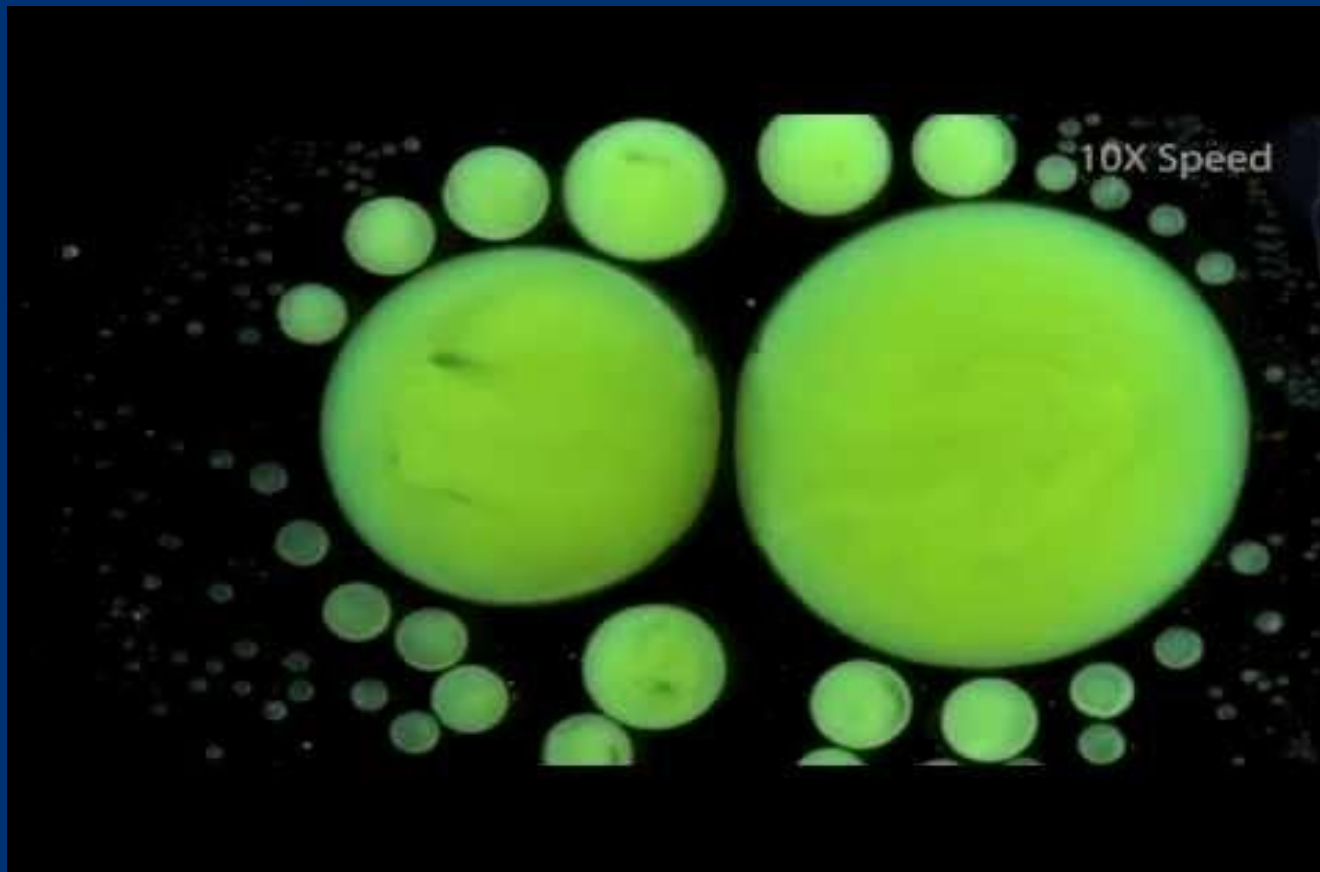




# CHEMICAL REACTIONS

# You Tube Video: Beautiful Chemical Reactions 6:40

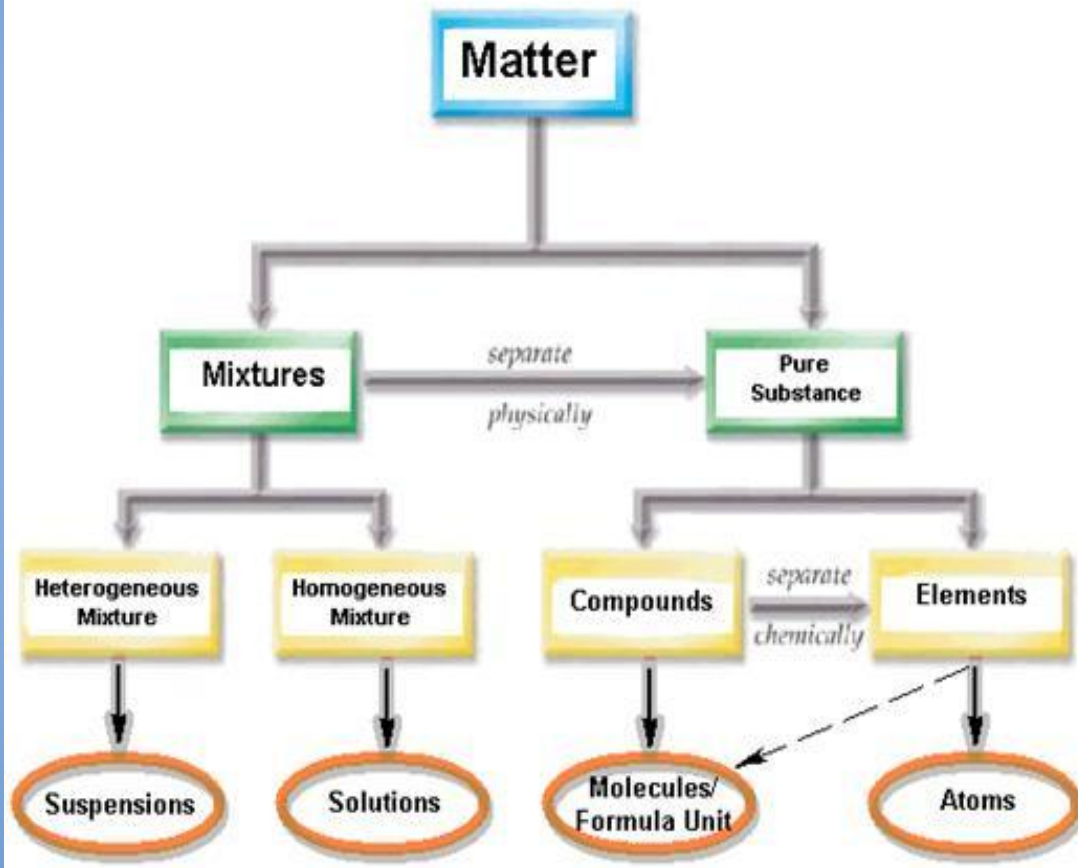


# REVIEW

## *Choose: Mixture or Compound*

1. Physical blend of two or more substances in which the components are not changed \_\_\_\_\_.
2. Different than the components from which it is made \_\_\_\_\_.
3. A change in which the resultant product has chemical properties that differ from its constituents \_\_\_\_\_.
4. A change that doesn't result in different chemical properties than its constituents \_\_\_\_\_.
5. Created only from a chemical reaction \_\_\_\_\_.
6. Physical blend of two or more substances \_\_\_\_\_.

# Classification of Matter by Composition





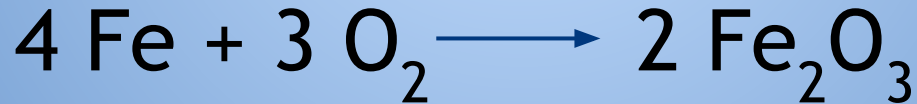
# Which processes or clues signify a chemical change has occurred.

