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) $Mg + O_2 \rightarrow MgO$ **b)** $2Mg + O_2 \rightarrow 2MgO$

c) $Mg + O_2 \rightarrow MgO_2$ **d)** $2Mg + 2O_2 \rightarrow 2MgO$

Answer: _____ Why? _____

2 **What type of reaction is $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$?**

a) Displacement **b)** Combination

c) Decomposition **d)** Double displacement

Answer: _____ Why? _____

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

a) Exothermic combination **b)** Double displacement

c) Endothermic decomposition **d)** Displacement

Answer: _____ Why? _____

4 **Which reaction gives a white precipitate of barium sulphate?**

a) Zinc with dilute sulphuric acid **b)** Magnesium burning in air

c) Electrolysis of water **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 **b)** To slow the oxidation of fats

c) To keep the chips warm **d)** To make the chips crunchier by reacting

Answer: _____ Why? _____

Answers on page 2

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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) $2Mg + O_2 \rightarrow 2MgO$

$2Mg + O_2 \rightarrow 2MgO$ 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

$CaCO_3 \rightarrow CaO + CO_2$ breaks one compound into two products and needs heat, so it is an endothermic (thermal) decomposition.

4 d) Sodium sulphate with barium chloride

$Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$ 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.