

# Introduction to Balancing Equations

The Law of Conservation of Mass tells us that the total amount of matter is neither created nor destroyed during any physical or chemical change. Therefore, the mass stays the same before and after a chemical reaction.



Chemical equations demonstrate this principle because they are always balanced. The total mass of the reactants must equal the total mass of the products. You can check to see if an equation is balanced by counting up the number of atoms- it has to be the same on each side of the equation.

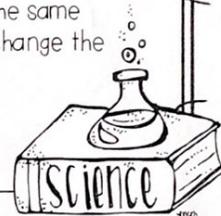
To balance an equation, you can adjust the coefficients until there are the same number of each type of atom on both sides. You are never allowed to change the smaller numbers that make up the chemical formulas.

See! This is balanced!



2 nitrogens and 6 fluorines on this side...

and 2 nitrogens and 6 fluorines on this side!



## Practice

Balance each equation using the law of conservation of mass. There is a chart above each problem to help you. Use the chart to make sure that you have the same number of atoms on each side.

First- Count up the number of atoms you currently have. Write that number in the chart for both sides of the equation.

Second- If the numbers don't match, try adjusting the coefficients one at a time. Make sure to change the number in the chart.

Remember- you can't change the formulas!

1

Reactants	
H	4
O	2

Products	
H	4
O	2

2 H<sub>2</sub> + 1 O<sub>2</sub> → 2 H<sub>2</sub>O

2

Reactants	
P	4
O	6

Products	
P	4
O	6

1 P<sub>4</sub> + 3 O<sub>2</sub> → 2 P<sub>2</sub>O<sub>3</sub>

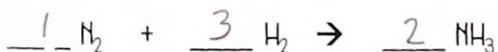
You should do this in pencil!



3. Reactants Products

N	2
H	6

N	2
H	6



4. Reactants Products

K	2
Cl	2

K	2
Cl	2



5. Reactants Products

C	1
F	4
Br	4

C	1
F	4
Br	4



6. Reactants Products

Ga	1
F	3
Cs	3

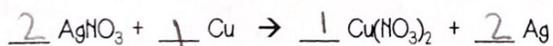
Ga	1
F	3
Cs	3



7. Reactants Products

Ag	2
N	2
O	6
Cu	1

Ag	2
N	2
O	6
Cu	1



8. Reactants Products

Ba	1
S	1
Pt	1
F	2

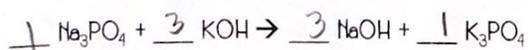
Ba	1
S	1
Pt	1
F	2



9. Reactants Products

Na	3
P	1
O	7
K	3
H	3

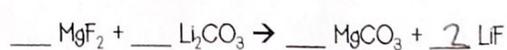
Na	3
P	1
O	7
K	3
H	3



10. Reactants Products

Mg	1
F	2
Li	2
C	1
O	3

Mg	1
F	2
Li	2
C	1
O	3



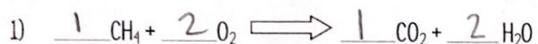
Kate

# C H E M I S T R Y

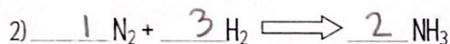
## Balancing Equations: Counting Atoms

### Guided Practice

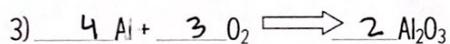
The Law of Conservation of Mass states that matter cannot be created nor destroyed, only rearranged. This means that all chemical equations must be balanced. To begin solving the equations on page, start first by counting the atoms on each side of the chemical equation. Then make the necessary changes to balance the equation.



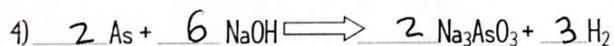
ELEMENT	* REACTANTS	* PRODUCTS
CARBON	1	1
HYDROGEN	4	4
OXYGEN	4	4



ELEMENT	* REACTANTS	* PRODUCTS
NITROGEN	2	2
HYDROGEN	6	6



ELEMENT	* REACTANTS	* PRODUCTS
ALUMINUM		
OXYGEN		



hola :)

ELEMENT	* REACTANTS	* PRODUCTS
ARSENIC		
SODIUM		
OXYGEN		
HYDROGEN		