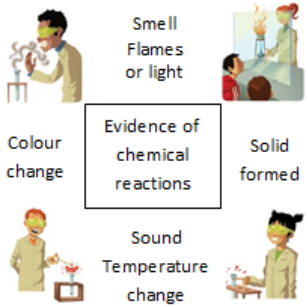
The big picture
Introduction to chemical reactions
Combustion
Word equations
Thermal decomposition
Oxidation
Reduction
Exothermic reactions
Endothermic reactions
Catalysis
Balancing equations

Key ideas and terms

Evidence of chemical reactions



Observations Things that describe what happens during a reaction.

Reactants The substances at the start of a chemical reaction.

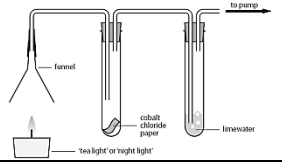
Reactants —form→ Products

Products The substances made in a chemical reaction.

Reactants —form→ Products

Combustion A reaction of a fuel with oxygen that releases useful energy in the form of heat and light.

Combustion experiment



Lime water

Used to test for carbon dioxide- goes cloudy.

Anhydrous copper sulfate Used to test for water- goes from white to blue.

Cobalt chloride paper

Used to test for water- goes from blue to pink.

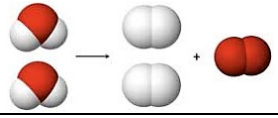
Hydrocarbon combustion hydrocarbon + oxygen → carbon + water dioxide

Word equations

Reactant words	Product words	Reaction types
reacts	make	Combustion
neutralises	produce	Oxidation
of	products	Direct combination
displaces	give	Precipitation
heated	formed	Displacement
combines with	create	Neutralisation
made from	generate	Thermal decomposition
takes part in	release	Reduction

Reactants → Products

water → hydrogen + oxygen



Thermal decomposition One chemical breaks down when heated to make two or more new chemicals.

Example:

metal → metal + carbon

carbonate oxide dioxide

Oxidation Where something reacts with oxygen e.g. during combustion.

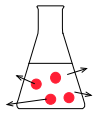
Oxide: These are the chemicals produced in oxidation reactions.

E.g: sodium + oxygen → sodium oxide

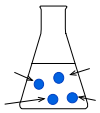
Reduction A reaction where oxygen is removed from a compound.

Redox: Where reduction and oxidation happen at the same time.

Exothermic reaction A reaction where the temperature rises because energy is given out by the chemicals. The energy makes the surroundings (e.g. the thermometer) get hotter.



Endothermic reaction A reaction where the temperature falls because energy is taken in by the chemicals. The energy makes the surroundings (e.g. the thermometer) get colder.



Catalyst A chemical that speeds up a reaction without being used up or changed. They are used in industry because they speed up reactions and lower the energy costs.

Balancing equations

What does this mean?

$4Al + 3O_2 \rightarrow 2Al_2O_3$

Proof it is balanced

Number of each element in the reactants	Number of each element in the products
Al = 4	Al = 4
O = 6	O = 6

$2H_2 + O_2 \rightarrow 2H_2O$

This equation is balanced because the number of hydrogens (white circles) is the same on each side of the arrow AND the number of oxygens (red circles) is the same on each side of the arrow.

Year 8
Chemical Reactions