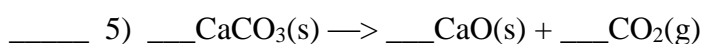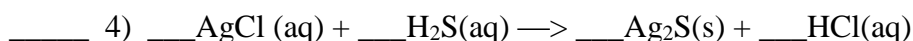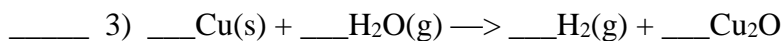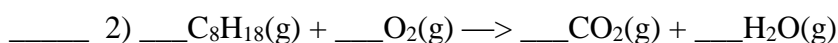## Spring Benchmark #1 Review Questions – C6 and C7 – Balancing equations, types of reactions, predicting products, molar conversions, and stoichiometry

Balance the following equations using the smallest whole numbers possible. On the left, classify each reaction as synthesis (S), decomposition (D), single replacement (SR), double replacement (DR), or combustion (C).

__S__ 1) ___$Mg(s)$ + ___$O_2(g)$ —> ___$MgO(s)$

_____ 2) ___$C_8H_{18}(g)$ + ___$O_2(g)$ —> ___$CO_2(g)$ + ___$H_2O(g)$

_____ 3) ___$Cu(s)$ + ___$H_2O(g)$ —> ___$H_2(g)$ + ___Cu_2O

_____ 4) ___$AgCl (aq)$ + ___$H_2S(aq)$ —> ___$Ag_2S(s)$ + ___$HCl(aq)$

_____ 5) ___$CaCO_3(s)$ —> ___$CaO(s)$ + ___$CO_2(g)$

_____ 6) ___$Cu(s)$ + ___$S_8(s)$ —> ___$CuS(s)$

_____ 7) ___$H_2S(aq)$ + ___$NaOH(aq)$ —> ___$H_2O(l)$ + ___$Na_2S(aq)$

_____ 8) ___$Al_2(SO_4)_3$ + _____ $Ca(OH)_2$ —> _____$Al(OH)_3$ + _____ $CaSO_4$

_____ 9) ___ Al + ____ HCl —> ___$AlCl_3$ + ___ H_2
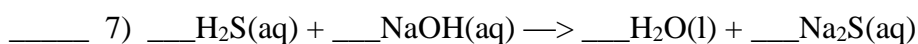
Complete each Q by identifying the type of reaction that takes place, naming the predicted products, and then writing the formulas for the products. You do NOT need to write the equation or balance it!

Q#	Type	Reactants	Names of Predicted Products	Formulas of Predicted Products
10	D	potassium chlorate	potassium chloride + oxygen	$KCl + O_2$
11		aluminum nitrate + sodium hydroxide		
12		ammonium nitrite	nitrogen + water	
13		iron(III) bromide + ammonium sulfide		
14		calcium oxide + diphosphorus pentoxide	calcium phosphate	
15		aluminum + copper (II) chloride		
16		bromine + magnesium iodide		
17		sodium bicarbonate	sodium oxide + carbon dioxide + water	
18		aluminum + oxygen		
19		iron (II) + silver acetate		

For the following problems, calculate the number of moles per sample. Show your work on your notebook paper

20) How many grams in two moles of sodium?

21) How many moles in 12.01g of carbon?

22) How many molecules in 6.005g of carbon dioxide?

23) If you have 20g of Boron how many atoms of boron do you have

24) If you have one mole of hydrogen gas how many atoms do you have?

*In the following problems, **BALANCE THE EQUATION** and then calculate how much of the indicated product is made. **Show all of your work on your notebook paper.***

25) $LiOH + HBr \longrightarrow LiBr + H_2O$
   (a) If you start with ten grams of lithium hydroxide, how many grams of lithium bromide will be produced? (*36.26 g LiBr*)
   (b) If you start with 12 moles of hydrogen bromide, how many molecules of lithium bromide will be produced?

26) $C_2H_4 + O_2 \longrightarrow CO_2 + H_2O$
   (a) If you start with 45 grams of ethylene (C_2H_4), how many grams of carbon dioxide will be produced? (*141.2 g CO_2*)
   (b) If you start with 6.2×10^{26} molecules of ethylene (C_2H_4), how many molecules of water will be produced?

27) $LiCl + CaSO_4 \longrightarrow CaCl_2 + Li_2SO_4$
   (a) If you start with 5.5 moles of lithium chloride, how many grams of calcium chloride will be produced?
   (b) If you start with 0.56 moles of Calcium Sulfate, how many moles of Lithium Sulfate will be produced?

28) $HCl + Na_2SO_4 \longrightarrow NaCl + H_2SO_4$
   (a) If you start with 20 grams of hydrochloric acid, how many molecules of sulfuric acid will be produced?
   (b) If you start with 0.95 grams of hydrochloric acid, how many moles of salt will be produced?

29) $FeCr_2O_7 + K_2CO_3 + O_2 \longrightarrow Fe_2O_3 + K_2CrO_4 + CO_2$
   (a) How many grams of $FeCr_2O_7$ are required to produce 3.95×10^{32} molecules of CO_2?
   (b) How many grams of O_2 are required to produce 100.0 g of Fe_2O_3?

30) Pick the top two topics that are difficult for you and write them here. BE SPECIFIC!

   1) _____

   2) _____
       You must do ten minutes of independent studying for each of those topics (twenty minutes total). On your notebook paper you must show evidence of this studying. You can use any resource you like, just make sure to tell me what it was and include your evidence such as: work for practice problems, scratch paper for an online practice test, a paragraph summarizing a YouTube video, etc. Remember that the class website has lots of resources!