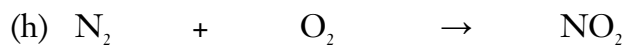
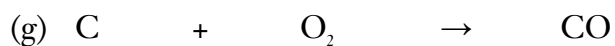
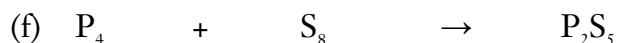
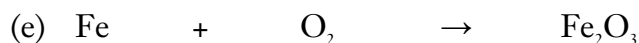
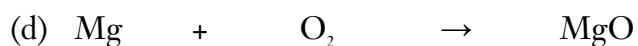
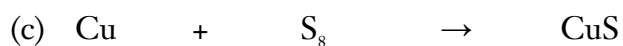
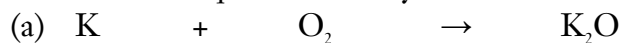


Goal • Use this page to practise balancing synthesis reaction equations.

What to Do

1. Balance each equation for a synthesis reaction.



2. Write a balanced chemical equation to represent each reaction described below.

(a) Aluminum metal reacts with oxygen to form aluminum oxide.

(b) Metallic zinc combines with sulphur to form zinc sulphide.

Decomposition Reaction Equations

Goal • Use this page to practise balancing decomposition reaction equations.

What to Do

1. Balance each equation for a decomposition reaction.



2. Write a balanced chemical equation to represent each reaction described below.

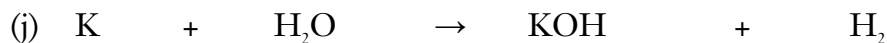
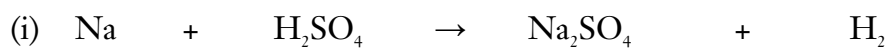
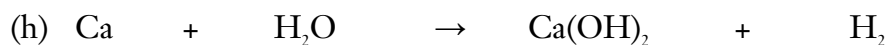
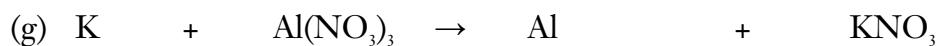
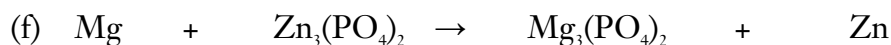
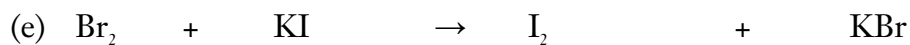
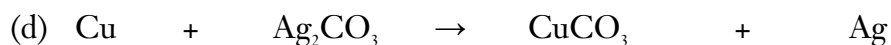
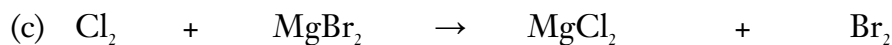
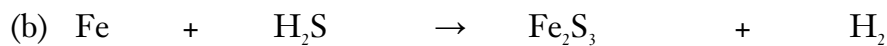
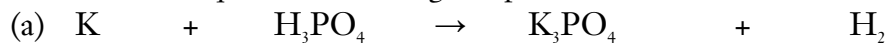
(a) Rubidium oxide decomposes into its elements.

(b) Calcium chloride decomposes into its elements.

Single Replacement Reaction Equations

Goal • Use this page to practise balancing single replacement reaction equations.

1. Balance each equation for a single replacement reaction.



2. Write a balanced chemical equation to represent each reaction described below.

(a) Silver reacts with gold(III) nitrate.

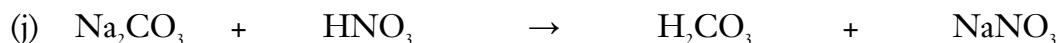
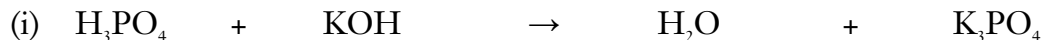
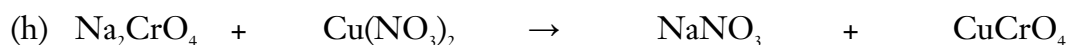
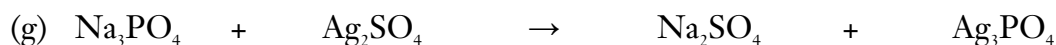
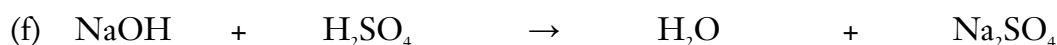
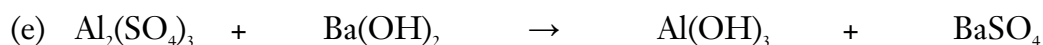
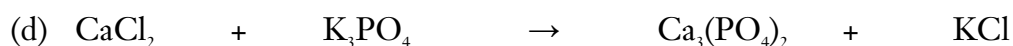
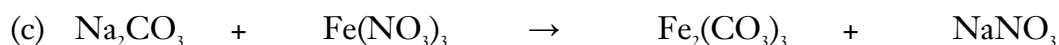
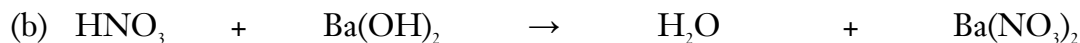
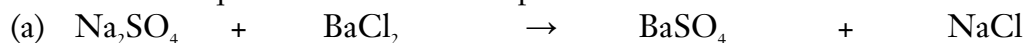
(b) Copper reacts with lead(II) sulphate.

Double Replacement Reaction Equations

Goal • Use this page to practise balancing double replacement reaction equations.

What to Do

1. Balance each equation for a double replacement reaction.



2. Write a balanced chemical equation to represent each reaction described below.

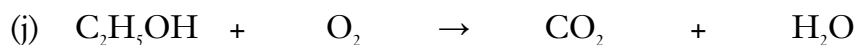
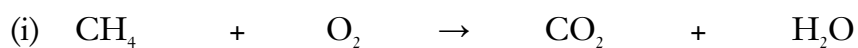
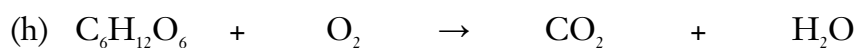
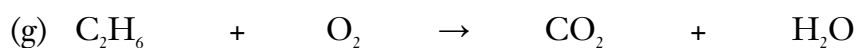
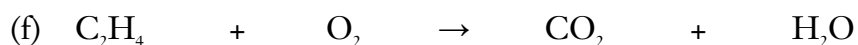
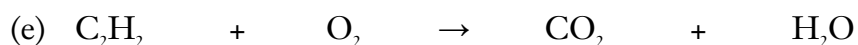
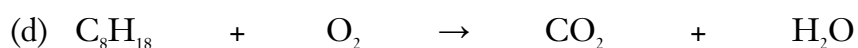
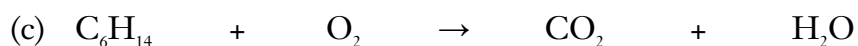
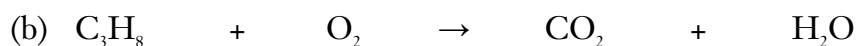
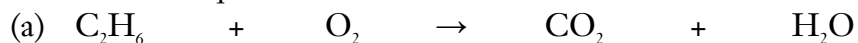
(a) Solutions of sodium hydroxide and hydrochloric acid react.

(b) A silver nitrate solution reacts with a sodium chloride solution.

Goal • Use this page to practise balancing combustion reaction equations.

What to Do

1. Balance each equation for a combustion reaction.



2. Write a balanced chemical equation to represent each reaction described below.

(a) Candle wax, $\text{C}_{25}\text{H}_{52}$, is burned to produce carbon dioxide and water.

(b) Sucrose, $\text{C}_{12}\text{H}_{22}\text{O}_{11}$, is burned to produce carbon dioxide and water.

Classifying and Balancing Equations

Goal • Use this page to practise classifying and balancing reactions.

What to Do

Classify each reaction as a synthesis (S), decomposition (D), single replacement (SR), double replacement (DR), or combustion (C) reaction. Then, balance each equation.

