

Ecosystem Ecology

by Sophia



WHAT'S COVERED

In this lesson, we will cover the topic of ecosystems ecology, which is the study of physical and biological structures and processes of living and nonliving components of an ecosystem. We will discuss ecosystem phenomena, as well as the flow of energy through ecosystems. Specifically, this lesson will cover the following:

1. Ecosystem Ecology

Ecosystem ecology is the study of physical and biological structures and processes of living and nonliving components of an ecosystem. You may recall that ecosystems are the living and nonliving components that interact in a given area.

The difference between ecosystem ecology and population ecology (or community ecology) is that ecosystem ecology includes the study of abiotic or nonliving elements. Ecosystem ecology considers the interactions between the following elements:

- The atmosphere, including gases like carbon dioxide, nitrogen, and oxygen
- The lithosphere, including rocks containing phosphate, potassium, and calcium
- The hydrosphere, including water in the oceans, surface land water, and groundwater
- Living organisms



HINT

In general, remember that ecosystems do not have clear boundaries and that their edges can change over time.

2. Ecosystem Phenomena

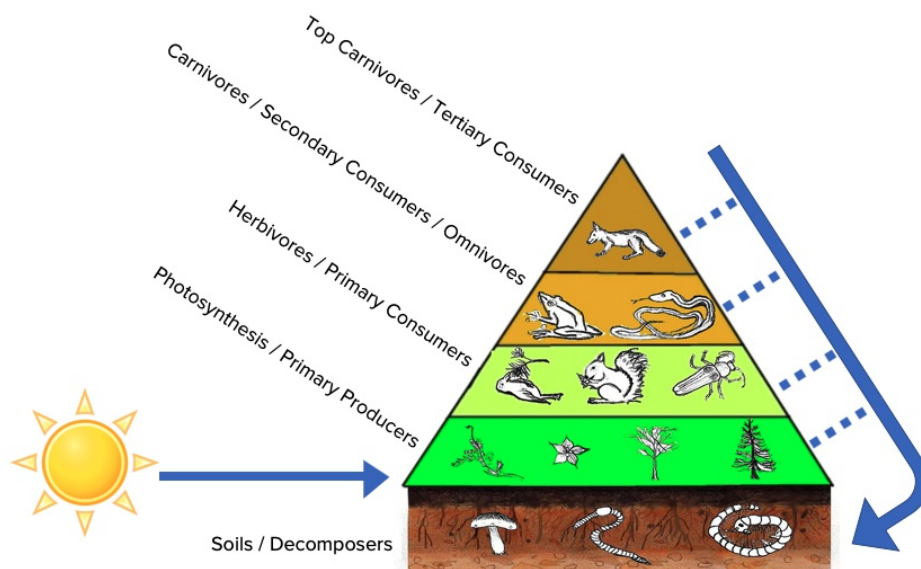
Ecosystem ecologists often study large-scale phenomena that include the following:

- Production of solar energy
- Flow of energy through an ecosystem
- Flow of nutrients through an ecosystem

- Decomposition and the role that it plays in the ecosystem
- Production of biomass
- Weather and climate and their effects on an ecosystem

3. Flow of Energy

The ecological pyramid below, also known as a trophic pyramid, illustrates the flow of energy in an ecosystem.



All energy in an ecosystem originates from sunlight, which is converted into sugars through photosynthesis by primary producers. These producers are also known as autotrophs because they produce their own food. Most plants and plankton are autotrophs.

Heterotrophs fill out the rest of the pyramid because they get their sustenance by consuming other organisms. The energy then flows upward in an ecosystem through various levels, such as from primary producers to primary consumers, for example from vegetables to rabbits. Secondary consumers like snakes eat organisms from the group below them. Finally, tertiary consumers like eagles and hawks eat organisms from the group below them, completing the pyramid.

☆ BIG IDEA

The energy is transferred as each level feeds on the one below it and metabolizes that energy. Eventually, all energy ends up back at the bottom when organisms die. They are then broken down and consumed by the decomposer group. This group is filled with things like worms and mushrooms.

📋 SUMMARY

In this lesson, we learned about **ecosystem ecology**, which is the study of physical and biological structures and processes of living and nonliving components of an ecosystem. We discussed a variety of ecosystem **phenomena** and explored the **flow of energy** through ecosystems.

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