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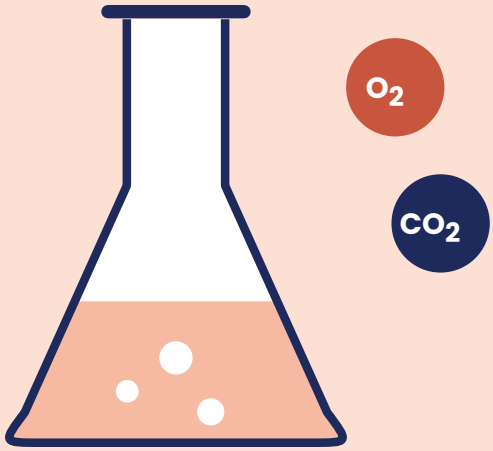
Year 8 • KS3 Chemistry

# Chemical Reactions

## Homework Worksheet

Practise physical and chemical changes, word equations, gas tests, conservation of mass and energy changes.




Changes | Word equations | Gas tests | Mass | Balancing | Energy

**KEY IDEAS IN THIS WORKSHEET** **YEAR 8**

Name: _____ Class: _____

Date set: _____ Date due: _____

## What's inside


| | | |
|---|---|---|
| **Section A** | Physical and chemical changes | **15 marks** |
| **Section B** | Word equations and gas tests | **12 marks** |
| **Section C** | Conservation of mass and balancing equations | **15 marks** |
| **Section D** | Energy changes and burning | **13 marks** |


**Instructions**

- Answer all questions in the spaces provided.
- Show your working in calculations.
- Marks for each question are shown in [ ].
- Use the word boxes and diagrams to help you.

**Total score**

**/ 55**

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# Chemical Reactions Worksheet

Year 8 • KS3 Chemistry • Physical and chemical changes, word equations, gas tests, conservation of mass and energy changes.

## Section A — Physical and chemical changes [15 marks]

**1** Decide whether each change is physical or chemical. Write **Physical** or **Chemical**. [8]

| Change | Physical or chemical? |
|---|---|
| Ice melting | |
| Magnesium burning | |
| Sugar dissolving in water | |
| Iron rusting | |
| Cooking an egg | |
| Water boiling | |
| Mixing iron filings and sulfur powder | |
| Baking a cake | |

**2** Give **three** signs that a chemical reaction has taken place. [3]

.....

.....

.....

**3** Explain why a chemical change is usually hard to reverse but a physical change is usually easy to reverse. [2]

.....

.....

**4** State what is meant by:

**(a)** a reactant [1]

.....

**(b)** a product [1]

.....

## Section B — Word equations and gas tests [12 marks]

**5** Complete each word equation.

**(a)** magnesium + oxygen → ..... [1]

**(b)** iron + sulfur → ..... [1]

**(c)** methane + oxygen → carbon dioxide + ..... [1]

**(d)** zinc + hydrochloric acid → ..... + hydrogen [1]

**(e)** calcium carbonate → calcium oxide + ..... [1]

**(f)** sodium + water → sodium hydroxide + ..... [1]

**(g)** copper carbonate → ..... + carbon dioxide [1]

**6** Complete the table to show the test and the positive result for each gas. [3]

| Gas | Test | Positive result |
|---|---|---|
| Hydrogen | | |
| Carbon dioxide | | |
| Oxygen | | |

**7** What is thermal decomposition? Give one example of a substance that decomposes when heated. [2]

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.....

## Section C — Conservation of mass and balancing equations [15 marks]

**8** State the law of conservation of mass. [1]

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.....

**9** 5.0 g of calcium carbonate is heated in an open crucible. After heating, the mass of solid left is 2.8 g.

**(a)** Explain why the mass goes down. **[1]**

.....

**(b)** Calculate the mass of carbon dioxide released. **[1]**

mass = ..... g

**(c)** What would the total mass be if the reaction was carried out in a sealed container? Explain. **[1]**

.....

**10** 0.24 g of magnesium ribbon is burned in air. The white ash has a mass of 0.40 g. Explain why the mass increases, and calculate the mass of oxygen that joined with the magnesium. **[3]**

.....

.....

.....

**11** Balance each equation by writing numbers in front of the formulas.

**(a)** ..... $H_2$ + ..... $O_2$ → ..... $H_2O$ **[2]**

**(b)** ..... Mg + ..... $O_2$ → ..... MgO **[2]**

**(c)** ..... Na + ..... $Cl_2$ → ..... NaCl **[2]**

**(d)** ..... $CH_4$ + ..... $O_2$ → ..... $CO_2$ + ..... $H_2O$ **[2]**

## Section D Energy changes and burning [13 marks]

**12** Explain the difference between an exothermic and an endothermic reaction. **[2]**

.....

.....

**13** Write **exothermic** or **endothermic** for each process. **[4]**

| Process | Exothermic or endothermic? |
|---|---|
| Burning a candle | |
| Photosynthesis | |
| Neutralising an acid with an alkali | |
| Thermal decomposition of calcium carbonate | |

**14** A student mixes citric acid and sodium hydrogencarbonate in a cup. The temperature falls from 21 °C to 14 °C.

**(a)** Calculate the temperature change. **[1]**

temperature change = ..... °C

**(b)** Is this reaction exothermic or endothermic? **[1]**

.....

**(c)** Suggest one use of a reaction like this. **[1]**

.....

**15** Name the three things needed for a fire, and explain why putting a lid on a burning pan stops the fire. **[4]**

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**END OF WORKSHEET** **Total: _____ / 55**