

Calorimetry — Combustion

Use this worksheet after reading the lesson to practise the key ideas and prove you can meet the success criteria.

Name _____

Date _____

Class _____

1. Key Ideas

Jet fuel releases roughly 43,000 kJ per kilogram. Wood releases about 15,000 kJ. That 3× difference isn't guesswork — it's measured in a calorimeter. The principle is simple: burn the fuel, heat water, and watch the thermometer.

- The formulas $q = mc\Delta T$ and $\Delta H_c = -q/n$
- Why 'm' in $q = mc\Delta T$ is the mass of water, not fuel

2. Success Criteria

By the end, you should be able to:

- The formulas $q = mc\Delta T$ and $\Delta H_c = -q/n$
- The components of a spirit burner calorimeter
- Five sources of error in combustion calorimetry

3. Key Terms

Negative sign

The negative sign in $\Delta H_c = -q/n$ converts a positive q into the correct negative ΔH_c .

Enthalpy change (ΔH)

The heat energy exchanged at constant pressure during a reaction.

Exothermic

A reaction releasing heat to surroundings ($\Delta H < 0$).

Endothermic

A reaction absorbing heat from surroundings ($\Delta H > 0$).

Calorimetry

The experimental measurement of heat changes during chemical processes.

Hess's Law

The total enthalpy change is independent of the pathway taken.

4. Activity: Build the Lesson Map

Use the lesson to complete the table. Keep answers brief but specific.

Prompt	Your answer
Main concept	
Important example	
Common mistake to avoid	
How this links to the next lesson	

5. Short Answer Questions

1. Explain this lesson goal in your own words: "The formulas $q = mc\Delta T$ and $\Delta H_c = -q/n$ ". Use one specific example from the lesson.

BAND 3 **2 MARKS**

2. Apply this idea to a new example: "The components of a spirit burner calorimeter". Show your reasoning clearly.

BAND 4 **3 MARKS**

3. Analyse why this idea matters for understanding Calorimetry — Combustion: "Five sources of error in combustion calorimetry".

BAND 5 **4 MARKS**

6. Extend: Apply the Idea

BAND 5/6

5 MARKS

A student gives a memorised answer about Calorimetry — Combustion but does not use evidence or reasoning.

Improve the answer by writing a stronger response that uses accurate terminology, a relevant example and a clear explanation.

7. Multiple Choice

1. What is the best first step when answering a question about Calorimetry — Combustion?

- A. Identify the key concept being tested
- B. Write every fact from memory
- C. Ignore the command word
- D. Skip examples and evidence

2. Which answer would show stronger understanding of Calorimetry — Combustion?

- A. An answer with accurate terms and reasoning
- B. A copied definition only
- C. A single-word response
- D. An answer with no example

3. What should you do if a question asks you to explain?

- A. Link the idea to a reason or cause
- B. List unrelated facts
- C. Only draw a diagram
- D. Write the shortest possible answer

8. Success Criteria Proof

Finish with evidence that you can do each success criterion.

SUCCESS CRITERION 1

Prove that you can: The formulas $q = mc\Delta T$ and $\Delta H_c = -q/n$

BAND 3 **2 MARKS**

SUCCESS CRITERION 2

Prove that you can: The components of a spirit burner calorimeter

BAND 4 **3 MARKS**

SUCCESS CRITERION 3

Prove that you can: Five sources of error in combustion calorimetry

BAND 5 **4 MARKS**

One thing I still need help with:
