

Candidate Name	Centre Number	Candidate Number
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GCSE

243/01

**SCIENCE BIOLOGY
FOUNDATION TIER
BIOLOGY 3**

P.M. WEDNESDAY, 21 May 2008

45 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	11	
2.	5	
3.	3	
4.	9	
5.	7	
6.	8	
7.	4	
8.	3	
Total	50	

ADDITIONAL MATERIALS

In addition to this paper you may require a calculator.

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

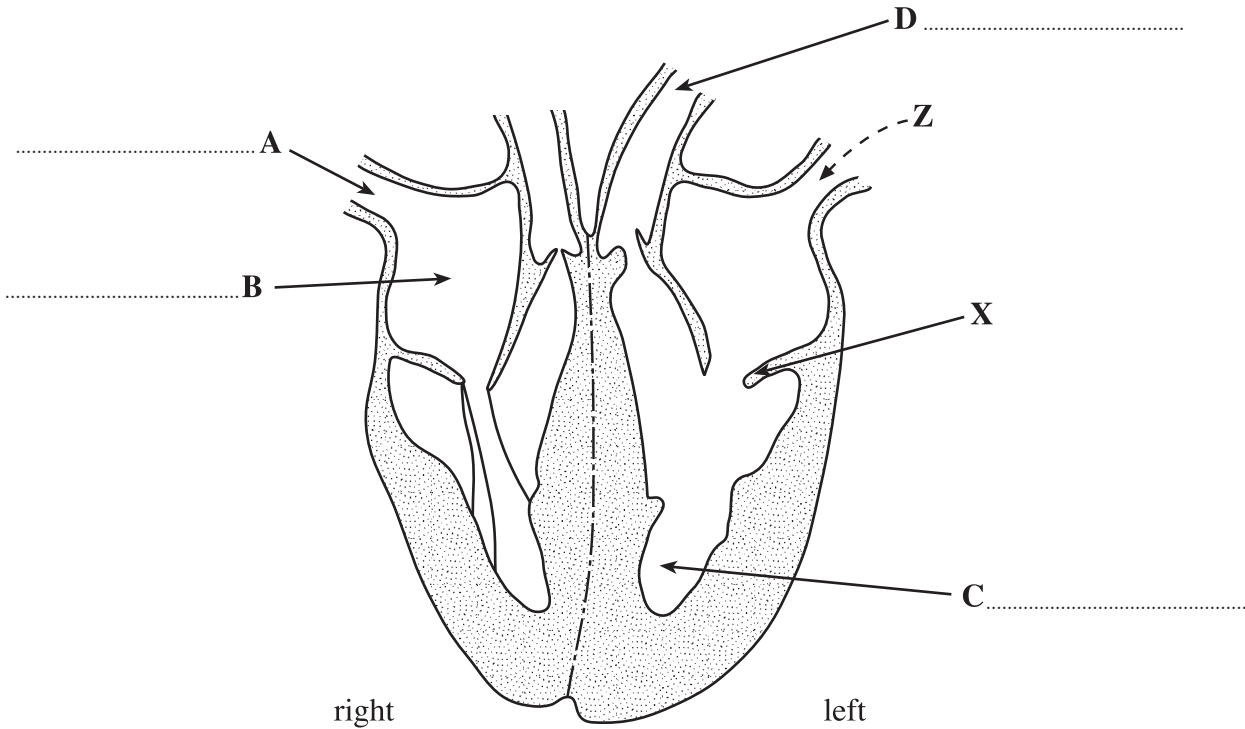
The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

1. (a) The diagram below shows the human heart.

(i) Label the structures **A-D** using some of the terms given in the list. [4]

aorta, valve, vena cava, atrium, ventricle.



