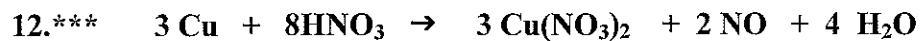
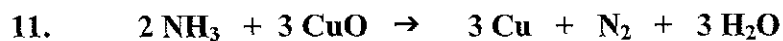
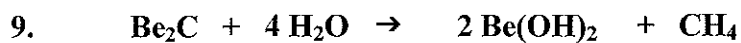
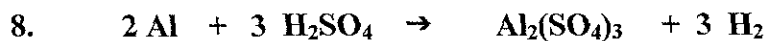
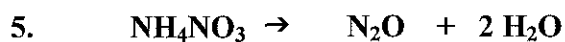
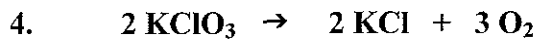
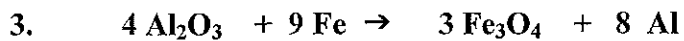
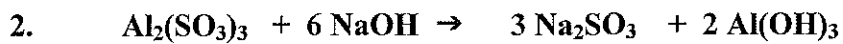
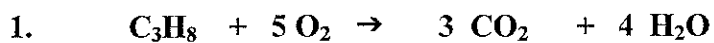


1. $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
2. $3\text{H}_2 + \text{N}_2 \rightarrow 2\text{NH}_3$
3. $2\text{Al}_2\text{O}_3 \rightarrow 4\text{Al} + 3\text{O}_2$
4. $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$
5. $\text{S}_8 + 8\text{O}_2 \rightarrow 8\text{SO}_2$
6. $2\text{C}_2\text{H}_6 + 7\text{O}_2 \rightarrow 4\text{CO}_2 + 6\text{H}_2\text{O}$
7. $\text{Al}_2(\text{SO}_4)_3 + 3\text{Ca}(\text{OH})_2 \rightarrow 2\text{Al}(\text{OH})_3 + 3\text{CaSO}_4$
8. $\text{P}_4 + 5\text{O}_2 \rightarrow 2\text{P}_2\text{O}_5$
9. $16\text{Ag} + \text{S}_8 \rightarrow 8\text{Ag}_2\text{S}$
10. $2\text{Al} + 3\text{Br}_2 \rightarrow 2\text{AlBr}_3$
11. $4\text{Cr} + 3\text{O}_2 \rightarrow 2\text{Cr}_2\text{O}_3$
12. $2\text{NaClO}_3 \rightarrow 2\text{NaCl} + 3\text{O}_2$
13. $2\text{AlBr}_3 + 3\text{Cl}_2 \rightarrow 2\text{AlCl}_3 + 3\text{Br}_2$
14. $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$
15. $2\text{AlI}_3 + 3\text{HgCl}_2 \rightarrow 2\text{AlCl}_3 + 3\text{HgI}_2$
16. $3\text{Ca}(\text{OH})_2 + 2\text{H}_3\text{PO}_4 \rightarrow \text{Ca}_3(\text{PO}_4)_2 + 6\text{H}_2\text{O}$
17. $3\text{AgNO}_3 + \text{K}_3\text{PO}_4 \rightarrow \text{Ag}_3\text{PO}_4 + 3\text{KNO}_3$
18. $\text{C}_3\text{H}_8 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
19. $2\text{C}_2\text{H}_2 + 5\text{O}_2 \rightarrow 4\text{CO}_2 + 2\text{H}_2\text{O}$
20. $2\text{C}_6\text{H}_6 + 15\text{O}_2 \rightarrow 12\text{CO}_2 + 6\text{H}_2\text{O}$

More #1

Problems with *** are the most difficult. If you can balance these, you can balance any equation given in class.



More
#2

Balancing Equations Worksheet – Answers

Note to students: It is acceptable to leave spaces blank when balancing equations – blank spaces are interpreted as containing the number “1”.

