

Integration of body systems · supported focus

Supported focus · HL

Supported scope

- Supported HL focus. First assessment 2025; current subject brief acquired; full Biology guide not acquired. Remaining guide, assessment and practical requirements retain their recorded holds.
- State model conditions and distinguish fictional data from measurements.

Homeostasis · 1.1

Reasoning

Blood glucose rises after a meal, but usually does not keep rising indefinitely. A control system responds to the change in internal conditions. Start with a prediction. State the quantities or features you would compare, then decide what evidence could distinguish two explanations.

Homeostasis · 2.1

Reasoning

Homeostasis maintains internal conditions within suitable limits. Receptors detect changes, coordination centres process information, and effectors respond. Negative feedback opposes the original change. homeostasis: Maintenance of suitable internal conditions; negative feedback: A response opposing the original change.

Homeostasis · 3.1

Reasoning

When blood glucose is high, insulin helps increase glucose uptake and storage as glycogen. When it is low, glucagon supports release of glucose from stores. These responses are coordinated, not identical effects of two hormones. Interpret a time graph by identifying the initial disturbance, the response and the return toward the normal range. Mark the delay before a response. Do not assume a graph shows an instantaneous correction.

Homeostasis · 4.1

Reasoning

State the known values and their units. Choose the relation because its assumptions fit this case, then rearrange before substitution. Known: glucose changes from 5.0 to 7.0 arbitrary concentration units. Increase = final - initial. Increase = $7.0 - 5.0 = 2.0$ units. Percentage increase = $2.0/5.0 \times 100 = 40\%$. The numerical change is evidence of a disturbance, not a diagnosis on its own.

Homeostasis · 4.2

Reasoning

A value rises from 4.0 to 5.0. Calculate the percentage increase. Use the same sequence: known quantities $\rightarrow$ model $\rightarrow$ relation $\rightarrow$ substitution $\rightarrow$ unit and interpretation.

Homeostasis · 5.1

Reasoning

Negative feedback does not mean the response is harmful or the measured value becomes negative. Diabetes has different mechanisms; do not treat every case as a failure to make insulin. Return to the original observation. Explain what the result supports, which conditions it assumes, and one way to test a competing explanation.

Homeostasis · 5.2

Reasoning

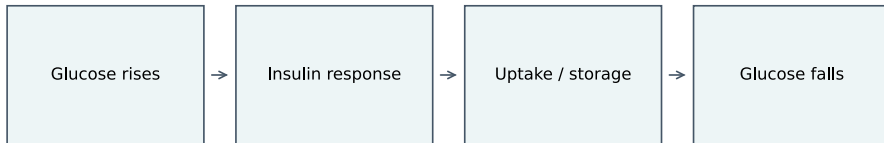
Negative feedback always makes the measured value negative. This claim is false: Negative feedback does not mean the response is harmful or the measured value becomes negative. Diabetes has different mechanisms; do not treat every case as a failure to make insulin.

Homeostasis · 5.3

Reasoning

Feedback and internal conditions: When blood glucose is high, insulin helps increase glucose uptake and storage as glycogen. When it is low, glucagon supports release of glucose from stores. These responses are coordinated, not identical effects of two hormones.

Homeostasis · diagram



- Original teaching diagram: Feedback and internal conditions
- Use the labels and the stated model together.

Homeostasis · original transfer

Your turn

A fictional regulated variable changes from 4 to 5 units, then returns to 4. Explain the sign of the corrective response and why recovery alone does not identify the sensor.

Homeostasis · transfer reasoning

Method and interpretation

The disturbance is +25%. A negative-feedback response opposes it. Recovery is consistent with regulation but cannot by itself identify sensor, signalling pathway or rule out another cause.

Check yourself

- Explain homeostasis using the stated model.
- Explain negative feedback using the stated model.
- Change one value in the original transfer; explain which assumption still matters.