



Rewarding Learning

General Certificate of Secondary Education
2022

Centre Number

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Candidate Number

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Biology

Unit 3 Practical Skills

Booklet A

Foundation Tier

[GBL31]



GBL31

TIME

2 hours.

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** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is **30**.

Task 1 is a practical exercise worth 15 marks.

Task 2 is a practical exercise worth 15 marks.

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.

You may use a ruler and calculator if required.

You will have access to apparatus and materials required for the practical exercise and any data you recorded on the Practical Instructions Sheet.

You will not have access to notes or textbooks to assist you.

For Examiner's use only

Question Number	Marks
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Task 1

1	
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Task 2

1	
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Total Marks	
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Task 1: Investigating water loss in plants using a weight potometer

Weigh each boiling tube and shoot after 48 hours.

Question 1

(a) Complete **Table 1** by

- recording the mass of each boiling tube and shoot at the start and after 48 hours to **one** decimal place. **The mass of each boiling tube and shoot at the start was recorded in the table in your Confidential Candidate Set-up Instruction Sheet.** [1]
- calculating and recording the loss in mass of each boiling tube and shoot. [2]
- completing the missing heading with units. [2]

Table 1

Shoot	Length of shoot remaining	Mass of boiling tube and shoot/g		
		At start	After 48 hours	
1	whole			
2	two thirds			
3	one third			

Examiner Only

Marks Remark

For the remainder of Task 1 you must work alone.

Examiner Only	
Marks	Remark

(b) Give **two** uses for water in a plant.

1. _____
2. _____ [2]

(c) Explain why it would be better to measure the mass to two decimal places rather than one decimal place.

 _____ [1]

Some pupils who carried out this investigation calculated the **percentage** loss in mass for each shoot.

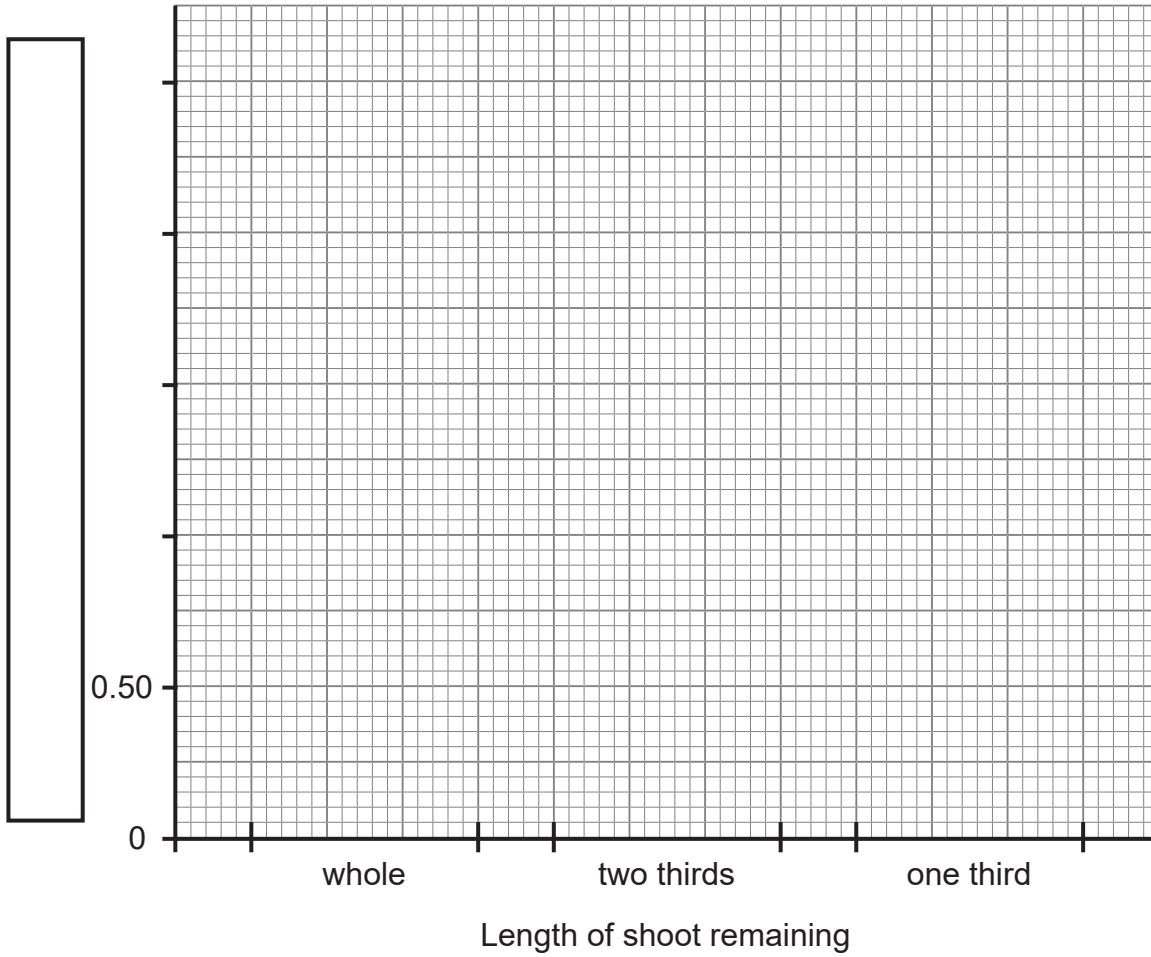
Table 2 shows their results.

