Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

5994646388

BIOLOGY **5090/62**

Paper 6 Alternative to Practical **May/June 2022**

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 **8** pages. Any blank pages are indicated.

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Answer **all** questions in the spaces provided.

1 Enzymes are used in the fruit juice industry to help with the extraction of juice from fruit.

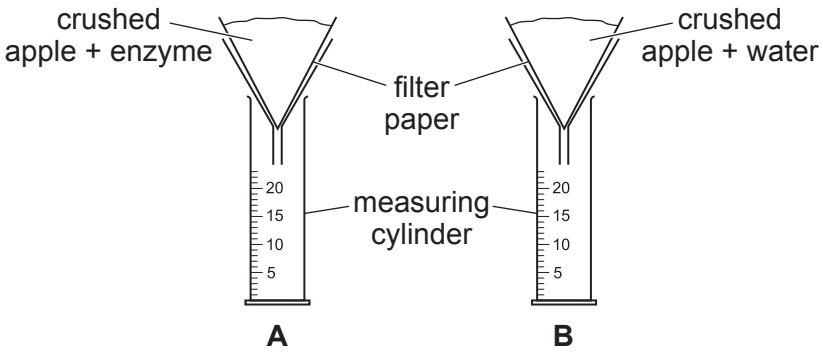
Some students wanted to investigate the extraction of juice from some crushed apples.

They were provided with:

- two beakers labelled **A** and **B** containing the same mass of crushed apples
- a solution of an enzyme
- two measuring cylinders labelled **A** and **B**
- two filter funnels and some filter paper.

They followed these instructions:

- add 2 cm^3 enzyme solution to beaker **A**
- add 2 cm^3 water to beaker **B**
- use a clean stirring rod to mix the contents of each beaker
- leave the beakers for five minutes
- place a piece of filter paper in each filter funnel
- place one filter funnel in measuring cylinder **A** and the other in measuring cylinder **B**
- after five minutes fill the filter paper in **A** with the crushed apple and enzyme solution from beaker **A** and fill the filter paper in **B** with the crushed apple and water from beaker **B**
- start the stop-clock and measure the volume of any apple juice collected in the measuring cylinders **A** and **B** every 2 minutes for 10 minutes.



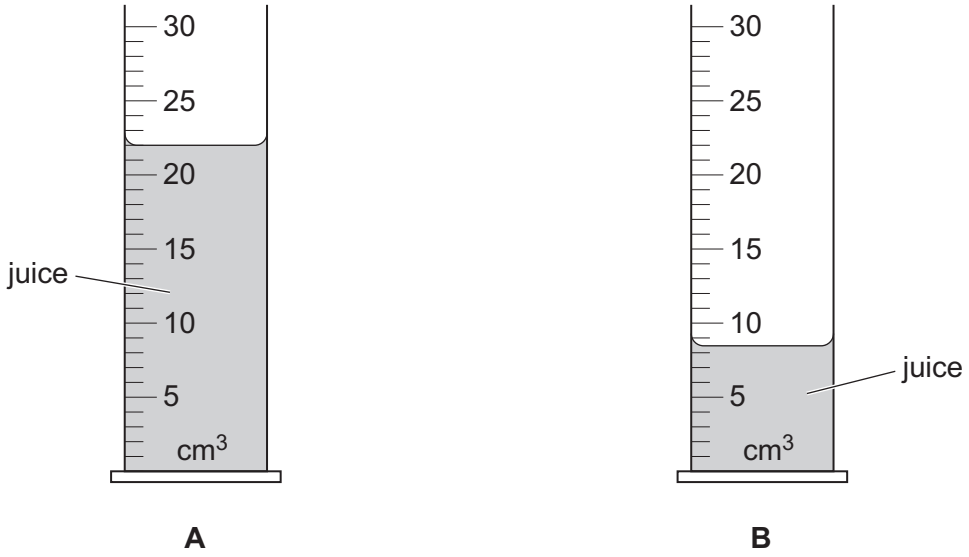
(a) Name a piece of apparatus suitable for measuring 2 cm^3, other than a measuring cylinder.

..... [1]

Some of the students' results are shown in the table.

time /	total volume of juice collected /	
	A	B
0	0.0	0.0
2	12.0	4.0
4	18.5	6.5
6	21.0	7.0
8	21.5	8.0
10		

The diagram below shows the juice collected in both measuring cylinders after 10 minutes.



(b) Complete the table headings and record the volumes of apple juice in the table. [3]

(c) Use the data in the table to suggest why the use of this enzyme is an advantage in the fruit juice industry.

.....

.....

.....

..... [3]

(d) Suggest reasons for:

(i) stirring the contents of beakers **A** and **B**

.....

..... [1]

(ii) using a clean stirring rod to stir the contents of beaker **B**.

.....

