

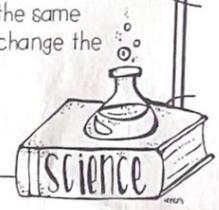
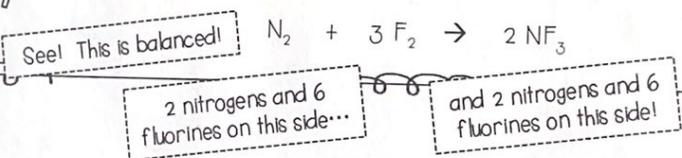
Introduction to Balancing Equations



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.



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.

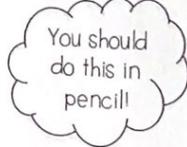
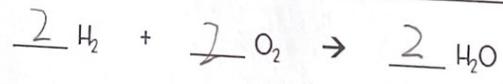
First- Count up the number of atoms you currently have. Write that number in the chart for both sides of the equation.

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!

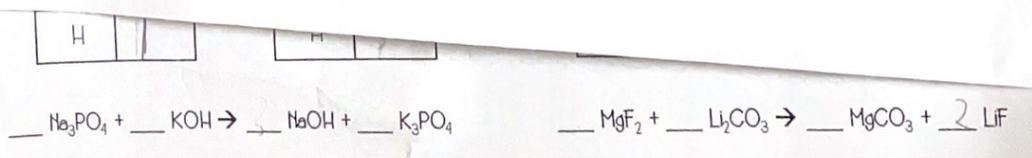
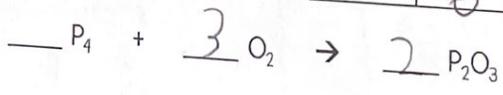
1

Reactants		Products	
H	4	H	4
O	2	O	2



2

Reactants		Products	
P	4	P	4
O	6	O	6



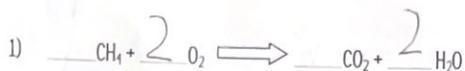
Ryan

CHEMISTRY

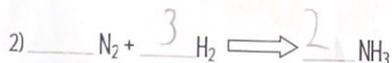
Balancing Equations: Counting Atoms

Guided Practice

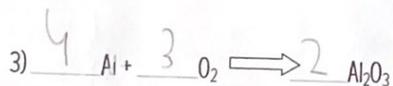
The Law of Conservation of Mass states that matter cannot be created nor destroyed, only rearranged. This means that all chemical equations must be balanced. To begin solving the equations on page, start first by counting the atoms on each side of the chemical equation. Then make the necessary changes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



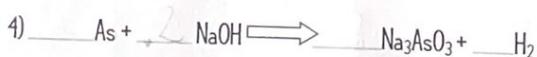
ELEMENT	• REACTANTS	• PRODUCTS
CARBON	1	1
HYDROGEN	4	4
OXYGEN	2	4



ELEMENT	• REACTANTS	• PRODUCTS
NITROGEN	2	2
HYDROGEN	6	6

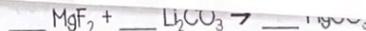
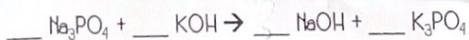


ELEMENT	• REACTANTS	• PRODUCTS
ALUMINUM	4	4
OXYGEN	6	6



ELEMENT	• REACTANTS	• PRODUCTS
ARSENIC	1	1
SODIUM	1	3
OXYGEN	1	3
HYDROGEN	1	2

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BALANCING CHEMICAL EQUATIONS WORKSHEET

1. $2 \text{H}_2 + 2 \text{O}_2 \rightarrow 1 \text{H}_2\text{O}$
2. $1 \text{Mg} + 2 \text{O}_2 \rightarrow 1 \text{MgO}$
3. $1 \text{Li} + 2 \text{F}_2 \rightarrow 1 \text{LiF}$
4. $1 \text{K} + 2 \text{O}_2 \rightarrow 0 \text{K}_2\text{O}$
5. $0 \text{H}_2\text{O}_2 \rightarrow 1 \text{H}_2\text{O} + 2 \text{O}_2$
6. $1 \text{Al} + 2 \text{Cl}_2 \rightarrow 0 \text{AlCl}_3$
7. $0 \text{Ag}_2\text{O} \rightarrow 1 \text{Ag} + 2 \text{O}_2$
8. $2 \text{H}_2 + 2 \text{N}_2 \rightarrow 0 \text{NH}_3$
9. $1 \text{Ca} + 1 \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + 1 \text{H}_2$
10. $1 \text{SeCl}_6 + 1 \text{O}_2 \rightarrow \text{SeO}_2 + 3 \text{Cl}_2$
11. $\text{CH}_4 + 1 \text{O}_2 \rightarrow \text{CO}_2 + 2 \text{H}_2\text{O}$
12. $1 \text{KClO}_3 \rightarrow 1 \text{KCl} + 0 \text{O}_2$
13. $\text{S}_8 + \text{O}_2 \rightarrow 1 \text{SO}_2$
14. $\text{P}_4 + \text{O}_2 \rightarrow 0 \text{P}_2\text{O}_5$
15. $\text{Na} + \text{H}_2\text{O} \rightarrow \text{NaOH} + 1 \text{H}_2$
16. $\text{NO} + \text{O}_2 \rightarrow 1 \text{NO}_2$
17. $\text{FeCl}_2 + \text{Cl}_2 \rightarrow 1 \text{FeCl}_3$
18. $\text{CrO}_3 \rightarrow \text{Cr}_2\text{O}_3 + 3 \text{O}_2$
19. $\text{AgBr} + \text{GaPO}_4 \rightarrow \text{Ag}_3\text{PO}_4 + 1 \text{GaBr}_3$
20. $\text{Al} + \text{Fe}_2\text{O}_3 \rightarrow \text{Fe} + 1 \text{Al}_2\text{O}_3$
21. $\text{KNO}_3 + \text{H}_2\text{CO}_3 \rightarrow \text{K}_2\text{CO}_3 + 0 \text{HNO}_3$
22. $\text{SiCl}_4 + \text{H}_2\text{O} \rightarrow \text{SiO}_2 + 0 \text{HCl}$
23. $\text{H}_3\text{PO}_4 + \text{HCl} \rightarrow \text{PCl}_5 + 1 \text{H}_2\text{O}$
24. $\text{Pb(NO}_3)_2 + \text{NaI} \rightarrow \text{PbI}_2 + 1 \text{NaNO}_3$
25. $\text{Al} + \text{H}_2\text{SO}_4 \rightarrow \text{Al}_2(\text{SO}_4)_3 + 1 \text{H}_2$