Your Science Online

Cambridge IGCSE Biology 0610 style

RESPIRATION

Topic practice paper (exam style)

CANDIDATE NAME	
CLASS	
DATE	

50 minutes

You will need: a pen, a pencil, a ruler and a calculator.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes or in the margins.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 45.
- The number of marks for each question or part question is shown in brackets [ ].
- Questions or parts marked **[Extended]** are for Extended-tier candidates. Core candidates may leave them out (Core total: 37 marks).
- Topics: uses of energy, aerobic and anaerobic respiration, word and symbol equations, yeast, exercise and oxygen debt, respirometers.

For teacher's use	
Question	**Mark**
1	
2	
3	
4	
5	
Total	

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1 Respiration happens in all living cells.

(a) State what is meant by *aerobic respiration*.

.....

..... [2]

(b) Complete the word equation for aerobic respiration.

glucose + ... → ..... + water

[2]

(c) State **three** uses of the energy released by respiration in the human body.

1

.....

2

.....

3

..... [3]

(d) ***[Extended]*** Write the balanced chemical equation for aerobic respiration.

.....

..... [2]

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2 An athlete runs as fast as possible for 10 minutes and then rests. The concentration of lactic acid in her blood is measured. Table 2.1 shows the results.

time / min	0	5	10	15	20	30
	rest	running	stops	resting	resting	resting
lactic acid / mmol/dm^3	1.0	6.5	11.0	7.0	4.0	1.5

Table 2.1

(a) Describe the changes in the concentration of lactic acid shown in Table 2.1. Use data in your answer.

.....

.....

..... [2]

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(b) Lactic acid is made by anaerobic respiration in muscles.

(i) Complete the word equation for anaerobic respiration in muscles.

glucose → .....

[1]

(ii) Explain why the muscles respire anaerobically during hard exercise.

.....

..... [2]

(c) ***[Extended]*** The athlete keeps breathing fast and deeply after she stops running. Explain how the lactic acid is removed from her body after exercise. Use the term *oxygen debt* in your answer.

.....

.....

.....

.....

..... [4]

(d) Suggest why the athlete's heart rate stays high for some time after exercise.

..... [1]

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3 A student investigates the effect of temperature on respiration in yeast. Fig. 3.1 shows the apparatus. The student counts the bubbles of gas made in one minute at different temperatures.

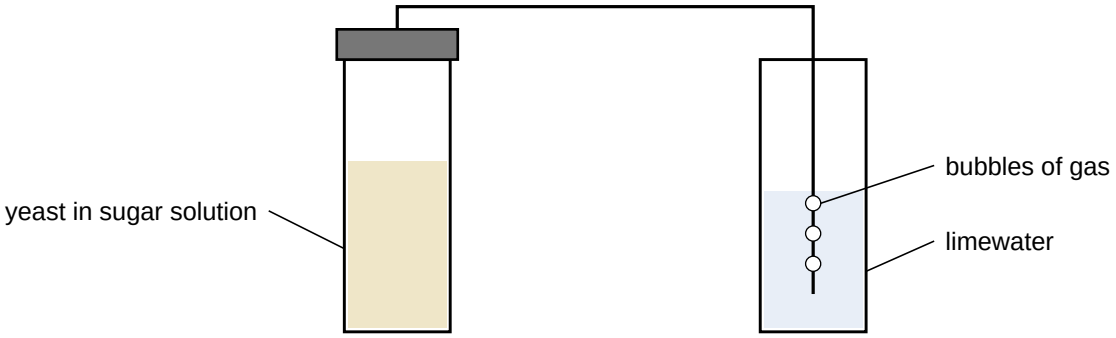

Fig. 3.1

(a) The limewater turns milky. Name the gas made by the yeast.

..... [1]

(b) Complete the word equation for anaerobic respiration in yeast.

glucose → ..... + ...

[2]

temperature / °C	10	20	30	40	50	70
bubbles per minute	3	9	20	32	14	0

Table 3.1

(c) Describe the effect of temperature on the rate of respiration in yeast. Use data from Table 3.1.

.....

.....

..... [2]

(d) Explain why no bubbles are made at 70 °C.

.....

..... [2]

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(e) State **two** variables the student should keep the same.

1 .....

2 ..... [2]

(f) State **one** way that people use anaerobic respiration in yeast.

..... [1]

4 Fig. 4.1 shows a respirometer used to measure the rate of respiration of germinating seeds. Soda lime absorbs carbon dioxide.

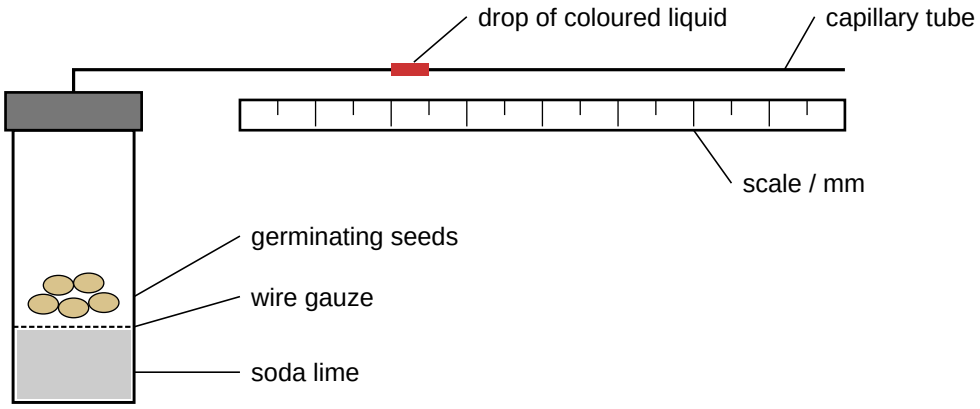

Fig. 4.1

(a) The drop of coloured liquid moves towards the seeds. Explain why.

.....

.....

..... [3]

(b) The drop moves 24 mm in 8 minutes. Calculate the rate of movement of the drop.

.....

rate = ... mm per min [2]

(c) A second respirometer is set up with the same mass of boiled (dead) seeds. Explain why this is done.

.....

..... [2]

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(d) Suggest why the respirometer is kept in a water bath at a constant temperature.

.....

..... [1]

(e) Predict what would happen to the movement of the drop if the soda lime was removed.

..... [1]

5 Table 5.1 compares aerobic and anaerobic respiration in human muscles.

(a) Complete Table 5.1.

	aerobic respiration	**anaerobic respiration in muscles**
oxygen needed		
products		
energy released per glucose		

Table 5.1

[4]

(b) ***[Extended]*** Explain why anaerobic respiration releases much less energy per glucose molecule than aerobic respiration.

.....

..... [2]

(c) Name the gas that is a product of aerobic respiration but **not** of anaerobic respiration in muscles.

..... [1]

END OF PAPER

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