



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

CANDIDATE  
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**HUMAN AND SOCIAL BIOLOGY**

**5096/02**

Paper 2

**May/June 2008**

**2 hours**

Candidates answer Section A on the Question Paper

Additional Materials: Answer Booklet/Paper

**READ THESE INSTRUCTIONS FIRST**

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.  
Write your Centre number, candidate number and name on all the work you hand in.  
Write in dark blue or black pen on both sides of the paper.  
Do not use staples, paper clips, highlighters, glue or correction fluid.  
**DO NOT WRITE IN ANY BARCODES.**

**Section A**

Answer **all** questions.  
Write your answers in the spaces provided on the question paper.  
You are advised to spend no longer than 1 hour on Section **A**.

**Section B**

Answer **all** the questions, including questions 8, 9 and 10 **Either** or 10 **Or**.  
Write your answers to questions 8, 9 and 10 on the separate answer paper provided.  
Write an E (for Either) or an O (for Or) next to the number 10 in the grid below to indicate which question you have answered.

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	
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2	
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<b>Section A sub-total</b>	
8	
9	
10	
<b>Total</b>	

This document consists of **13** printed pages and **3** blank pages.



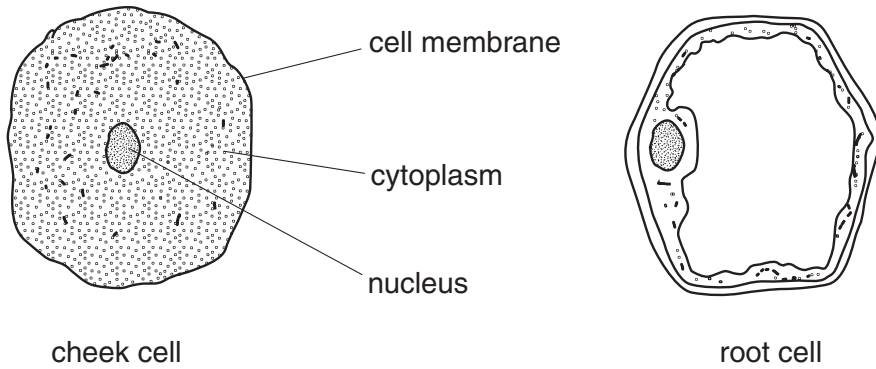
**Section A**

Answer **all** the questions.

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Write your answers in the spaces provided.

- 1 Fig. 1.1 shows a cell from the lining of the mouth and one from the root of a plant, as seen through a light microscope.



**Fig. 1.1**

- (a) Three parts of the cheek cell have been labelled for you. Identify the same parts of the root cell by suitable label lines running from the label to the correct part of the root cell. [3]
- (b) State how a bacterial cell would
- (i) differ from either of the cells above, .....
- (ii) resemble the plant cell. .... [2]
- (c) In the human body, cells are specialised to perform certain functions efficiently. Identify the cells whose specialisations are described in Table 1.1 below.

**Table 1.1**

cell specialisation	name of cell
cytoplasm secretes calcium salts and protein fibres	
contains pigment responding to bright light	
cytoplasm contains haemoglobin	
nucleus is haploid	

[4]

Specialised cells are grouped together into tissues, each performing a particular function. Several tissues make up an organ. Fig. 1.2 shows some of the tissues that make up the elbow joint of the arm.

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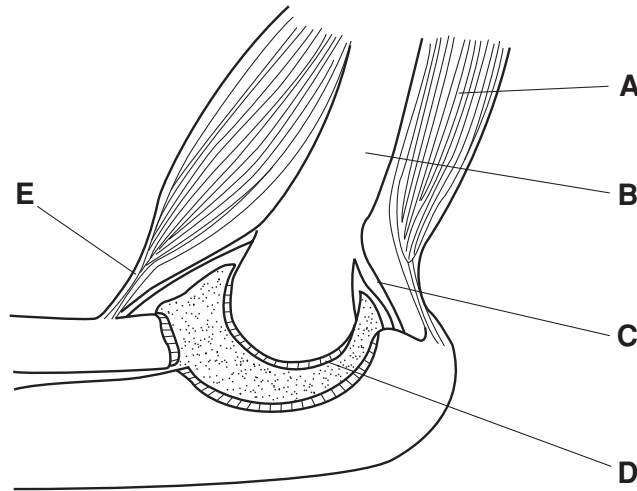


Fig. 1.2

(d) Name the **types of tissue** labelled **A** to **E**.