(ii) Arrow **Z** shows blood entering the heart. Continue the arrow to show the path of blood leaving the heart. [1]

(iii) Name structure **X** and state its function. [2]

Name

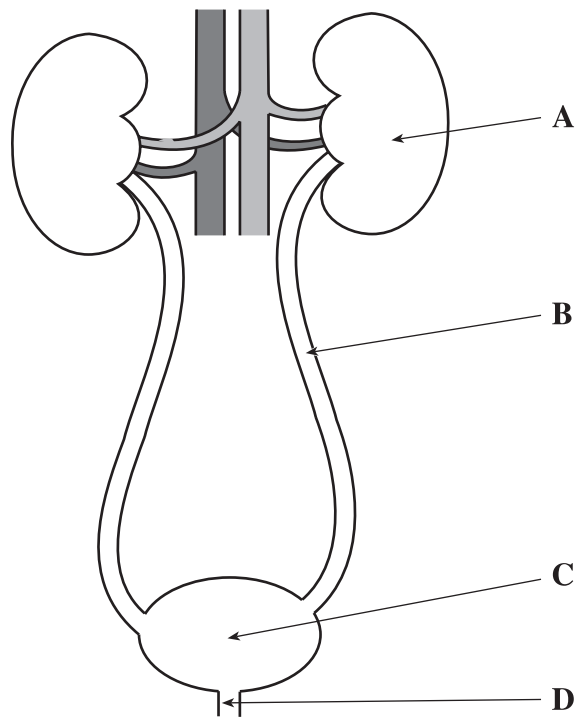
Function

(b) Complete the sentences below by choosing words from the list. [4]

circulate, veins, organs, muscle, arteries, pump.

The heart is made from and acts as a to circulate blood around the human body. Blood leaves the heart in and returns to the heart in

2. The following diagram shows the structure of the human excretory system.



- (a) (i) Which of the labels **A**, **B**, **C** or **D** shows the ureter? [1]

.....

- (ii) What is stored in **C**? [1]

.....

- (b) The table shows the amounts of substances present in the blood entering and leaving the kidney.
Use the information to answer the questions which follow.

<i>Substance</i>	<i>In blood entering kidney (units)</i>	<i>In blood leaving kidney (units)</i>
urea	35	5
protein	30	30
glucose	85	85
water	120	100
salts	300	280

- (i) Which substance is removed from the blood in the greatest amount? [1]

.....

- (ii) Name **two** substances which are **not** excreted by the kidneys. [2]

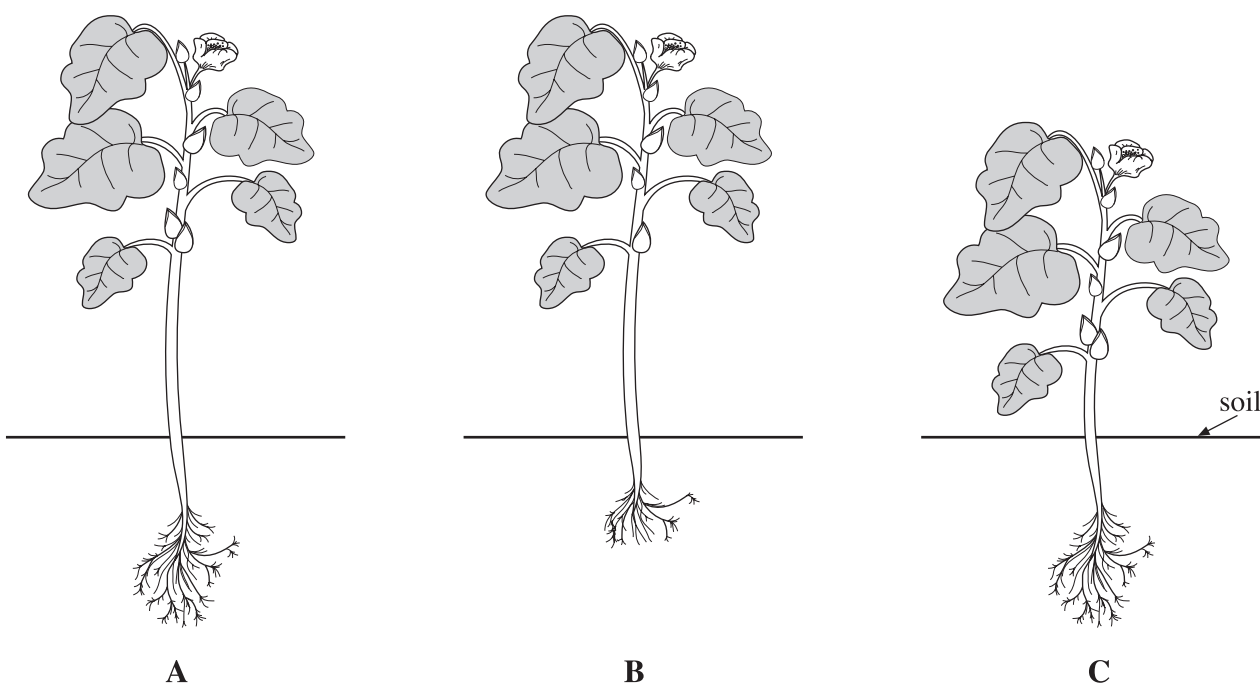
1.

