



# Cambridge IGCSE™

CANDIDATE  
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## BIOLOGY

0610/63

Paper 6 Alternative to Practical

May/June 2023

1 hour

You must answer on the question paper.

No additional materials are needed.

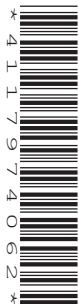
## INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

## INFORMATION

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages. Any blank pages are indicated.



1 A student investigated the nutrient content of three types of drink:

- drink **A**
- drink **B**
- drink **C**.

The student used these methods for the three tests on each of the drinks:

**Test 1 Testing for reducing sugars:**

- Label three test-tubes **A**, **B** and **C**.
- Put 1 cm<sup>3</sup> of drink **A** into test-tube **A**.
- Put 1 cm<sup>3</sup> of drink **B** into test-tube **B**.
- Put 1 cm<sup>3</sup> of drink **C** into test-tube **C**.
- Add 1 cm<sup>3</sup> of Benedict's reagent to each test-tube.
- Put all three test-tubes into a hot water-bath.
- Start the stop-clock and leave the test-tubes in the water-bath for five minutes.
- After five minutes, remove the test-tubes from the water-bath.
- Observe and record the colours in each test-tube.

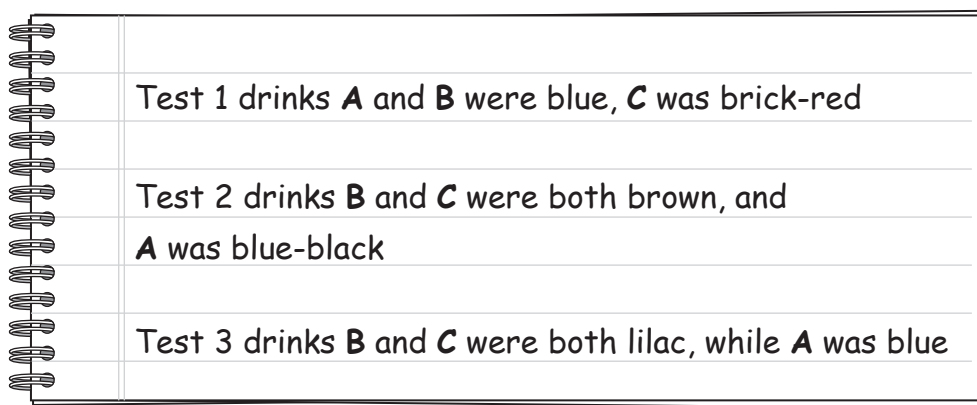
**Test 2 Testing for starch:**

- Place two drops of each drink onto a white tile.
- Add two drops of iodine solution to each drink sample.
- Observe and record the colours on the tile for each sample.

**Test 3 Testing for protein:**

- Label three test-tubes **A**, **B** and **C**.
- Put 1 cm<sup>3</sup> of drink **A** into test-tube **A**.
- Put 1 cm<sup>3</sup> of drink **B** into test-tube **B**.
- Put 1 cm<sup>3</sup> of drink **C** into test-tube **C**.
- Add 1 cm<sup>3</sup> of biuret reagent to each drink sample.
- Observe and record the colours in each test-tube.

(a) The student's observations are shown in Fig. 1.1.



Test 1 drinks <b>A</b> and <b>B</b> were blue, <b>C</b> was brick-red
Test 2 drinks <b>B</b> and <b>C</b> were both brown, and <b>A</b> was blue-black
Test 3 drinks <b>B</b> and <b>C</b> were both lilac, while <b>A</b> was blue

Fig. 1.1

- (i) Prepare a table to record the **colours observed** by the student for all three tests for each drink.

Do **not** include conclusions in your table.

[4]

- (ii) State which nutrients are present in each drink.

drink **A** .....

drink **B** .....

drink **C** .....

[3]

- (iii) Identify **one** safety hazard associated with **Test 1**.

.....

.....

..... [1]

(b) The vitamin C content and the fat content of three other drinks **D**, **E** and **F** were determined.

It was found that:

- drink **D** contained vitamin C
- drink **E** contained fat
- drink **F** contained vitamin C and fat.

(i) State the reagent used when testing for vitamin C.

..... [1]

(ii) Describe the method for the emulsion test for fats.

.....  
 .....  
 .....  
 .....  
 ..... [2]

(iii) The results for **one** of the drinks are shown in Table 1.1.

**Table 1.1**

test	observation
vitamin C	the solution is colourless
fat	a white emulsion has formed

Identify the drink from the results provided in Table 1.1.

drink ..... [1]

(iv) Explain how you identified the drink from the results provided in Table 1.1.

.....  
 .....  
 ..... [1]



2 (a) The nutrient content of foods can affect a person's bones.

In a study, the diet and bone density of 120 women were monitored for two years. The women were all between 50 and 70 years of age.

The scientists:

- calculated the mean daily calcium intake for each woman
- measured the change in density of one of their bones by using X-ray scans.