**A** .....

**B** .....

**C** .....

**D** .....

**E** .....

[5]

(e) Using letters from **A** to **E**, state which of these tissues is

(i) elastic, .....

(ii) contractile, .....

(iii) non-elastic but soft, .....

(iv) bathed by synovial fluid. ....

[4]

(f) All animal and plant cells contain mitochondria in their cytoplasm.

(i) Name the cell process that mitochondria carry out. ....

(ii) State which of the tissues **A** to **E** has highest number of mitochondria in its cells. ....

[2]

[Total: 20]

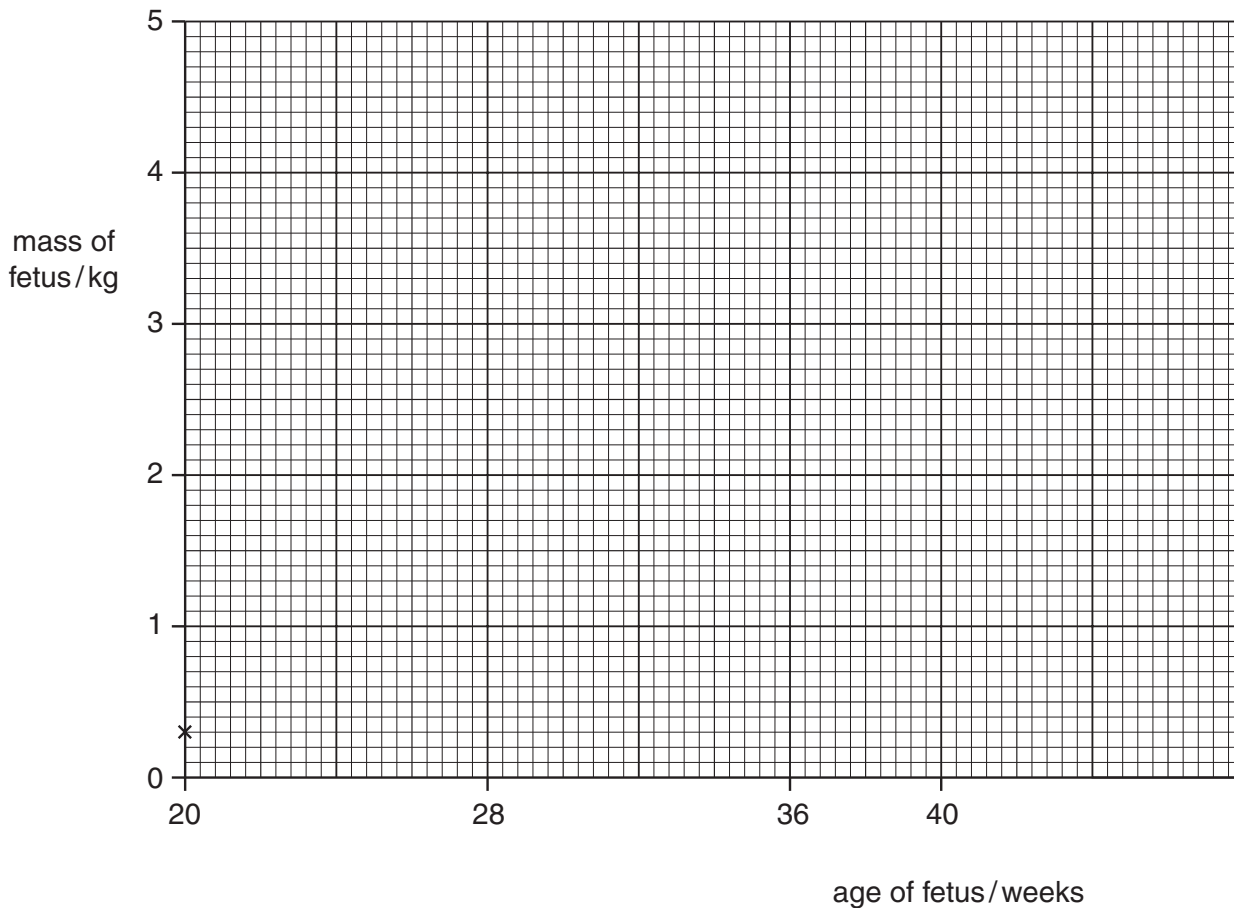
2 Table 2.1 shows the growth of a fetus during the last twenty weeks of a pregnancy.