2.

3. (a) The table shows why plants need minerals.

<i>Mineral</i>	<i>Importance in plant</i>
Nitrate	Good growth of stem
Phosphate	Strong root growth
Potassium	Good growth of flowers

Steffan grew three plants **A**, **B** and **C** in an investigation. Plant **A** had a full supply of minerals, **B** and **C** did not. The results are shown in the diagram.



Use the information to complete the table.

[2]

<i>Plant</i>	<i>Mineral not present</i>	<i>Evidence</i>
B		
C		

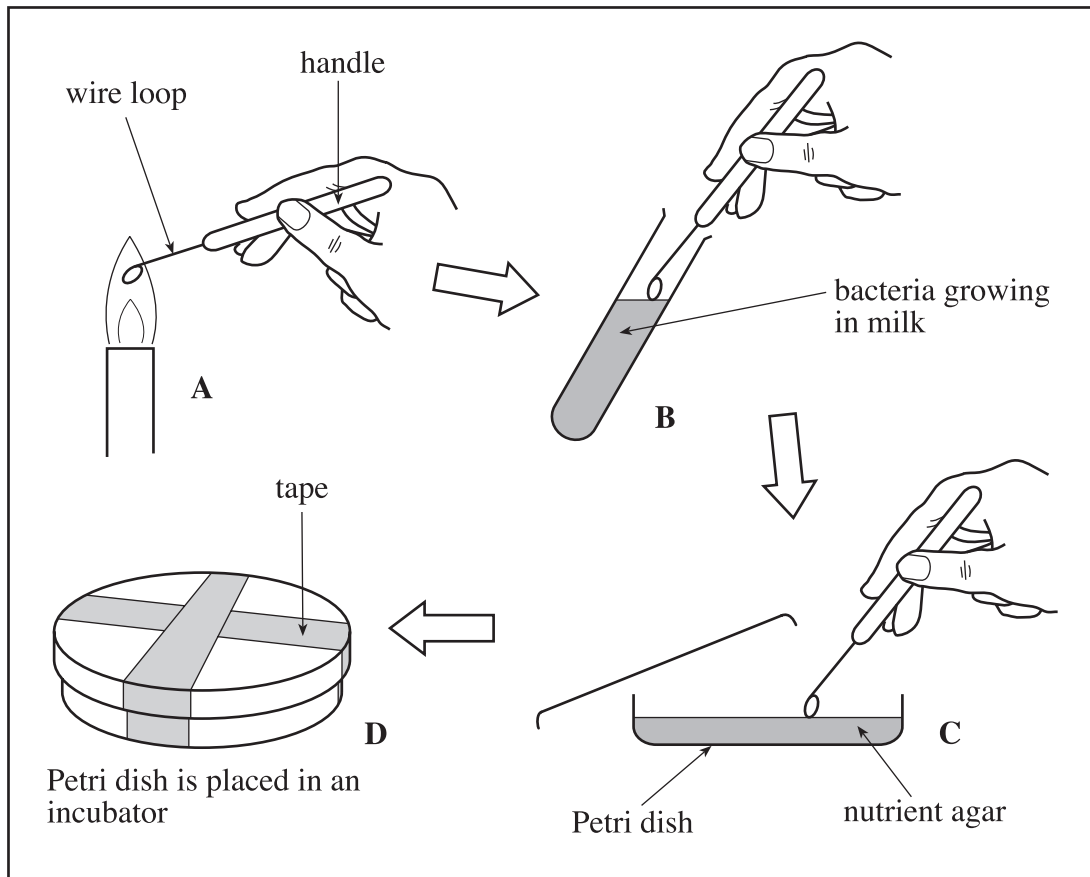
- (b) How do plants obtain the minerals they need for healthy growth? Underline your answer. [1]

