

GCSE Combined Science: Trilogy

Worksheet: Group 1

TIME 30 min	TOTAL 26 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
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Topics: Group 1

NAME	CLASS	DATE
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- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer all questions in the spaces provided.
- In all calculations, show clearly how you work out your answer.
- The marks for questions are shown in brackets.

0 1

A teacher added small pieces of lithium, sodium and potassium to separate troughs of water.

0 1 . 1

Which metal fizzed and moved slowly on the surface of the water but did **not** melt?

Tick (✓) **one** box.

Lithium

☐

Sodium

☐

Potassium

☐

[1 mark]

0 1 . 2

Potassium burned with a coloured flame.

What colour was the flame?

.....

.....

.....

[1 mark]

0 1 . 3

Give **one** observation that shows a gas was produced.

.....

.....

[1 mark]

0 1 . 4

All three metals floated on the water.
Explain why.

.....

.....

[1 mark]

0 2

Lithium, sodium and potassium are Group 1 metals. Caesium is below potassium in Group 1.

0 2 . 1

Predict how caesium reacts with water, compared with potassium.

Tick (✓) **one** box.

Less vigorously than potassium

☐

About the same as potassium

☐

More vigorously than potassium

☐

It does not react at all

☐

[1 mark]

0 2 . 2

Name the gas produced when a Group 1 metal reacts with water.

.....

.....

.....

.....

[1 mark]

0 3

Sodium is a Group 1 element.

0 3 . 1

What name is given to the elements in Group 1?

.....

.....

.....

.....

[1 mark]

0 3 . 2

Group 1 metals are stored under oil.
Suggest why.

.....

.....

[1 mark]

0 3 . 3

Complete the word equation for the reaction of sodium with water.
sodium + water → +

.....

.....

.....

.....

[2 marks]

0 3 . 4

Universal indicator was added to the solution formed.
What is the pH of the solution?
Tick (✓) **one** box.

1

5

7

13

☐☐☐☐

[1 mark]

0 4

Lithium and sodium are both in Group 1. Sodium reacts more vigorously with water than lithium does.

0 4 . 1

Explain why sodium is more reactive than lithium.

[3 marks]

0 5

The melting points and the reactivity of the Group 1 metals both change down the group.

0 5 . 1

Describe how the melting point and the reactivity of the Group 1 metals change down the group.

Explain the change in reactivity, in terms of electrons.

[4 marks]

0 6

A student says:

'Group 1 metals are stored under oil because they are flammable.'

0 6 . 1

Evaluate the student's statement.

.....

.....

.....

.....

[2 marks]

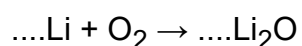
0 7

Group 1 metals react with oxygen and with chlorine.

0 7 . 1

Lithium burns in oxygen to form lithium oxide, Li_2O .

Balance the equation.



.....

.....

[1 mark]

0 7 . 2

Write a balanced symbol equation for the reaction of potassium with chlorine.

.....

.....

.....

.....

[2 marks]

0 7 . 3

Describe the appearance of the product of the reaction between potassium and chlorine.

.....

.....

[1 mark]

0 7 . 4

A freshly cut surface of sodium is shiny, but it quickly becomes dull.
Explain why.

.....

.....

.....

.....

[2 marks]

END OF QUESTIONS

Original practice questions written to match the specification. Not produced by, affiliated with or endorsed by AQA.

Mark scheme

GCSE Combined Science: Trilogy · Worksheet: Group 1 · 26 marks

Question 1 (4 marks)

01.1 [1 mark]

Correct: Lithium

01.2 [1 mark]

Answer: lilac

- lilac (1)

Notes: Allow purple / violet / mauve.

01.3 [1 mark]

Answer: fizzing / bubbles

- fizzing / bubbles / effervescence (1)
-

01.4 [1 mark]

Answer: They are less dense than water.

- (they are) less dense than water / have a low density (1)
-
-

Question 2 (2 marks)

02.1 [1 mark]

Correct: More vigorously than potassium

02.2 [1 mark]

Answer: hydrogen

- hydrogen (1)

Notes: Allow H₂.

Question 3 (5 marks)

03.1 [1 mark]

Answer: the alkali metals

- alkali metals (1)

03.2 [1 mark]

Answer: To stop them reacting with oxygen and water vapour in the air.

- to stop them reacting with oxygen / water (vapour) / air (1)

03.3 [2 marks]

Answer: sodium hydroxide + hydrogen

- sodium hydroxide (1)
- hydrogen (1)

Notes: Either order.

03.4 [1 mark]

Correct: 13

Question 4 (3 marks)

04.1 [3 marks]

Answer: Sodium's outer electron is in a shell further from the nucleus, so it is less strongly attracted and is lost more easily.

- sodium's outer electron is in a shell further from the nucleus / sodium atoms have more shells (1)
- so the outer electron is less strongly attracted to the nucleus (1)
- so sodium loses its outer electron more easily (1)

Notes: Allow 'more shielding' for the second mark.

Question 5 (4 marks)

05.1 [4 marks]

Answer: Melting point decreases and reactivity increases down the group. The outer electron is further from the nucleus, so it is less strongly attracted and lost more easily.

Levels of response

- **Level 2 (3–4)** A clear, logically linked answer covering the key points accurately.
- **Level 1 (1–2)** One or two relevant points with little linking.
- **No marks (0)** Nothing relevant or worthy of credit.

Indicative content

- melting point decreases down Group 1
 - reactivity increases down Group 1
 - the outer electron is in a shell further from the nucleus / there are more shells down the group
 - so the outer electron is less strongly attracted to the nucleus and is lost more easily
-

Question 6 (2 marks)

06.1 [2 marks]

Answer: This is not the main reason: the oil keeps oxygen and water vapour in the air away from the metal, because Group 1 metals react quickly with both.

- the main reason is to stop the metals reacting with oxygen and water (vapour) in the air, not because they are flammable (1)
 - Group 1 metals react quickly with oxygen and with water (their outer electron is easily lost), so without the oil they would tarnish / corrode (1)
-

Question 7 (6 marks)

07.1 [1 mark]

Answer: $4\text{Li} + \text{O}_2 \rightarrow 2\text{Li}_2\text{O}$

- $4\text{Li} + \text{O}_2 \rightarrow 2\text{Li}_2\text{O}$ (1)

07.2 [2 marks]

Answer: $2\text{K} + \text{Cl}_2 \rightarrow 2\text{KCl}$

- correct formulae: $\text{K} + \text{Cl}_2 \rightarrow \text{KCl}$ (1)
- balanced: $2\text{K} + \text{Cl}_2 \rightarrow 2\text{KCl}$ (1)

Notes: Allow multiples. Do not accept Cl in place of Cl_2 .

07.3 [1 mark]

Answer: white solid

- white solid (1)

Notes: Allow white crystals / white powder.

07.4 [2 marks]

Answer: Sodium reacts with oxygen in the air, forming a layer of sodium oxide.

- sodium reacts with oxygen (in the air) (1)
- forming (a layer of) sodium oxide (1)

Notes: Allow 'oxidises' for the first mark.