Table 2

Length of shoot remaining	Loss in mass/%
whole	2.50
two thirds	0.50
one third	0.25

(d) Use the results from **Table 2** to complete the **bar chart**, showing the percentage loss in mass of each shoot by

- labelling the y-axis, including appropriate units, in the box provided. [2]
- completing the scale for the y-axis, which uses at least half of the grid. [1]
- using a ruler to plot the bars accurately. [2]



Examiner Only	
Marks	Remark

(e) Describe and explain the difference in the results for the whole shoot and the one-third shoot.

[2]

Task 2: Investigating the action of amylase on starch

You **must** wear eye protection during this investigation.

Instructions:

- 1 Set up a water bath at 20°C.
- 2 Use a syringe to add 5 cm³ of starch solution (1%) into a boiling tube and label it 'starch'.
- 3 Use the other syringe to add 5 cm³ of amylase solution (2%) into a boiling tube and label it 'amylase'.
- 4 Leave both boiling tubes in the water bath for five minutes.
- 5 Place one drop of iodine solution in each of the wells in the spotting tile.
- 6 Pour the amylase solution into the starch solution, stir the mixture and start the stopwatch.
- 7 Immediately add one drop of the mixture into a well of the spotting tile using a dropper.
- 8 Repeat every minute until there is no colour change.
- 9 Record the time taken for no colour change to occur.

Question 1

(a) Complete **Table 1**.

Table 1

Amylase concentration /%	Time taken for no colour change /minutes
2	

[1]

For the remainder of Task 2 you must work alone.

(b) Name the dependent variable in this investigation.

_____ [1]

(c) Give **one** variable which was controlled in this investigation.

_____ [1]

(d) Why were the amylase and starch solutions placed in a water bath for five minutes before being mixed?

_____ [1]

(e) Suggest how you could have made your investigation more reliable.

_____ [2]

Examiner Only	
Marks	Remark

Pupils repeated this investigation using a **range** of amylase concentrations.

They used the time taken for no colour change to occur to calculate the rate of reaction.

Table 2 shows their results.

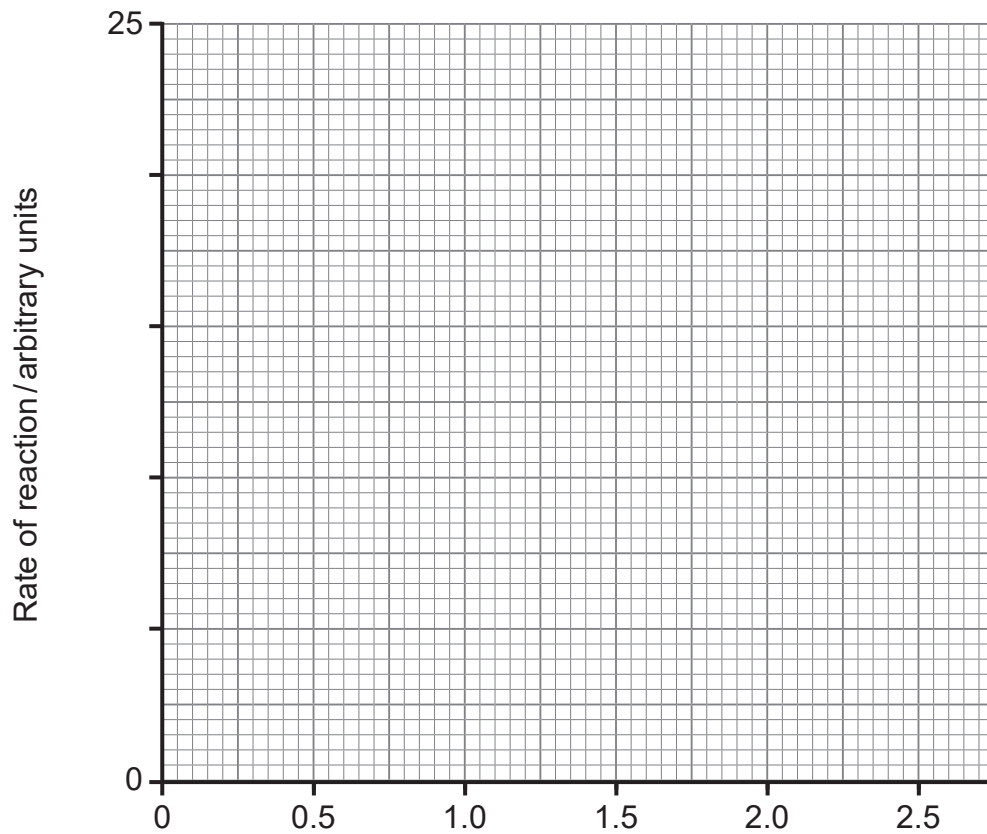
Table 2

Amylase concentration/%	Rate of reaction/ arbitrary units
0	0
0.5	10
1.0	15
1.5	24
2.0	24
2.5	24

(f) Use the results from **Table 2** to draw a **line graph** of the rate of reaction against amylase concentration by

- labelling the x-axis, including appropriate units, in the box provided. [2]
- completing the scale for the y-axis. [1]
- plotting the points accurately. [2]
- using a ruler to join the points with straight lines. [1]

Examiner Only	
Marks	Remark



Examiner Only

Marks	Remark

(g) Describe the trend shown in the line graph.

[2]

(h) Name the substance produced when amylase breaks down starch.

[1]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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