	Reaction	Classification
1.	$\text{Li} + \text{AlCl}_3 \rightarrow \text{Al} + \text{LiCl}$	
2.	$\text{NH}_3 \rightarrow \text{N}_2 + \text{H}_2$	
3.	$\text{K} + \text{Br}_2 \rightarrow \text{KBr}$	
4.	$\text{C}_{10}\text{H}_{22} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$	
5.	$\text{NH}_4\text{OH} + \text{H}_2\text{CO}_3 \rightarrow \text{H}_2\text{O} + (\text{NH}_4)_2\text{CO}_3$	
6.	$\text{H}_2\text{O} \rightarrow \text{H}_2 + \text{O}_2$	
7.	$\text{Al} + \text{Cl}_2 \rightarrow \text{AlCl}_3$	
8.	$\text{Zn} + \text{SnF}_4 \rightarrow \text{Sn} + \text{ZnF}_2$	
9.	$\text{Ni} + \text{HCl} \rightarrow \text{NiCl}_2 + \text{H}_2$	
10.	$\text{Au}(\text{CN})_3 + \text{Zn} \rightarrow \text{Au} + \text{Zn}(\text{CN})_2$	
11.	$\text{O}_2 + \text{Be} \rightarrow \text{BeO}$	
12.	$\text{FeCl}_3 + \text{Na}_2\text{SO}_3 \rightarrow \text{NaCl} + \text{Fe}_2(\text{SO}_3)_3$	
13.	$\text{C}_8\text{H}_{18} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$	
14.	$(\text{NH}_4)_2\text{S} + \text{Mn}(\text{NO}_3)_2 \rightarrow \text{NH}_4\text{NO}_3 + \text{MnS}$	
15.	$\text{P}_4 + \text{F}_2 \rightarrow \text{PF}_3$	
16.	$\text{Al}_2(\text{SO}_4)_3 + \text{Na}_3\text{PO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{AlPO}_4$	
17.	$\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$	
18.	$\text{H}_3(\text{PO}_4) + \text{Cu}(\text{OH})_2 \rightarrow \text{H}_2\text{O} + \text{Cu}_3(\text{PO}_4)_2$	

BLM 2-34, Synthesis Reaction Equations

- $4\text{K} + \text{O}_2 \rightarrow 2\text{K}_2\text{O}$
 - $\text{P}_4 + 10\text{Cl}_2 \rightarrow 4\text{PCl}_5$
 - $8\text{Cu} + \text{S}_8 \rightarrow 8\text{CuS}$
 - $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$
 - $4\text{Fe} + 3\text{O}_2 \rightarrow 2\text{Fe}_2\text{O}_3$
 - $4\text{P}_4 + 5\text{S}_8 \rightarrow 8\text{P}_2\text{S}_5$
 - $2\text{C} + \text{O}_2 \rightarrow 2\text{CO}$
 - $\text{N}_2 + 2\text{O}_2 \rightarrow 2\text{NO}_2$
 - $6\text{Li} + \text{N}_2 \rightarrow 2\text{Li}_3\text{N}$
 - $\text{S}_8 + 8\text{O}_2 \rightarrow 8\text{SO}_2$
- $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$
 - $8\text{Zn} + \text{S}_8 \rightarrow 8\text{ZnS}$

BLM 2-35, Decomposition Reaction Equations

- $2\text{NaCl} \rightarrow 2\text{Na} + \text{Cl}_2$
 - $\text{CaBr}_2 \rightarrow \text{Ca} + \text{Br}_2$
 - $\text{CCl}_4 \rightarrow \text{C} + 2\text{Cl}_2$
 - $2\text{NCl}_3 \rightarrow \text{N}_2 + 3\text{Cl}_2$
 - $\text{P}_4\text{O}_{10} \rightarrow \text{P}_4 + 5\text{O}_2$
 - $2\text{Ag}_2\text{O} \rightarrow 4\text{Ag} + \text{O}_2$
 - $2\text{HCl} \rightarrow \text{H}_2 + \text{Cl}_2$
 - $2\text{KI} \rightarrow 2\text{K} + \text{I}_2$
 - $2\text{AlCl}_3 \rightarrow 2\text{Al} + 3\text{Cl}_2$
 - $2\text{CuO} \rightarrow 2\text{Cu} + \text{O}_2$
- $2\text{Rb}_2\text{O} \rightarrow 2\text{Rb} + \text{O}_2$
 - $\text{CaCl}_2 \rightarrow \text{Ca} + \text{Cl}_2$

