Science 10

Unit D: Energy flow in global systems

Biomes as open systems

Grassland boundaries

- Sunlight, water, organisms, gases, and nutrients cross any chosen biome boundary.
- Matter cycles within and across the boundary while energy flows through and leaves mainly as thermal energy.



Matter and energy exchange

- A biome includes its climate, soils, living communities, and the materials that cross its boundary.
- Matter and energy move between the biome and its surroundings.
- When you model a biome, name what cycles, what flows through, and what the climate allows to live there.

Key terms

biome

A large ecological region characterized by climate and typical communities.

open system

A system that exchanges matter and energy with its surroundings.

matter cycle

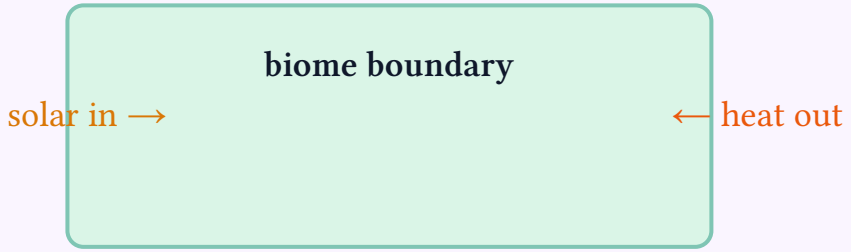
Repeated movement and transformation of matter among reservoirs.

energy flow

One-way transfer and transformation of energy through a system.

Biome inputs and outputs

- A biome boundary is a line people choose for study. Living things cross it freely.
- Light, water, gases, animals, and nutrients cross it.
- Matter can loop among soil, water, air, and organisms.
- Energy arrives mostly as sunlight and leaves mostly as heat.



Matter cycles; energy flows through: compare to cell open system

System inventory

- Choose a biome and draw the boundary you are studying.
- Sort four exchanges into inputs and outputs.
- Say which exchanges are matter, which are energy, and how the climate limits the community.

System inventory

- Choose a biome boundary and classify four exchanges as inputs or outputs.
- A complete answer names the boundary, separates matter from energy, and connects the exchanges to the climate.

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