Unit 5 Ecology

Content Area: **Science**
Course(s): **Biology CP, Biology Honors, STEM Biology Honors**
Time Period: **December**
Length: **4 weeks**
Status: **Published**

Transfer Skills

Organisms interact with one another and with the environment in which they live.

Enduring Understandings

Big Idea: Organisms interact with one another and with the environment in which they live.

- Continual input of energy from sunlight keeps matter and energy flowing through ecosystems.
- Each recombination of matter and energy results in storage and dissipation of energy into the environment as heat.
- As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.
- Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.
- Stability in an ecosystem can be disrupted by natural or human interactions.

Essential Questions

- How does energy flow through an ecosystem?
- How do nutrients cycle through an ecosystem?
- How are organisms impacted by biotic and abiotic factors in an ecosystem?
- How are organisms dependent on each other?
- How do human activities impact ecosystems?

Content

Chapters 3-6

Vocabulary

- species
- population
- community

- ecology
- ecosystem
- biome
- biosphere
- biotic factor
- abiotic factor
- herbivore
- carnivore
- omnivore
- detritivore
- scavenger
- producer
- consumer
- trophic level
- predation
- competition
- mutualism
- parasitism
- commensalism
- succession

Skills

- Explain how food webs are limited and how pyramidal relationships exist
- Recognize that all matter tends toward more disorganized states, and that living systems require a continuous input of energy to maintain their chemical and physical organizations
- Calculate the trends in production, use and transfer of energy from one trophic level to another using data
- Trace the path that energy entering ecosystems as sunlight follows when being transferred by producers into chemical energy through photosynthesis, and then being passed from organism to organism through food webs
- Recognize that living systems require a continuous input of energy to maintain their chemical and physical organizations and also understanding that with death (the cessation of energy input), living systems rapidly disintegrate
- Analyze and describe how the process of photosynthesis provides a vital connection between the sun and the energy needs of living systems
- Explain how plants and many microorganisms use solar energy to combine molecules of carbon dioxide and water into complex, energy rich organic compounds and release oxygen to the environment
- Trace the cycling of atoms and molecules on Earth among the living and nonliving components of the biosphere
- Follow the transfer of matter (molecules) from one organism to another repeatedly and between organisms and their physical environment
- Identify how the total amount of matter in a system remains constant, even though its form and location change
- Predict how natural disasters such as hurricanes, floods, volcanoes will affect population dynamics in a

given ecosystem based on data and accepted mathematical models
- Identify situations where humans intentionally and unintentionally modify ecosystems as a result of population growth, technology, and consumption
- Provide evidence of how human destruction of habitats threatens current local and global ecosystem stability
- Predict how direct harvesting, pollution, atmospheric changes, and other factors will affect population dynamics in a given ecosystem based on data and accepted mathematical models
- Analyze the interactions between organisms that result from the ability to produce populations of infinite size in an environment where resources are finite
- Provide evidence of how organisms both cooperate and compete in ecosystems
- Using evidence to explain why interrelationships and interdependencies of organisms may generate stable ecosystems

Resources

Standards