BLM 2-36, Single Replacement Reaction Equations

- $6\text{K} + 2\text{H}_3\text{PO}_4 \rightarrow 2\text{K}_3\text{PO}_4 + 3\text{H}_2$
 - $2\text{Fe} + 3\text{H}_2\text{S} \rightarrow \text{Fe}_2\text{S}_3 + 3\text{H}_2$
 - $\text{Cl}_2 + \text{MgBr}_2 \rightarrow \text{MgCl}_2 + \text{Br}_2$
 - $\text{Cu} + \text{Ag}_2\text{CO}_3 \rightarrow \text{CuCO}_3 + 2\text{Ag}$
 - $\text{Br}_2 + \text{KI} \rightarrow \text{I}_2 + \text{KBr}$
 - $3\text{Mg} + \text{Zn}_3(\text{PO}_4)_2 \rightarrow \text{Mg}_3(\text{PO}_4)_2 + 3\text{Zn}$
 - $3\text{K} + \text{Al}(\text{NO}_3)_3 \rightarrow \text{Al} + 3\text{KNO}_3$
 - $\text{Ca} + 2\text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{H}_2$
 - $2\text{Na} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2$
 - $\text{K} + \text{H}_2\text{O} \rightarrow \text{KOH} + \text{H}_2$
- $3\text{Ag} + \text{Au}(\text{NO}_3)_3 \rightarrow \text{Au} + 3\text{AgNO}_3$
 - $\text{Cu} + \text{PbSO}_4 \rightarrow \text{Pb} + \text{CuSO}_4$

BLM 2-37, Double Replacement Reaction Equations

- $\text{Na}_2\text{SO}_4 + \text{BaCl}_2 \rightarrow \text{BaSO}_4 + 2\text{NaCl}$
 - $2\text{HNO}_3 + \text{Ba}(\text{OH})_2 \rightarrow 2\text{H}_2\text{O} + \text{Ba}(\text{NO}_3)_2$
 - $3\text{Na}_2\text{CO}_3 + 2\text{Fe}(\text{NO}_3)_3 \rightarrow \text{Fe}_2(\text{CO}_3)_3 + 6\text{NaNO}_3$
 - $3\text{CaCl}_2 + 2\text{K}_3\text{PO}_4 \rightarrow \text{Ca}_3(\text{PO}_4)_2 + 6\text{KCl}$
 - $\text{Al}_2(\text{SO}_4)_3 + 3\text{Ba}(\text{OH})_2 \rightarrow 2\text{Al}(\text{OH})_3 + 3\text{BaSO}_4$
 - $2\text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow 2\text{H}_2\text{O} + \text{Na}_2\text{SO}_4$
 - $2\text{Na}_3\text{PO}_4 + 3\text{Ag}_2\text{SO}_4 \rightarrow 3\text{Na}_2\text{SO}_4 + 2\text{Ag}_3\text{PO}_4$
 - $\text{Na}_2\text{CrO}_4 + \text{Cu}(\text{NO}_3)_2 \rightarrow 2\text{NaNO}_3 + \text{CuCrO}_4$

- (i) $\text{H}_3\text{PO}_4 + 3\text{KOH} \rightarrow 3\text{H}_2\text{O} + \text{K}_3\text{PO}_4$
 (j) $\text{Na}_2\text{CO}_3 + 2\text{HNO}_3 \rightarrow \text{H}_2\text{CO}_3 + 2\text{NaNO}_3$
 2. (a) $\text{NaOH} + \text{HCl} \rightarrow \text{H}_2\text{O} + \text{NaCl}$
 (b) $\text{AgNO}_3 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$

