



Homeostasis

EQ: How does homeostasis manage our internal environment?

How do organisms work?

- Organisms must carry out many chemical reactions to grow, obtain energy, and reproduce.
- Many organisms also move, breathe, produce heat, and do other tasks.
- All of these activities require a relatively stable internal environment.

How does the environment impact organisms?

- The external environment around an organism is constantly changing.
- These environmental changes threaten the stability of an organism's internal environment.
- Failure to respond to change can result in an organism's death.

What is Homeostasis?

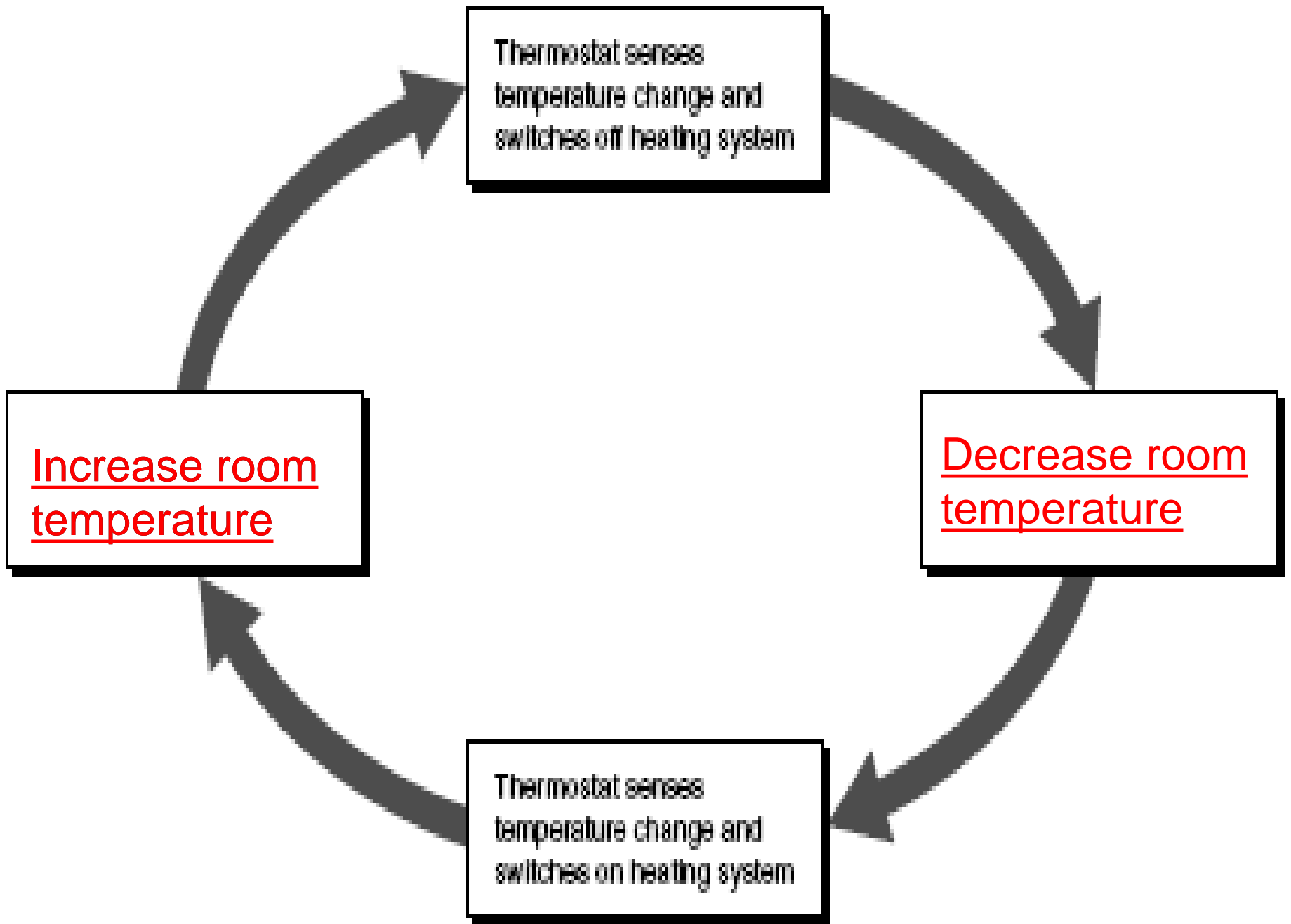
- The process by which organisms maintain a relatively stable internal environment
- Conditions within the body must remain within a narrow range – like your body temperature
 - Important Variables:
 - *blood sugar*
 - *fluid balance*
 - *blood pressure*
 - *body temperature*
 - *oxygen levels*
 - *pH*

How do human handle homeostasis?

- Humans are constantly subjected to environmental stresses that threaten to upset the delicate balance that exists within our cells and tissues.
- Humans require multiple systems for digestion, respiration, reproduction, circulation, movement, coordination, and immunity.
- Our organ systems interact to maintain homeostasis.

