



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education  
Advanced Subsidiary Level and Advanced Level

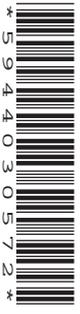
CANDIDATE  
NAME

CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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**BIOLOGY**

**9700/31**

Advanced Practical Skills 1

**October/November 2010**

**2 hours**

Candidates answer on the Question Paper.

Additional Materials: As listed in the Confidential Instructions.

**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 ink.  
You may use a pencil for any diagrams, graphs or rough working.  
Do **not** use red ink, staples, paper clips, highlighters, glue or correction fluid.  
**DO NOT WRITE IN ANY BARCODES.**

Answer **all** questions.

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.

For Examiner's Use	
1	
2	
<b>Total</b>	

This document consists of **9** printed pages and **3** blank page.



You are reminded that you have only one hour for each question in the practical examination. You should read carefully through the whole of each question and then plan your use of the time to make sure that you finish all of the work that you would like to do.

You will gain marks for recording your results according to the instructions.

- 1 Plant cells contain an enzyme, catalase, which catalyses the breakdown of hydrogen peroxide into oxygen and water.

When a piece of potato is dropped into hydrogen peroxide it will sink and then the production of oxygen causes the potato to rise. The more oxygen produced the less time it takes for the potato to rise.

You are required to investigate the independent variable, the surface area to volume ratio of pieces of potato, on the breakdown of hydrogen peroxide. The relationship of pieces of potato of different sizes to their surface area to volume ratio is shown in Fig. 1.1.

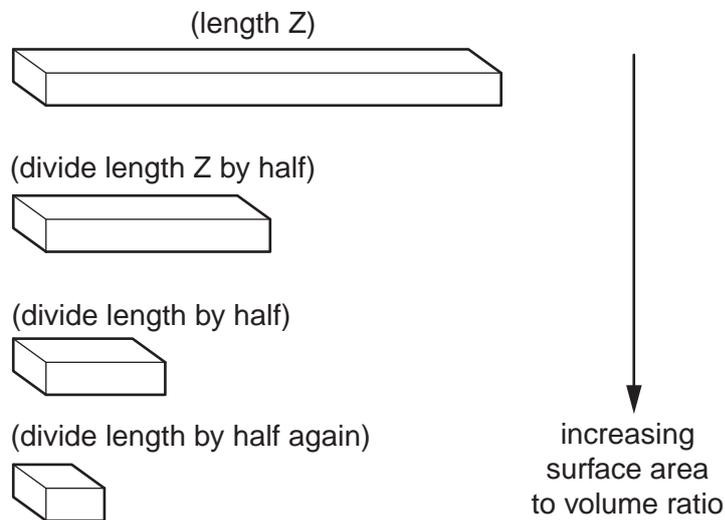


Fig. 1.1

You are provided with

labelled	contents	hazard	volume/cm <sup>3</sup>
H	hydrogen peroxide	irritant oxidising substance	200 cm <sup>3</sup>

labelled	contents	details	quantity
P	potato pieces	same cross-sectional area	4

Proceed as follows:

1. Prepare the pieces of potato as shown in Fig. 1.2.

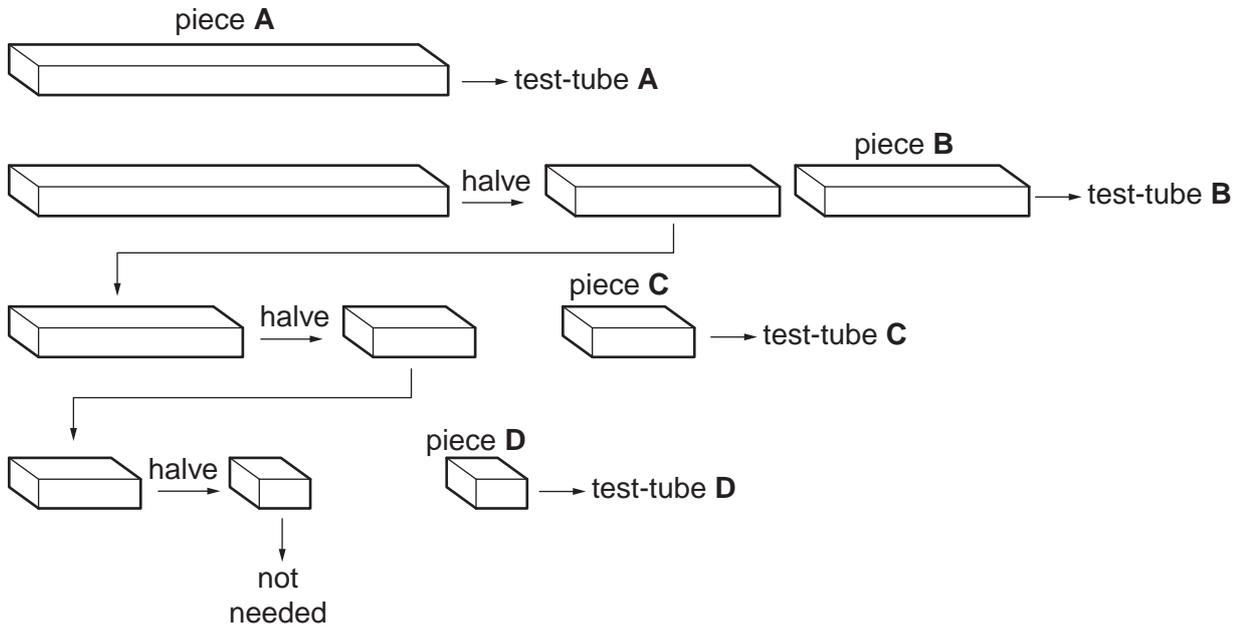


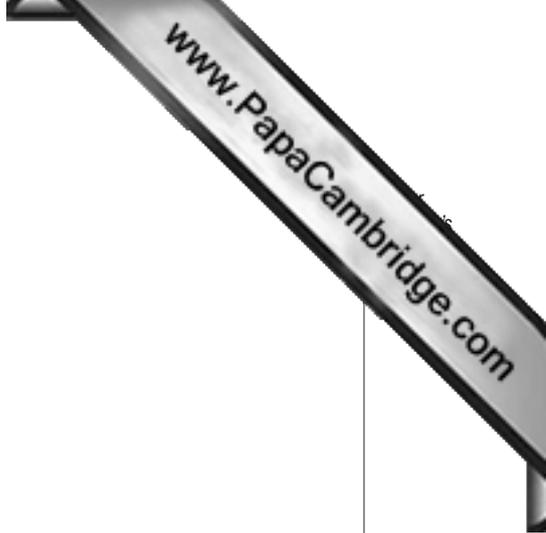
Fig. 1.2

2. Label four test-tubes **A**, **B**, **C** and **D**.
3. Put  $25\text{ cm}^3$  of **H** into test-tube **A**.
4. Put piece **A** onto a paper towel and gently remove any excess water.
5. Put piece **A** into test-tube **A**. Immediately start timing.
6. Record the time taken for piece **A** to rise to the surface.

**Do not touch the test-tube after you have started timing.**

**If the piece of potato does not rise after 2 minutes stop timing and record 'more than 2 minutes'. Proceed to the next test.**

7. Repeat steps 3 to 6 for one piece of **B**, one piece of **C** and one piece of **D**.



(a) (i) Prepare the space below and record your results.

[6]

(ii) Identify **two** significant sources of error in your investigation.

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[2]

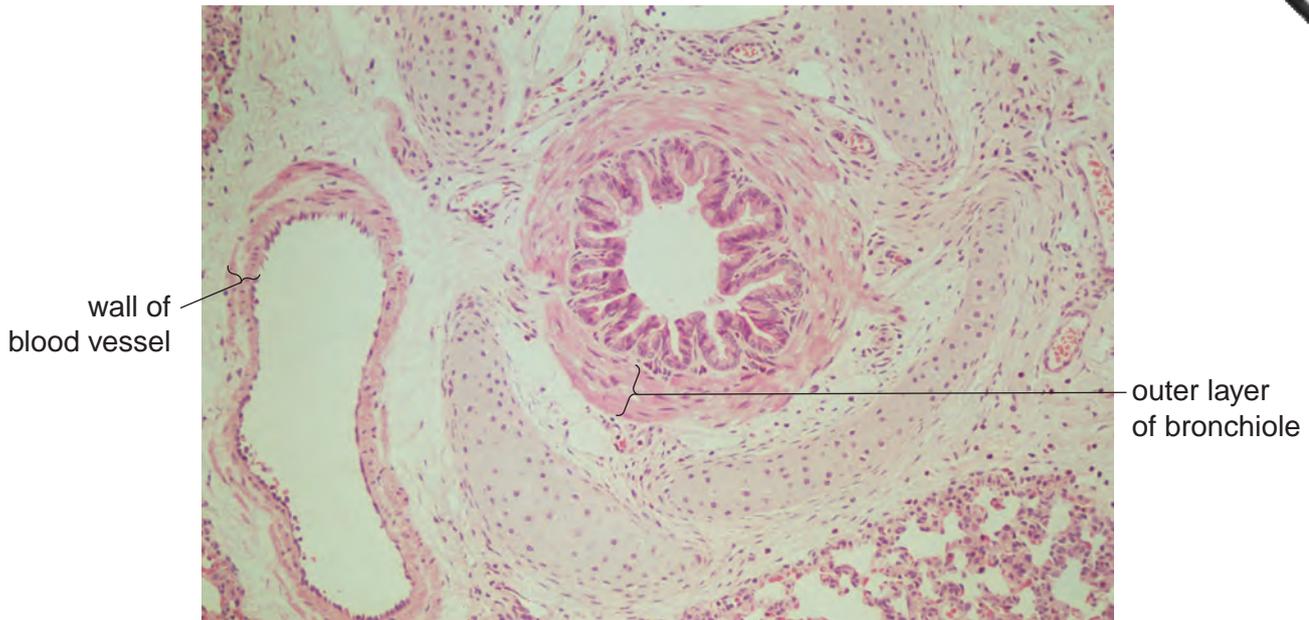




- 2 **J1** is a slide of a stained transverse section showing part of a lung of a mammal.
- (a) Make a large, high-power drawing to show details of five of the structures specialised for gas exchange (alveoli). The walls of one alveolus must be touching the walls of at least two other alveoli.

Label where gas exchange takes place.

Fig. 2.1 is a photomicrograph of a transverse section through a lung from a mammal. The outer layer of the bronchiole and the wall of the blood vessel are labelled.



**Fig. 2.1**

- (b) (i)** Draw a large plan diagram of the bronchiole shown in Fig. 2.1.  
Label the lumen.

- (ii) Calculate the ratio of the mean thickness of the outer layer of the bronchiole compared to the mean thickness of the wall of the blood vessel shown in Fig. 2.1.

Show clearly on Fig. 2.1 where you measured the thicknesses.

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

[4]

- (iii) Prepare the space below so that it is suitable for you to compare the observable features of the bronchiole and blood vessel in the photomicrograph Fig. 2.1.

[6]





