Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

BIOLOGY **0610/62**

Paper 6 Alternative to Practical **October/November 2020**

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. Blank pages are indicated.

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1 A student investigated the effect of temperature on the rate of rising of bread dough.

Step 1 The student made bread dough by mixing water, sugar, yeast and flour in a beaker.

Step 2 The student used their hands to divide the dough into two pieces of similar size.

Step 3 The student placed one piece of dough into a transparent plastic cup labelled **C** and one piece into a transparent plastic cup labelled **W**. They pushed each piece of dough to the bottom of the cup.

Step 4 The student measured the height of the dough in each cup. They took their measurement from the base of the cup to the highest point of the dough.

Step 5 The student put cup **C** into a cool water-bath and cup **W** into a warm water-bath. The cups were left in the water-baths for 10 minutes.

Step 6 After 10 minutes the cups were removed from the water-baths. The maximum height of the dough in cup **C** and in cup **W** was measured.

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(a) (i) Fig. 1.1 shows the height of the dough in each cup in step 4 and step 6.

View solution

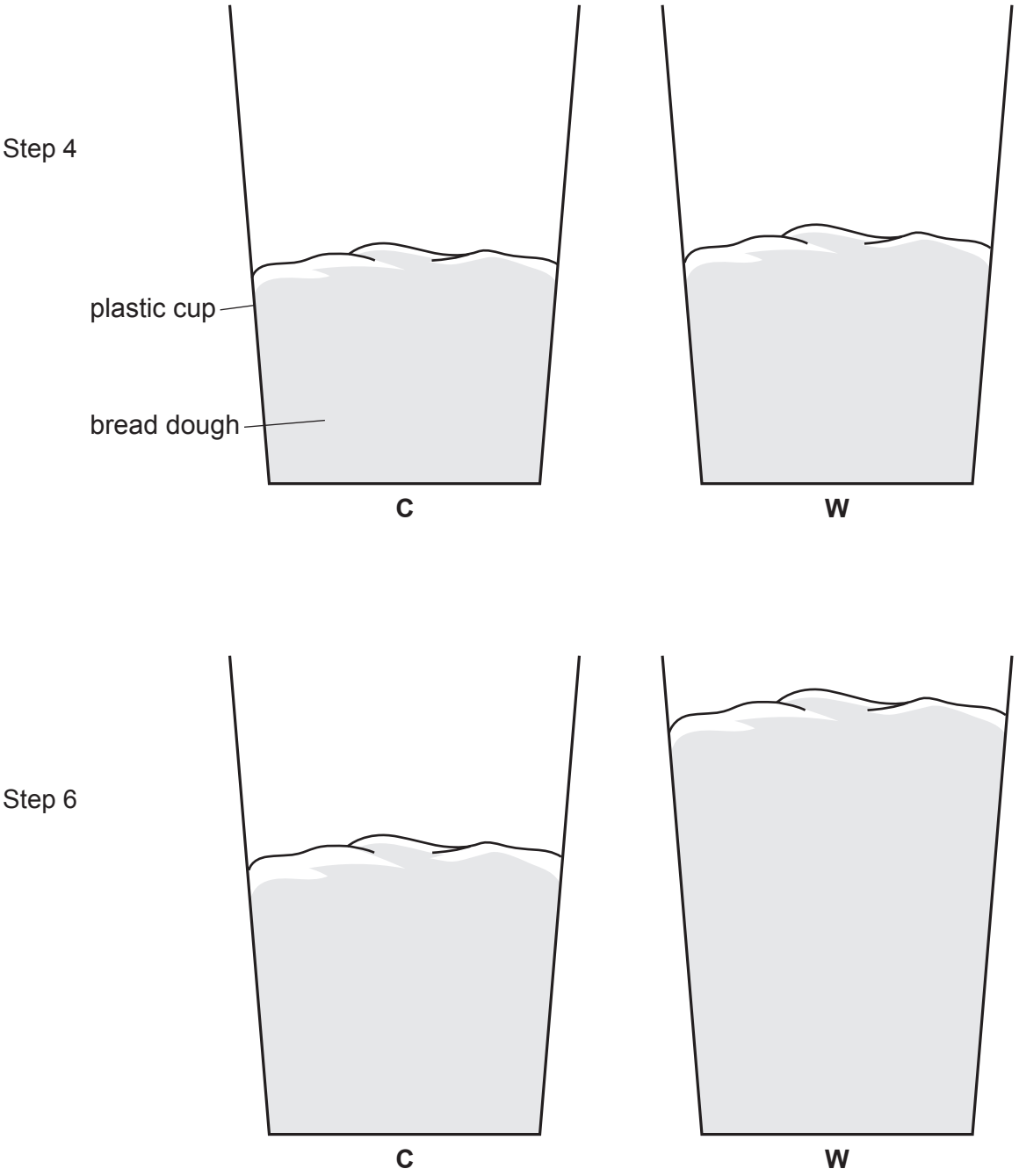

Fig. 1.1

Prepare a table to record the results of this investigation in the space provided.

