

Name

Key Notes

per

date

4.18.2016

mail box

Chemistry Sci 8

Lab: Identifying Elements, Compounds, and Mixtures

Directions: Read through the review chart below and answer the pre-lab questions.

Elements	Compound	Mixture
1 • pure substance made up of only one kind of atom 2 • All elements are located on the <u>Periodic Table of Elements</u> 3 • <u>Cannot be separated</u> into any simpler form chemically or physically	• / 2 or more elements that are <u>chemically combined</u> to make a new substance • 2 Properties of the elements used to make the compound are changed	• 2 or more elements <i>physically</i> combined • Elements used keep their original properties (not chemically combined) <u>Homogeneous</u> – two or more substance that are evenly mixed, unable to identify the different substances <u>Heterogeneous</u> -a mixture in which different substances can be identified

Pre-Lab Questions:

1. What is the difference between an element and a compound?

Element is a pure substance / compounds are 2 or more elements.

2. How is a heterogeneous mixture different from a homogeneous mixture?

Heterogeneous is like a tossed salad while homogeneous - is like saltwater (solutions)

3. How is the way a mixture is combined DIFFERENT from how a compound is combined?

Mixtures are simply physically mixed while compounds are chemically combined.

4. What is easier to separate, a mixture or a compound? Explain why?

Mixtures require less energy typically. Compound require more chem.

5. Which can be found on the periodic table: elements, compounds or mixtures?

7

1. **Synthesis Reaction:** when two or more substances combine
during a chemical reaction and become one.



https://youtu.be/Y3kDZXP4_5A?t=222

Synthesis : to build

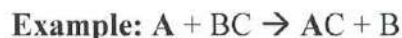
2. **Decomposition Reaction:** describes when one compound breaks down
into two or more simpler substances.



<https://youtu.be/MUensqlmzXM>

Decompose : to break down
break apart, etc.

3. **Single Displacement Reaction:** this is when one element replaces another
in a compound.



<https://youtu.be/OxGjbHzxQSI>

"Like when two people are dancing
and another cuts in."

4. **Double Displacement Reaction:** this is when two elements replace each other,
in a compound.



Reactants

Products

"Here we have two pairs of
dancers, couple AB & couple -
DC. Both couples switch
dancing partners with one
another."

Types of Chemical Reactions

Directions: Write the correct letter on the line that best defines each term.

Term	Definition
<u>F</u> 1. Double Displacement	A . when two or more substances combine together during a chemical reaction and become one. ($A + B \rightarrow AB$)
<u>B</u> 2. Decomposition Reaction	B . describes when one substance breaks down into two or more simpler substances. ($AB \rightarrow A + B$)
<u>D</u> 3. Single - Displacement	D. this is when one element replaces another in a compound. ($A + BC \rightarrow AC + B$)
<u>A</u> 4. Synthesis Reaction	F . this is when two elements replace each other in a compound ($AB + DC \rightarrow AC + DB$)

Directions: Identify the types of chemical reaction using the word bank below:

Synthesis Reaction	Single Displacement	Decomposition Reaction
	Double Displacement	

Double Replc. 1. $AgNO_3 + H_2S \rightarrow Ag_2S + 2HNO_3$

Synthesis 2. $Al + N_2 \rightarrow 2AlN$

Single Replc. 3. $Fe_2O_3 + H_2 \rightarrow 2Fe + 3H_2O$

Decomposition 4. $Mg(ClO_3)_2 \rightarrow Mg + Cl_2 + O_2$

Balancing Chemical Equation Notes

Quick Review

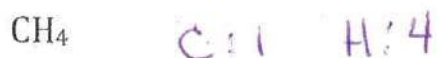
Chemical Formula - representation of how elements combine to make up compound

Shows TWO things

- the elements that make up the compound
- the number of atoms of each element called subscripts

H_2O = the 2 is a **subscript**.

(H= 2 and O= 1)



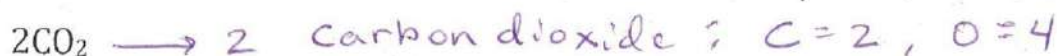
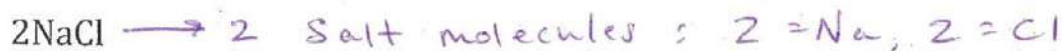
Coefficient is the number of molecules in a chemical reaction.

$2KI$ = the 2 represents a coefficient.

So, 2 KI units are involved in this reaction.

