



General Certificate of Secondary Education
2023

Centre Number

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Candidate Number

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Double Award Science Biology

Unit 7: Practical Skills

Booklet A
Higher Tier



GDW75

[GDW75]

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all** parts of Question 1.

INFORMATION FOR CANDIDATES

The total mark for this paper is **15**.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Follow all health and safety instructions.
The apparatus and materials required to complete the task are provided.
You will require a calculator.

For Examiner's use only	Mark	Remark
Biology (15 marks)		
Chemistry (15 marks)		
Physics (15 marks)		
Total (45 marks)		

For Examiner's use only	
Question Number	Marks
1	

Total Marks	
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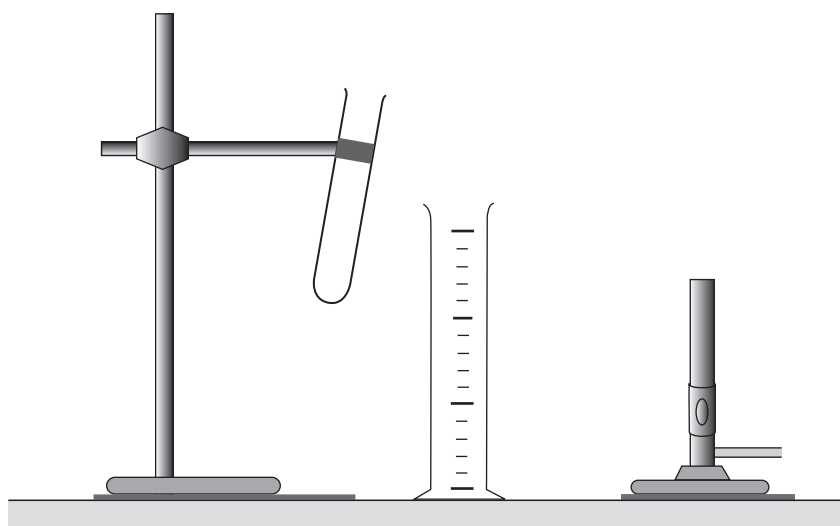
Investigating the energy content of food

The energy content of food can be investigated by measuring the rise in temperature of water heated by burning food.

In this investigation you will be burning a cracker.

Instructions

The diagram shows some of the apparatus you will use in this investigation.



- 1 (a)** Measure the mass of your cracker in grams to **one decimal place** using the balance.

Record this mass in **Table 1** opposite, in the column labelled **Mass of cracker /g**.

[1]

- (b)** Measure **20 cm³** of water using the measuring cylinder and pour it into the boiling tube.

Measure the temperature of the water in the boiling tube using the thermometer.

Record this temperature in **Table 1** opposite, in the column labelled **Initial temperature of water /°C**.

[1]

Hold the cracker with tongs or place it on a mounted needle.

Light the cracker using the Bunsen burner.

Hold the burning cracker under the boiling tube until it has **completely** burnt.

If the cracker goes out before it is completely burnt, relight it and place it back under the boiling tube.

- (c) Use a stirring rod to stir the water in the boiling tube.

Immediately measure the final temperature of the water using the thermometer.

Record this temperature in **Table 1** below, in the column labelled **Final temperature of water /°C**.

[1]

You must complete the remainder of this paper on your own.

- (d) Calculate the rise in temperature of the water and record this temperature in **Table 1** below, in the column labelled **Rise in temperature of water /°C**.

[1]

Table 1

Mass of cracker /g	Initial temperature of water /°C	Final temperature of water /°C	Rise in temperature of water /°C

- (e) Use the equation below, and your data from **Table 1**, to calculate the energy in one gram of your cracker.

Energy in cracker /J per gram	=	$\frac{\text{Rise in temperature of water /°C} \times \text{Volume of water /cm}^3 \times 4.2}{\text{Mass of cracker /g}}$
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Show your working.

_____ J per gram [3]

Examiner Only

Marks Remark

Changes in the investigation may cause an increase, decrease or have no effect on the rise in temperature of the water.

- (f) Place a tick (✓) in the correct boxes in the table to show how each change in the investigation would affect the rise in temperature of the water.

Change in the investigation	Effect on rise in temperature of the water		
	Increase	Decrease	No effect
increasing the volume of water in the boiling tube			
holding the cracker closer to the boiling tube			
incomplete burning of the cracker			
lower initial temperature of the water			
increasing the mass of the cracker			

[5]

Examiner Only	
Marks	Remark

- (g) A student carried out the **same** investigation on a different type of cracker.

Some of the energy in her cracker did not go into heating the water.

The student calculated that the energy that **did** heat the water, in one gram of her cracker, was 230.7 J.

The total energy in one gram of this type of cracker is 330.6 J.

What percentage of the total energy in one gram of cracker heated the water?

Show your working.

Give your answer to the nearest **whole number**.

_____ % [3]

THIS IS THE END OF THE QUESTION PAPER

Examiner Only	
Marks	Remark

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