Measure the maximum height of the dough in each cup in Fig. 1.1.

Draw lines **on Fig. 1.1** to show where you took each of these measurements.

Record these measurements in your table.

[4]

(ii) Calculate the change in the height of the dough in cup **C** and in cup **W** between step 4 and step 6.

C .....

W ..... [1]

(iii) State a conclusion for these results.

.....

.....

..... [1]

(iv) Identify the independent variable (the variable that was changed) in this investigation.

..... [1]

(v) Identify the dependent variable (the variable that was measured) in this investigation.

..... [1]

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(b) **(i)** Identify **one** possible source of error in step 2 and describe how the method could be improved to avoid this error.

error .....

.....

improvement .....

.....

.....

.....

[2]

(ii) Explain why a more valid conclusion can be made by comparing the change in heights rather than the final heights of the dough.

.....

.....

..... [1]

(c) State the test that could be used to show that starch was present in a sample of bread dough.

Give a positive test result.

View solution

test .....

positive result .....

[2]

(d) The dough mixture in step 1 contained 50 g of flour, 3 g of sugar and 2 g of yeast. Carbon dioxide gas is produced when yeast respires. The gas causes the dough to rise.

(i) State the name of an indicator which could be used to show that the gas is carbon dioxide and give the positive test result for this indicator.

indicator .....

positive test result .....

[2]

View solution

(ii) Plan an investigation to determine the effect of the mass of sugar on the volume of carbon dioxide produced by a yeast suspension.

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..... [6]

[Total: 21]

View solution

2 Fig. 2.1 is a photomicrograph showing several cells from an *Elodea sp.* aquatic plant.

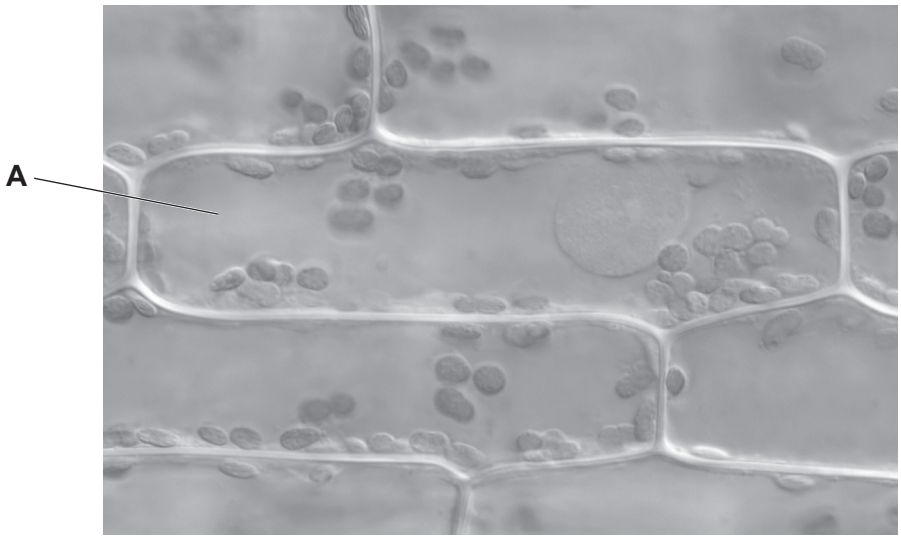


Fig. 2.1

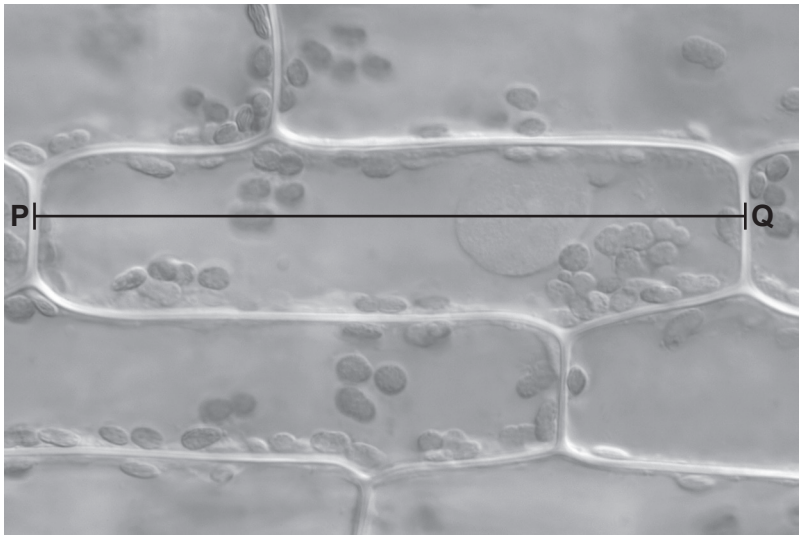
(a) (i) Draw a large diagram of the cell labelled **A** in Fig. 2.1.

View solution

[4]

(ii)

View solution



magnification ×1200

Fig. 2.2

Measure the length of the line **PQ** on Fig. 2.2.

length of **PQ** ..... mm

Calculate the actual length of the cell using the formula and your measurement.

$$\text{magnification} = \frac{\text{length of line } \mathbf{PQ}}{\text{actual length of cell}}$$

Include the unit.