Or KI and KI

Examples:



Chemical Equation - describe ratios of atoms in a simple way

Balancing Chemical Equations:

Kinds of Atoms	Number of Atoms				
	Ag + H ₂ S	→	Ag ₂ S +	H ₂	Single Replacement
Ag metal	Ag : 1 2		Ag : 2 2		✓
H alkali	H : 2 2	→	H : 2 2		✓
S non metal	S : 1 1		S : 1 1		✓



Balanced

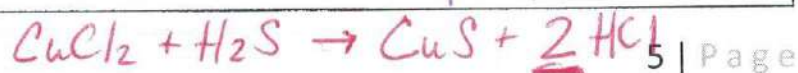
Label Reaction type

Kinds of Atoms	Number of Atoms		Synthesis	
	<u>2</u> Mg + O ₂ → <u>2</u> MgO			
Mg metal	Mg: 1	2 →	Mg: 1	2 ✓
O nonmetal	O: 2	2	O: 1	2 ✓



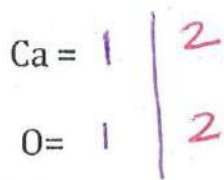
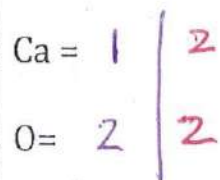
Kinds of Atoms	Number of Atoms		Single Displacement	
	Cl ₂ + <u>2</u> NaBr → <u>2</u> NaCl + Br ₂ ← (exception)			
Cl halogen	Cl: 2	2	Cl: 1	2 "Bromine is a diatomic element so the 2 becomes a subscript."
Na alkali	Na: 1	2 →	Na: 1	2
Br halogen	Br: 1	2	Br: 1	2

Kinds of Atoms	Number of Atoms		Double Displacement	
	CuCl ₂ + H ₂ S → CuS + <u>2</u> HCl			
Cu metal	Cu: 1	1	Cu: 1	1
Cl halogen	Cl: 2	2 →	Cl: 1	2
H alkali	H: 2	2	H: 1	2
S nonmetal	S: 1	1	S: 1	1

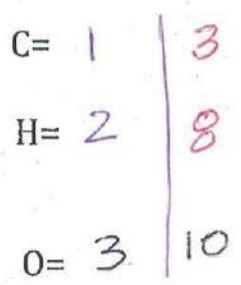
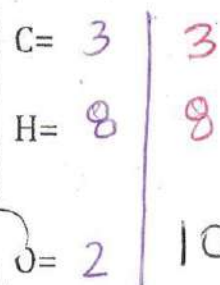
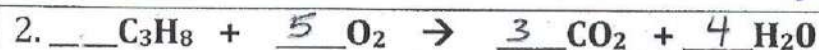


Balancing Act

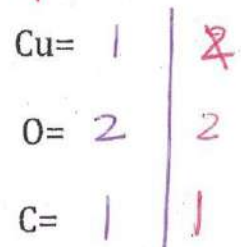
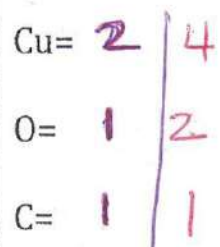
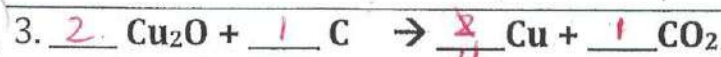
Atoms are not created or destroyed during a chemical reaction. Scientists know that there must be the *same* number of atoms on *each side* of the equation. REMEMBER – you may *add coefficients* in front of the chemical formulas, but you *can not* add or change the *subscripts*.



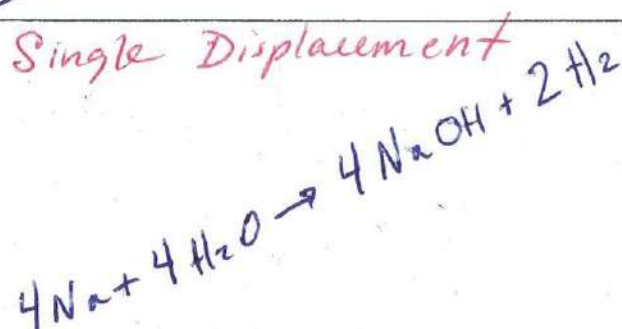
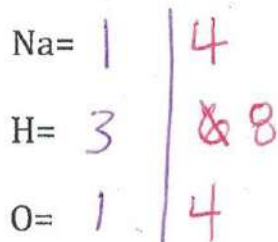
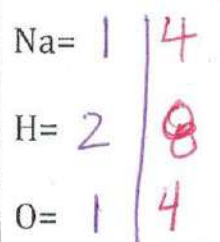
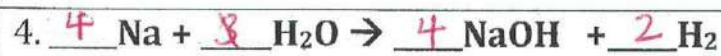
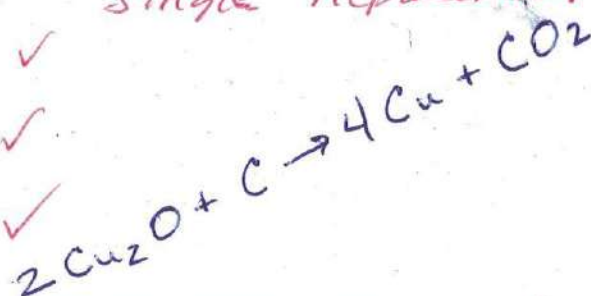
Synthesis
 $2\text{Ca} + \text{O}_2 \rightarrow 2\text{CaO}$

