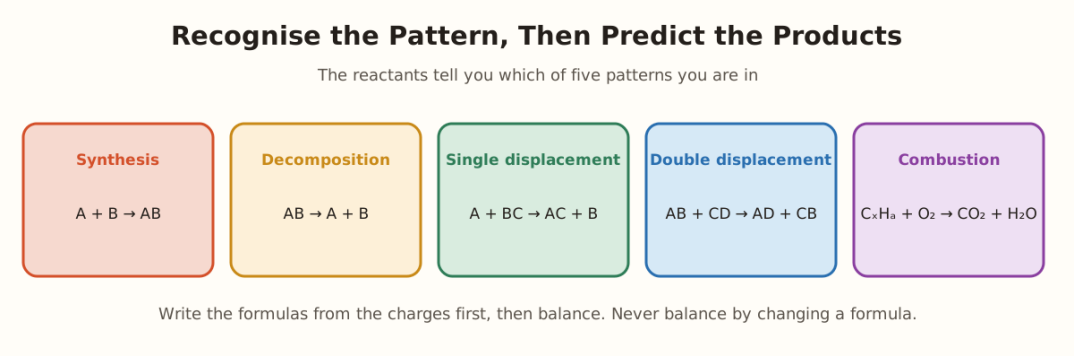
Predicting Products Worksheet

Grade 11 Chemistry · five patterns, then balance

Name: Date: Score: / 18



Before you start: work out the formulas from the ion charges before you balance anything. Balancing changes coefficients only — if you find yourself editing a subscript, the formula was wrong.

Part A · synthesis and decomposition

#	Reactants	Balanced equation
1	$Mg + O_2$	
2	$Na + Cl_2$	
3	$H_2 + N_2$	
4	$CaCO_3$	
5	$KClO_3$	
6	H_2O	

Part B · complete combustion

#	Reactants	Balanced equation
7	$CH_4 + O_2$ (complete combustion)	
8	$C_2H_6 + O_2$ (complete combustion)	
9	$C_3H_8 + O_2$ (complete combustion)	
10	$C_4H_{10} + O_2$ (complete combustion)	

Part C · single displacement

#	Reactants	Balanced equation
11	Zn + HCl	
12	Mg + HCl	
13	Fe + $CuSO_4$	
14	Al + HCl	

Part D · double displacement: name the precipitate too

#	Reactants	Balanced equation
15	$AgNO_3$ (aq) + NaCl (aq)	
16	$BaCl_2$ (aq) + Na_2SO_4 (aq)	
17	$Pb(NO_3)_2$ (aq) + KI (aq)	
18	$CaCl_2$ (aq) + Na_2CO_3 (aq)	

Answer Key

Predicting Products · Grade 11 Chemistry

Parts A to C

#	Balanced equation	Type
1	$2Mg + O_2 \rightarrow 2MgO$	**synthesis**
2	$2Na + Cl_2 \rightarrow 2NaCl$	**synthesis**
3	$3H_2 + N_2 \rightarrow 2NH_3$	**synthesis**
4	$CaCO_3 \rightarrow CaO + CO_2$	**decomposition**
5	$2KClO_3 \rightarrow 2KCl + 3O_2$	**decomposition**
6	$2H_2O \rightarrow 2H_2 + O_2$	**decomposition**
7	$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$	**combustion**
8	$2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$	**combustion**
9	$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$	**combustion**
10	$2C_4H_{10} + 13O_2 \rightarrow 8CO_2 + 10H_2O$	**combustion**
11	$Zn + 2HCl \rightarrow ZnCl_2 + H_2$	**single displacement**
12	$Mg + 2HCl \rightarrow MgCl_2 + H_2$	**single displacement**
13	$Fe + CuSO_4 \rightarrow FeSO_4 + Cu$	**single displacement**
14	$2Al + 6HCl \rightarrow 2AlCl_3 + 3H_2$	**single displacement**

Part D · the insoluble product leaves solution

#	Balanced equation	Precipitate
15	$AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$	**AgCl**
16	$BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaCl$	**$BaSO_4$**
17	$Pb(NO_3)_2 + 2KI \rightarrow PbI_2 + 2KNO_3$	**PbI_2**
18	$CaCl_2 + Na_2CO_3 \rightarrow CaCO_3 + 2NaCl$	**$CaCO_3$**