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**Table 2.1**

age of fetus/weeks	mass of fetus/kg
20	0.30
28	1.20
36	2.25
40	3.50

(a) Plot the last three figures onto the graph in Fig. 2.1. The first has been done for you. Join the points up to make a line. [4]



**Fig. 2.1**

(b) State which part of the pregnancy shown has the fastest growth.

.....[1]

(c) By extending your graph, estimate the mass of the fetus if it was born at 42 weeks.

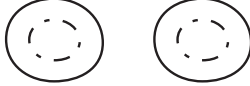

birth weight = ..... kg [2]

[Total: 7]

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- 3 Three drops of blood were taken and one drop placed in each of three different solutions, **A**, **B** and **C**, and their appearances recorded. Small amounts of each of the resulting solutions were then examined under a microscope to see the appearance of the red blood cells. The results are recorded in Table 3.1 below.

Table 3.1

solution	appearance to naked eye	appearance under microscope
<b>A</b> distilled water	clear, red solution	no cells visible
<b>B</b> plasma	cloudy, red solution	
<b>C</b> strong salt	cloudy, red solution	

- (a) Explain why no cells are visible in **A**.

.....  
 ..... [3]

- (b) Explain what has happened to the cells in **C**.

.....  
 ..... [2]

[Total: 5]

4 Fig. 4.1 summarises some of the processes by which nitrogen circulates through the ecosystem.

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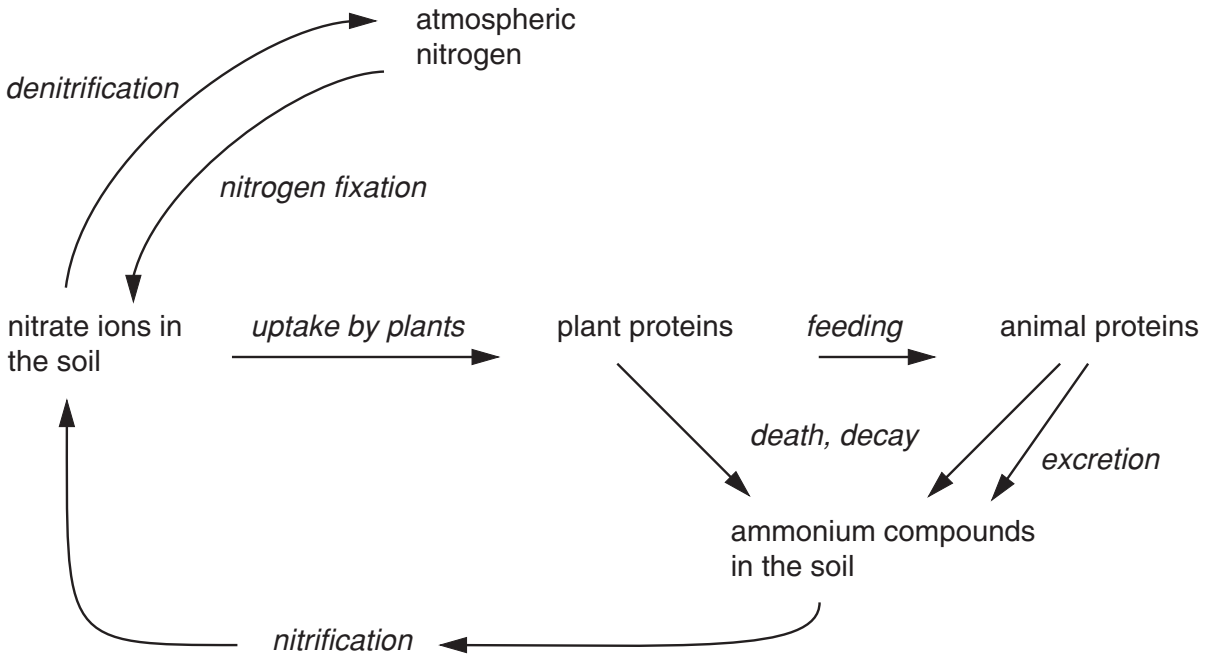