from the air

from water in the soil

from photosynthesis

4. The diagrams show how scientists grow bacteria on nutrient agar in the laboratory. Care is needed as the air has many other microbes.



(a) State why the following actions are necessary.

- (i) Strongly heating the wire loop in **A**.

[1]

- (ii) Keeping the lid over most of the agar in **C**.

[1]

- (iii) Sealing the dish with tape in **D**.

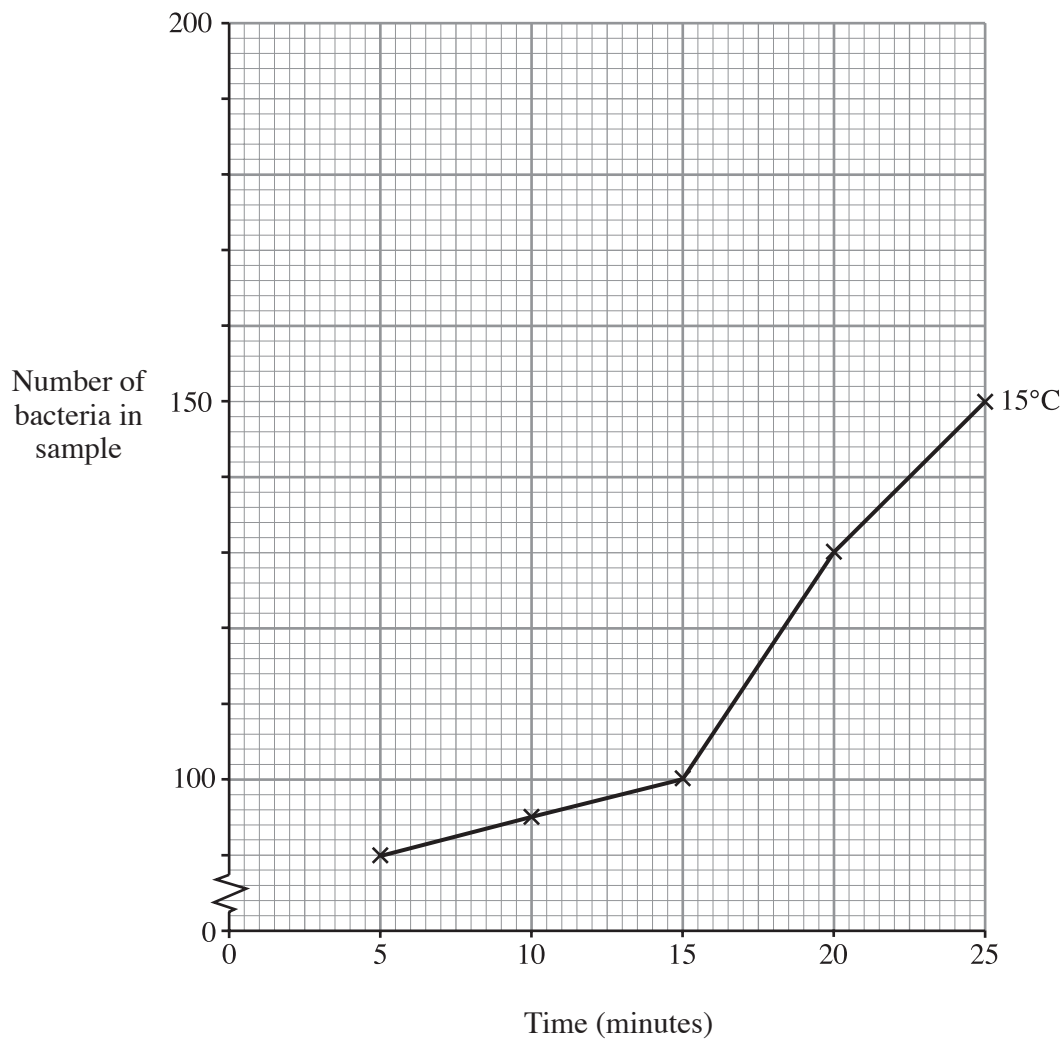
[1]