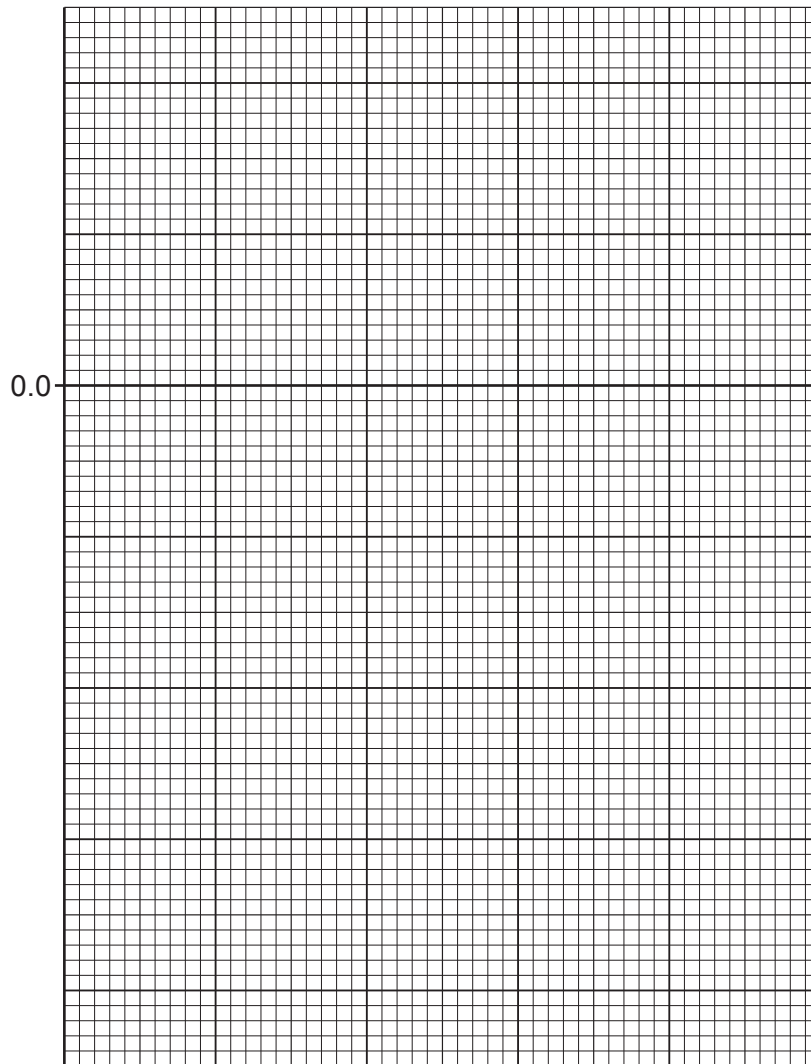
The results for five of the women are shown in Table 2.1.

**Table 2.1**

mean daily calcium intake for each woman / mg per day	mean change in bone density / mg per cm <sup>2</sup> per year
250	-8.6
750	-5.4
1250	-1.2
1750	+1.2
2250	+4.2

(i) Plot a line graph on the grid of the data in Table 2.1.

One axis has been started for you.



[4]

(ii) State **two** conclusions for the data in your graph.

1 .....

.....

.....

2 .....

.....

.....

[2]

(iii) Identify the independent variable in this investigation.

..... [1]

(iv) Describe **two** variables that the scientists should have considered when selecting women for the study.

1 .....

.....

2 .....

.....

[2]

(v) Suggest a reason for a large number of women (120) being included in the study.

.....

.....

..... [1]

(vi) State **one** way this study is **not** representative of the population.

.....

.....

..... [1]



(vii) A student stated that more women were losing bone mass than were gaining bone mass.

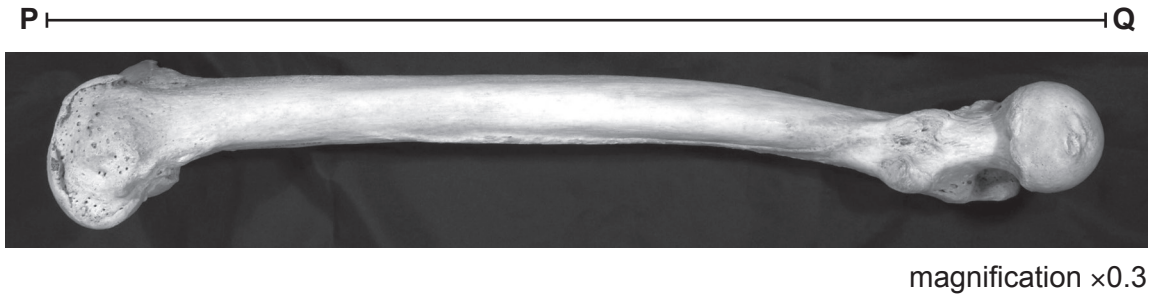
Explain why this statement may **not** be correct for the data in this study.

.....

.....

..... [1]

(b) Fig. 2.1 is a photograph of a femur, which is a bone in the leg.



**Fig. 2.1**

(i) Make a large drawing of the bone shown in Fig. 2.1.

(ii) The length of line **PQ** represents the length of the femur in Fig. 2.1.

Measure the length of line **PQ** on Fig. 2.1.

length of line **PQ** on Fig. 2.1 ..... mm

Use your measurement and the formula to calculate the actual length of the bone.

$$\text{magnification} = \frac{\text{length of line PQ on Fig. 2.1}}{\text{actual length of the bone}}$$

Give your answer to **three** significant figures.

Space for working.

..... mm  
[3]

(iii) Fig. 2.2 shows a bone from a person who had vitamin D deficiency.



magnification  $\times 0.3$

**Fig. 2.2**

State **two** ways the bone in Fig. 2.2 is different from the bone in Fig. 2.1.

- 1 .....
- .....
- 2 .....
- .....

[2]

[Total: 21]

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