Fig. 4.1

(a) Using **only** information from Fig. 4.1, state which two processes lower the levels of nitrate ions in the soil.

.....  
 ..... [2]

(b) *Decay* and *nitrification* are carried out by aerobic bacteria; *denitrification* is carried out by anaerobic bacteria.

(i) State what will be the effect on soil nitrate levels of prolonged flooding.

..... [1]

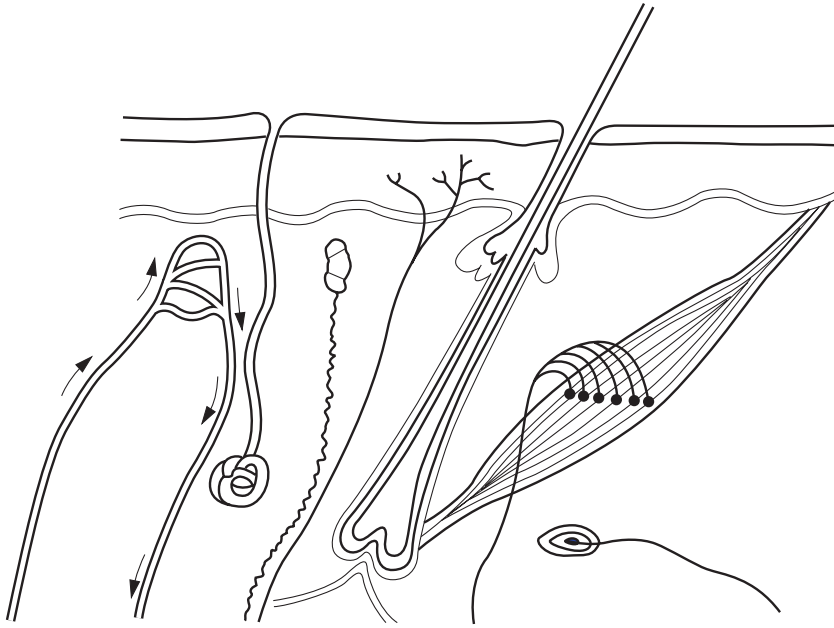
(ii) Explain your answer to (b)(i) above.

.....  
 .....  
 .....  
 ..... [3]

[Total: 6]

5 Fig. 5.1 is a section through human skin.

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**Fig. 5.1**

(a) Using label lines and the letters **M**, **N**, **O**, **P** and **Q**, label the following on Fig. 5.1.

**M**, a layer of dead cells

**N**, a structure generating nerve impulses

**O**, a layer of cells dividing by mitosis

**P**, a gland used in temperature control

**Q**, a blood vessel with a muscular wall.

[5]

(b) Use named label lines to identify,

(i) a sensory neurone,

(ii) a motor neurone.

[2]

[Total: 7]



6 Table 6.1 shows the composition of 100 g samples of different foods.

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**Table 6.1**

food	energy /kJ	protein /g	fat /g	carbohydrate /g	calcium /mg	iron /mg	vitamin C /mg	vitamin D /micrograms
meat	950	18	17	0	7	2.0	0	0
fish	320	18	1	0	15	0.5	0	0
eggs	610	12	12	0	54	2.0	0	1.5
bread	1025	10	3	50	28	3.0	0	0
milk	270	3.5	4	5	120	0.1	1	0.05
rice	1525	6.2	1	80	4	0.5	0	0
potatoes	330	1.5	0	20	4	0.5	7	0

Using information from Table 6.1,

(a) explain why fish might be a healthier option than meat as a source of protein.

