

Surname	Centre Number	Candidate Number
Other Names		0



GCSE

4471/01

ADDITIONAL SCIENCE/BIOLOGY

**BIOLOGY 2
FOUNDATION TIER**

A.M. WEDNESDAY, 8 January 2014

1 hour

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	7	
2.	6	
3.	11	
4.	5	
5.	7	
6.	6	
7.	4	
8.	7	
9.	7	
Total	60	

ADDITIONAL MATERIALS

In addition to this paper you may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

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 that assessment will take into account the quality of written communication used in your answer to question **9**.

Answer **all** questions.

1. (a) Some different types of cells are listed below.

1. Bacterial
2. Yeast
3. Plant
4. Animal
5. Algal

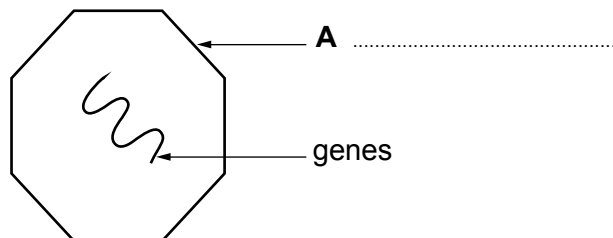
(i) From the list above, name **two** types of cells which are micro-organisms. [2]

.....

(ii) Use numbers from the list above to complete the table below. You may use numbers more than once. *One row has been done for you.* [3]

Features of cell	Cells with these parts present
has chloroplasts	3 5
has a cell wall
has a nucleus
has cytoplasm but no nucleus

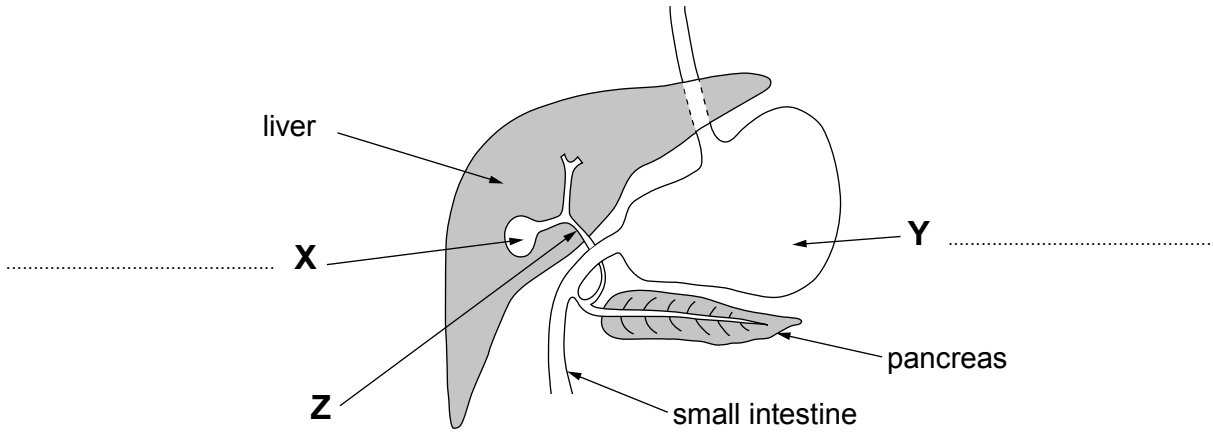
(b) (i) The diagram shows a virus. Complete label **A**. [1]



(ii) How does a virus reproduce? Underline one answer from the three choices shown below. [1]

- by budding;
- by multiplying inside a host cell;
- by dividing into two.

2. The diagram below shows the liver and some other parts of the digestive system.



(a) Complete labels **X** and **Y** on the diagram above. [2]

(b) (i) Fats are digested in the small intestine. Complete the sentence below. [3]

The liver secretes a substance called This helps
the enzyme named to digest fats into fatty acids and
.....

