# 1.2 Unifying Themes of Biology

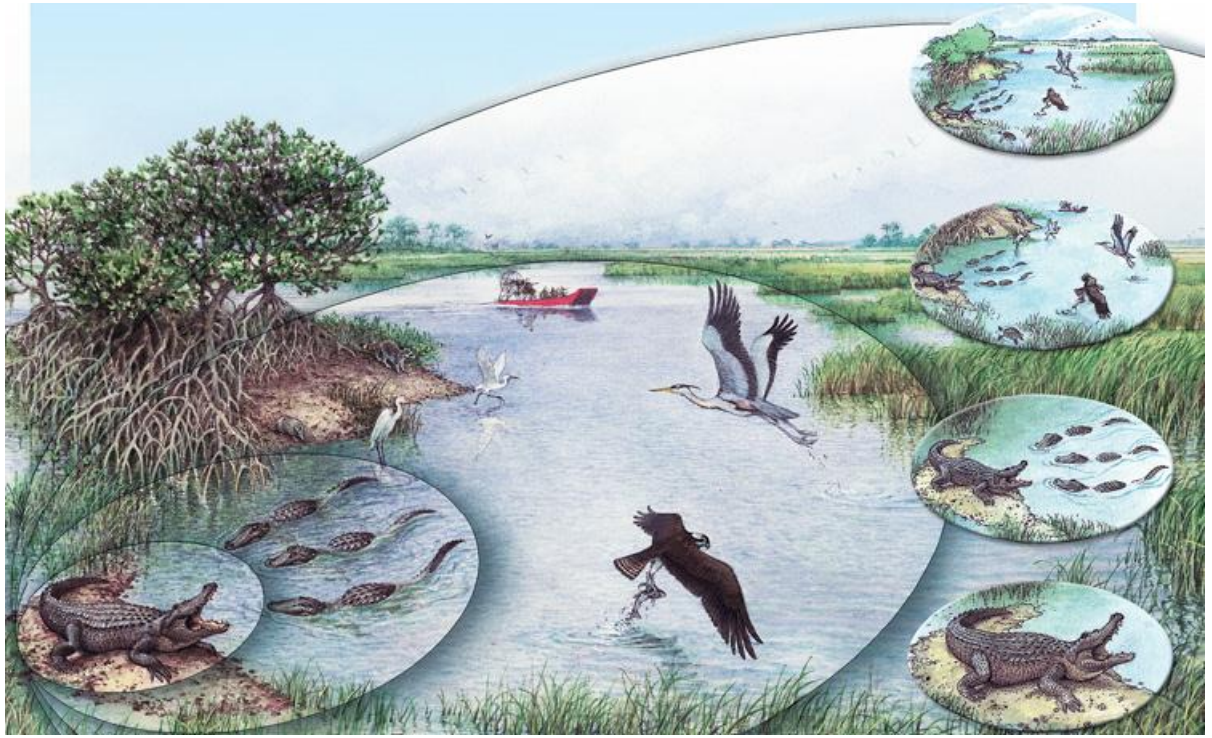
## KEY CONCEPT

**Unifying themes connect concepts from many fields of biology.**

# 1.2 Unifying Themes of Biology

## All levels of life have systems of related parts.

- A system is an organized group of interacting parts.
  - A cell is a system of chemicals and processes.
  - A body system includes organs that interact.
  - An ecosystem includes living and nonliving things that interact.



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- Biologists study many different systems.

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- **Structure and function are related in biology.**
  - Structure determines function.
    - Proteins with different structures perform different functions.
    - Heart muscle cells have a different structure and function than stomach muscle cells.
    - Different species have different anatomical structures with different functions.

