For help, see pages 70-74 and mole infographic on page 67.

**11.** How many moles are in 346 grams of  $\text{PbSO}_4$ ?

**12.** How many moles are in 462 grams of  $\text{Li}_2\text{O}$ ?

Name: \_\_\_\_\_ Block: \_\_\_\_\_

**13.** How many grams are in 4.8 moles of  $\text{Al}(\text{NO}_3)_3$ ?

**14.** How many moles are in 48 grams of  $\text{CaCO}_3$ ?

**15.** How many grams are in 17 moles of  $\text{CaO}$ ?

**16.** How many grams are in 467 moles of  $\text{Zn}_3(\text{PO}_4)_2$ ?

**Using percent composition by mass to find out how much stuff we have**

**Learning Target 6: I can calculate the percent composition of each element in a compound.** For help see page 86 ( I think).

17. What percent of magnesium bromide is magnesium?

Name: \_\_\_\_\_ Block: \_\_\_\_\_

18. What percent of aluminum oxide is oxygen?

19. What percent of  $\text{Ca}(\text{NO}_3)_2$  is nitrogen?

20. What percent of  $\text{PbSO}_4$  is Pb?

**Getting information from molecular formulas**

**Learning Target 7: I can determine the molecular formula of a compound.** For help see page 81-84.

21. The empirical formula of the anticancer drug atremanine is  $\text{C}_3\text{H}_6\text{N}_2$ . The experimental molar mass is 210 g/mol. What is its molecular formula?

22. Benzene has the empirical formula CH and an experimental molar mass of 78 g/mol. What is its molecular formula?

23. Oleic acid has the empirical formula  $\text{C}_9\text{H}_{17}\text{O}$ . If the experimental molecular mass is 282 g/mol, what is the molecular formula of oleic acid?

- Learning Target 8: I can name the groups on the periodic table
  - Learning Target 9: I can interpret the organization of the periodic table to distinguish metals from nonmetals.
  - Learning Target 10: I can describe general properties of some groups on the periodic table
  - Learning Target 11: I can define a period and identify elements in the same period

**24.** Who created the first periodic table?

25. Identify the following groups on the periodic table below:

- a. Alkali metals
  - b. Alkaline Earth metals
  - c. Transition metals
  - d. Halogens
  - e. Noble Gases

Group		Key																		18			
1 1A		1 Hydrogen Name Symbol 1.008 Atomic weight																		2 8A			
Period	1	1 Hydrogen H 1.008		2 Boron Be 9.012		3 Lithium Li 6.941		4 Beryllium Be 9.012		5 Boron B 10.81		6 Carbon C 12.01		7 Nitrogen N 14.01		8 Oxygen O 16.00		9 Fluorine F 19.00		10 Neon Ne 20.18			
	2	3 Boron B 10.81		4 Carbon C 12.01		5 Nitrogen N 14.01		6 Oxygen O 16.00		7 Fluorine F 19.00		8 Neon Ne 20.18		9 Argon Ar 39.95		10 Krypton Kr 83.80		11 Chlorine Cl 35.45					
	3	11 Sodium Na 22.99		12 Magnesium Mg 24.31		13 Aluminum Al 26.98		14 Silicon Si 28.09		15 Phosphorus P 30.97		16 Sulfur S 32.07		17 Chlorine Cl 32.07		18 Argon Ar 39.95		19 Potassium K 40.08					
	4	19 Potassium K 40.08		20 Calcium Ca 40.08		21 Scandium Sc 44.96		22 Titanium Ti 47.87		23 Vanadium V 50.94		24 Chromium Cr 52.00		25 Manganese Mn 54.94		26 Iron Fe 55.85		27 Cobalt Co 58.93		28 Nickel Ni 65.55		29 Copper Cu 65.41	
	5	37 Boron B 85.47		38 Sodium Na 87.62		39 Magnesium Mg 88.91		40 Aluminum Al 91.22		41 Silicon Si 92.91		42 Phosphorus P 95.94		43 Sulfur S 98		44 Chromium Cr 101.07		45 Iron Fe 102.91		46 Cobalt Co 107.87		47 Nickel Ni 112.41	
	6	55 Cesium Cs 132.91		56 Barium Ba 137.33		57 Lanthanum La 174.97		58 Lanthanum La 178.49		59 Cerium Ce 140.12		60 Praseodymium Pr 144.24		61 Neodymium Nd 150.36		62 Samarium Sm 151.96		63 Europium Eu 157.25		64 Gadolinium Gd 158.93		65 Terbium Tb 162.50	
	7	87 Francium Fr [223]		88 Radium Ra [226]		89 Lanthanum La [261]		104 Boron B [262]		105 Lanthanum La [266]		106 Cerium Ce [266]		107 Praseodymium Pr [264]		108 Neodymium Nd [277]		109 Samarium Sm [268]		110 Europium Eu [281]		111 Gadolinium Gd [272]	
Lanthanides		57 Lanthanum La 138.91		58 Cerium Ce 140.12		59 Praseodymium Pr 144.24		60 Neodymium Nd 150.36		61 Samarium Sm 151.96		62 Europium Eu 157.25		63 Gadolinium Gd 158.93		64 Terbium Tb 162.50		65 Dysprosium Dy 164.93		66 Holmium Ho 167.26			
Actinides		89 Actinium Ac [227]		90 Thorium Th [232.04]		91 Protactinium Pa [231.04]		92 Uranium U [238.03]		93 Neptunium Pu [237.04]		94 Plutonium Pu [244]		95 Americium Am [243]		96 Curium Cm [247]		97 Berkelium Bk [251]		98 Californium Cf [252]		99 Einsteinium Es [257]	
18 8A		100 Rutherfordium Rf [261]		101 Dubnium Db [266]		102 Mendelevium Md [258]		103 Rutherfordium Rf [261]		104 Dubnium Db [266]		105 Mendelevium Md [258]		106 Rutherfordium Rf [261]		107 Dubnium Db [266]		108 Mendelevium Md [258]		109 Rutherfordium Rf [261]			

Name: \_\_\_\_\_ Block: \_\_\_\_\_

- 26.** Name two elements in the Alkali metal group.
- 27.** When atoms from the alkali metal group form ions, what charge do they have?
- 28.** Name three elements in the halogen group
- 29.** When atoms in the alkaline earth group form ions, what charge do those ions have?
- 30.** Name 3 elements in period 3.
- 31.** Name 3 elements in period 2
- 32.** Write three properties of metals
- 33.** Write three properties of nonmetals.