- (b) Scientists grew bacteria at 15°C . They counted the bacteria every 5 minutes for 25 minutes. The investigation was repeated at 25°C and the results shown in the table.

<i>Time (minutes)</i>	<i>Number of bacteria (in standard sample) at 25°C</i>
5	90
10	100
15	130
20	150
25	200

- (i) Plot the results for 25°C on to the graph. Join the points with a ruler. Label your line 25°C . **The results at 15°C have been done for you.**

[3]



(c) (i) From the graph of 15°C, what is the number of bacteria at 22 minutes? [1]

.....

(ii) Using the information from the graph, underline the correct statement: [1]

growth is faster at 15°C than at 25°C

growth is faster at 25°C than at 15°C

growth is equal at 15°C and 25°C

(iii) Why is it important to keep fresh food in a refrigerator at 3°C? [1]

.....

5. Read the passage and answer the questions which follow, using **this** information.

How to Make Yogurt

Buy a small pot of plain, live yogurt which contains living bacteria.

Boil 1dm³ of milk and then cool to 30°C.

Stir in the plain yogurt then pour the mixture into small containers.

Keep in a warm place at 43°C for 8-10 hours. During this time acids from the bacteria will cause the protein in milk to solidify, making the yogurt firm.



- (a) What is meant by the term *live* yogurt? [1]

.....

- (b) Why is it necessary to boil the milk? [1]

.....

- (c) State the temperature

(i) for mixing the milk and yogurt; [1]

(ii) for incubating the mixture while the yogurt forms. [1]

- (d) For how long must the milk mixture be kept warm? [1]

.....

- (e) (i) What produces the acids? [1]

