

Chemical Reactions and Equations: Lesson Slides & Worksheet

Ages 15–16 · Science

Name _____ Class _____ Date _____

A Key terms: match each term to its meaning

Write the letter of the correct meaning in the box next to each term.

1 Chemical equation	☐	A An insoluble solid that forms when two solutions react, as in many double displacement reactions.
2 Balanced equation	☐	B A short way of showing a reaction using formulas, with reactants on the left and products on the right of an arrow.
3 Combination reaction	☐	C A reaction in which one reactant breaks down into two or more simpler products, using heat, light or electricity.
4 Decomposition reaction	☐	D An equation with the same number of atoms of each element on both sides, as required by the law of conservation of mass.
5 Precipitate	☐	E The unpleasant change in smell and taste of fats and oils in food caused by oxidation.
6 Exothermic reaction	☐	F Gain of oxygen or loss of hydrogen by a substance; reduction is the opposite.
7 Oxidation	☐	G A reaction that releases heat to the surroundings, such as respiration or burning fuel.
8 Rancidity	☐	H A reaction in which two or more reactants form a single product.

B Quick quiz

Circle the best answer, write its letter, then explain your choice in a few words.

1 Which of these is a balanced chemical equation?

- a) $\text{Mg} + \text{O}_2 \rightarrow \text{MgO}$
c) $\text{Mg} + \text{O}_2 \rightarrow \text{MgO}_2$

- b) $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$
d) $2\text{Mg} + 2\text{O}_2 \rightarrow 2\text{MgO}$

Answer: _____ Why? _____

2 What type of reaction is $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$?

- a) Displacement
c) Decomposition

- b) Combination
d) Double displacement

Answer: _____ Why? _____

3 Heating calcium carbonate to make quicklime is an example of which kind of reaction?

- a) Exothermic combination
c) Endothermic decomposition

- b) Double displacement
d) Displacement

Answer: _____ Why? _____

4 Which reaction gives a white precipitate of barium sulphate?

- a) Zinc with dilute sulphuric acid
c) Electrolysis of water

- b) Magnesium burning in air
d) Sodium sulphate with barium chloride

Answer: _____ Why? _____

5 Why are packets of crisps (potato chips) often filled with nitrogen gas?

- a) To add flavour
c) To keep the chips warm

- b) To slow the oxidation of fats
d) To make the chips crunchier by reacting

Answer: _____ Why? _____

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Answer key for teachers · Ages 15–16 · Science

A Key terms

1	Chemical equation	B	A short way of showing a reaction using formulas, with reactants on the left and products on the right of an arrow.
2	Balanced equation	D	An equation with the same number of atoms of each element on both sides, as required by the law of conservation of mass.
3	Combination reaction	H	A reaction in which two or more reactants form a single product.
4	Decomposition reaction	C	A reaction in which one reactant breaks down into two or more simpler products, using heat, light or electricity.
5	Precipitate	A	An insoluble solid that forms when two solutions react, as in many double displacement reactions.
6	Exothermic reaction	G	A reaction that releases heat to the surroundings, such as respiration or burning fuel.
7	Oxidation	F	Gain of oxygen or loss of hydrogen by a substance; reduction is the opposite.
8	Rancidity	E	The unpleasant change in smell and taste of fats and oils in food caused by oxidation.

B Quick quiz

1 b) $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$

$2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$ has two magnesium atoms and two oxygen atoms on each side. Writing MgO_2 changes the formula, which is not allowed.

2 a) Displacement

Iron is more reactive than copper, so it displaces copper from copper sulphate solution. Only one element swaps places, so it is a displacement reaction.

3 c) Endothermic decomposition

$\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$ breaks one compound into two products and needs heat, so it is an endothermic (thermal) decomposition.

4 d) Sodium sulphate with barium chloride

$\text{Na}_2\text{SO}_4 + \text{BaCl}_2 \rightarrow \text{BaSO}_4 + 2\text{NaCl}$ is a double displacement reaction. The insoluble barium sulphate appears as a white solid.

5 b) To slow the oxidation of fats

Nitrogen is unreactive and pushes out oxygen, which slows the oxidation of the fats in the crisps and delays rancidity.