- 1) $1 \text{ Na}_3\text{PO}_4 + 3 \text{ KOH} \rightarrow 3 \text{ NaOH} + 1 \text{ K}_3\text{PO}_4$
- 2) $1 \text{ MgF}_2 + 1 \text{ Li}_2\text{CO}_3 \rightarrow 1 \text{ MgCO}_3 + 2 \text{ LiF}$
- 3) $1 \text{ P}_4 + 3 \text{ O}_2 \rightarrow 2 \text{ P}_2\text{O}_3$
- 4) $2 \text{ RbNO}_3 + 1 \text{ BeF}_2 \rightarrow 1 \text{ Be}(\text{NO}_3)_2 + 2 \text{ RbF}$
- 5) $2 \text{ AgNO}_3 + 1 \text{ Cu} \rightarrow 1 \text{ Cu}(\text{NO}_3)_2 + 2 \text{ Ag}$
- 6) $1 \text{ CF}_4 + 2 \text{ Br}_2 \rightarrow 1 \text{ CBr}_4 + 2 \text{ F}_2$
- 7) $2 \text{ HCN} + 1 \text{ CuSO}_4 \rightarrow 1 \text{ H}_2\text{SO}_4 + 1 \text{ Cu}(\text{CN})_2$
- 8) $1 \text{ GaF}_3 + 3 \text{ Cs} \rightarrow 3 \text{ CsF} + 1 \text{ Ga}$
- 9) $1 \text{ BaS} + 1 \text{ PtF}_2 \rightarrow 1 \text{ BaF}_2 + 1 \text{ PtS}$
- 10) $1 \text{ N}_2 + 3 \text{ H}_2 \rightarrow 2 \text{ NH}_3$
- 11) $2 \text{ NaF} + 1 \text{ Br}_2 \rightarrow 2 \text{ NaBr} + 1 \text{ F}_2$
- 12) $1 \text{ Pb}(\text{OH})_2 + 2 \text{ HCl} \rightarrow 2 \text{ H}_2\text{O} + 1 \text{ PbCl}_2$
- 13) $2 \text{ AlBr}_3 + 3 \text{ K}_2\text{SO}_4 \rightarrow 6 \text{ KBr} + 1 \text{ Al}_2(\text{SO}_4)_3$
- 14) $1 \text{ CH}_4 + 2 \text{ O}_2 \rightarrow 1 \text{ CO}_2 + 2 \text{ H}_2\text{O}$
- 15) $2 \text{ Na}_3\text{PO}_4 + 3 \text{ CaCl}_2 \rightarrow 6 \text{ NaCl} + 1 \text{ Ca}_3(\text{PO}_4)_2$
- 16) $2 \text{ K} + 1 \text{ Cl}_2 \rightarrow 2 \text{ KCl}$
- 17) $2 \text{ Al} + 6 \text{ HCl} \rightarrow 3 \text{ H}_2 + 2 \text{ AlCl}_3$
- 18) $1 \text{ N}_2 + 3 \text{ F}_2 \rightarrow 2 \text{ NF}_3$
- 19) $1 \text{ SO}_2 + 2 \text{ Li}_2\text{Se} \rightarrow 1 \text{ SSe}_2 + 2 \text{ Li}_2\text{O}$
- 20) $2 \text{ NH}_3 + 1 \text{ H}_2\text{SO}_4 \rightarrow 1 (\text{NH}_4)_2\text{SO}_4$