1. rust *chemical*
2. decompose *chemical*
3. ferment *chemical*
4. grind *physical*
5. explode *chemical*
6. precipitate formed *chemical*
7. transfer of energy *chemical*
8. burn *chemical*
9. color change *chemical*
10. corrode *chemical*
11. gas formed *chemical or physical*

# Law of Conservation of Mass

Reactants  
mass

Products  
mass



# Describing Chemical Reactions

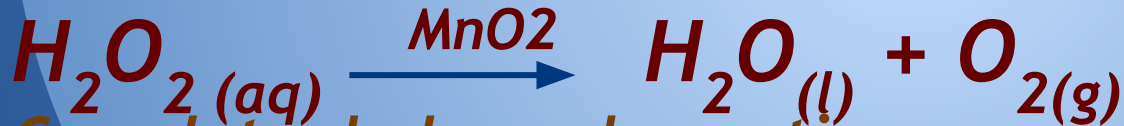
## Word Equation

Hydrogen peroxide → water  
& oxygen

## Skeleton Equation



## With physical states included



## Complete, balanced equation



<b>Symbol</b>	<b>Explanation</b>
$\rightarrow$	<b>“Yields,” separates reactants from products</b>
$\rightleftharpoons$	<b>Used to indicate reversible reactions</b>
<b>(s) (l) (g)</b>	<b>Reactant or product in the solid state, liquid state, or gas state</b>
<b>(aq)</b>	<b>Reactant(s) &amp;/or product(s) is aqueous.</b>
$\xrightarrow{\Delta}$	<b>Heat is added in the reaction</b>
$\xrightarrow{\text{Pt}}$	<b>Indicates a catalyst was added to the reaction</b>
$\uparrow$	<b>gas is created in the reaction</b>



# “Tricks” for Balancing Equations

## MINOH

*1st* **M**etals

*2nd* **I** (polyatomic ions)

*3rd* **N** (non-metals)

*4th* **O**xygen

*5th* **H**ydrogen

## Combustion Reax

### CHO

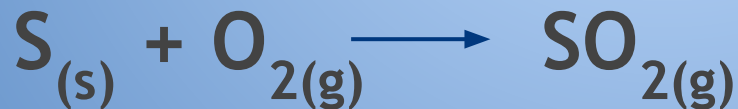
*1st* **C**arbon

*2nd* **H**ydrogen

*3rd* **O**xygen

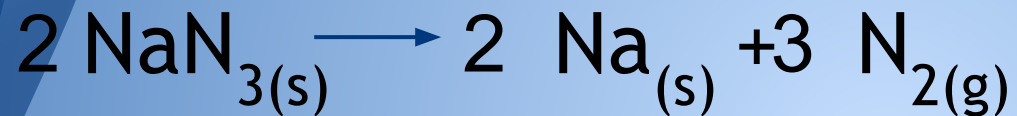
# Classifying Chemical Reactions

## Direct Combination (Synthesis)



# Decomposition \*usually requires heating

## Air Bag detonation

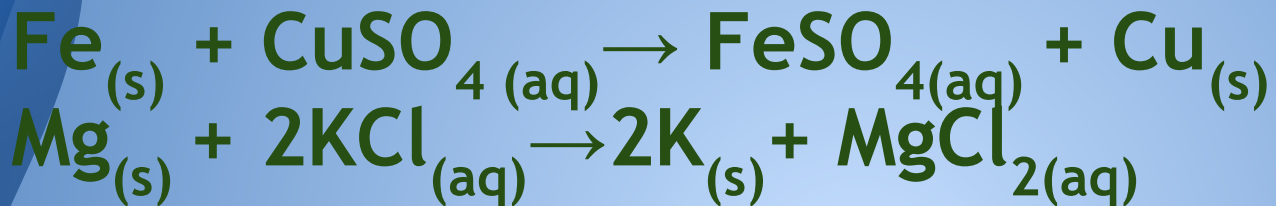
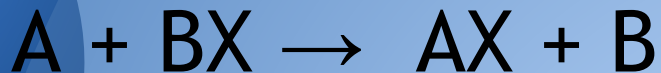


*Upon impact the detonator cap ignites, quickly decomposing the sodium azide ( $\text{NaN}_3$ ) releasing nitrogen gas.*

