

Thermoregulation

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

Name _____ Class _____ Date _____

1. Worked example

Explain why body temperature must be kept close to 37 °C. (2 marks)

Step 1 · Enzymes

Enzymes in the body work best at their optimum temperature, about 37 °C.

Step 2 · Too high or low

Too high and enzymes denature; too low and reactions are too slow for life processes.

Answer: Keeps enzymes at their optimum

Check: This is why body temperature is controlled by homeostasis.

2. Now try one with the steps

Explain how sweating cools the body. (2 marks)

Step 1 · Release

Step 2 · Evaporation

Answer:

3. Practice

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

1. What is the normal core body temperature of a human? [1]

2. Where is body temperature monitored and controlled? [1]

3. Name two ways the body responds when it is too hot. [2]

4. Name two ways the body responds when it is too cold. [2]

5. Where are the receptors that detect changes in skin temperature? [1]

6. Explain why shivering warms the body. [2]

7. Explain why a person looks flushed (red) when hot. [1]

8. Explain why sweating cools the body less on a humid day. [2]

9. Temperature fell from 37.0 °C to 35.2 °C. Calculate the decrease in °C. [1]

10. A cyclist loses 1.2 kg of water by sweating; they weighed 60 kg. Calculate the percentage of body mass lost. [2]

11. Explain how the thermoregulatory centre detects a rise in core temperature. [1]

12. Explain why vasodilation and vasoconstriction are an example of negative feedback. [2]

13. Body temperature rose 0.05 °C per minute for 30 minutes from 37.0 °C. Calculate the final temperature. [2]

14. Explain why elderly people and babies are at greater risk of hypothermia in cold weather. [3]

4. Before you hand it in

"Capillaries move closer to the skin when you are hot."

The vessels SUPPLYING the skin capillaries widen (vasodilation), so more blood flows through capillaries already near the surface.

"Sweat cools you because it is cold."

It is the EVAPORATION of sweat that transfers heat away.

"Shivering produces heat from the movement."

Shivering increases RESPIRATION in muscles, which transfers energy