

Respiration: practice questions

5 questions · 16 marks · mark scheme at the back

For Edexcel GCSE Biology 1BI0 and Combined Science 1SC0. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 16

1 Respiration is an exothermic reaction. What does this mean? [1 mark]

- A. ☐ Energy is transferred to the surroundings
- B. ☐ Energy is taken in from the surroundings
- C. ☐ Oxygen is used up
- D. ☐ Carbon dioxide is produced

2 Write the word equation for aerobic respiration. [2 marks]

3 Describe how a respirometer can be used to compare the rate of respiration of germinating seeds at two different temperatures. [4 marks]

4 In a respirometer experiment, the coloured liquid moved 12 mm in 4 minutes at 20 °C and 30 mm in 5 minutes at 30 °C. Calculate the rate of movement at each temperature in mm per minute and state how many times faster the rate of respiration was at 30 °C. [3 marks]

Answer =

5 Compare the process of aerobic respiration with the process of anaerobic respiration. **[6 marks]**

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Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

A A (energy is transferred to the surroundings)

2. [2]

- glucose + oxygen (1)
- → carbon dioxide + water (1) allow correct balanced symbol equation

3. [4]

- place seeds in a tube with soda lime / carbon dioxide absorber, connected to a capillary tube with a drop of coloured liquid (1)
- place the tubes in water baths at the two temperatures (1)
- measure the distance the liquid moves in the same time (1)
- control variables, for example the same mass of seeds and the same time (1)
- repeat and calculate a mean (1)
- Max 4

4. [3]

- 20 °C: $12 \div 4 = 3$ mm per minute (1)
- 30 °C: $30 \div 5 = 6$ mm per minute (1)
- twice as fast / 2 times (1)

5. [6]

Level 3 5-6	A detailed comparison covering oxygen requirement, energy released and the products in animals and in plants or yeast. Similarities and differences are clearly linked.
Level 2 3-4	Some similarities and differences are described, but the comparison is incomplete, for example products for only one type of organism.
Level 1 1-2	Basic statements about one or both types of respiration, with little or no comparison.

Indicative content

- both are exothermic reactions that release energy from glucose
- both happen in living cells to release energy for metabolic processes
- aerobic respiration needs oxygen, anaerobic respiration does not
- aerobic respiration breaks glucose down completely, anaerobic is an incomplete breakdown
- aerobic releases much more energy per glucose molecule
- aerobic products are carbon dioxide and water
- anaerobic products in animals: lactic acid
- anaerobic products in plants and yeast: ethanol and carbon dioxide