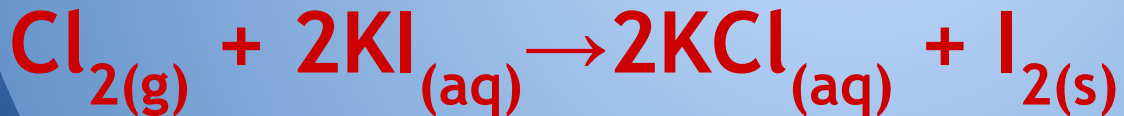
*100g of  $\text{NaN}_3$  produces 50L of nitrogen gas.*



# Single Replacement Reactions



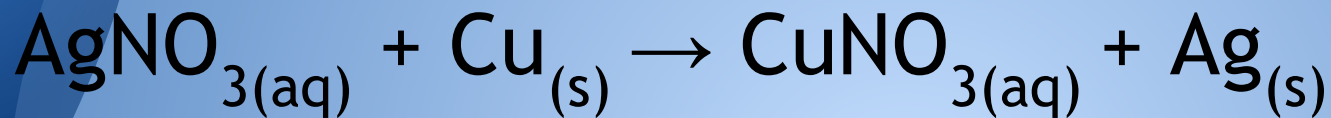
*\*More active metals replace less active metals or hydrogen when in an aqueous solution. Consult the Activity Series of Metals.*



*\*More active halogens replace less active halogens. The halogens are less active as you go down the group.*

## You try:

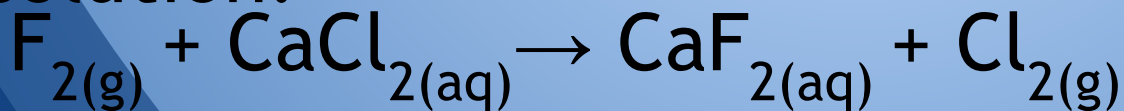
1. A copper coil is placed in silver nitrate solution.



2. A gold coil is placed in silver nitrate solution.

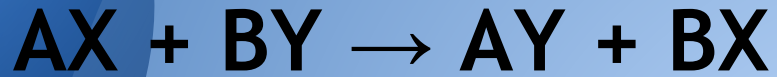


3. Fluorine gas is mixed in calcium chloride solution.





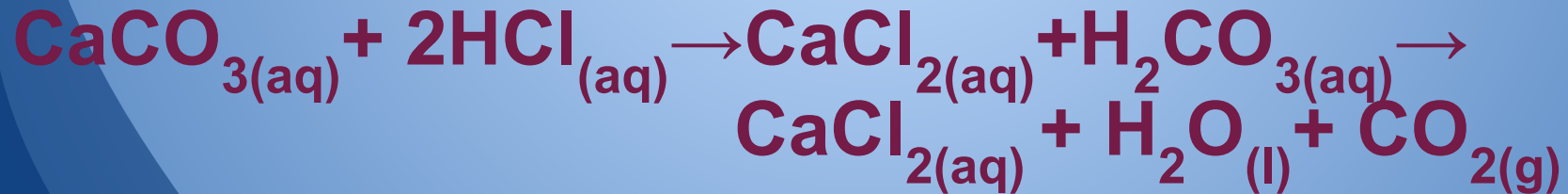
# Double Replacement Reactions



*How does Tums help your stomach feel better?*

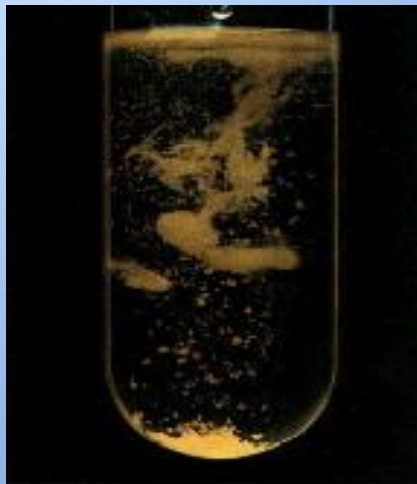
*\*Active ingredient in tums is calcium carbonate.*