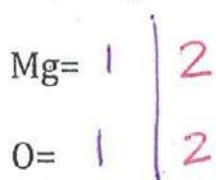
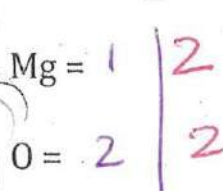


Double Displacement
(Combustion)

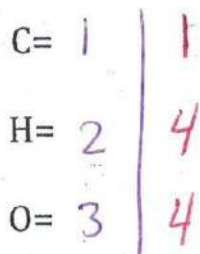
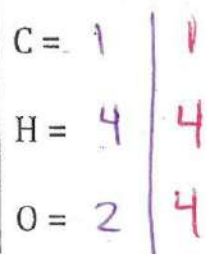
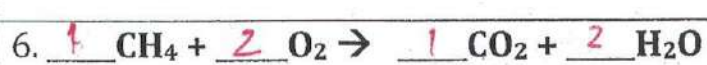
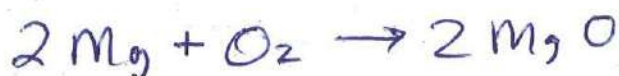


Single Replacement

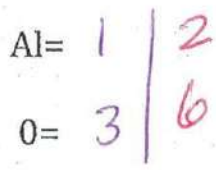
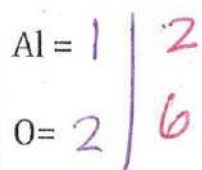




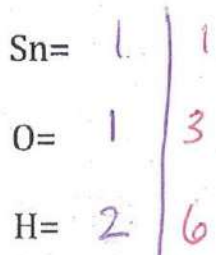
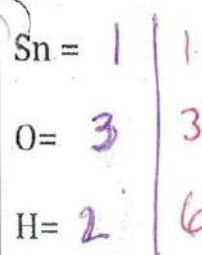
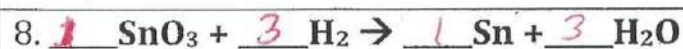
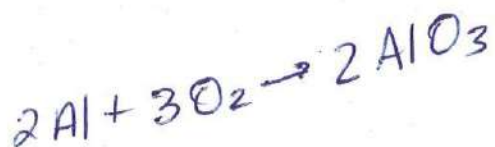
Synthesis



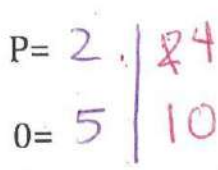
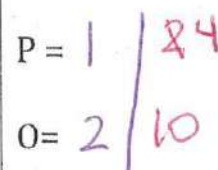
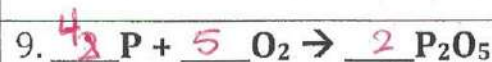
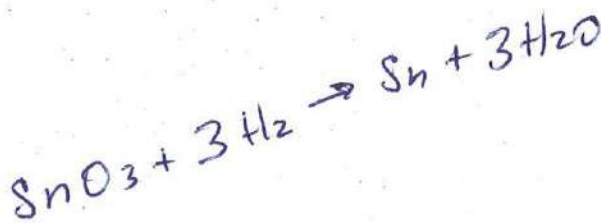
Double Displacement
(Combustion)



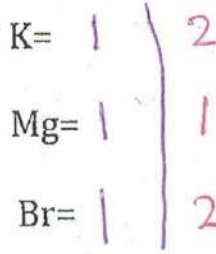
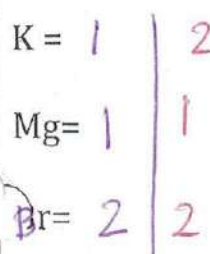
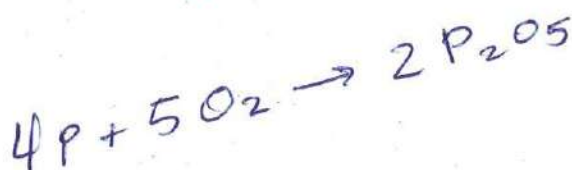
Synthesis



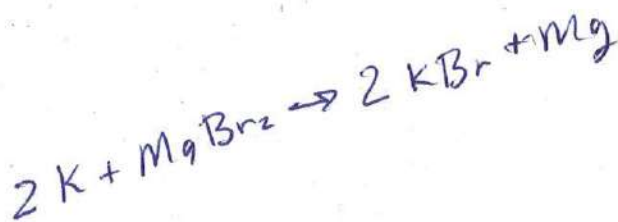
Single Replacement



Synthesis



Single Displacement



Balancing Equations

Directions: Balance the following equations. You must show all your work.