..... [1]

(b) state which two of the foods would best prevent

(i) scurvy, .....

(ii) rickets. .... [2]

(c) Give two reasons why rice is better for growth than potatoes.

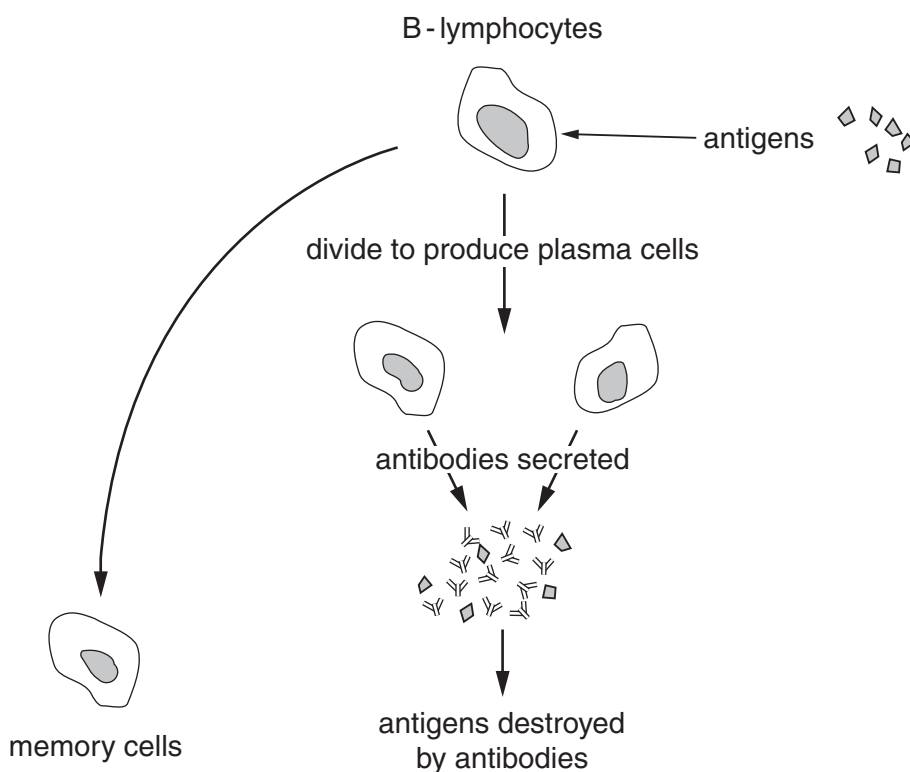
1. ....

2. .... [2]

[Total: 5]

7 Fig. 7.1 shows how cells of the immune system react to antigens.

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**Fig. 7.1**

(a) Name the cell types produced by the lymphocytes.

1..... [1]

2..... [2]

(b) Name the type of cell division that gives rise to plasma cells.

..... [1]

(c) State which cells in Fig. 7.1 respond to future attacks by that particular antigen.

..... [1]

(d) Explain why plasma cells have many ribosomes.

..... [1]

[Total: 5]

## Section B

Answer **all** the questions, including questions 8, 9 and 10 **Either** or 10 **Or**.

Write your answers on the separate answer paper provided.

8 Both cholera and schistosomiasis are diseases obtained from infected water.

(a) Compare these two diseases using the following headings

- causative organism
- how the disease enters the body
- where in the body the organism lives
- symptoms

[10]

(b) Fig. 8.1 shows stages in the large-scale treatment of water to make it safe for use.