Questions:

- 1. Write a short explanation of how you think a thermostat on a furnace helps to keep the room temperature at a comfortable level.**
- 2. How does the human body act like a thermostat?**

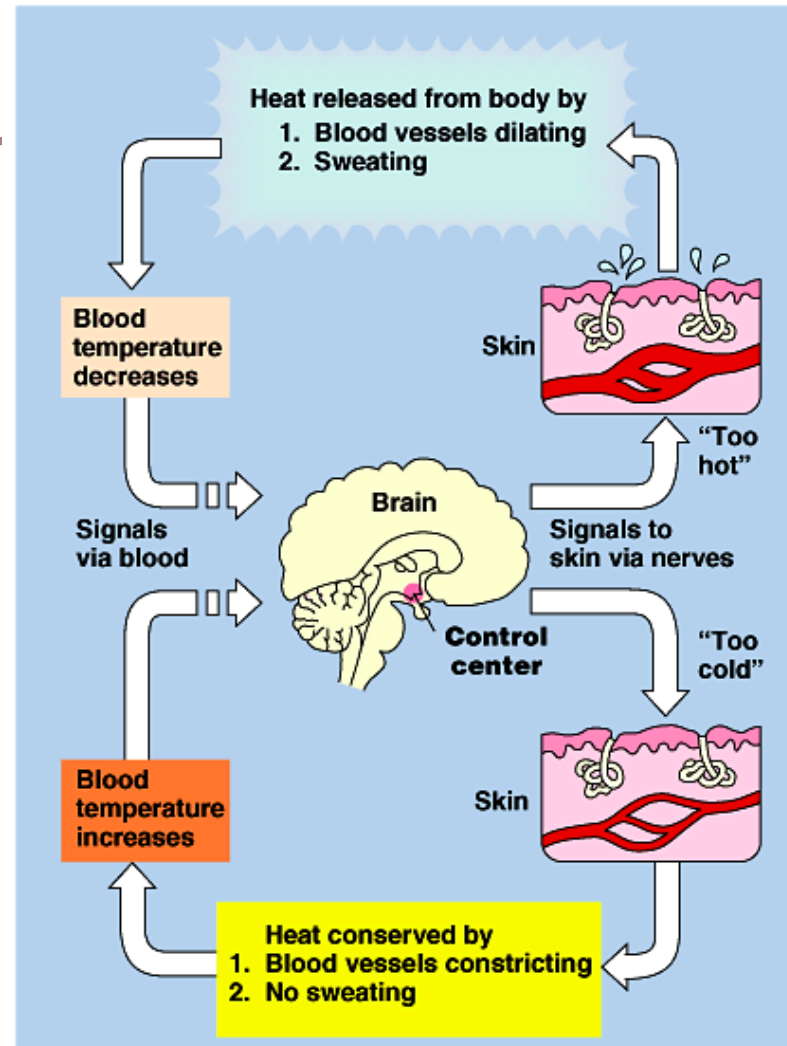


How does your body manage change?

