

Module 1 Study Guide: Ecology

Key Terms

- **Ecology:** Study of organism-environment interactions
- **Population:** Group of same species in an area
- **Community:** Multiple species populations
- **Ecosystem:** Community plus abiotic factors
- **Biome:** Large-scale ecosystem type
- **Producer:** Autotrophic organism
- **Consumer:** Heterotrophic organism
- **Trophic Level:** Position in food chain
- **Carrying Capacity:** Maximum sustainable population
- **Biotic:** Living factors
- **Abiotic:** Non-living factors

Ecological Levels

1. Individual → Population → Community → Ecosystem → Biome → Biosphere

Energy Flow

- Sunlight → Producers → Primary Consumers → Secondary Consumers → Tertiary Consumers
- Energy decreases at each level (10% rule)
- Decomposers recycle nutrients

Nutrient Cycles

- **Carbon:** Photosynthesis, respiration, decomposition
- **Nitrogen:** Nitrogen fixation, nitrification, denitrification
- **Water:** Evaporation, precipitation, transpiration
- **Phosphorus:** Weathering, uptake, decomposition

Population Growth

- Exponential: J-shaped curve, unlimited resources
- Logistic: S-shaped curve, limited by carrying capacity
- Factors: Density-dependent and density-independent

Study Questions

1. What are the levels of ecological organization?
2. How does energy flow through ecosystems?
3. Describe the carbon cycle.
4. What limits population growth?
5. Compare exponential and logistic growth.

Practice

- Draw a food web for a local ecosystem
- Explain energy loss in trophic levels
- Describe factors affecting population size
- Compare nutrient cycles