Balancing Chemical Equations
The Basics

A + B \[\rightarrow\] C + D

Reactants (starting materials)  Products (ending materials)
\[ A_{(g)} + B_{(s)} \rightarrow C_{(l)} + D_{(aq)} \]

g = gas

s = solid

l = liquid

aq = “aqueous” – ions in water
Diatomnic Gases

Horses Need Oats For Clear Brown “Eyes”
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

\[ \text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow 2\text{HCl} \ (\text{g}) \]
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.

Example: \( \text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow 2\text{HCl} (\text{g}) \)

- **Reactants**: 2 H & 2 Cl
- **Products**: 2 H & 2 Cl
- The two sides are balanced!