BLM 2-38, Combustion Reaction Equations

1. (a) $2\text{C}_2\text{H}_6 + 7\text{O}_2 \rightarrow 4\text{CO}_2 + 6\text{H}_2\text{O}$
 (b) $\text{C}_3\text{H}_8 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
 (c) $2\text{C}_6\text{H}_{14} + 19\text{O}_2 \rightarrow 12\text{CO}_2 + 14\text{H}_2\text{O}$
 (d) $2\text{C}_8\text{H}_{18} + 25\text{O}_2 \rightarrow 16\text{CO}_2 + 18\text{H}_2\text{O}$
 (e) $2\text{C}_2\text{H}_2 + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 2\text{H}_2\text{O}$
 (f) $\text{C}_2\text{H}_4 + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 2\text{H}_2\text{O}$
 (g) $2\text{C}_2\text{H}_6 + 7\text{O}_2 \rightarrow 4\text{CO}_2 + 6\text{H}_2\text{O}$
 (h) $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$
 (i) $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
 (j) $\text{C}_2\text{H}_5\text{OH} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 3\text{H}_2\text{O}$
 2. (a) $\text{C}_{25}\text{H}_{52} + 38\text{O}_2 \rightarrow 25\text{CO}_2 + 26\text{H}_2\text{O}$
 (b) $2\text{C}_{12}\text{H}_{22}\text{O}_{11} + 24\text{O}_2 \rightarrow 24\text{CO}_2 + 22\text{H}_2\text{O}$

BLM 2-39, Classifying and Balancing Chemical Equations

	Reaction	Classification
1.	$3\text{Li} + \text{AlCl}_3 \rightarrow \text{Al} + 3\text{LiCl}$	SR
2.	$2\text{NH}_3 \rightarrow 3\text{N}_2 + 3\text{H}_2$	D
3.	$2\text{K} + \text{Br}_2 \rightarrow 2\text{KBr}$	S
4.	$2\text{C}_{10}\text{H}_{22} + 31\text{O}_2 \rightarrow 20\text{CO}_2 + 22\text{H}_2\text{O}$	C
5.	$2\text{NH}_4\text{OH} + \text{H}_2\text{CO}_3 \rightarrow 2\text{H}_2\text{O} + (\text{NH}_4)_2\text{CO}_3$	DR
6.	$2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$	D
7.	$2\text{Al} + 3\text{Cl}_2 \rightarrow 2\text{AlCl}_3$	S
8.	$2\text{Zn} + \text{SnF}_4 \rightarrow \text{Sn} + 2\text{ZnF}_2$	SR
9.	$\text{Ni} + 2\text{HCl} \rightarrow \text{NiCl}_2 + \text{H}_2$	SR
10.	$2\text{Au}(\text{CN})_3 + 3\text{Zn} \rightarrow 2\text{Au} + 3\text{Zn}(\text{CN})_2$	SR
11.	$\text{O}_2 + 2\text{Be} \rightarrow 2\text{BeO}$	S
12.	$2\text{FeCl}_3 + 3\text{Na}_2\text{SO}_3 \rightarrow 6\text{NaCl} + \text{Fe}_2(\text{SO}_3)_3$	DR
13.	$2\text{C}_8\text{H}_{18} + 25\text{O}_2 \rightarrow 16\text{CO}_2 + 18\text{H}_2\text{O}$	C
14.	$(\text{NH}_4)_2\text{S} + \text{Mn}(\text{NO}_3)_2 \rightarrow 2\text{NH}_4\text{NO}_3 + \text{MnS}$	DR
15.	$\text{P}_4 + 6\text{F}_2 \rightarrow 4\text{PF}_3$	S
16.	$\text{Al}_2(\text{SO}_4)_3 + 2\text{Na}_3\text{PO}_4 \rightarrow 3\text{Na}_2\text{SO}_4 + 2\text{AlPO}_4$	DR
17.	$6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$	O
18.	$2\text{H}_3(\text{PO}_4) + 3\text{Cu}(\text{OH})_2 \rightarrow 6\text{H}_2\text{O} + \text{Cu}_3(\text{PO}_4)_2$	DR