## Balancing Chemical Equations



## The Basics

$\mathrm{A}+\mathrm{B} \rightarrow \mathrm{C}+\mathrm{D}$
Reactants
(starting materials)
(ending materials)

## Phases

$$
\mathrm{A}_{(\mathrm{g})}+\mathrm{B}_{(\mathrm{s})} \rightarrow \mathrm{C}_{(\mathrm{l})}+\mathrm{D}_{(\mathrm{aq})}
$$

$\mathrm{g}=$ gas
$\mathrm{s}=$ solid
l = liquid
aq = "aqueous" - ions in water


## Writing Equations

## Word Equations

Written with the names of the compounds
hydrogen gas and chlorine gas combine to form hydrogen chloride gas

## Skeleton Equations

Written with formulas

$$
\mathrm{H}_{2}(\mathrm{~g})+\mathrm{Cl}_{2}(\mathrm{~g})-->2 \mathrm{HCl}(\mathrm{~g})
$$

## Balancing Equations

## Law of Conservation of Matter

Matter is not created or destroyed
\# of atoms for each element before and after the reaction must be equal.

$$
\text { Example: } \mathrm{H}_{2}(\mathrm{~g})+\mathrm{Cl}_{2}(\mathrm{~g})-->2 \mathrm{HCl}(\mathrm{~g})
$$

- Reactants: $2 \mathrm{H} \& 2 \mathrm{Cl}$
- Products 2 H \& 2 Cl
- The two sides are balanced!

