

Science

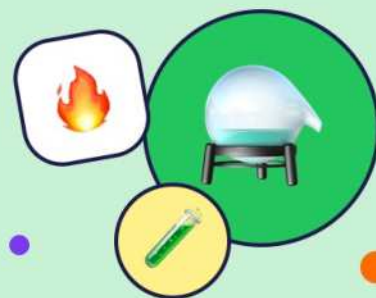
Grade 10

Chemical reactions

Spot signs of reactions, balance equations and classify reaction types.



I can recognise chemical reactions and balance simple equations.



1 🔥 Sort it

Write each word in the right box.



burning wood

melting ice

rusting iron

dissolving sugar

baking a cake

breaking glass

Chemical change**Physical change**

2 Fill the gaps

Write the missing answer.

1. _____ $\text{H}_2 + \text{O}_2 \rightarrow 2 \text{H}_2\text{O}$
2. $\text{CH}_4 +$ _____ $\text{O}_2 \rightarrow \text{CO}_2 + 2 \text{H}_2\text{O}$
3. $\text{Mg} + 2 \text{HCl} \rightarrow \text{MgCl}_2 +$ _____
4. In a reaction, mass is _____.

3 Match up

Draw a line to match each pair.

☐ Combustion ●

☐ Neutralisation ●

☐ Oxidation ●

☐ Decomposition ●

● A. a substance gains oxygen

● B. a fuel reacts with oxygen

● C. one substance breaks into simpler ones

● D. acid + base $\rightarrow$ salt + water

4 True or false

Circle true or false.

1. In a chemical reaction, new substances are formed.
2. Atoms are destroyed in a chemical reaction.
3. An exothermic reaction gives out heat to the surroundings.
4. A catalyst is used up in the reaction.
5. Raising the temperature usually increases the rate of reaction.

True

False

True

False

True

False

True

False

True

False

5 Balance the equations

Write the missing number so each equation is balanced.

1. $\text{N}_2 + \underline{\hspace{2cm}} \text{H}_2 \rightarrow 2 \text{NH}_3$
2. $2 \text{Na} + \text{Cl}_2 \rightarrow \underline{\hspace{2cm}} \text{NaCl}$
3. $\underline{\hspace{2cm}} \text{Al} + 3 \text{O}_2 \rightarrow 2 \text{Al}_2\text{O}_3$
4. $\text{C}_3\text{H}_8 + \underline{\hspace{2cm}} \text{O}_2 \rightarrow 3 \text{CO}_2 + 4 \text{H}_2\text{O}$
5. $\text{Fe}_2\text{O}_3 + 3 \text{CO} \rightarrow \underline{\hspace{2cm}} \text{Fe} + 3 \text{CO}_2$
6. $2 \text{KClO}_3 \rightarrow 2 \text{KCl} + \underline{\hspace{2cm}} \text{O}_2$

6 Reaction problems

Circle the right answer.

1. Which reaction is endothermic?

☒ A burning methane ☐ B thermal decomposition of calcium carbonate
☐ C neutralisation of an acid

2. Acid + metal carbonate $\rightarrow$ salt + water + ...

☒ A hydrogen ☐ B oxygen ☐ C carbon dioxide

3. Which change would NOT speed up a reaction?

☐ A grinding the solid into a powder ☐ B lowering the temperature
☒ C adding a catalyst

4. 12 g of magnesium reacts completely with 8 g of oxygen. What mass of magnesium oxide forms?

☐ A 20 g ☐ B 4 g ☒ C 96 g

7

**Tests for gases**

Fill in the empty boxes.

Gas	Test	Positive result
Hydrogen		
Oxygen		
Carbon dioxide		
Chlorine		

8

**Making copper sulfate crystals**

Number the boxes to put them in the right order.

☐

Filter the mixture to remove the extra copper oxide.

☐

Warm some dilute sulfuric acid in a beaker.

☐

Leave the solution in a warm place to crystallise.

☐

Add copper oxide powder and stir until no more dissolves.

☐

Heat the filtrate gently to evaporate some of the water.

9

**Think and write**

List three signs that a chemical reaction has taken place and give an example of each.

How did it go?



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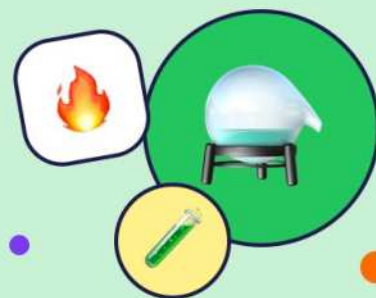
Answer key

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rusting iron

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Chemical change

burning wood, rusting iron, baking a cake

Physical change

melting ice, dissolving sugar, breaking glass

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3. $\text{Mg} + 2 \text{HCl} \rightarrow \text{MgCl}_2 +$ H_2
4. In a reaction, mass is conserved.

3 Match up

Draw a line to match each pair.

B Combustion •

D Neutralisation •

A Oxidation •

C Decomposition •

• **A.** a substance gains oxygen

• **B.** a fuel reacts with oxygen

• **C.** one substance breaks into simpler ones

• **D.** acid + base $\rightarrow$ salt + water

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☐ C 96 g

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Tests for gases

Fill in the empty boxes.

Gas	Test	Positive result
Hydrogen	lit splint	squeaky pop
Oxygen	glowing splint	the splint relights
Carbon dioxide	limewater	turns cloudy (milky)
Chlorine	damp litmus paper	is bleached white

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