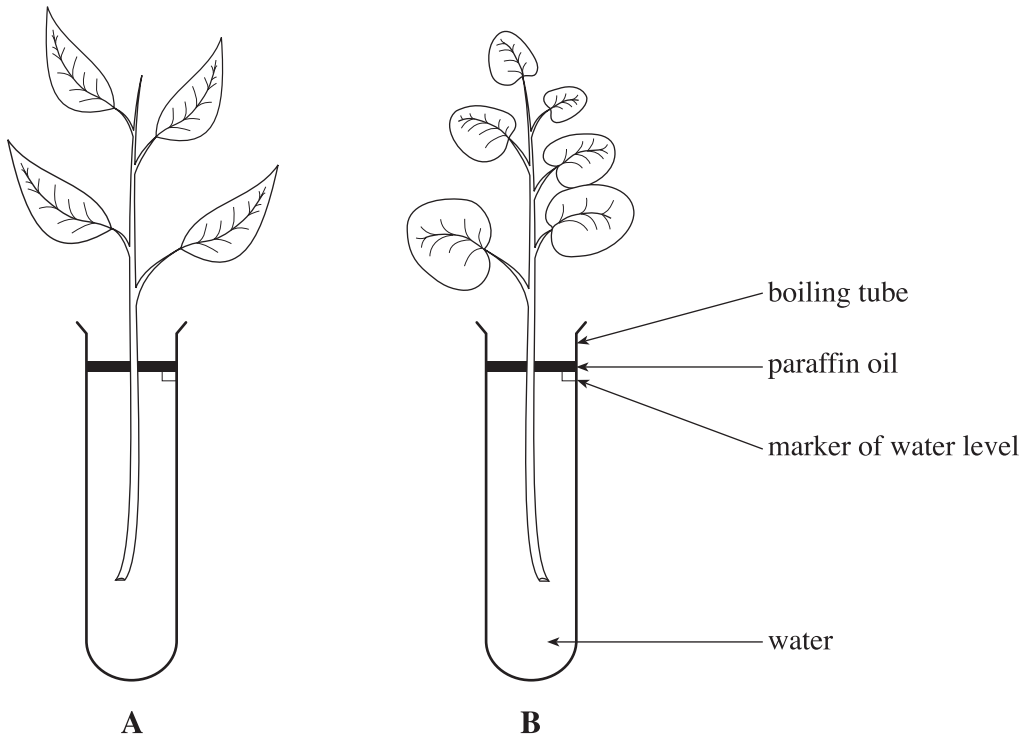
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(ii) What effect do the acids have on the yogurt? [1]

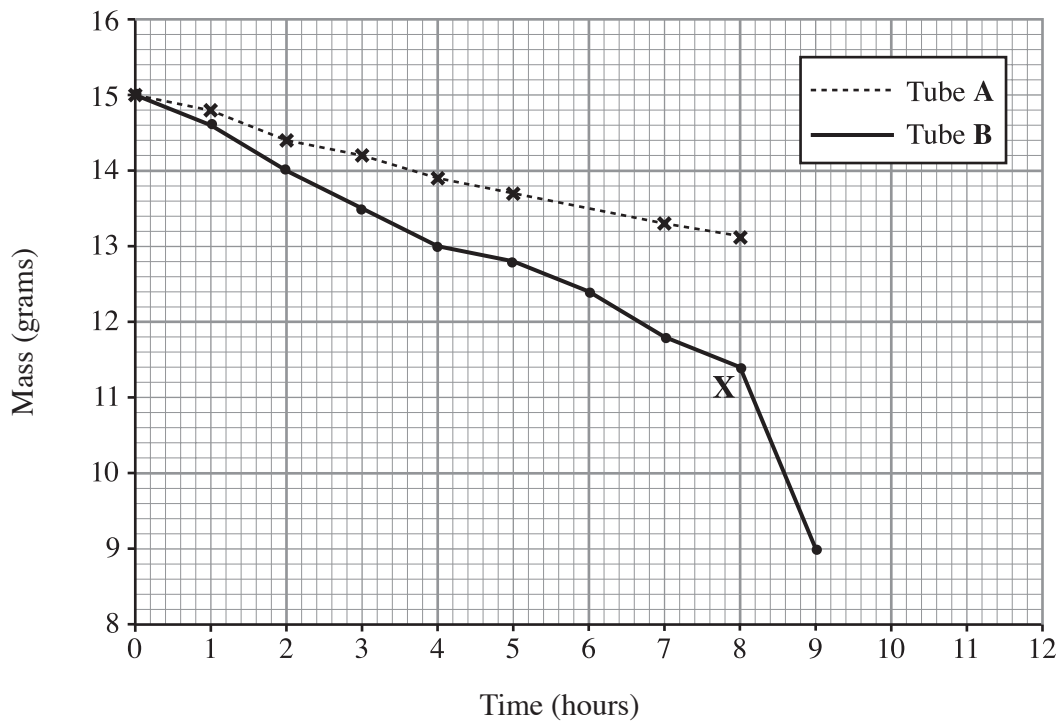
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6. Two different plant shoots were placed in water in boiling tubes. Both were weighed and the mass recorded.