Space for working.

.....

[3]

(b) A student investigated the effect of light intensity on the rate of photosynthesis in *Elodea sp*. They changed the light intensity by placing a light source at different distances from the plant. The student counted the number of bubbles of oxygen produced in three minutes.

View solution

The results of the investigation are shown in Table 2.1.

Table 2.1

distance of the light source from the plant / cm	number of bubbles produced in three minutes	rate of bubble production / bubbles per minute
80	312	104
100	312	104
120	309	
140	264	88
160	162	54
180	96	32
200	57	19

(i) Calculate the rate of bubble production when the light source was 120 cm from the plant.

..... bubbles per minute [1]

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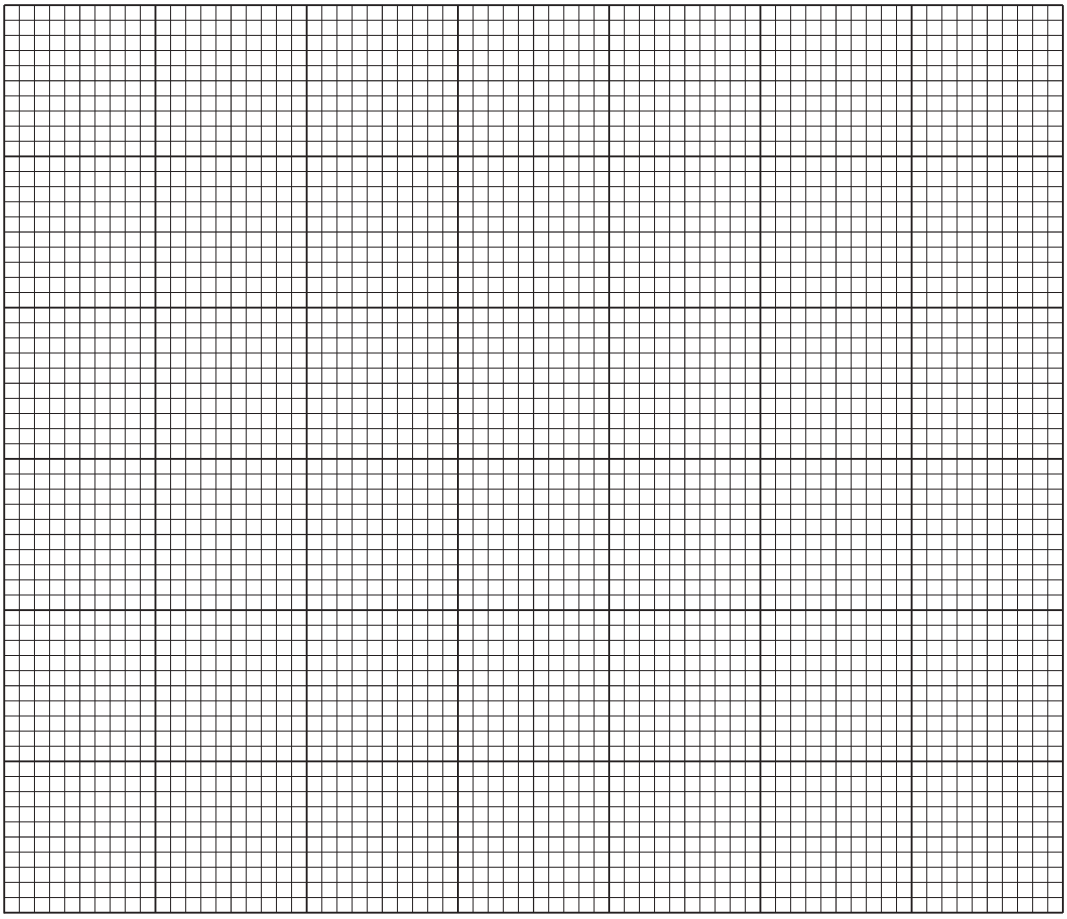
(ii) Plot a line graph on the grid to show the relationship between the distance of the light source from the plant and the **rate** of bubble production.



[4]

(iii) Estimate, using your graph, the **rate** of bubble production per minute if the distance from the light source was 170 cm.

..... bubbles per minute [1]

(iv) Describe the trends shown on your graph.

.....

.....

.....

.....

..... [2]

(v) The student repeated the experiment described in **2(b)** at a higher temperature. The student left the plant for ten minutes at the new temperature before starting to measure the rate of bubble production.

Suggest why the student waited for ten minutes before taking measurements.

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.....

..... [1]

(vi) Table 2.1 shows that when the light source was 140 cm from the plant, the rate of bubble production was 88 bubbles per minute at the original temperature. At the higher temperature, the rate of bubble production when the light source was 140 cm from the plant was 122 bubbles per minute.

Calculate the percentage change in the number of bubbles when the temperature was increased.

Give your answer to the nearest whole number.

Space for working.

..... %
[3]

[Total: 19]

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