MORE
#3

MORE #4

Answers

Question 1

- a. $2 \text{Cu}_{(s)} + \text{O}_{2(g)} \rightarrow 2 \text{CuO}_{(s)}$ (formation)
b. $2 \text{H}_2\text{O}_{(l)} \rightarrow 2 \text{H}_{2(g)} + \text{O}_{2(g)}$ (decomposition)
c. $3 \text{Fe}_{(s)} + 4 \text{H}_2\text{O}_{(g)} \rightarrow 4 \text{H}_{2(g)} + \text{Fe}_3\text{O}_{4(s)}$ (single replacement)
d. $2 \text{AsCl}_3(aq) + 3 \text{H}_2\text{S}(aq) \rightarrow \text{As}_2\text{S}_3(s) + 6 \text{HCl}(aq)$ (double replacement)
e. $\text{CuSO}_4 \cdot 5 \text{H}_2\text{O}_{(s)} \rightarrow \text{CuSO}_4(s) + 5 \text{H}_2\text{O}_{(g)}$ (other – dehydration or decomposition)
f. $\text{Fe}_2\text{O}_3(s) + 3 \text{H}_2(g) \rightarrow 2 \text{Fe}_{(s)} + 3 \text{H}_2\text{O}_{(l)}$ (single replacement)
g. $\text{CaCO}_3(s) \rightarrow \text{CaO}_{(s)} + \text{CO}_{2(g)}$ (other or decomposition)
h. $8 \text{Fe}_{(s)} + \text{S}_8(s) \rightarrow 8 \text{FeS}_{(s)}$ (formation)
i. $\text{H}_2\text{S}(aq) + 2 \text{KOH}(aq) \rightarrow 2 \text{H}_2\text{O}_{(l)} + \text{K}_2\text{S}(aq)$ (double replacement)
j. $2 \text{NaCl}_{(l)} \rightarrow 2 \text{Na}_{(l)} + \text{Cl}_{2(g)}$ (decomposition)
k. $2 \text{Al}_{(s)} + 3 \text{H}_2\text{SO}_4(aq) \rightarrow 3 \text{H}_{2(g)} + \text{Al}_2(\text{SO}_4)_3(aq)$ (single replacement)
l. $\text{H}_3\text{PO}_4(aq) + 3 \text{NH}_4\text{OH}(aq) \rightarrow 3 \text{H}_2\text{O}_{(l)} + (\text{NH}_4)_3\text{PO}_4(aq)$ (double replacement)
m. $\text{C}_3\text{H}_8(g) + 5 \text{O}_2(g) \rightarrow 3 \text{CO}_2(g) + 4 \text{H}_2\text{O}_{(l)}$ (hydrocarbon combustion)
n. $4 \text{Al}_{(s)} + 3 \text{O}_2(g) \rightarrow 2 \text{Al}_2\text{O}_3(s)$ (formation)
o. $\text{CH}_4(g) + 2 \text{O}_2(g) \rightarrow \text{CO}_2(g) + 2 \text{H}_2\text{O}_{(l)}$ (hydrocarbon combustion)
p. $\text{K}_2\text{SO}_4(aq) + \text{BaCl}_2(aq) \rightarrow 2 \text{KCl}(aq) + \text{BaSO}_4(s)$ (double replacement)
q. $\text{C}_5\text{H}_{12}(l) + 8 \text{O}_2(g) \rightarrow 5 \text{CO}_2(g) + 6 \text{H}_2\text{O}_{(g)}$ (hydrocarbon combustion)
r. $\text{Ca}(\text{OH})_2(aq) + 2 \text{NH}_4\text{Cl}(aq) \rightarrow 2 \text{NH}_4\text{OH}(aq) + \text{CaCl}_2(aq)$ (double replacement)
s. $\text{V}_2\text{O}_5(s) + 5 \text{Ca}_{(s)} \rightarrow 5 \text{CaO}_{(s)} + 2 \text{V}_{(s)}$ (single replacement)
t. $2 \text{Na}_{(s)} + \text{ZnI}_2(aq) \rightarrow 2 \text{NaI}(aq) + \text{Zn}_{(s)}$ (single replacement)
u. $\text{C}_7\text{H}_6\text{O}_3(l) + 7 \text{O}_2(g) \rightarrow 7 \text{CO}_2(g) + 3 \text{H}_2\text{O}_{(l)}$ (hydrocarbon combustion)
v. $3 \text{Ca}_{(s)} + \text{N}_2(g) \rightarrow \text{Ca}_3\text{N}_2(s)$ (formation)
w. $\text{Fe}_2\text{O}_3(s) + 3 \text{H}_2(g) \rightarrow 2 \text{Fe}_{(s)} + 3 \text{H}_2\text{O}_{(l)}$ (single replacement)
x. $2 \text{C}_{15}\text{H}_{30}(l) + 45 \text{O}_2(g) \rightarrow 30 \text{CO}_2(g) + 30 \text{H}_2\text{O}_{(g)}$ (hydrocarbon combustion)
y. $2 \text{BN}_{(s)} + 3 \text{F}_2(g) \rightarrow 2 \text{BF}_3(s) + \text{N}_2(g)$ (single replacement)
z. $2 \text{C}_{12}\text{H}_{26}(l) + 37 \text{O}_2(g) \rightarrow 24 \text{CO}_2(g) + 26 \text{H}_2\text{O}_{(g)}$ (hydrocarbon combustion)