..... [1]

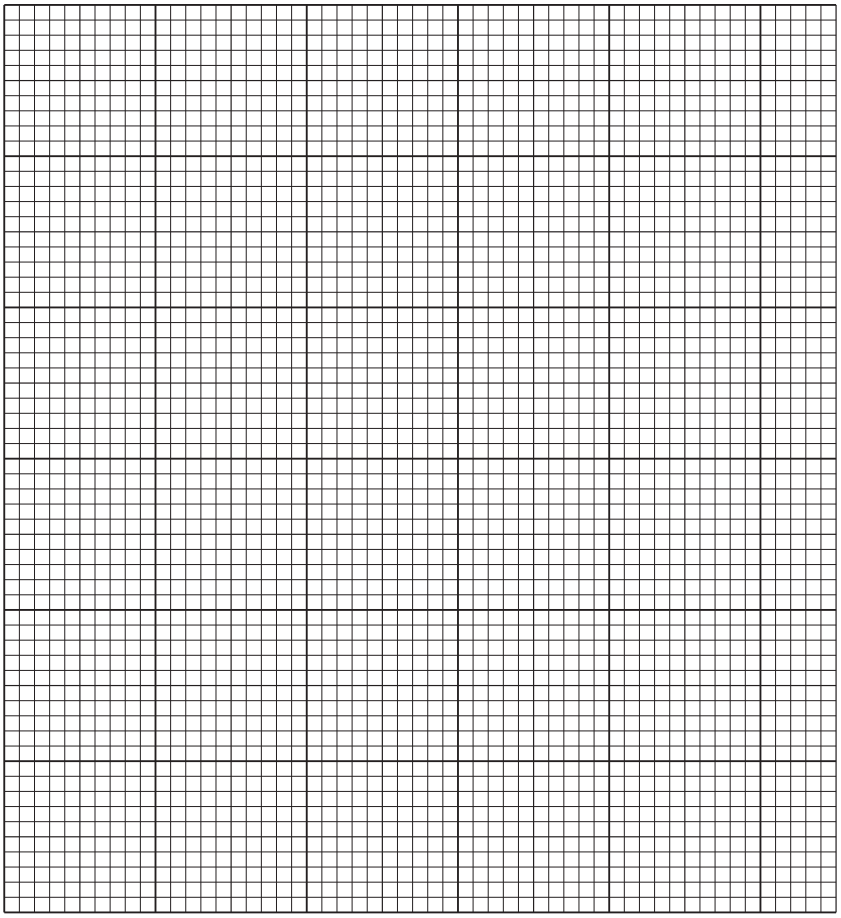
(e) Explain how the contents of beaker **B** act as a control.

.....

.....

..... [2]

(f) **(i)** Use the information in the table to construct a line graph **for the data for A**. Join your points with ruled, straight lines.



[4]

(ii) Use your graph to estimate the volume of juice collected at five minutes. Show your working on your graph.

volume of juice collected at five minutes ..... [3]

(g) Design an experiment, based on the method used by the students, to investigate the effect of the enzyme on the production of juice from different varieties (types) of apple.

Give full experimental details.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

(h) A student tested some apple juice for the presence of reducing sugar and observed a red colour.

Name the testing solution the student used, state a temperature at which the test was carried out and a conclusion for the student's observation.

testing solution .....

temperature .....

conclusion .....
[3]

[Total: 27]

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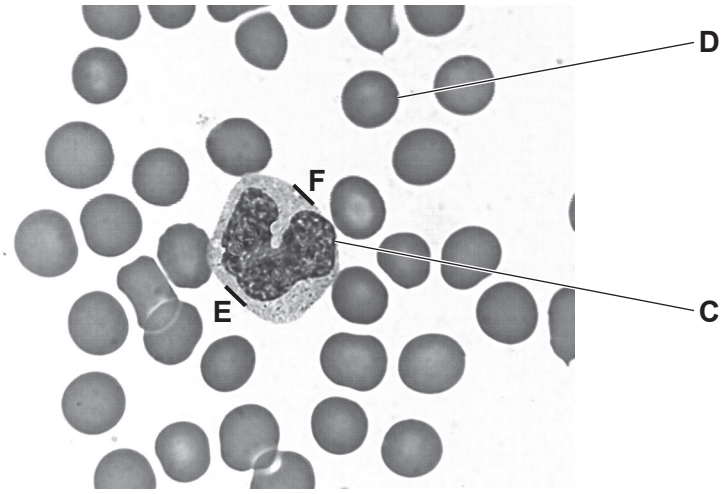
2 The photomicrograph shows some human blood cells.



(a) In the space below make a large drawing of the cell labelled **C** as it appears in the photomicrograph.

[4]

(b) Identify the cells labelled **C** and **D**.

C .....

D .....

[1]

(c) Complete the table by describing **three visible** differences between cell **C** and cell **D**.

	cell C	**cell D**
1		
2		
3		

[3]

(d) **(i)** Draw a straight line on the photomicrograph to join **E** and **F**.

Measure and record the length of this line.

length of line **E–F** ..... mm [1]

(ii) On your drawing, draw a straight line at the same location as the line **E–F**.

Measure and record the length of this line.

length of line on drawing ..... mm [2]

(iii) Use your measurements in **(i)** and **(ii)** to calculate the magnification of your drawing compared to the photomicrograph. Give your answer to 1 decimal place.

Space for working.

magnification × ..... [2]

[Total: 13]

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