

## Section 2.1.

# Energy Flow in Ecosystems.

Textbook pages 56 to 67.

### Before You Read.

In this section, you will explore food chains and food webs, as well as food pyramids. What are the main differences between a chain and a web?

### How does energy flow in an ecosystem?

**Energy flow** is the transfer of energy from one organism to another in an ecosystem. Every organism interacts with its ecosystem in two ways:

1. the organism obtains food energy from the ecosystem.
2. the organism contributes energy to the ecosystem.

### How are energy flow and feeding relationships in ecosystems modeled?

Ecologists use three models to illustrate energy flow and feeding relationships in an ecosystem:

1. Food chains: **Food chains** show the flow of energy from plant to animal and from animal to animal. Plants are called **producers** because they “produce” food in the form of carbohydrates during photosynthesis. **Consumers** eat plants and other organisms. Each step in a food chain is called a **trophic level**.

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2. Food webs: Many animals are part of more than one food chain in an ecosystem because they eat or are eaten by several organisms. Interconnected food chains are illustrated in a model called a **food web**. Animals that eat plants and other animals are called omnivores.
3. Food pyramids: A **food pyramid** (or **ecological pyramid**) is a model that shows the loss of energy from one trophic level to another. When one organism consumes another, the energy stored in the food organism is transferred to the consumer. However, not all of this energy is incorporated into the consumer’s tissues. Between 80 and 90 percent of it is used for chemical reactions and is lost as heat. This means ecosystems can support fewer organisms at higher trophic levels, as less energy reaches these levels.

## How do dead organisms contribute to energy flow?

**Decomposition** describes the breakdown of organic wastes and dead organisms. Energy is released in decomposition. When living organisms carry out decomposition, it is called **biodegradation**.

- **Detrivores**, such as small insects, earthworms, bacteria, and fungi, obtain energy and nutrients by eating dead plants and animals, as well as animal waste.
- **Decomposers**, such as bacteria and fungi, change wastes and dead organisms into nutrients that can once again be used by plants and animals.

Detrivores and decomposers feed at every trophic level.

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