

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
<ul style="list-style-type: none"> • pure substance made up of only one kind of atom • All elements are located on the Periodic Table of Elements • Cannot be separated into any simpler form chemically or physically 	<ul style="list-style-type: none"> • 2 or more elements that are <i>chemically</i> combined to make a new substance • Properties of the elements used to make the compound are changed 	<ul style="list-style-type: none"> • 2 or more elements <i>physically</i> combined • Elements used keep their original properties (not chemically combined) <p><u>Homogeneous</u> – two or more substance that are evenly mixed, unable to identify the different substances</p> <p><u>Heterogeneous</u> -a mixture in which different substances can be identified</p>

Pre-Lab Questions:

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

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

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

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

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

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



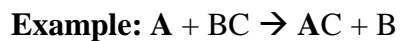
https://youtu.be/Y3kDZXP4_5A?t=222

2. **Decomposition Reaction:** describes when one _____
into two or more simpler substances.



<https://youtu.be/MUensqImzXM>

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



<https://youtu.be/OxGjbHxzQSI>

4. **Double Displacement Reaction:** this is when two elements _____
in a compound.



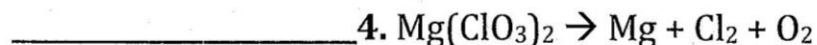
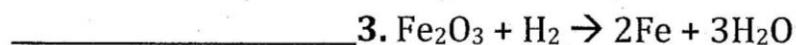
Types of Chemical Reactions

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

Term	Definition
_____ 1. Double Displacement	A. when two or more substances combine together during a chemical reaction and become one. ($A + B \rightarrow AB$)
_____ 2. Decomposition Reaction	B. describes when one substance breaks down into two or more simpler substances. ($AB \rightarrow A + B$)
_____ 3. Single - Displacement	D. this is when one element replaces another in a compound. ($A + BC \rightarrow AC + B$)
_____ 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	



Balancing Chemical Equation Notes

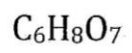
Quick Review

Chemical Formula- representation of how _____ make up a compound

Shows TWO things

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

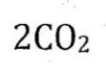
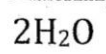
H₂O = the **2** is a **subscript**.
(H= 2 and O= 1)



Coefficient is the number of _____ 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 _____ in a simple way

Balancing Chemical Equations:

Kinds of Atoms	Number of Atoms			
	Ag + H ₂ S	→	Ag ₂ S +	H ₂
Ag				
H				

Kinds of Atoms	Number of Atoms
	$\text{Mg} + \text{O}_2 \rightarrow \text{MgO}$
Mg	
O	

Kinds of Atoms	Number of Atoms
	$\text{Cl}_2 + \text{NaBr} \rightarrow \text{NaCl} + \text{Br}$
Cl	
Na	
Br	

Kinds of Atoms	Number of Atoms
	$\text{CuCl}_2 + \text{H}_2\text{S} \rightarrow \text{CuS} + \text{HCl}$
Cu	
Cl	
H	
S	

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*.

