What do you remember about chemistry?

1. Classify each of the following as physical (P) or chemical (C) property.

   a) _____ the aluminum metal is malleable

   b) _____ when placed in acid, Mg metal produces hydrogen gas

   c) _____ the density of water is 1.0 g.ml

   d) _____ the melting point of water is 0C

2. Classify each of the following as physical (P) or chemical (C) change.

   a) _____ Water freezes into an icicle. The icicle melts producing water.

   b) _____ A teaspoon of vinegar is placed into a glass of milk. The milk curdles, and separates into solid lumps, and a clear liquid.

   c) _____ A glass is dropped on the floor, and breaks into many pieces. The change is permanent. Perhaps the glass can be recycled.

   d) _____ A teaspoon of dry, white solid salt is stirred into a glass of pure water. The salt no longer be seen, but the water tastes salty.

   e) _____ Meat left too long in the refrigerator gradually changes colour form red to grey, and foul odour forms in it.

3. Complete the following chart.

Subatomic Particle	Symbol	Charge	Relative Mass	Location in the atom
Proton				
		-1		
			0	

4. Write the chemical formula/the chemical name for the following compounds

   a. Lead (II) oxide _____ b. Li_2S _____

   c. magnesium nitride _____ d. P_2O_5 _____

   e. nitrogen trioxide _____ f. $PtCl_4$ _____

   g. sulfur hexabromide _____ h. ammonium bromide _____

   i. potassium phosphate _____ j. potassium nitrate _____

   k. arsenic trichloride _____

5. Complete the following chart.

Standard Atomic Notation	Element Name	Atomic Number	Mass Number	Number of Protons	Number of Electrons	Number of neutrons
$^{27}_{13}Al$						

6. Draw Bohr-Rutherford diagrams for each of the elements below and indicate combing capacity for each.

Standard Atomic Notation	Lewis Dot Diagram	Standard Atomic Notation	Lewis Dot Diagram
$^{27}_{13}Al$		$^{23}_{11}Na$	
$^{40}_{18}Ar$		$^{14}_{7}N$	

7. Balance the following chemical reactions and classify each **as synthesis, decomposition, single displacement, double displacement, or combustion.**

a. ___Mg(s) + ___O_2(g) → ___MgO(s) _____

b. ___$Ca(OH)_2$ (s) → ___CaO(s) + ___H_2O(g) _____

c. ___Mg(s) + ___H_2O(g) → ___MgO(s) + ___H2(g) _____

d. ___Cl_2 (g) + ___NaBr(aq) → ___NaCl(aq) + ___Br_2 (l) _____

e. ___HCl(aq) + ___FeS(s) → ___$FeCl_2$ (aq) + ___H_2S(g) _____

8. Try to complete and balance the following equations:

(a) ___ $(NH_4)_3PO_4$(aq) + ___Ba$(OH)_2$ (aq) □

(b) ___Li(s) + ___$H_2O(l)$ □

(c) ___NH_3(g) + ___O_2 (g) □

ANSWERS

1. Classify each of the following as physical or chemical property.
   a) the aluminum metal is malleable - **P**
   b) when placed in acid, Mg metal produces hydrogen gas - **C**
   c) the density of water is 1.0 g.ml - **P**
   d) the melting point of water is 0C - **P**

2. Classify each of the following as physical or chemical change.
   a) Water freezes into an icicle. The icicle melts producing water. - **P**
   b) A teaspoon of vinegar is placed into a glass of milk. The milk curdles, and separates into solid lumps, and a clear liquid. - **C**
   c) A glass is dropped on the floor, and breaks into many pieces. The change is permanent. Perhaps the glass can be recycled. - **P**
   d) A teaspoon of dry, white solid salt is stirred into a glass of pure water. The salt no longer be seen, but the water tastes salty. - **P**
   e) Meat left too long in the refrigerator gradually changes colour form red to grey, and foul odour forms in it. - **C**

3. Complete the following chart.

Subatomic Particle	Symbol	Charge	Relative Mass	Location in the atom
Proton	**P**	**+1**	**1**	**Nucleus**
Electron	**E**	-1	**0**	**Outside the nucleus**
Neutron	N	**0**	**1**	**Nucleus**

4. Write the chemical formula/the chemical name for the following compounds

a. Lead (II) oxide	____PbO_____	b. Li_2S	lithium sulfide
c. magnesium nitride	___Mg_3N_2____	d. P_2O_5	diphoshphorus pentoxide
e. nitrogen trioxide	___NO_3_____	f. $PtCl_4$	platinum (IV) chloride
g. SBr_6	sulfur hexabromide	h. NH_4Br	ammonium bromide
i. K_3PO_4	potassium phosphate	j. KNO_3	potassium nitrate
k. $AsCl_3$	arsenic trichloride		

5. Complete the following chart.

Standard Atomic Notation	Element Name	Atomic Number	Mass Number	Number of Protons	Number of Electrons	Number of neutrons
$^{27}_{13}Al$	Aluminum	13	27	13	13	14
$^{40}_{18}Ar$	Argon	18	40	18	18	22
$^{23}_{11}Na$	Sodium	11	23	11	11	12

7. Balance the following chemical reactions and classify each as synthesis, decomposition, single displacement, double displacement, or combustion.

a. _2_$Mg_{(s)}$ + ___$O_{2(g)}$ → _2_$MgO_{(s)}$	synthesis
b. ___$Ca(OH)_{2(s)}$ → ___$CaO_{(s)}$ + ___$H_2O_{(g)}$	decomposition
c. ___$Mg_{(s)}$ + ___$H_2O_{(g)}$ → ___$MgO_{(s)}$ + ___$H_{2(g)}$	single displacement
d. ___$Cl_{2(g)}$ + __2$NaBr_{(aq)}$ → _2_$NaCl_{(aq)}$ + ___$Br_{2(l)}$	single displacement
e. _2_$HCl_{(aq)}$ + ___$FeS_{(s)}$ → ___$FeCl_{2(aq)}$ + ___$H_2S_{(g)}$	double displacement

8. Try to complete and balance the following equations:

(a) _2_ $(NH_4)_3PO_4(aq)$ + __3__$Ba(OH)_2$ (aq) □ _____$Ba_3(PO_4)_2$ (s) + __6__$NH_4OH(aq)$

(b) _2_Li(s) + _2_$H_2O(l)$ □ __2__LiOH(aq) + _____H_2 (g)

(c) _4_NH_3(g) + _3_O_2 (g) □ __2__N_2 (g) + __6__$H_2O(l)$