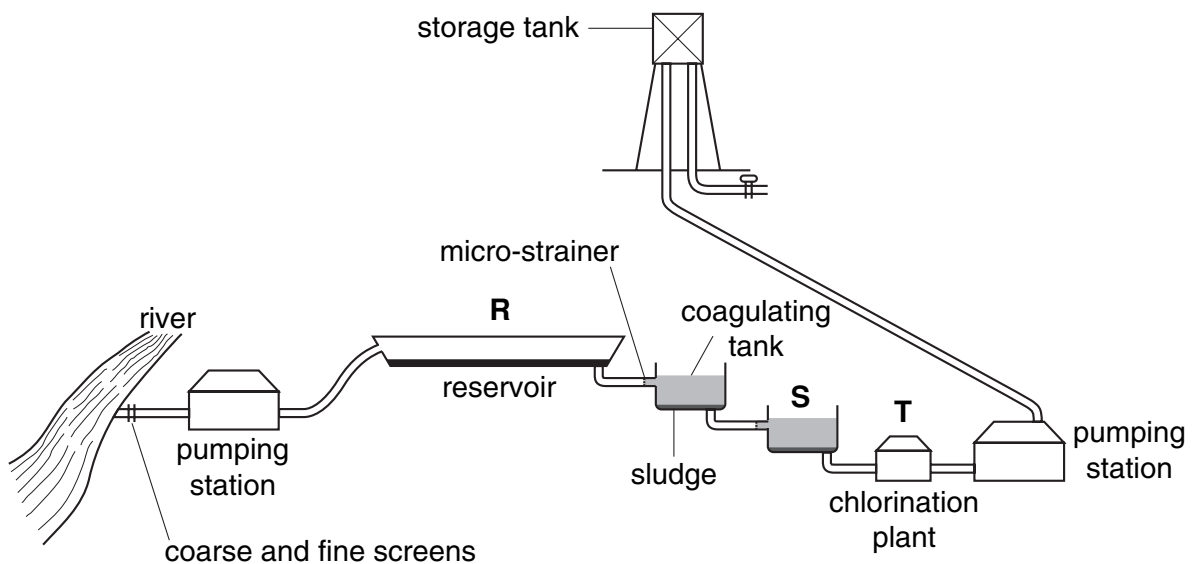
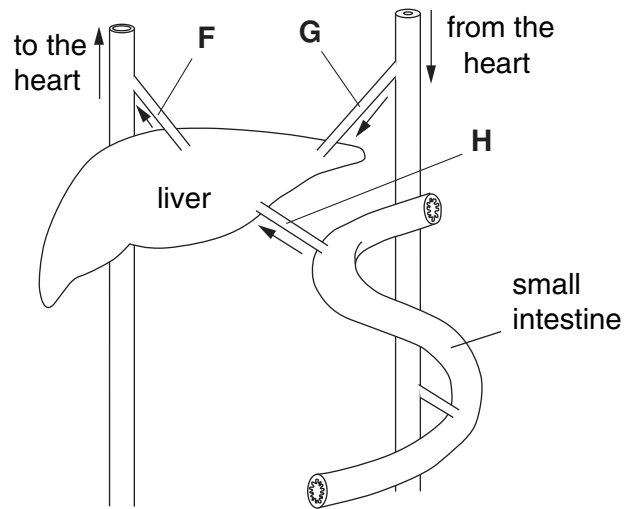


Fig. 8.1

Describe how stages **R**, **S** and **T** help to purify the water.

[5]

- 9 Fig. 9.1 shows a diagram of the liver and its three blood vessels labelled **F**, **G** and **H**.



**Fig. 9.1**

- (a) Name **F**, **G** and **H**. [3]
- (b) Explain how the liver assists in digestion. [3]
- (c) Liver cells assist in controlling the concentration of glucose in the blood. They do this by responding to several hormones.

Describe how liver cells respond to these hormones. [9]

## 10 Either

- (a) Distinguish between **antiseptic** and **antibiotic** in the control of an infection. [4]
- (b) Explain why patients given a course of antibiotics must finish taking the course, even if they feel better after a few days. [4]
- (c) Explain why some of the earliest antibiotics are no longer effective. [2]
- (d) Describe how you could show that a substance had antibiotic properties. [5]

## 10 Or

- (a) Distinguish between **egestion** and **excretion**. [4]
- (b) Explain **why** the products of egestion and excretion must be disposed of safely. [4]
- (c) Write an equation for respiration. [2]
- (d) Carbon dioxide turns lime water milky. Using this information, describe an experiment to show that we produce more carbon dioxide when we exercise. [5]





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