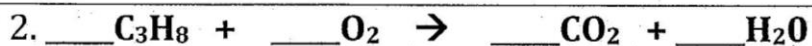


Ca =

Ca =

O =

O =



C =

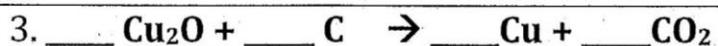
C =

H =

H =

O =

O =



Cu =

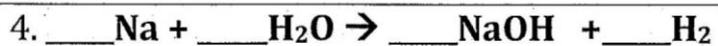
Cu =

O =

O =

C =

C =



Na =

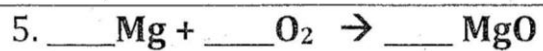
Na =

H =

H =

O =

O =

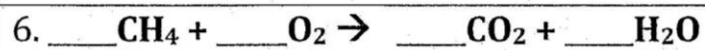


Mg =

Mg =

O =

O =



C =

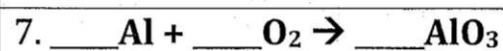
C =

H =

H =

O =

O =

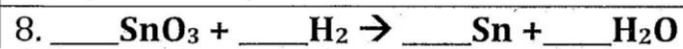


Al =

Al =

O =

O =



sn =

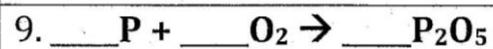
Sn =

O =

O =

H =

H =

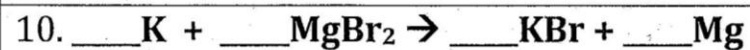


P =

P =

O =

O =



K =

K =

Mg =

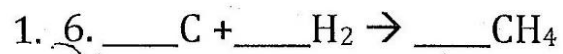
Mg =

Br =

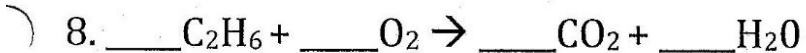
Br =

Balancing Equations

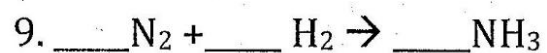
Directions: Balance the following equations. You must show all your work.



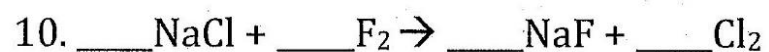
3.



4.



5.



- 1) $\underline{\quad} \text{Fe}_2\text{O}_3 + \underline{\quad} \text{SiO}_2 \rightarrow \underline{\quad} \text{Fe}_2\text{Si}_2\text{O}_7$
- 2) $\underline{\quad} \text{Fe} + \underline{\quad} \text{H}_2\text{O} \rightarrow \underline{\quad} \text{Fe}_3\text{O}_4 + \underline{\quad} \text{H}_2$
- 3) $\underline{\quad} \text{O}_2 \rightarrow \underline{\quad} \text{O}_3$
- 4) $\underline{\quad} \text{Na}_2\text{Cr}_2\text{O}_7 + \underline{\quad} \text{S} \rightarrow \underline{\quad} \text{Cr}_2\text{O}_3 + \underline{\quad} \text{Na}_2\text{SO}_4$
- 5) $\underline{\quad} \text{Bi}(\text{NO}_3)_3 + \underline{\quad} \text{H}_2\text{S} \rightarrow \underline{\quad} \text{Bi}_2\text{S}_3 + \underline{\quad} \text{HNO}_3$
- 6) $\underline{\quad} \text{PCl}_5 + \underline{\quad} \text{H}_2\text{O} \rightarrow \underline{\quad} \text{H}_3\text{PO}_4 + \underline{\quad} \text{HCl}$
- 7) $\underline{\quad} \text{NiS} + \underline{\quad} \text{O}_2 \rightarrow \underline{\quad} \text{NiO} + \underline{\quad} \text{SO}_2$
- 8) $\underline{\quad} \text{Al} + \underline{\quad} \text{FeO} \rightarrow \underline{\quad} \text{Al}_2\text{O}_3 + \underline{\quad} \text{Fe}$
- 9) $\underline{\quad} \text{NaCl} + \underline{\quad} \text{H}_2\text{SO}_4 \rightarrow \underline{\quad} \text{Na}_2\text{SO}_4 + \underline{\quad} \text{HCl}$
- 10) $\underline{\quad} \text{MgNH}_4\text{PO}_4 \rightarrow \underline{\quad} \text{Mg}_2\text{P}_2\text{O}_7 + \underline{\quad} \text{NH}_3 + \underline{\quad} \text{H}_2\text{O}$
- 11) $\underline{\quad} \text{PbCrO}_4 + \underline{\quad} \text{HNO}_3 \rightarrow \underline{\quad} \text{Pb}(\text{NO}_3)_2 + \underline{\quad} \text{H}_2\text{CrO}_4$
- 12) $\underline{\quad} \text{AgBr} + \underline{\quad} \text{Na}_2\text{S}_2\text{O}_3 \rightarrow \underline{\quad} \text{Na}_3[\text{Ag}(\text{S}_2\text{O}_3)_2] + \underline{\quad} \text{NaBr}$
- 13) $\underline{\quad} \text{Fe}_2(\text{SO}_4)_3 + \underline{\quad} \text{KOH} \rightarrow \underline{\quad} \text{K}_2\text{SO}_4 + \underline{\quad} \text{Fe}(\text{OH})_3$
- 14) $\underline{\quad} \text{Ca}_3(\text{PO}_4)_2 + \underline{\quad} \text{H}_2\text{SO}_4 \rightarrow \underline{\quad} \text{CaSO}_4 + \underline{\quad} \text{Ca}(\text{H}_2\text{PO}_4)_2$