

Anaerobic Respiration

KS3 Biology · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Write the word summary for anaerobic respiration in human muscles.

Step 1 · Anaerobic means

Without oxygen.

Step 2 · Reactant

Glucose only.

Step 3 · Product

Lactic acid, with a small amount of energy released.

Answer: glucose → lactic acid (a little energy released)

Check: No carbon dioxide is made in human anaerobic respiration.

2. Now try one with the steps

Write the word summary for fermentation in yeast.

Step 1 · Reactant

Step 2 · Products

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What does 'anaerobic' mean? [1]

2. What is made in human muscles during anaerobic respiration? [1]

3. What are the products of fermentation in yeast? [2]

4. Which releases more energy from each glucose: aerobic or anaerobic respiration? [1]

5. When do human muscles respire anaerobically? [1]

6. Why does bread dough rise? [2]

7. What is the 'oxygen debt'? [2]

8. Give TWO differences between aerobic and anaerobic respiration in humans. [2]

9. Name ONE food or drink made using fermentation by microorganisms. [1]

10. Yeast made 2 cm³ of gas at 5 °C, 14 cm³ at 20 °C, 38 cm³ at 35 °C and 0 cm³ at 60 °C. At which temperature was fermentation fastest, in °C? [1]

11. Explain why no gas was made at 60 °C. [2]

12. At 20 °C yeast made 14 cm³ of gas in 30 minutes. What is the rate in cm³ per minute? Give your answer to 2 decimal places. [1]

13. Name the control in the yeast experiment and explain its purpose. [2]

14. Explain why anaerobic respiration releases less energy than aerobic respiration. [2]

4. Before you hand it in

"Humans make carbon dioxide in anaerobic respiration."

Humans: glucose → lactic acid only. Yeast: glucose → ethanol + carbon dioxide.

"Anaerobic respiration releases no energy."

It releases a small amount — enough for a short burst — but far less than aerobic.

"Lactic acid causes the soreness you feel days after exercise."

Lactic acid is cleared within about an hour. Next-day soreness is mainly caused by tiny damage to muscle fibres.