Question 2

- a. $\text{Pb}(\text{NO}_3)_2(aq) + 2 \text{NaI}(aq) \rightarrow \text{PbI}_2(s) + 2 \text{NaNO}_3(aq)$ (double replacement)
b. $8 \text{ZnS}_{(s)} + 4 \text{O}_{2(g)} \rightarrow 8 \text{ZnO}_{(s)} + \text{S}_8(s)$ (single replacement)
c. $2 \text{C}_4\text{H}_{10}(l) + 13 \text{O}_2(g) \rightarrow 8 \text{CO}_2(g) + 10 \text{H}_2\text{O}_{(g)}$ (hydrocarbon combustion)
d. $\text{Ba}(\text{OH})_2(aq) + 2 \text{HCl}(aq) \rightarrow \text{BaCl}_2(aq) + 2 \text{H}_2\text{O}_{(l)}$ (double replacement)
e. $\text{Cu}_{(s)} + 2 \text{AgNO}_3(aq) \rightarrow \text{Cu}(\text{NO}_3)_2(aq) + 2 \text{Ag}_{(s)}$ (single replacement)
f. $\text{S}_8(s) + 8 \text{O}_2(g) \rightarrow 8 \text{SO}_2(g)$ (formation)
g. $\text{Al}_2(\text{SO}_4)_3(aq) + 3 \text{Ca}(\text{OH})_2(aq) \rightarrow 2 \text{Al}(\text{OH})_3(s) + 3 \text{CaSO}_4(s)$ (double replacement)
h. $\text{Zn}_{(s)} + \text{H}_2\text{SO}_4(aq) \rightarrow \text{ZnSO}_4(aq) + \text{H}_2(g)$ (single replacement)
i. $2 \text{Al}_{(s)} + 3 \text{Cl}_2(g) \rightarrow 2 \text{AlCl}_3(s)$ (formation)
j. $\text{C}_{12}\text{H}_{22}\text{O}_{11}(s) + 12 \text{O}_2(g) \rightarrow 12 \text{CO}_2(g) + 11 \text{H}_2\text{O}_{(l)}$ (hydrocarbon combustion)

Solutions for the Balancing Equations Practice Worksheet

MORE
#5

- 1) $2 \text{NaNO}_3 + \text{PbO} \rightarrow \text{Pb}(\text{NO}_3)_2 + \text{Na}_2\text{O}$
- 2) $6 \text{AgI} + \text{Fe}_2(\text{CO}_3)_3 \rightarrow 2 \text{FeI}_3 + 3 \text{Ag}_2\text{CO}_3$
- 3) $\text{C}_2\text{H}_4\text{O}_2 + 2 \text{O}_2 \rightarrow 2 \text{CO}_2 + 2 \text{H}_2\text{O}$
- 4) $\text{ZnSO}_4 + \text{Li}_2\text{CO}_3 \rightarrow \text{ZnCO}_3 + \text{Li}_2\text{SO}_4$
- 5) $\text{V}_2\text{O}_5 + 5 \text{CaS} \rightarrow 5 \text{CaO} + \text{V}_2\text{S}_5$
- 6) $\text{Mn}(\text{NO}_2)_2 + \text{BeCl}_2 \rightarrow \text{Be}(\text{NO}_2)_2 + \text{MnCl}_2$
- 7) $3 \text{AgBr} + \text{GaPO}_4 \rightarrow \text{Ag}_3\text{PO}_4 + \text{GaBr}_3$
- 8) $3 \text{H}_2\text{SO}_4 + 2 \text{B}(\text{OH})_3 \rightarrow \text{B}_2(\text{SO}_4)_3 + 6 \text{H}_2\text{O}$
- 9) $\text{S}_8 + 8 \text{O}_2 \rightarrow 8 \text{SO}_2$
- 10) $\text{Fe} + 2 \text{AgNO}_3 \rightarrow \text{Fe}(\text{NO}_3)_2 + 2 \text{Ag}$