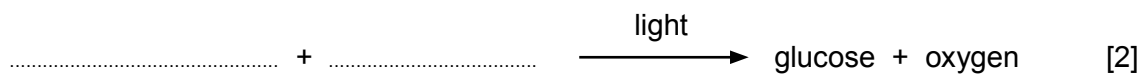
(ii) State the function of structure **Z** shown on the diagram above. [1]

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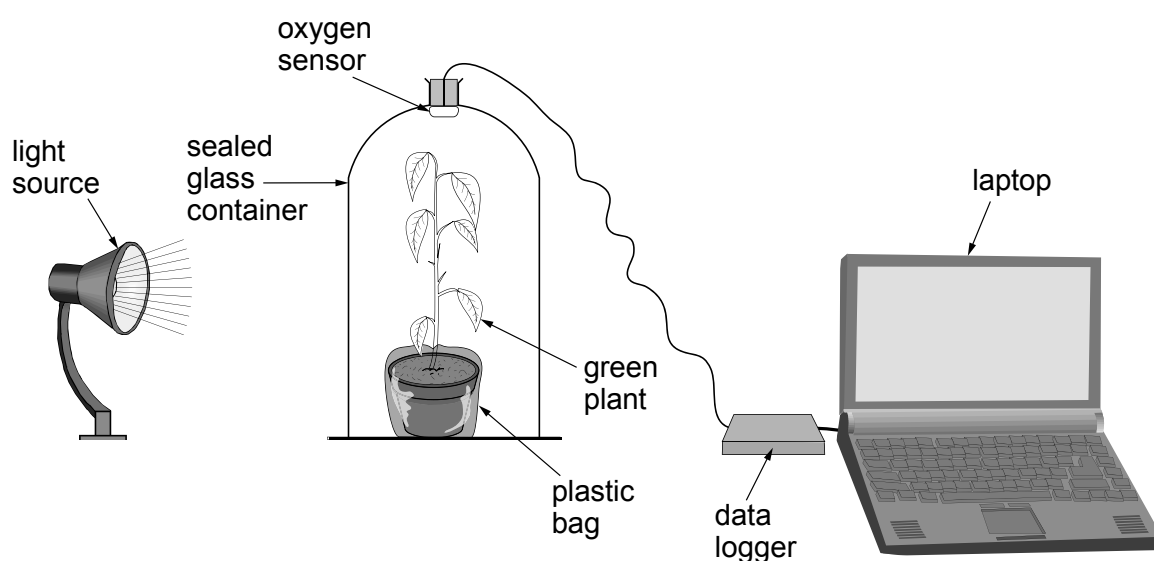
3. (a) (i) Complete the word equation for photosynthesis below.



- (ii) Name the substance in plant cells which absorbs light. [1]

.....

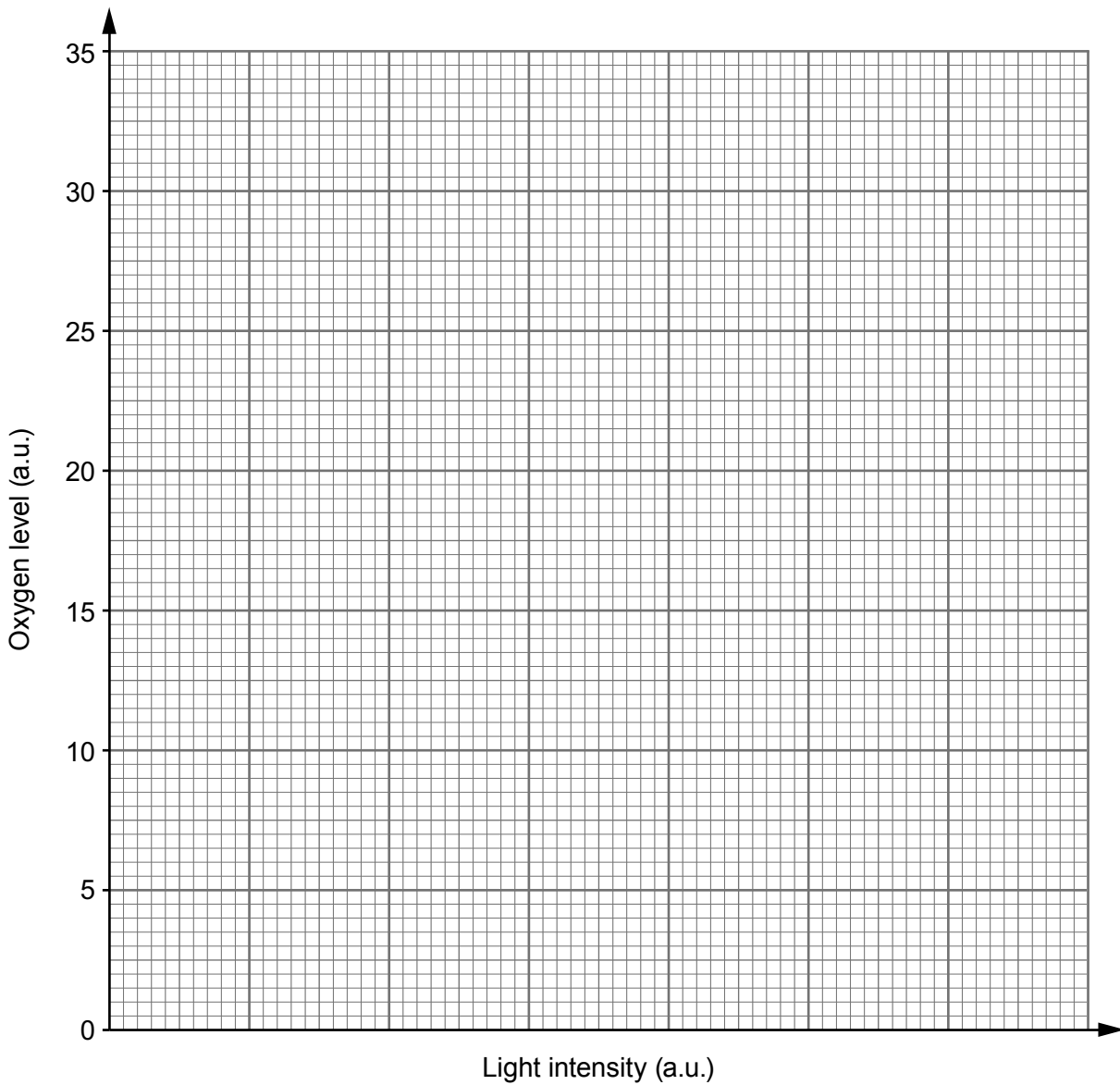
- (b) Students investigated photosynthesis in a plant. They used a data logger to monitor the oxygen given out by the plant at different light intensities, as shown in the diagram below. They used the same plant for the same time at each light intensity.



The results of the investigation are shown in the table below.

Light intensity (a.u.)	Oxygen level (a.u.)
10	5
15	7
20	11
25	20
30	29
35	34

- (i) Draw a line graph of the data above on the grid opposite by:
- I. choosing a suitable scale for light intensity; [1]
 - II. plotting the points shown above; [2]
 - III. joining your plots, using a ruler. [1]



(ii) Use your graph to answer the following questions.

I. How does the concentration of oxygen change as light intensity increases? [1]

.....

II. Which change in light intensity shown below causes the greatest change in the oxygen concentration? **Circle** the correct answer. [1]

12 – 15 a.u. 22 – 25 a.u. 32 – 35 a.u.

(iii) State **one** way in which the students tried to make their investigation a fair test. [1]

.....

(c) State **one** way in which the glucose produced in photosynthesis is used in plant cells. [1]

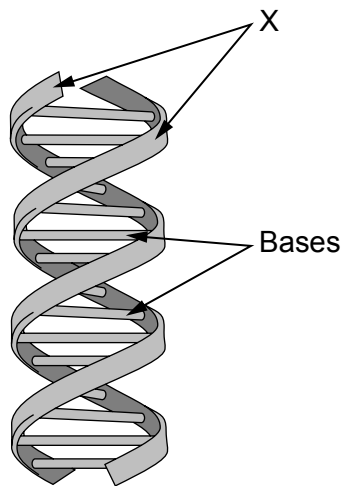
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4. (a) Which part of a plant cell contains DNA? Underline your answer.

[1]

vacuole nucleus cytoplasm cell membrane

(b) The diagram below shows a small section of DNA.



Use the information in the diagram above and your own knowledge to answer the following questions. Underline the correct answer for **each** question.

(i) Which molecules make up the two strands labelled **X**?

[1]

sugar and protein

phosphate and protein

sugar and phosphate

phosphate and salt

(ii) There are four bases A, G, T and C. How are they paired in DNA?

[1]

A with T and G with C

A with G and C with T

A with C and G with T

A with A, C with C, T with T and G with G

(iii) What term is used to describe the structure of DNA?

[1]

double coil

double helix

double spiral

single helix

(c) Complete the sentence below.

[1]

The order of the bases A, G, T and C in DNA forms a code which controls how

..... are linked together to form different

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5

5. Control of Red Spider Mite

- Red spider mites are pests on crops, such as tomatoes, growing in greenhouses in the UK.
- They feed on the leaves and destroy the plants.
- Predatory mites feed on red spider mites.



Tomato plants in a greenhouse



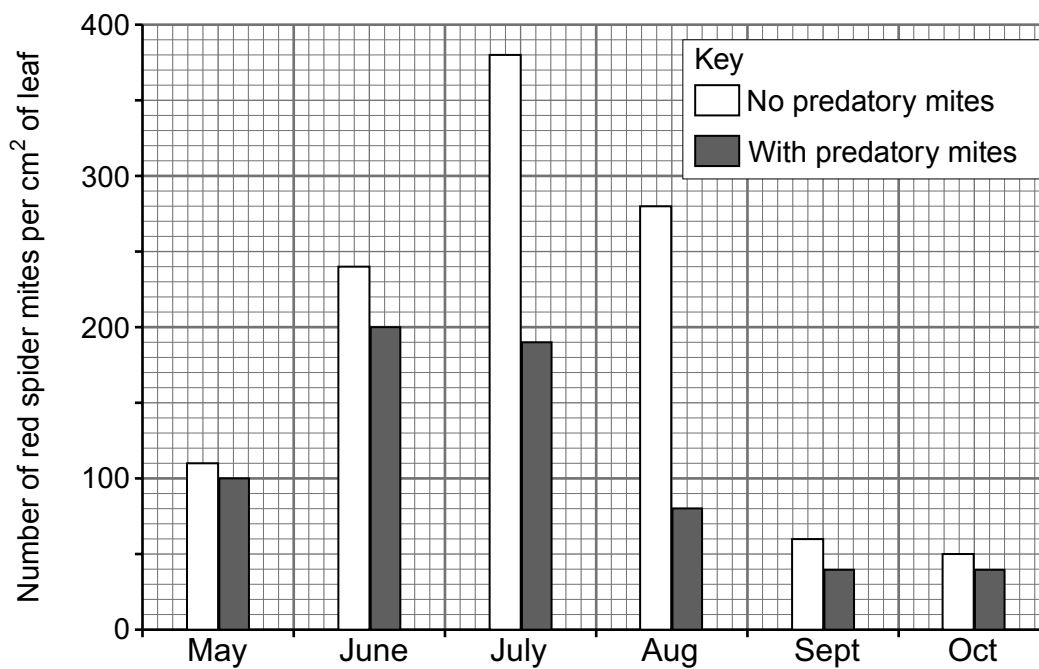
red spider mite



predatory mite

Photographs not to scale

Scientists investigated the use of predatory mites to control red spider mites on tomato plants in a greenhouse. The bar chart below shows their results.



(a) What term is used for this type of pest control? [1]

.....

(b) Use the bar chart opposite to answer the following questions.

(i) Complete the table below to state the month when the numbers of red spider mites are highest. State the numbers present. [2]

	Month when numbers of red spider mites are highest	Number of red spider mites present (per cm ² leaf)
No predatory mites present		
With predatory mites present		

(ii) What is the effect of predatory mites on numbers of red spider mites? [1]

.....

(iii) During which month does the predatory mite have the greatest effect on numbers of red spider mite? State the reason why you chose this month. [1]

Month

Reason

.....

(c) (i) Suggest **one** fact about the predatory mites that the scientists would have to check before using them to protect tomato plants. [1]

.....

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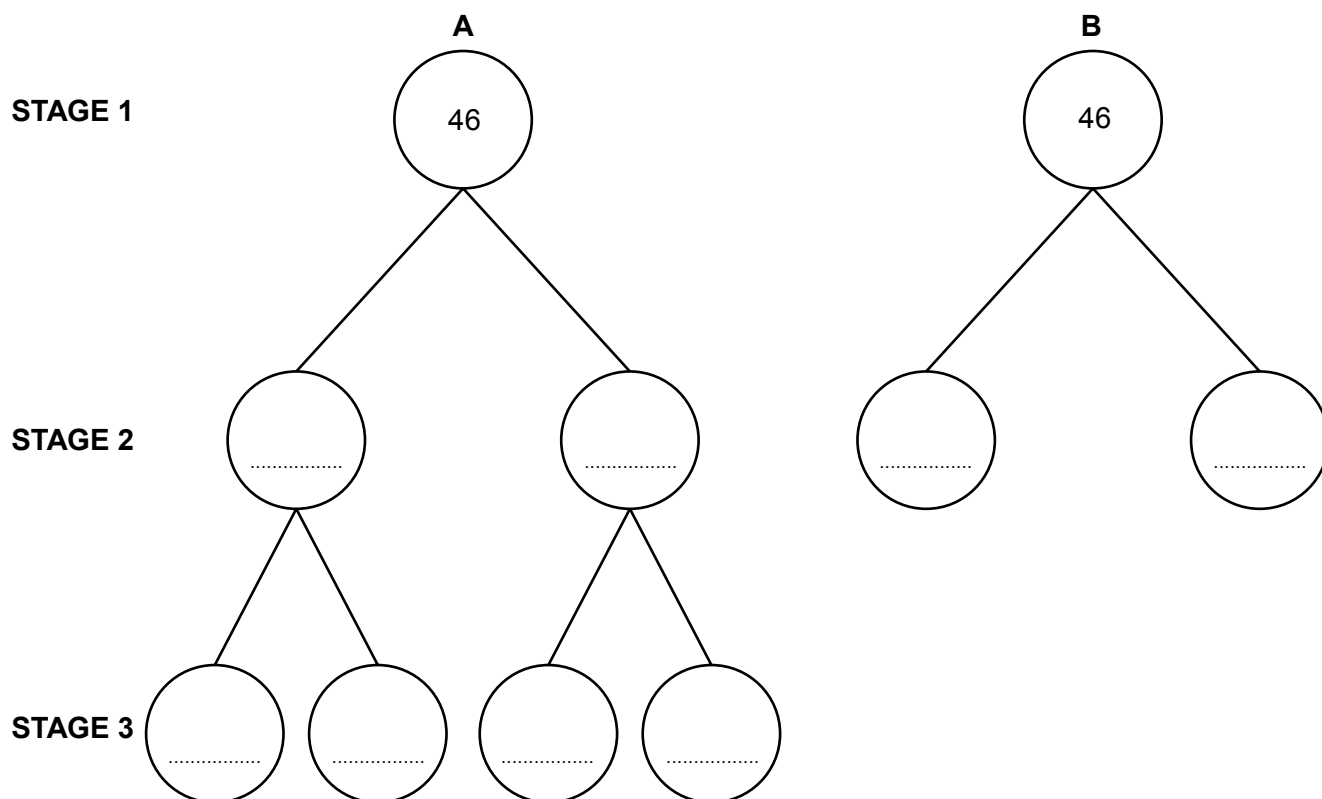
(ii) What could the scientists do to be more confident of their results? [1]

.....

.....

7

6. The diagram below shows the two **different** types of cell division **A** and **B**, which occur in the human body.



- (a) Name the type of cell division shown in diagram **A**. [1]
- (b) The cells in **STAGE 1** each contain 46 chromosomes. Complete the diagram by writing in the number of chromosomes found in **each** of the cells in **STAGE 2** and **STAGE 3**. [2]
- (c) The cells drawn in **STAGE 3** develop into specialised cells. What name is given to these cells? [1]
.....
- (d) Complete the sentence below by placing a **circle** around the correct word. [1]
All the cells in **STAGE 3** are genetically **identical** / **different**.
- (e) Name **one** process during which the type of cell division shown in diagram **B** would occur. [1]

7. Some students wanted to estimate the number of dandelions on a school playing field. The playing field was too large to count every dandelion so they sampled a 10m × 10m area of the field using a quadrat.



© Martyn F. Chillmaid/Science Photo Library

- (a) The stages the students used in their sampling technique are listed below in the **WRONG ORDER**. Write the numbers **1, 2, 3** and **4** in the table below to show the correct order. [3]

Stage in the sampling technique	Number
Calculate the number of dandelions on the playing field	
Repeat the sampling 10 times	
Select a random sampling method	
Drop the quadrat and count the number of dandelions	

- (b) Why is it important that when the students sample in the chosen area of the field it is done randomly? [1]

.....

4

8. Sian and Rhys were investigating the use of visking tubing as a model gut. The following is an extract from their notebook showing the method they used.
- (i) Soak a piece of visking tube in water for 10 minutes.
 - (ii) Tie a knot in one end of the visking tube.
 - (iii) Fill the visking tube with starch solution and tie the open end of the tubing.
 - (iv) Suspend the visking tubing in a beaker of water.
 - (v) Test the water in the beaker every 15 minutes for the presence of starch and glucose.
 - (vi) After 45 minutes inject amylase enzyme into the visking tubing.
 - (vii) Continue to test the water for starch and glucose every 15 minutes.

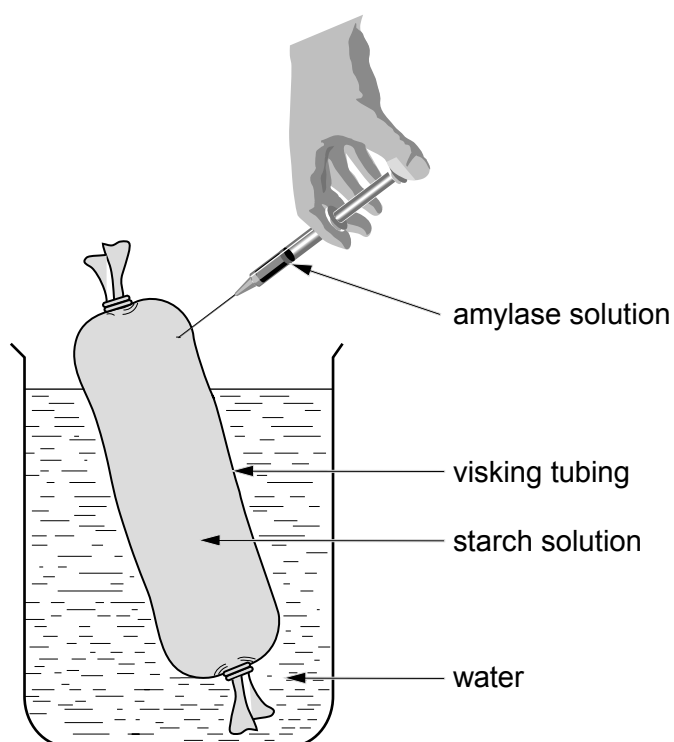


Table of results.

Time (minutes)	Starch present	Glucose present
0	No	No
15	No	No
30	No	No
45	No	No
60	No	Yes
75	No	Yes
90	No	Yes

Amylase added →

- (a) After the amylase was added, glucose was present in the sampled water. Explain this result.

[3]

.....

.....

.....

.....

.....

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- (b) State why starch was not found in the sampled water.

[1]

.....

.....

- (c) In the model gut shown opposite, what does the water surrounding the visking tubing represent in the living body?

[1]

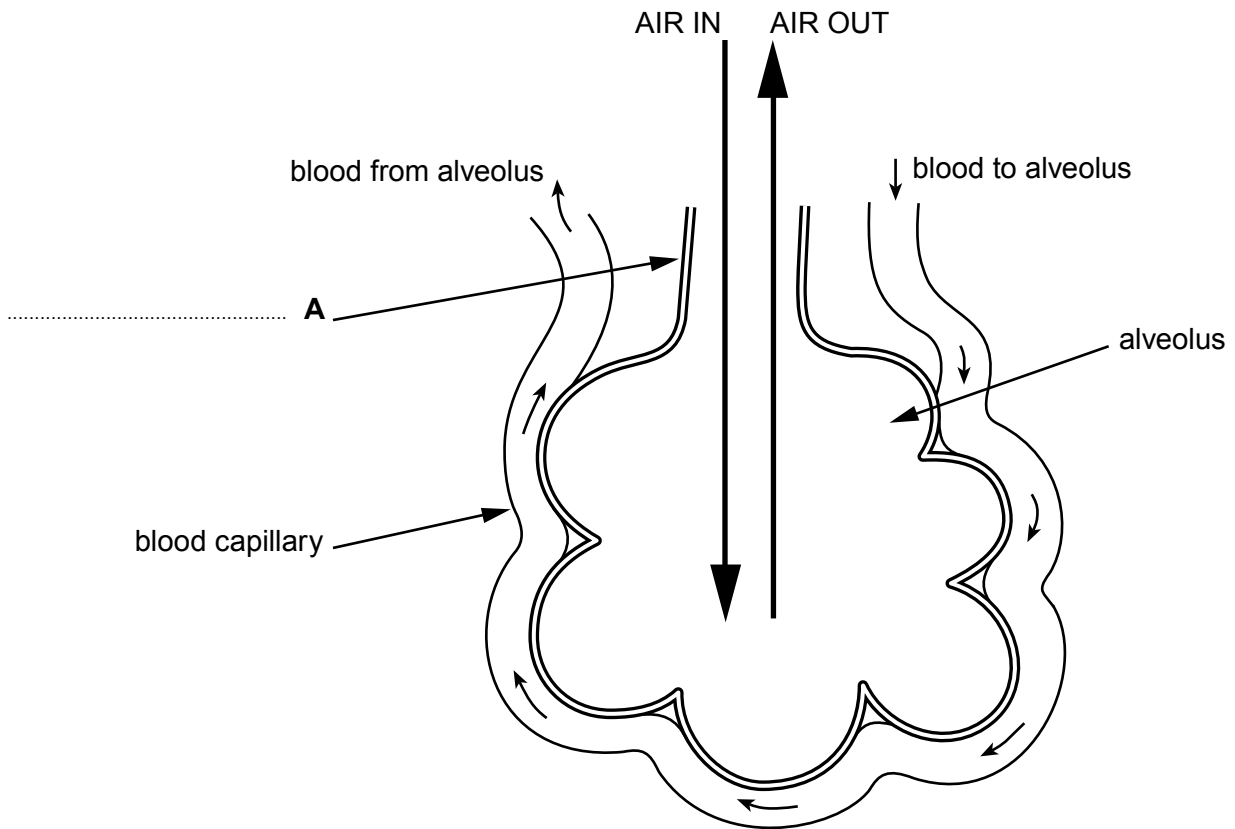
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- (d) Complete the following table about food tests.

[2]

Substance tested for	Reagent used	Colour of reagent	Colour with positive result
	Iodine solution		blue-black
Glucose		blue	

9. The diagram shows an alveolus and its blood supply.



- (a) Complete label **A** on the diagram above.

[1]

