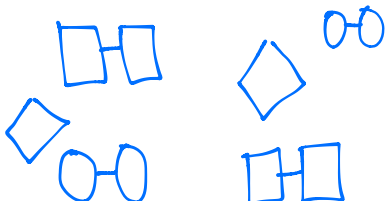Name: __KEY_____
Date: _____ Block: 1A 3A 4A 3B

Classify each mixture as either homogeneous or heterogeneous and then match the following mixture to the separation technique that would be used to separate it.

Type of Mixture		Mixture	Separation Technique	
homogeneous	1. C	Salt Water	a.	Distillation
heterogeneous	2. E	Iron and Carbon	b.	Chromatography
homogeneous	3. B	Pigments in Ink	c.	Evaporation/Boiling
heterogeneous	4. F	Pennies and Water	d.	Filtration
homogeneous	5. A	Acetone and Isopropyl Alcohol	e	Magnets
heterogeneous	6. D	Sand and Water	f.	Decanting

Use the following symbols to make particle diagrams for numbers 7 – 10. Draw 5 particles in each picture.
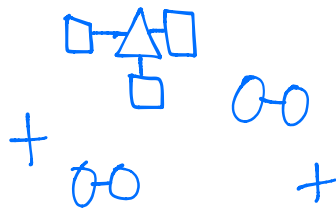
Element	H	O	Na	N	C
Shape	▪	●	◆	▲	✚

7.	Mixture of any 3 elements		What would be the formula for your picture? $H_2 + Na + O_2$
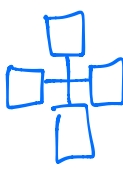
8.	Mixture 2 elements and a compound		What would be the formula for your picture? $NH_3 + O_2 + C$
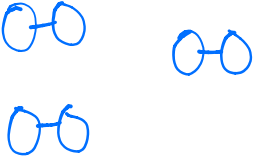
9.	A pure compound		What would be the formula for your picture? CH_4

			What would be the formula for your picture?
10.	A pure element	(handwritten drawing of paired circles)	O_2

Identify the following substances as either an <u>element (E)</u>, <u>compound (C)</u> or <u>mixture (M)</u>.

11. __M__ $PbI_2 + H_2O$ 15. __M__ $Cu + Zn$

12. __C__ $Ca_3(PO_4)_2$ 16. __E__ Si

13. __E__ F_2 17. __C__ C_5H_{12}

14. __M__ $K_2S + LiF$ 18. __✗__

19. Determine the number of each kind of element in the following compounds:

    a. P_2O_5

    2 P, 5 O

    b. K_2CO_3

    2 K, 1 C, 3 O

    c. $NaHCO_3$

    1 Na, 1 H, 1 C, 3 O
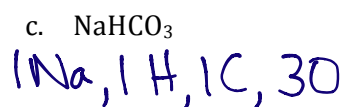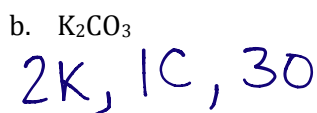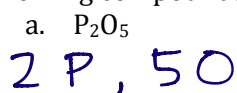
20. Write formulas for the following combinations of elements

    a. 1 N + 3 O

    NO_3

    b. 1 Ba + 2 O + 2 H

    BaO_2H_2 or $Ba(OH)_2$

    c. 3 C + 8 H

    C_3H_8
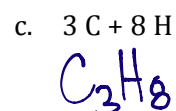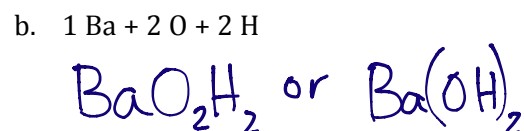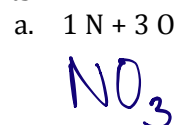
21. You have two mystery compounds and can't decide if they are the same or different. You analyze each compound for elemental percent composition by mass.

    a. Compound A has 63.6 g of nitrogen and 36.4 g of oxygen in a 100 g sample. Determine the percent composition of each element. Show all work.

$$N = \frac{63.6g}{100g} \times 100 = 63.6\% \qquad O = \frac{36.4g}{100g} \times 100 = 36.4\%$$

    b. Compound B has 93.4 g of nitrogen and 106.6 g of oxygen in a 200 g sample. Determine the percent composition of each element. Show all work.

$$N = \frac{93.4g}{200g} \times 100 = 46.7\% \qquad O = \frac{106.6g}{200g} \times 100 = 53.3\%$$

    c. Are the two mystery compounds the same or different? Explain in 1-2 sentences using the percent compositions calculated above.

These two compounds are not the same because they do not have the same mass percent, and therefore do not follow the law of proportions. They are however

an example of the law of multiple proportions.