Respiration

GCSE Biology · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Give three ways organisms use the energy transferred by respiration. (3 marks)

Step 1 · Chemical reactions

To build larger molecules from smaller ones (e.g. proteins from amino acids).

Step 2 · Movement

For muscle contraction.

Step 3 · Warmth

To keep warm (maintaining body temperature in mammals and birds).

Answer: Building molecules; movement; keeping warm

Check: Respiration is exothermic: it transfers energy to the surroundings.

2. Now try one with the steps

Compare aerobic respiration with anaerobic respiration in muscles. (4 marks)

Step 1 · Oxygen

Step 2 · Products

Step 3 · Energy

Step 4 · Oxidation

Answer:

3. Practice

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

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

2. Is respiration exothermic or endothermic? [1]

3. Write the word equation for anaerobic respiration in muscles. [1]

4. Write the word equation for anaerobic respiration in yeast. [2]

5. Give two uses of fermentation by yeast. [2]

6. Name the sub-cellular structure where aerobic respiration mainly takes place. [1]

7. Explain why anaerobic respiration transfers less energy than aerobic respiration. [2]

8. Explain why plant roots in waterlogged soil may respire anaerobically. [2]

9. Yeast produced 15 cm^3 of CO_2 in 5 minutes. Calculate the rate in cm^3/min. [1]

10. The rate rose from 1.5 to 3.0 cm^3/min when temperature increased. Calculate the percentage increase. [2]

11. Write the balanced symbol equation for aerobic respiration. [2]

12. How many molecules of oxygen are needed to respire 4 molecules of glucose aerobically? [1]

13. Suggest how you could show that germinating peas respire, using a temperature measurement. [3]

14. Explain why a yeast and sugar solution stops producing CO_2 after several days even though sugar remains. [2]

4. Before you hand it in

"Respiration is breathing."
Respiration is a chemical reaction in every living cell that transfers energy from glucose. Breathing moves air in and out of the lungs.

"Respiration produces energy."
Respiration TRANSFERS energy from glucose for use by the cell.

"Plants only respire at night."
Plant cells respire all the time; in daylight photosynthesis is usually faster, hiding it.

"Anaerobic respiration in humans produces ethanol."
Human muscles: lactic acid only. Yeast and plants: ethanol and carbon dioxide.