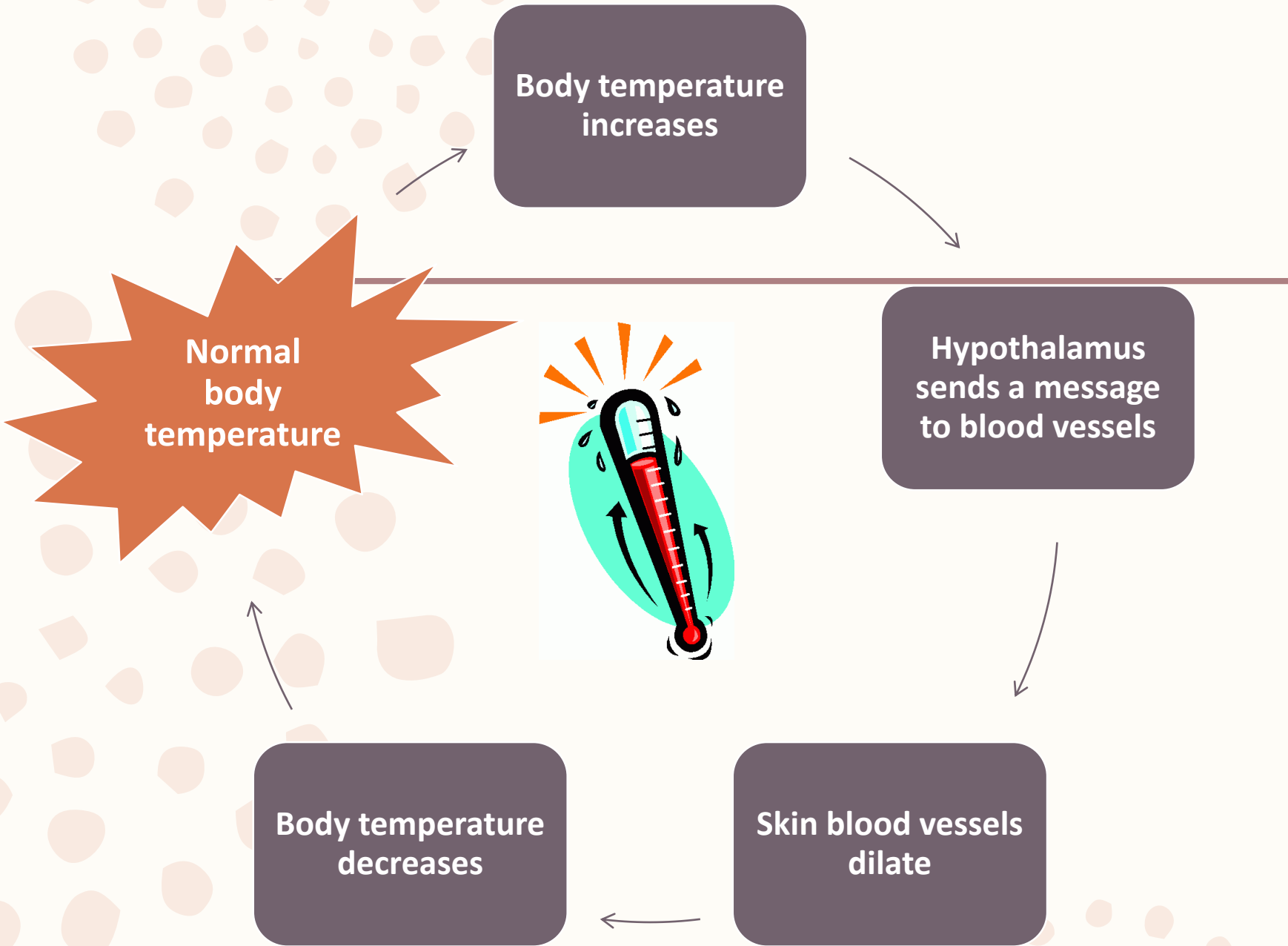
- **Your body has a variety of feedback mechanisms that detect changes in the body's internal environment and make corrections.**
- **A feedback mechanism is a mechanism in which the last step in a series of events controls the first step.**
- **Our bodies have both negative and positive feedback.**

What is negative feedback?

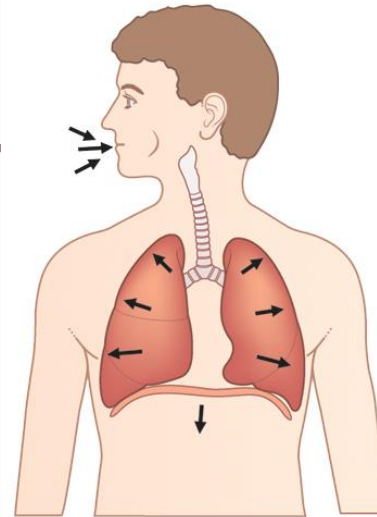
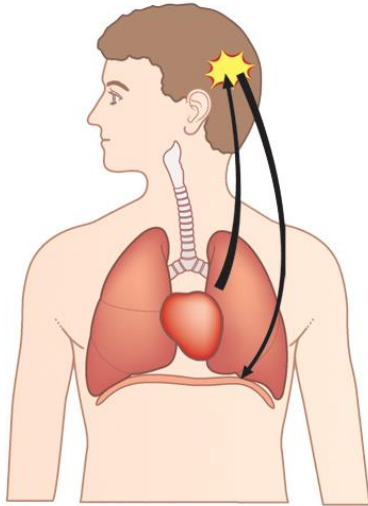
- Negative feedback is necessary for homeostasis
- every time the body is too high or too low from normal level a signal tells the body to make changes that will bring body back
- Examples:
 - *body temperature*
 - *control of blood sugar*



(b) Control of body temperature

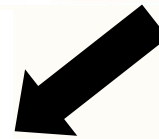
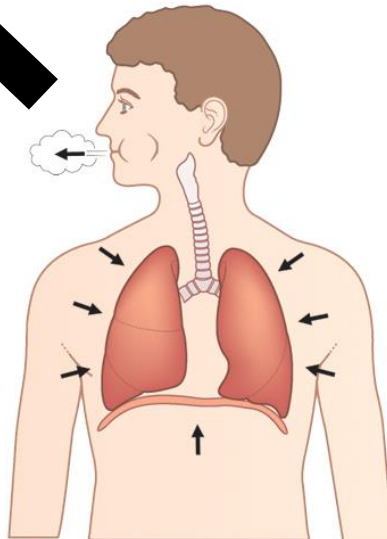


Negative Feedback Loop Example:



Holding
breath,
CO₂ levels
rise

O₂ / CO₂ level
returns to normal



Control system
forces exhale,
inhale

What is positive feedback?

- Positive feedback increases the change (brings the body further from homeostasis)
 - Example: Blood Clotting