The weighing was repeated at hourly intervals and the results are shown in the graph below.



(a) (i) Calculate the loss in mass for both tubes **A** and **B** after **8 hours**. [2]

Tube **A**

..... g

Tube **B**

..... g

(ii) Explain **fully** the difference in loss of mass between tubes **A** and **B**. [3]

.....
.....
.....
.....
.....

(iii) State the purpose of the paraffin oil. [1]

.....

(iv) Which of the following treatments could be applied to shoot **B**, at point **X**, to produce the graph shown between 8 and 9 hours?
Underline the correct answer. [1]

Enclosed in a bell jar

Upper surface of leaves coated with vaseline

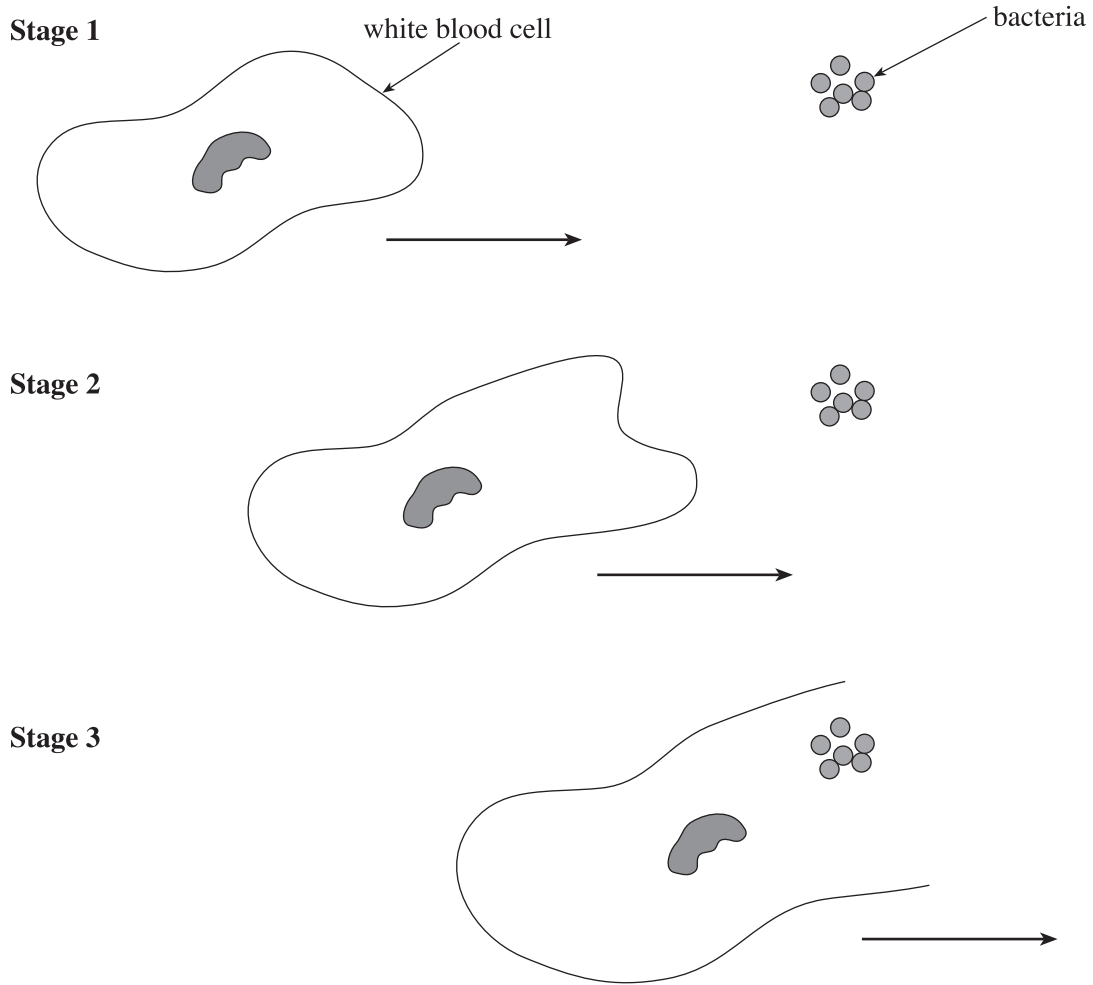
Half the leaves removed

Air directed at the leaves by a fan

(b) Name the structures in a leaf that control water loss. [1]

.....

7. (a) The diagram shows a white blood cell at a site in the body where disease causing bacteria have entered. Complete stage 3 of the diagram to show how the white blood cell protects the body from the bacteria. [2]



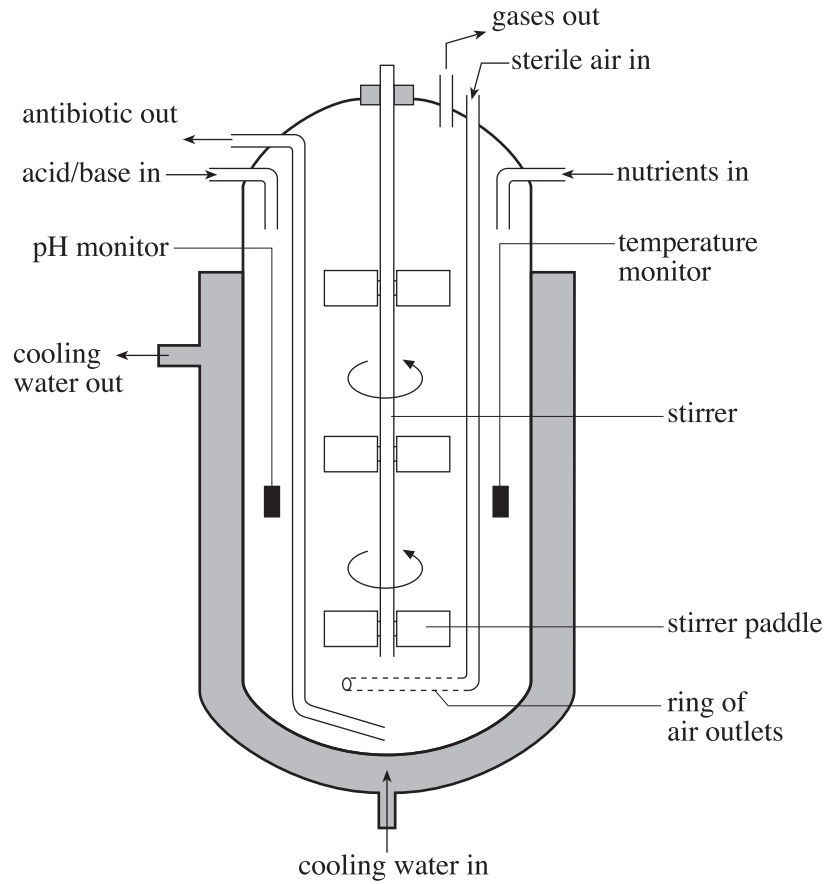
- (b) Explain how disease causing bacteria are prevented from **entering** through the surface of the body. [2]

.....

.....

.....

8. The antibiotic penicillin is produced in large stainless steel fermenters containing a liquid nutrient culture medium in which *Penicillium* is grown. The diagram below shows a fermenter.



- (a) (i) Name a nutrient that should be added to the fermenter. [1]

.....

- (ii) Why is air pumped into the fermenter? [1]

.....

- (b) To which group of living organisms does *Penicillium* belong? [1]

.....