CST Review Practice Problems Conservation of Matter & Stoichiometry Name

1) What kind of bonding is seen in these atom pairings? Na + Cl Fe + Ag H + N O + Cl

2) How many hydrogen atoms are found in each of the following compounds? H_2O NH_3 LiH

3) Identify the name and number of each atom in the following compounds:
MgO $CaCl_2$ PCl_3 H_2SO_4 $CuNO_3$ K_3N

4) Write balanced ionic compound formulas in the pairings that follow:
Ba + Cl Al + F Cs + O Mg + S

5) State the law of conservation of matter.

6) Balance the following:
__Na(s) + __Cl_2(g) → __NaCl(s) __Mg(s) + __O_2(g) → __MgO(s)

__K(s) + __H_2O(l) → __H_2(g) + __KOH(aq) __CH_4(g) + __O_2(g) → __CO_2(g) + __H_2O(g)

7) A mole is based upon the number of atoms found in exactly _____ of the isotope _____.

8) Find the number of moles in each sample:

3.5×10^{24} atoms 2.57×10^{21} molecules

7.447×10^{23} ions 1.00×10^{27} atoms

9) Complete the table below:

# of Moles	setup	**# of Particles**
4.57 mol Li		
		4.55×10^{25} molecules CO_2
0.00500 mol Cu^{2+}		
3.5×10^{4} mol F_2		
		1.50×10^{23} molecules Al_2O_3

10) Both mass and moles tell you the _____ of a sample being measured.

11) Mass is an amount that is compared to a _____.

12) Moles and molecules are not compared, they are _____ units.

13) Molecular Weight (Molar Mass) allows us to _____ by weighing.

14) Find the Molar Masses of the following: Na F_2 H_2O MgS CO_2 H_2SO_4 NO_3

15) To find the number of moles in a 10g sample of LiCl, you first must find the _____.

16) To find the number of grams in a 3.50 mole sample of H_2, you first must find the _____.

17) Complete the table below:

Starting Amount & Unit	Conversion Factor	Ending Amount & Unit
10.00 mol Ca		
35 g NH_3		
0.250 mol C_2H_6		
450. g PCl_3		
6 x 10^2 g $FePO_4$		

18) 1 mole of any gas occupies a volume of _____ L under standard conditions.

19) Standard temperature and pressure are abbreviated as _____.

20) STP values in °C and atm are ___ & ___, respectively.

21) To find a mole ratio you must start with a _____.

22) A mole ratio compares _____ of two substances in a chemical reaction.

23) Mole ratios are conversion factors, meaning you can use them to _____.

24) Determine the ratios below using the following reaction:

$$C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4H_2O(g)$$

a) C_3H_8 to CO_2 b) CO_2 to H_2O c) O_2 to C_3H_8 d) H_2O to O_2

25) Convert using the following reaction: $C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4H_2O(g)$

a) 3.00 mol C_3H_8 will produce _____ mol CO_2?

b) 8.0 mol H_2O are formed from _____ mol C_3H_8?

c) How many moles of O_2 are required to completely react with 0.500 moles of C_3H_8?

d) 3.00 moles of C_3H_8 will form how many grams of H_2O?

e) How many grams of O_2 are required to form 9.0 moles of CO_2?