Exercise Metabolism

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

Name _____ Class _____ Date _____

1. Worked example

Describe and explain how the body responds to exercise. (4 marks)

Step 1 · Heart

Heart rate increases, pumping blood faster.

Step 2 · Breathing

Breathing rate and breath volume increase.

Step 3 · Why

To supply more oxygenated blood and glucose to the muscles for faster aerobic respiration.

Step 4 · And

To remove the extra carbon dioxide produced more quickly.

Answer: Heart rate, breathing rate and breath volume rise to supply O_2 and remove CO_2

Check: Always link the change to the muscles' increased respiration.

2. Now try one with the steps

Use the example data: calculate the percentage increase in heart rate from rest (70 bpm) to the end of exercise (154 bpm). (2 marks)

Step 1 · Increase

Step 2 · Percentage

Answer:

3. Practice

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

1. Give three changes in the body during exercise. [3]

2. Explain why heart rate increases during exercise. [2]

3. What causes muscle fatigue during long periods of vigorous activity? [1]

4. Define metabolism. [1]

5. Name the substance formed when excess proteins are broken down in the liver. [1]

6. Exercise stopped at 4 minutes, when heart rate was 154 bpm. Heart rate returned to its resting value of 70 bpm at 10 minutes. Calculate the recovery time in minutes. [1]

7. Name the molecules that join to make a lipid. [2]

8. Give two molecules made by joining glucose molecules. [2]

9. A heart rate rises from 64 to 160 bpm. Calculate the percentage increase. [2]

10. 18 breaths per minute of 0.6 dm^3 each. Calculate the volume breathed per minute in dm^3. [1]

11. What is meant by oxygen debt? [2]

12. Describe what happens to lactic acid after exercise. [2]

13. Suggest why a trained athlete's heart rate returns to normal faster than an untrained person's. [3]

14. Explain why metabolism needs energy from respiration. [2]

4. Before you hand it in

"Lactic acid is breathed out after exercise."
Lactic acid is carried to the liver and converted back into glucose; the extra oxygen needed is the oxygen debt.

"Heart rate goes up so muscles get more blood to make energy."
More blood brings more oxygen and glucose for respiration, which transfers more energy.

"Metabolism means how fast you burn fat."
In biology metabolism is the sum of ALL reactions in a cell or body, building up and breaking down.