

CANDIDATE
NAME

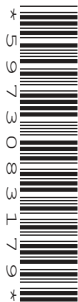
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CENTRE
NUMBER

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BIOLOGY

Paper 6 Alternative to Practical

5090/62

May/June 2014

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.

You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

This document consists of **8** printed pages.

1 Fresh food is often cooked before it is eaten.

Fig. 1.1 shows a fresh living green plant cell before cooking, as seen under a microscope.

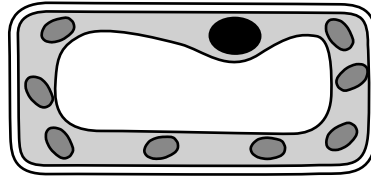


Fig. 1.1

(a) (i) On Fig. 1.1, label the cell membrane and a chloroplast. [2]

Some green cabbage leaves were cut into small pieces and placed in **clean** water and then boiled for 10 minutes. After that time the water was green.

(ii) Suggest how the membranes may have been changed by boiling to cause the water to become green.

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.....[2]

(b) An investigation was carried out to discover what happens to the vitamin C in cabbage leaves during cooking.

100g of fresh cabbage leaves were cut up, placed into boiling water and left to continue boiling for 10 minutes.

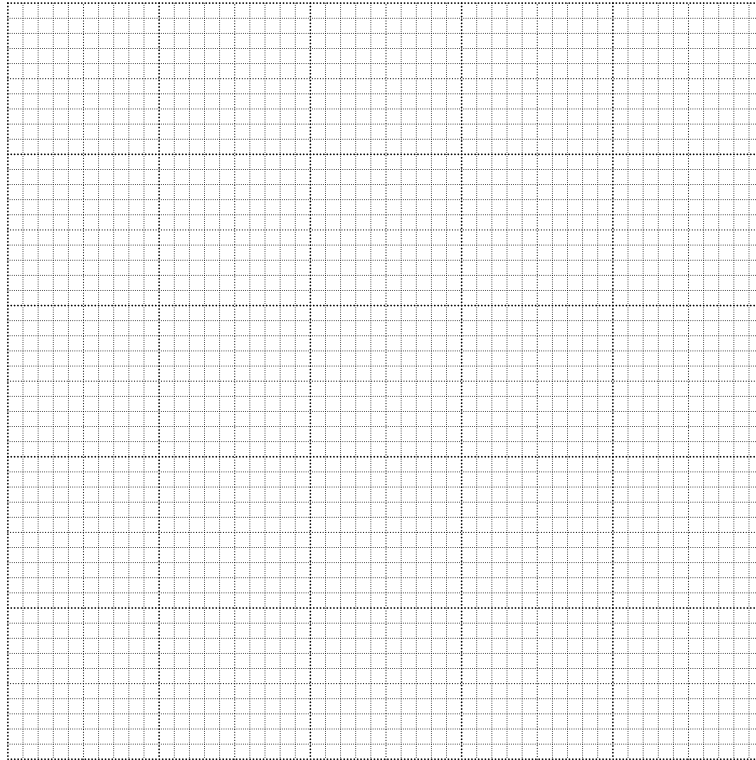
Samples of cabbage leaves and of the water they were boiled in were taken at intervals, cooled, and the vitamin C content was measured. There is no vitamin C in clean water.

These measurements are shown in Table 1.1.

Table 1.1

boiling time / min	vitamin C / mg per 100g	
	cabbage	water
0.0	50.0	0.0
1.0	33.0	17.0
2.0	27.0	23.0
4.0	24.0	26.0
8.0	20.0	22.0
10.0	17.0	20.0

- (i) Construct a graph of the data in Table 1.1.
Use the same axes for both sets of data.



[5]

- (ii) After boiling for 10 minutes only about one third of the vitamin C remained in the cabbage leaves.

Use your graph to find the time at which the vitamin C content in cabbage had fallen to half.

Show your working.

answer [2]

(iii) Describe the changes in vitamin C content of the cabbage and the water during the 10 minutes.

in cabbage

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.....

in water

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[4]

(c) To extend this investigation, some students wanted to compare what happens to the vitamin C in a sample of fresh cabbage leaves when they were cooked in oil, safely, instead of water.

Describe **four** factors that would need to be kept the same to make a fair comparison.

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[4]

(d) Suggest **two** ways of improving the method used in these investigations.

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[2]

[Total: 21]

Turn over for Question 2

2 Fig. 2.1 shows two rose hips, fruit of the rose.



x2

Fig. 2.1

- (a) (i) Make a large drawing of the rose hip shown in the box in Fig. 2.1. Label a sepal on your drawing.

- (ii) Measure the widest part of the rose hip, between **X** and **X** on Fig. 2.1, and record it below.

.....

Measure the widest part of the rose hip on your drawing and record it below.

.....

Calculate the magnification of your drawing compared to the actual size of the rose hip.

Show your working.

magnification \times [5]

- (iii) Describe how you could practically demonstrate that a rose hip is a fruit.

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.....[1]

Fig. 2.2 shows fruits from another plant.

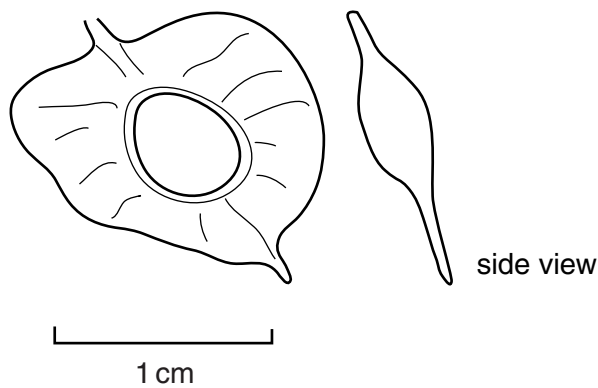


Fig. 2.2

- (b) List the physical adaptations that can be seen in Fig. 2.2 that help dispersal of this fruit.

1

2

[2]

(c) (i) Explain why it is important that fruits are dispersed away from the plant that produced them.

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.....[2]

(ii) You are provided with a packet of seeds, two Petri dishes, two filter papers and water.

Describe how you might use these to investigate the effect of overcrowding on the growth of seedlings.

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.....[4]

[Total: 19]

Copyright Acknowledgements:

Fig. 2.1 ANN PICKFORD/SCIENCE PHOTO LIBRARY.

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