Balancing Chemical Equations – Answer Key

Balance the equations below:

- 1) $1 \text{ N}_2 + 3 \text{ H}_2 \rightarrow 2 \text{ NH}_3$
- 2) $2 \text{ KClO}_3 \rightarrow 2 \text{ KCl} + 3 \text{ O}_2$
- 3) $2 \text{ NaCl} + 1 \text{ F}_2 \rightarrow 2 \text{ NaF} + 1 \text{ Cl}_2$
- 4) $2 \text{ H}_2 + 1 \text{ O}_2 \rightarrow 2 \text{ H}_2\text{O}$
- 5) $1 \text{ Pb(OH)}_2 + 2 \text{ HCl} \rightarrow 2 \text{ H}_2\text{O} + 1 \text{ PbCl}_2$
- 6) $2 \text{ AlBr}_3 + 3 \text{ K}_2\text{SO}_4 \rightarrow 6 \text{ KBr} + 1 \text{ Al}_2(\text{SO}_4)_3$
- 7) $1 \text{ CH}_4 + 2 \text{ O}_2 \rightarrow 1 \text{ CO}_2 + 2 \text{ H}_2\text{O}$
- 8) $1 \text{ C}_3\text{H}_8 + 5 \text{ O}_2 \rightarrow 3 \text{ CO}_2 + 4 \text{ H}_2\text{O}$
- 9) $2 \text{ C}_8\text{H}_{18} + 25 \text{ O}_2 \rightarrow 16 \text{ CO}_2 + 18 \text{ H}_2\text{O}$
- 10) $1 \text{ FeCl}_3 + 3 \text{ NaOH} \rightarrow 1 \text{ Fe(OH)}_3 + 3 \text{ NaCl}$
- 11) $4 \text{ P} + 5 \text{ O}_2 \rightarrow 2 \text{ P}_2\text{O}_5$
- 12) $2 \text{ Na} + 2 \text{ H}_2\text{O} \rightarrow 2 \text{ NaOH} + 1 \text{ H}_2$
- 13) $2 \text{ Ag}_2\text{O} \rightarrow 4 \text{ Ag} + 1 \text{ O}_2$
- 14) $1 \text{ S}_8 + 12 \text{ O}_2 \rightarrow 8 \text{ SO}_3$
- 15) $6 \text{ CO}_2 + 6 \text{ H}_2\text{O} \rightarrow 1 \text{ C}_6\text{H}_{12}\text{O}_6 + 6 \text{ O}_2$
- 16) $1 \text{ K} + 1 \text{ MgBr} \rightarrow 1 \text{ KBr} + 1 \text{ Mg}$
- 17) $2 \text{ HCl} + 1 \text{ CaCO}_3 \rightarrow 1 \text{ CaCl}_2 + 1 \text{ H}_2\text{O} + 1 \text{ CO}_2$
- 18) $1 \text{ HNO}_3 + 1 \text{ NaHCO}_3 \rightarrow 1 \text{ NaNO}_3 + 1 \text{ H}_2\text{O} + 1 \text{ CO}_2$
- 19) $2 \text{ H}_2\text{O} + 1 \text{ O}_2 \rightarrow 2 \text{ H}_2\text{O}_2$
- 20) $2 \text{ NaBr} + 1 \text{ CaF}_2 \rightarrow 2 \text{ NaF} + 1 \text{ CaBr}_2$
- 21) $1 \text{ H}_2\text{SO}_4 + 2 \text{ NaNO}_2 \rightarrow 2 \text{ HNO}_2 + 1 \text{ Na}_2\text{SO}_4$

MORE
#6.