*Calcium carbonate reacts with hydrochloric acid to produce...*



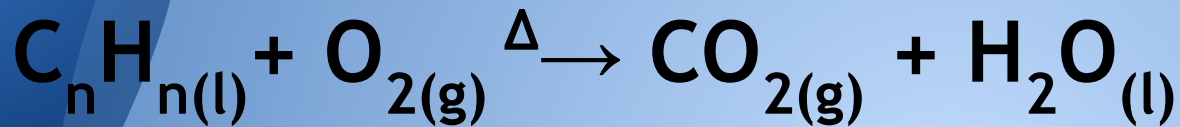
# Requirements for Double Replacement Reactions

- \*Reactants must be ionic compounds.
- \*Reactants must be dissolved in water.  
*Otherwise reactants won't dissociate.*
- \*Often one product is molecular or a precipitate or gas and the other is an ionic compound.



# Combustion Reactions

*Complete Combustion:*



*Incomplete Combustion:*



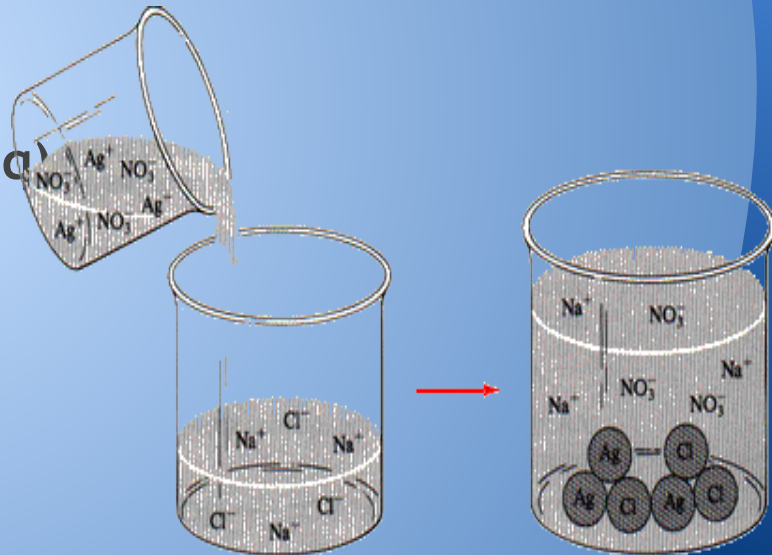
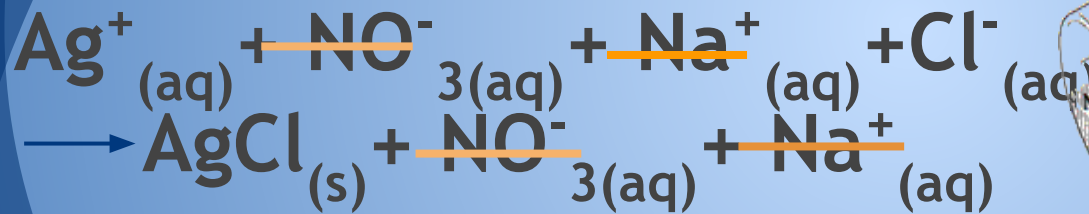
\*Compounds containing oxygen atoms will also produce carbon dioxide & water.



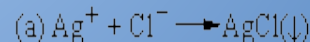
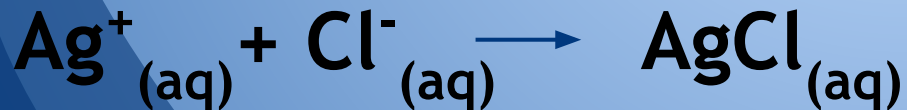
# Net Ionic Equations



*\*The ions in the aqueous solution stay separated. They are called spectator ions.*



**The Net Ionic Equation is:**



# Steps for Writing Net Ionic Equations

1. Write the complete balanced equation for the double replacement or single replacement reaction. *\*Make sure you include the phases of each reactant & product.*
2. Separate the ions in the aqueous phase and include the ions common charge.
3. Cross out the spectator ions. *\*Those are the ions that stay in the aqueous phase.*
4. Rewrite the equation without the spectator ions. This equation is called the net ionic equation.
5. Check the balance of mass and charge.



Try these:

