

Surname	Centre Number	Candidate Number
Other Names		0



**New GCSE**

4471/01

**ADDITIONAL SCIENCE  
FOUNDATION TIER  
BIOLOGY 2**

A.M. WEDNESDAY, 9 January 2013

1 hour

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	5	
2	7	
3	7	
4	11	
5	6	
6	2	
7	3	
8	5	
9	8	
10	6	
<b>Total</b>	<b>60</b>	

**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 **10**.

*Answer all questions.*

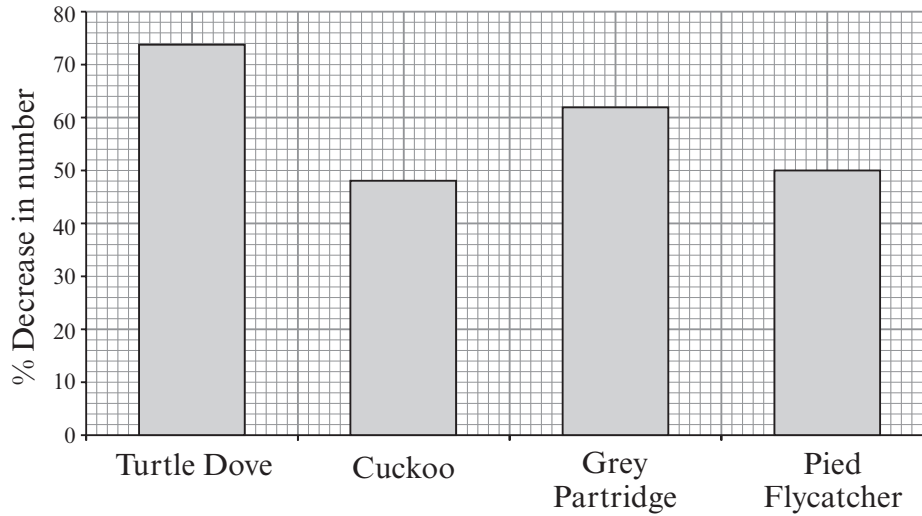
1. Read the information below about bird species which are at risk of becoming endangered.

- Conservation scientists investigated the numbers of the four species of birds, shown below, in an area of the UK.
- They counted in 1999 and again in 2009.
- Numbers had decreased.

Species	Habitat
 Pied Flycatcher	Oak trees
 Turtle Dove	Farmland
 Cuckoo	Woodland
 Grey Partridge	Farmland

*Drawings not to scale*

The bar chart below shows the % decrease in number between 1999 and 2009.



(Data from British Trust for Ornithology)

Answer the questions below using the information **opposite and above**.

- (a) Which species is most at risk of becoming endangered? [1]

Species .....

Reason .....

- (b) The number of Pied Flycatchers in 2009 was 520.  
Calculate the number that would have been present in 1999. [1]

Answer .....

- (c) Bird numbers can decrease because of human activities.  
Name **one** species which could be affected by each of the following: [1]
- (i) building houses on fields previously used for growing crops;

.....

- (ii) cutting down trees for agriculture. [1]

.....

- (d) If the numbers of these birds continue to decline in future years how will biodiversity in the area be affected? Underline your answer and give a reason. [1]

increase      decrease      no change

Reason .....

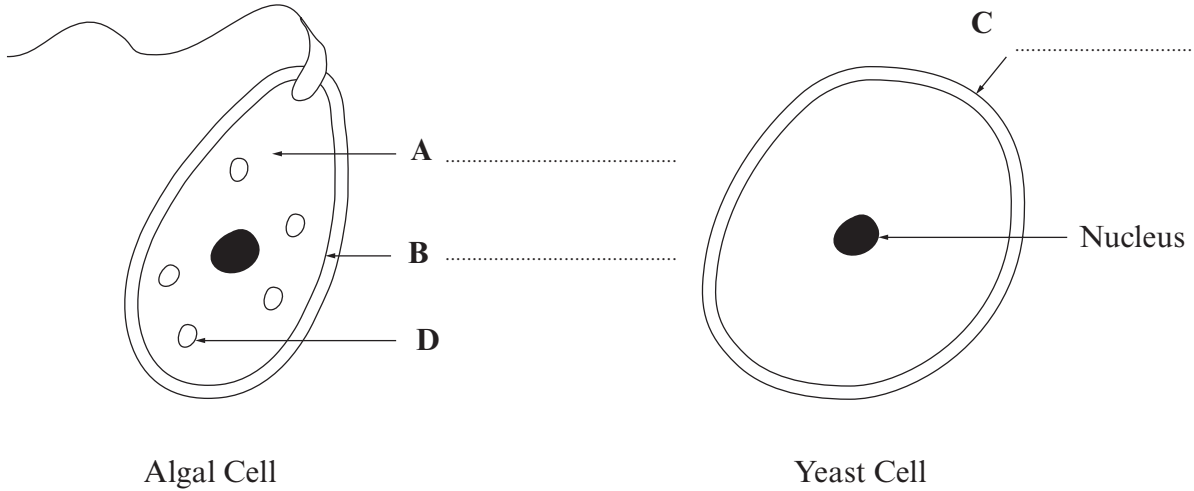
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2. (a) The diagrams below show two micro-organisms.

(i) Label **A**, **B** and **C** on the diagrams below.

[3]



(ii) Structure **D** contains chlorophyll. Name this structure and state its function. [2]

Name .....

Function .....

(iii) Name **one** structure shown on the diagrams above, which would *not* be present in a bacterial cell. [1]

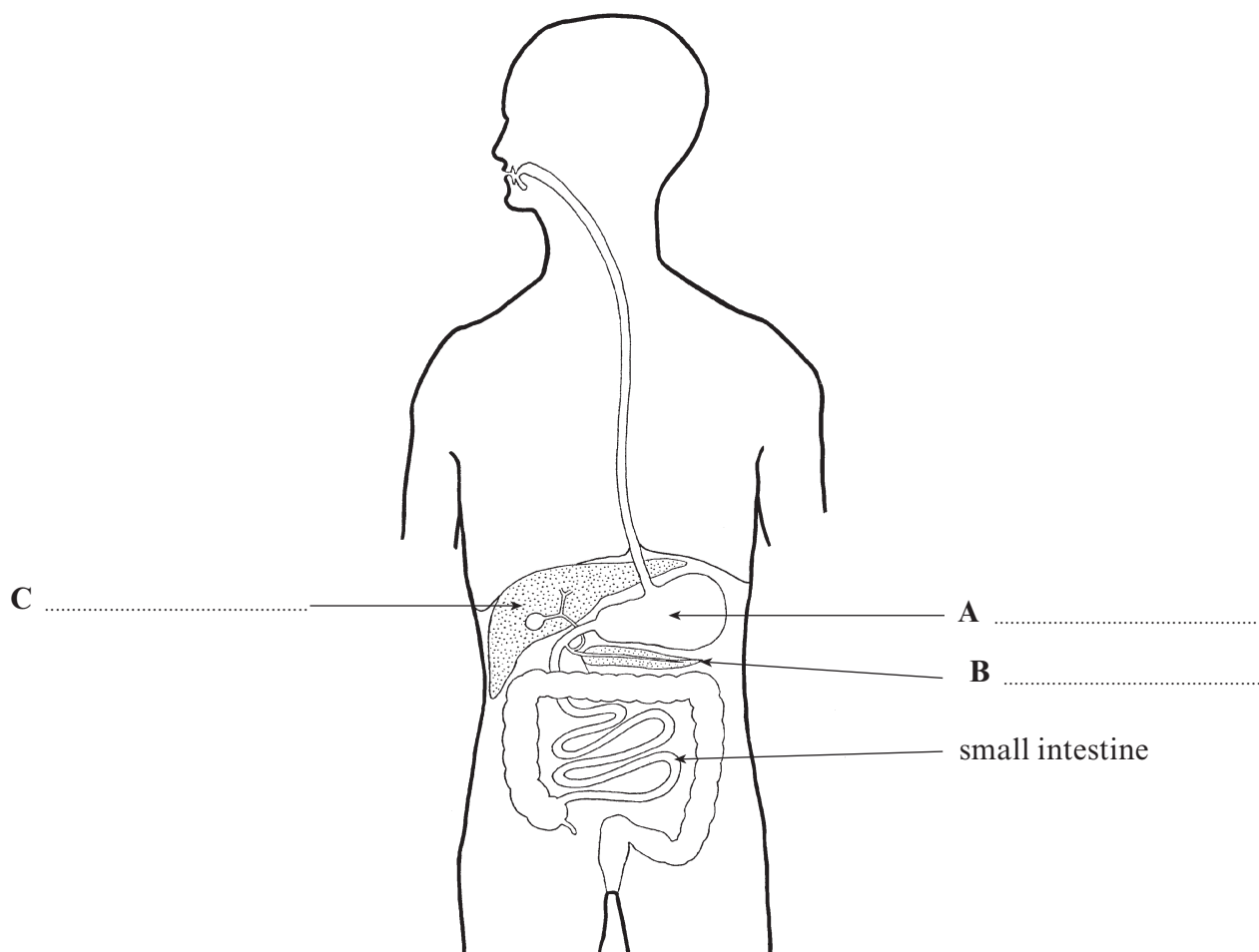
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(b) Scientists use light microscopes to study living cells. Why is an electron microscope *unsuitable* for this task? [1]

.....

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3. (a) Label **A**, **B** and **C** on the diagram of the human digestive system shown below. [3]



- (b) Complete the table below by writing your answers on the dotted lines [3]

Digestion in the small intestine

Substance digested	Enzyme	Digested product(s)
.....	carbohydrase	glucose
fats	.....	fatty acids and .....

- (c) Which solution would be used to identify protein in a sample of food? Underline the correct answer below. [1]

Benedict's solution

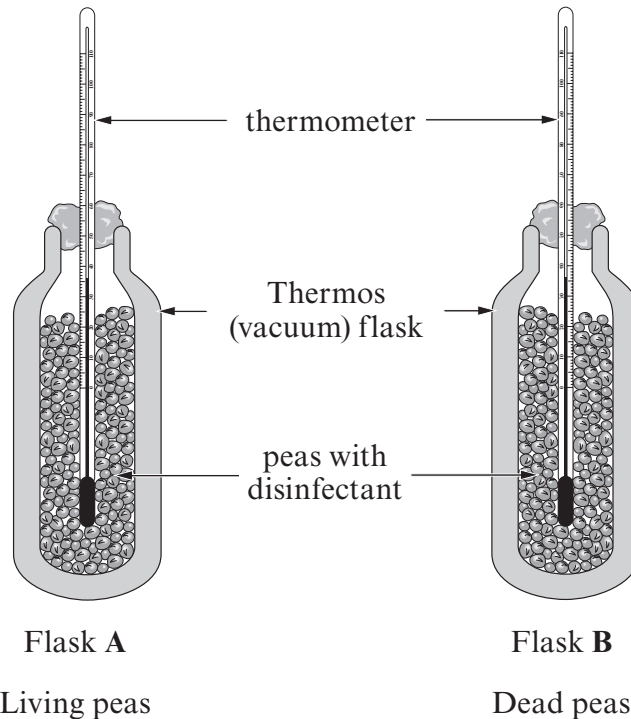
Biuret solution

bicarbonate solution

4. (a) Complete the word equation below which shows respiration, the process which releases energy in living cells. [1]

glucose + .....  $\longrightarrow$  ..... + water

- (b) Some students investigated the release of energy during respiration in living peas. They used the apparatus shown in the diagram below and measured the temperature over a period of 11 days.



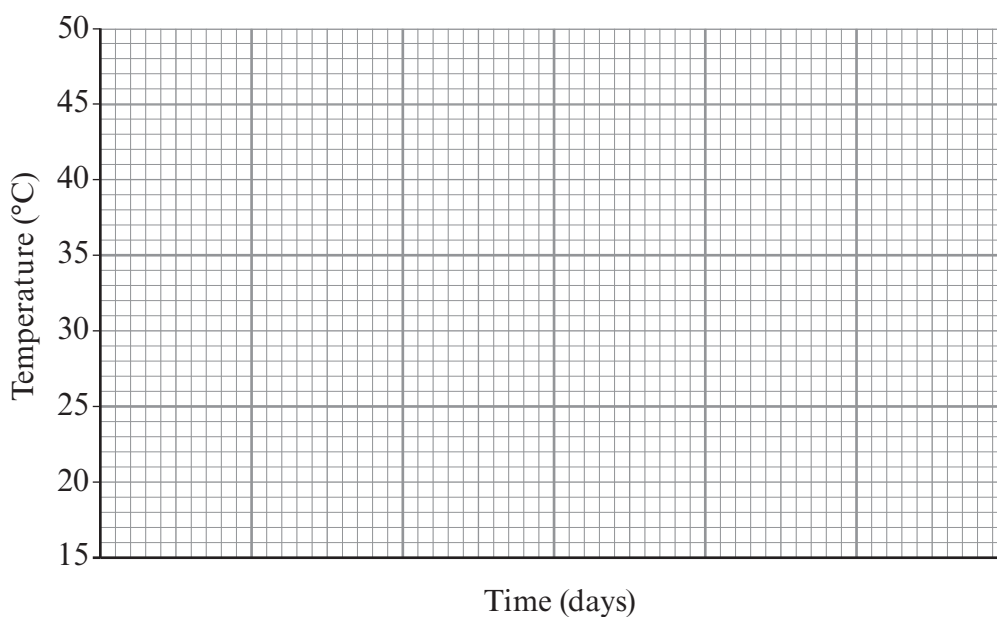
Investigation results

Time (days)	Temperature (°C)	
	Flask A	Flask B
1	18	18
3	20	18
5	23	18
7	35	18
9	38	18
11	38	18

- (i) Complete a line graph of the results for flask A on the grid opposite by:

- I. Choosing the scale on the time axis
- II. Plotting the points
- III. Joining the plots with a ruler

[1]  
[2]  
[1]



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

I. Describe how the temperature changed in flask A from day 3 to day 11. [1]

.....  
 .....

II. During which time period did the temperature change most rapidly? Place a tick (✓) by your answer. [1]

2-4 days ..... 4-6 days ..... 8-10 days .....

(iii) In what form was energy released in the living peas? [1]

.....

(c) Give the reason for the results obtained in flask B. [1]

.....

(d) (i) Why were Thermos (vacuum) flasks used rather than ordinary glass flasks? [1]

.....

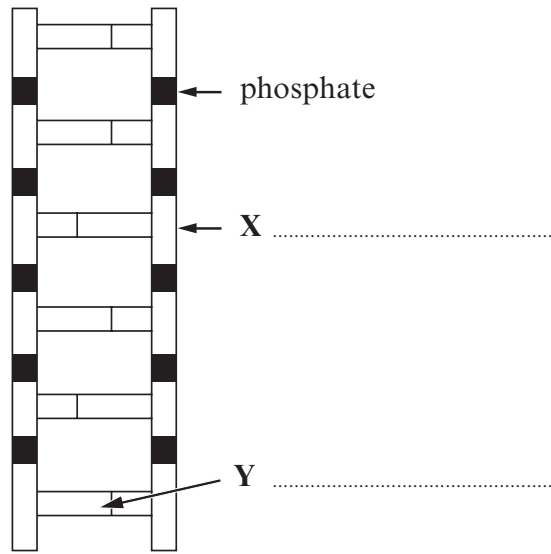
(ii) Why did the students use disinfectant in the flasks? [1]

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5. (a) (i) Using some of the words in the list given below, label X and Y on the diagram of DNA. [2]

amino acid                      sugar                      base



- (ii) Structure Y occurs in four forms. Two are G and C. State the other two. [1]  
 ..... and .....

- (iii) The diagram shows DNA as a straight ladder-like structure. How is the shape different in DNA in a living cell? [1]

.....  
 .....

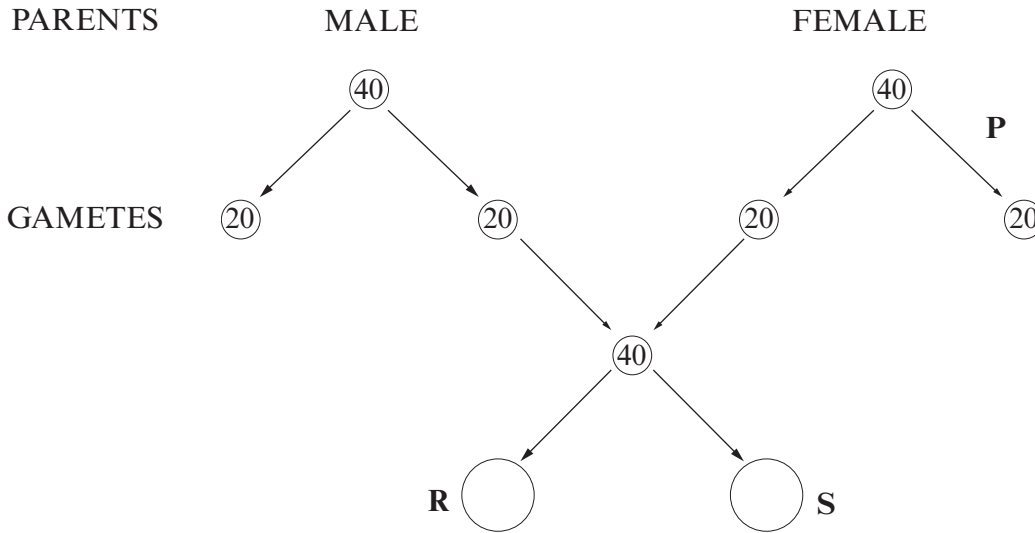
- (b) Complete the following sentence using some of the words below. [2]

amino acids                      sugars                      proteins                      salts

DNA contains a code which enables ..... to be joined together to form .....



6. The following diagram represents the stages in the life cycle of a mammal.  
The numbers of chromosomes in cells at different stages in the life cycle are shown.



- (a) Name the type of cell division taking place at letter **P**.

[1]

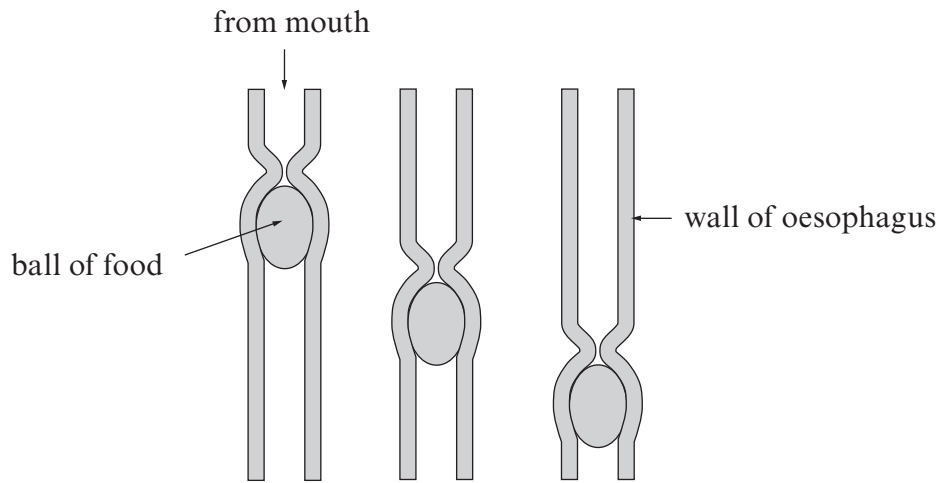
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- (b) Complete the diagram above by writing in the number of chromosomes found in **each** of the cells labelled **R** and **S** produced during growth.

[1]

2

7. The diagram shows a ball of food moving along the oesophagus (gullet).



(a) What name is given to this process?

[1]

.....

(b) Explain how the ball of food is moved along the oesophagus.

[2]

.....

.....

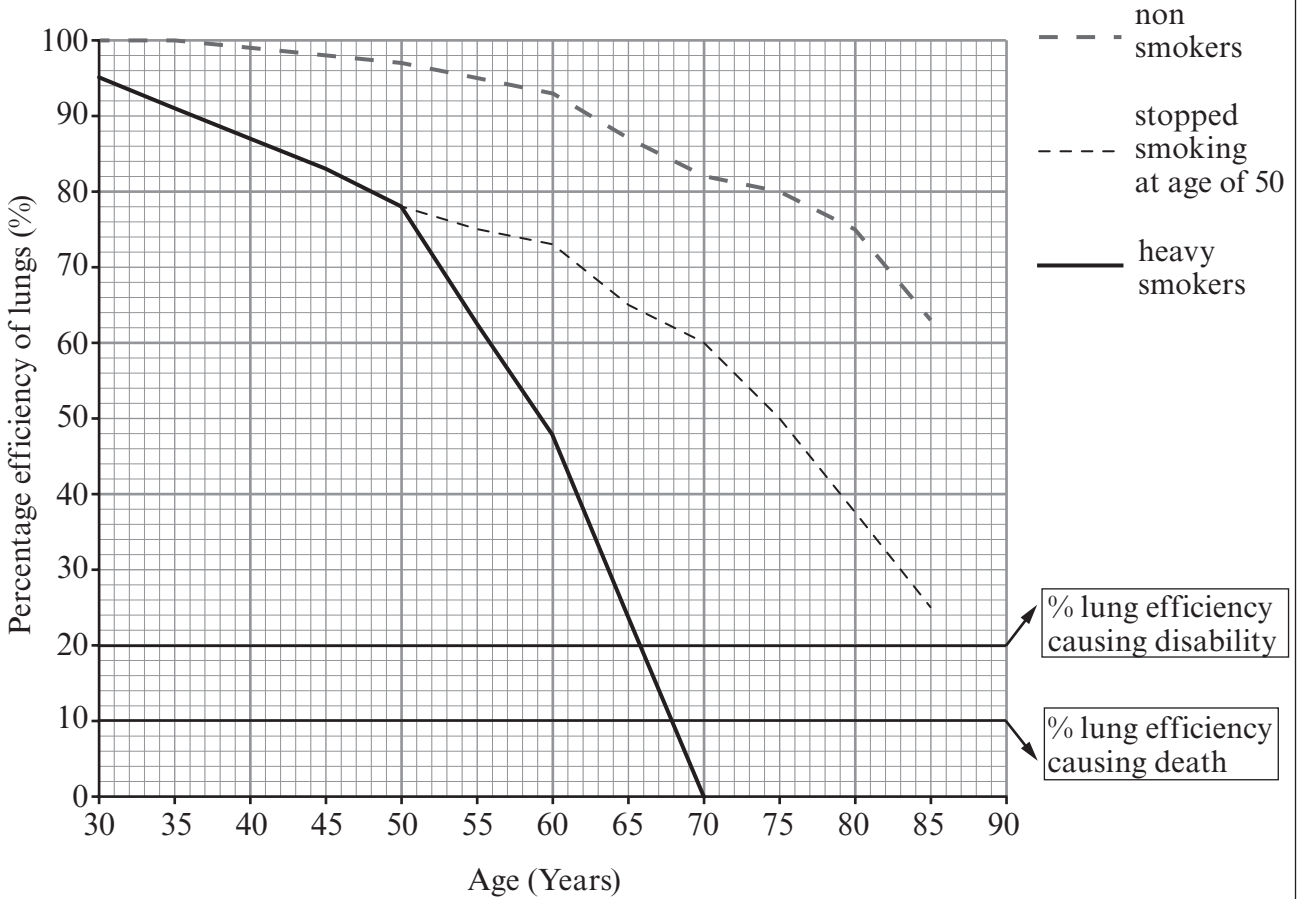
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8. The graph below shows the efficiency of the lungs (how well they work) in three different groups of people: non-smokers, smokers who stopped smoking at the age of 50 and heavy smokers.



(a) What is the difference in percentage efficiency of a 60 year old non-smoker and a 60 year old heavy smoker? [1]

..... %

(b) (i) Continuing to smoke heavily can damage the lungs and lead to disability. At what age does the graph above show this disability occurring? [1]

.....

(ii) Suggest what the lung damage mentioned in (i) could be. [1]

.....

(c) Susan is a 50 year old heavy smoker.



Use the graph opposite to suggest what Susan might expect to happen if she gives up smoking now. [2]

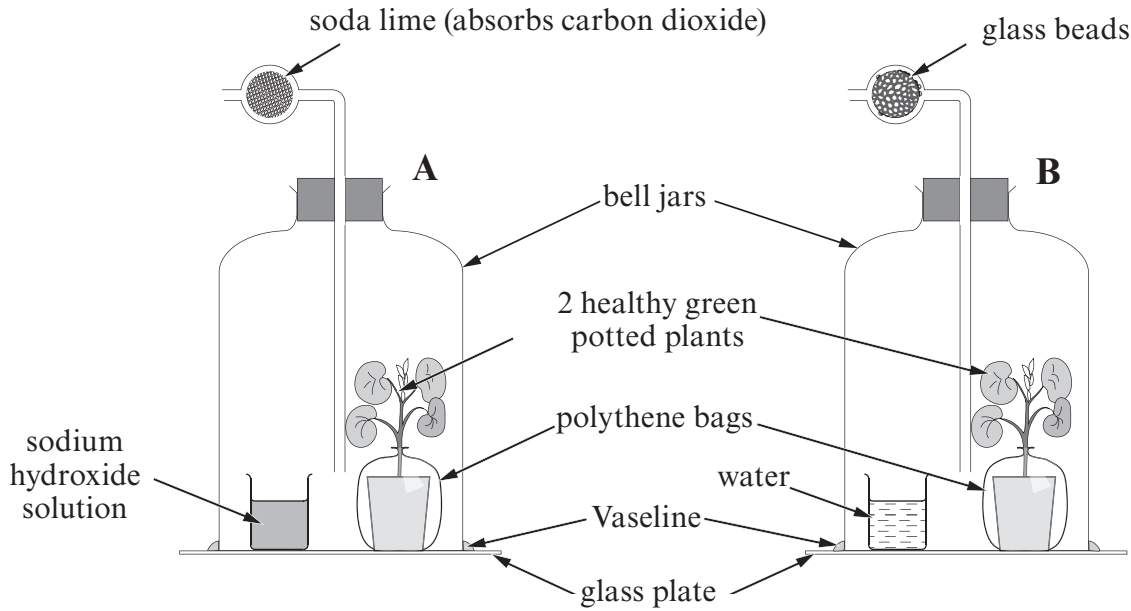
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9. The experiment was set up in a school laboratory using the apparatus shown below and left near a window for 4 days.



- (a) State the purpose of the experiment. [1]

(b) State the function of

- (i) the polythene bag [1]

- (ii) the sodium hydroxide solution [1]

- (iii) the apparatus labelled B. [1]

- (iv) the Vaseline. [1]

(c) Explain why the plants were placed in the dark for 48 hours prior to the experiment. [1]

.....

.....

(d) At the end of the experiment a leaf was taken from each plant and tested for starch. State the colour observed for each leaf and the reason.

(i) Apparatus A [1]

colour observed .....

reason .....

.....

(ii) Apparatus B [1]

colour observed .....

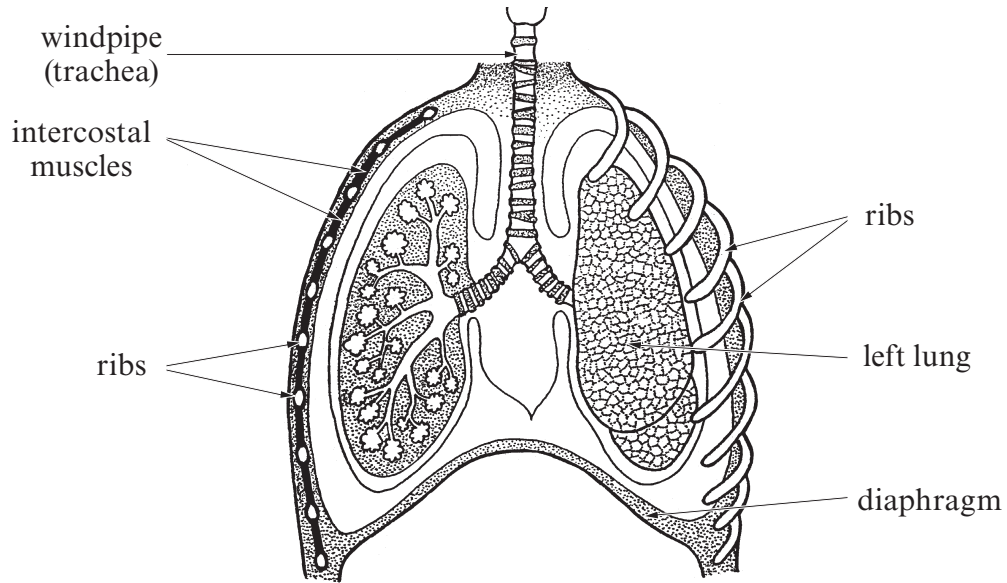
reason .....

.....

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**TURN OVER**

10. The diagram below shows a section through the chest.



Use the above diagram **and your own knowledge** to explain how air is drawn into the lungs during inspiration (breathing in). [6 QWC]

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END OF PAPER