

Respiration: practice questions

6 questions • 19 marks • mark scheme at the back

For Pearson Edexcel International GCSE Biology 4BI1 and Science (Double Award) 4SD0. **Biology only** is not in the Double Award and is only examined on Paper 2.

Name

Total / 19

1 What does ATP do in a cell? [1 mark]

- A. ☐ It stores glucose for later use
- B. ☐ It provides energy for cell processes
- C. ☐ It carries oxygen in the blood
- D. ☐ It speeds up chemical reactions as an enzyme

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

3 Write the balanced chemical symbol equation for aerobic respiration. [2 marks]

4 Describe the differences between aerobic respiration and anaerobic respiration in animal cells. [4 marks]

- 5** A student investigates the heat released by germinating peas. She puts germinating peas into one vacuum flask and boiled peas into a second flask. She places a thermometer in each flask. (a) Explain why she uses boiled peas. (b) Explain why she rinses both batches of peas in disinfectant. (c) Predict the change in temperature in the flask of germinating peas. **[4 marks]**

[illegible]

- 6** During a sprint, muscle cells use a lot of ATP. Explain how respiration produces ATP, why muscle cells need ATP, and how respiration in the muscle cells differs when oxygen supply is low. **[6 marks]**

[illegible]

Mark scheme

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

1. [1]

B B (1)

2. [2]

- glucose + oxygen (1)
- → carbon dioxide + water (1)
- allow reactants and products in either order if correct sides

3. [2]

- $C_6H_{12}O_6 + 6O_2$ (1)
- → $6CO_2 + 6H_2O$ (1)
- allow 1 mark for correct formulae if the equation is not balanced

4. [4]

- aerobic needs oxygen / anaerobic does not need oxygen (1)
- aerobic breaks glucose down completely / anaerobic breaks it down incompletely (1)
- aerobic releases more energy (per glucose) / anaerobic releases less energy (1)
- aerobic produces carbon dioxide and water / anaerobic produces lactic acid (1)

5. [4]

- (a) as a control / to show that the temperature change is caused by living (respiring) seeds (1)
- (b) to kill microorganisms (on the surface of the peas) (1)
- which would also respire and release heat / so only the peas cause the temperature change (1)
- (c) temperature increases / rises (1)

6. [6]

Level 3 5-6	A clear, well-structured explanation that links respiration to ATP production, gives a correct use of ATP in muscle cells and describes the difference between aerobic and anaerobic respiration, using correct scientific terms.
Level 2 3-4	Explains at least two of the three parts correctly, with some use of scientific terms. Some links may be missing or unclear.
Level 1 1-2	Gives one or two simple correct statements about respiration or ATP, with little or no explanation.

Indicative content

- respiration breaks down glucose and releases energy
- the energy released is used to make ATP (from ADP and phosphate)
- ATP is broken down to release energy where it is needed
- muscle cells need ATP for muscle contraction (so movement)
- with enough oxygen, aerobic respiration: glucose + oxygen → carbon dioxide + water, releasing a large amount of energy
- when oxygen is low, anaerobic respiration: glucose → lactic acid
- anaerobic respiration releases much less energy per glucose, so less ATP is made