Types of chemical reaction diagram

Combustion

Burning! Oxygen combines with another substance to produce heat and light.

Fuel + oxygen → carbon dioxide + water

Thermal decomposition

Uses HEAT to BREAK a compound down

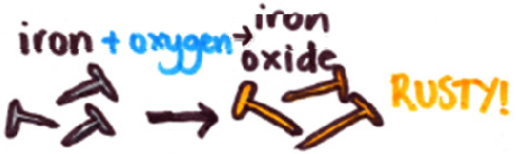
Copper carbonate → Copper oxide + Carbon dioxide

Oxidation

When oxygen is added to a substance.

Iron + oxygen → Iron oxide

Copper + oxygen → Copper oxide



Displacement

A more reactive element takes the place of a less reactive element

iron + copper chloride → iron chloride + copper

B has been 'displaced' by A

$A + BC \rightarrow B + AC$

!BULLY!

1) For each equation below, decide what type of reaction it is and then complete the table.

Equation	Type of chemical reaction	Reason for choice
petrol + oxygen → carbon dioxide + water		
sodium + magnesium chloride → magnesium + sodium chloride		
magnesium carbonate → magnesium oxide + carbon dioxide		
ethane + oxygen → carbon dioxide + water		
magnesium + oxygen → magnesium oxide		
lead + silver sulphate → lead sulphate + silver		
zinc nitrate → zinc oxide + nitrogen dioxide + oxygen		
kerosene + oxygen → carbon dioxide + water		
sodium + oxygen → sodium oxide		

2) Did you find it difficult to decide the 'type of chemical reaction' for any of the equations in the table? Why?

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3) For each equation below, decide what type of reaction it is and then try to complete the word equation.

a) Type of reaction: .....

wood + oxygen → .... + ...

b) Type of reaction: .....

..... + ... → silver oxide

c) Type of reaction: .....

sodium carbonate (+ heat) → .... + ...

d) Type of reaction: .....

potassium + iron chloride → .... + iron

4) Write word equations for:

a) The combustion of diesel

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b) The oxidation of sodium

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c) The thermal decomposition of potassium carbonate

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d) A displacement reaction between magnesium and copper sulphate

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5) Explain why magnesium and potassium chloride will not react together.

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Teaching notes

These questions were designed to be used with the 'Types of chemical reaction' diagram. However, they could be used with other information about the same types of reaction (combustion, oxidation, thermal decomposition, displacement). Some modification of the questions may be necessary in this case.

Suggested answers (the reasons will be varied):

1) For each equation below, decide what type of reaction it is and then complete the table.

Equation	Type of chemical reaction	Reason for choice
petrol + oxygen → carbon dioxide + water	*combustion*	*burning a fuel*
sodium + magnesium chloride → magnesium + sodium chloride	*displacement*	*an element has taken the place of another*
magnesium carbonate → magnesium oxide + carbon dioxide	*thermal decomposition*	*a compound has been broken down*
ethane + oxygen → carbon dioxide + water	*combustion*	*burning a fuel*
magnesium + oxygen → magnesium oxide	*oxidation*	*oxygen has been added*
lead + silver sulphate → lead sulphate + silver	*displacement*	*an element has taken the place of another*
zinc nitrate → zinc oxide + nitrogen dioxide + oxygen	*thermal decomposition*	*a compound has been broken down*
kerosene + oxygen → carbon dioxide + water	*combustion*	*burning a fuel*
sodium + oxygen → sodium oxide	*oxidation*	*oxygen has been added*

2) For each equation below, decide what type of reaction it is and then try to complete the word equation.

a) Type of reaction: combustion

wood + oxygen → carbon dioxide + water

b) Type of reaction: oxidation

silver + oxygen → silver oxide

c) Type of reaction: thermal decomposition

sodium carbonate (+ heat) → sodium oxide + carbon dioxide

d) Type of reaction: displacement

potassium + iron chloride → potassium chloride + iron

3) Write word equations for:

a) The combustion of diesel

diesel + oxygen → carbon dioxide + water

b) The oxidation of sodium

sodium + oxygen → sodium oxide

c) The thermal decomposition of potassium carbonate

potassium carbonate → potassium oxide + carbon dioxide

d) A displacement reaction between magnesium and copper sulphate

magnesium + copper sulphate → magnesium sulphate + copper

4) Explain why magnesium and potassium chloride will not react together.

Magnesium is less reactive than potassium and so it can't displace the potassium (NB: no reactivity series is provided, but this could be deduced from the information given.