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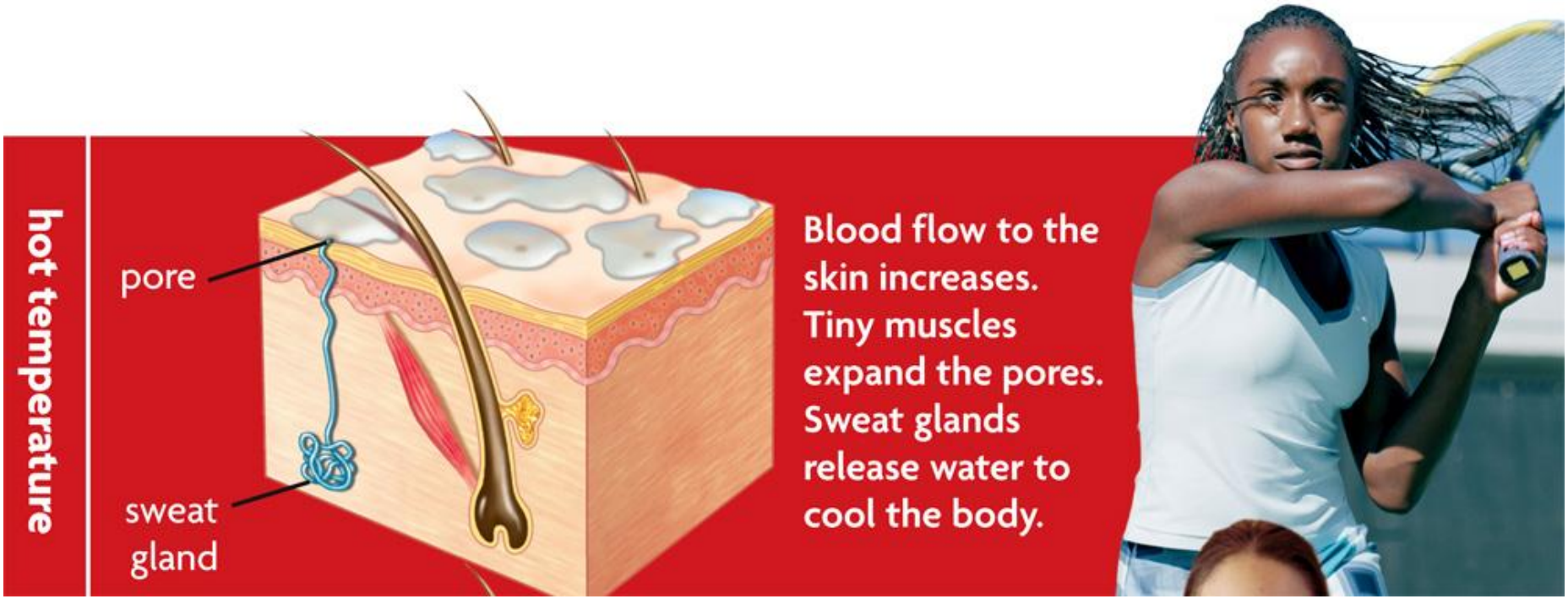
- **Organisms must maintain homeostasis to survive in diverse environments.**
  - Homeostasis is the maintenance of constant internal conditions.



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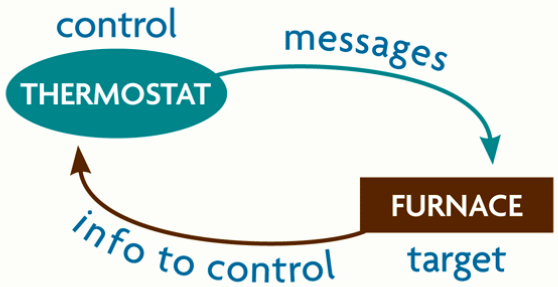
- Homeostasis is the maintenance of constant internal conditions.
  - Homeostasis is usually maintained through negative feedback.
  - Negative feedback systems return a condition to its normal (set) point.

**VISUAL VOCAB**

**Thermoregulation** maintains a stable body temperature under a variety of conditions, just as a thermostat regulates a furnace. Both mechanisms use feedback to keep temperatures within set ranges.



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- Behaviors and adaptations can help maintain homeostasis.

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## Evolution explains the unity and diversity of life.

- Evolution is the change in living things over time.
  - The genetic makeup of a population of a species changes.
  - Evolution can occur through natural selection of adaptations.
  - Adaptations are beneficial inherited traits that are passed to future generations.

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- Evolution accounts for both the diversity and the unity of life.