

Principles of Ecology

Section 2 Flow of Energy in an Ecosystem

Main Idea

Details

Scan Section 2 of the chapter. Make a list of the ways in which organisms obtain energy.

Accept all reasonable responses, such as using light energy, eating food, and breaking down dead organisms.

Review Vocabulary

Use your book or dictionary to define energy. Then name the ultimate source of energy for Earth.

energy

the ability to cause change; the Sun

New Vocabulary

Use your book or dictionary to fill in vocabulary terms in this paragraph about food chains.

- autotroph
- biomass
- carnivore
- decomposer
- detritivore
- food chain
- food web
- herbivore
- heterotroph
- omnivore
- trophic level

In a **food chain**, matter and energy move from **autotrophs** to **heterotrophs** to **decomposers**. A food chain is made of many steps; each organism in the food chain represents a step called a **trophic level**. An **herbivore** is a heterotroph that eats only plants, whereas a **carnivore** preys on other heterotrophs. An **omnivore** eats both plants and animals. Nutrients are returned to the soil, air, and water by **detritivores**. A model that shows all the possible feeding relationships at each trophic level is called a **food web**. If you were a scientist and you wanted to determine the weight of living matter at a certain trophic level, you would measure the **biomass**.

Academic Vocabulary

Use foundation in a sentence which shows its scientific meaning.

foundation

The foundation of survival of organisms is energy flow.

Section 2 Flow of Energy in an Ecosystem (continued)

Main Idea _____ **Details** _____

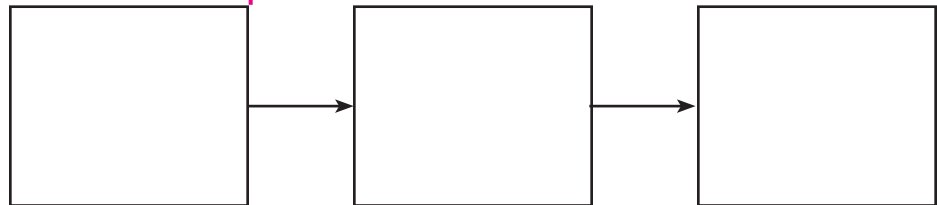
Energy in an Ecosystem

I found this information on page _____.
SE, pp. 41–42
RE, pp. 16–17

Summarize *three ways that organisms get energy, by completing the table.*

| Type of Organism | Autotrophs | Heterotrophs | Decomposers |
|-------------------------------|---|---|---|
| Other name(s) for this type | producers | consumers, herbivores, carnivores, scavengers, omnivores | no other name |
| Food comes from | a process using elements from soil and air and solar energy | <ol style="list-style-type: none"> eating plants eating animals eating plants and animals | dead organisms |
| Chemical reactions that occur | Light energy and carbon dioxide are stored in energy-rich compounds. | The organisms that are eaten release energy and molecules for the consumer's body. | The organisms that are decomposed release energy and molecules for the decomposer's body. |
| Examples | algae, plants | bears, lions, deer | fungi, bacteria |

Design *your own three-step example of the flow of energy. Accept all reasonable responses.*



Classify *each of the following organisms as an autotroph or a heterotroph. Put an A in front of those that are autotrophs and an H in front of those that are heterotrophs.*

- | | | |
|----------------------------|--------------------------------|----------------------------|
| <u> H </u> 1. Alligator | <u> A </u> 5. Moss | <u> A </u> 9. Dandelion |
| <u> H </u> 2. Squirrel | <u> H </u> 6. Siberian tiger | <u> H </u> 10. Rabbit |
| <u> A </u> 3. Maple tree | <u> A </u> 7. Daffodil | <u> A </u> 11. Tomato |
| <u> H </u> 4. Whale | <u> H </u> 8. Rhinoceros | <u> H </u> 12. Cockroach |

Section 2 Flow of Energy in an Ecosystem (continued)

Main Idea

Models of Energy Flow

I found this information on page _____.

SE, pp. 42–44
RE, pp. 17–18

Details

Contrast a food chain *with* a food web.

Food chains show how matter and energy move through an ecosystem. Food webs show all feeding relationships at each trophic level in a community.

State three things that an ecological pyramid shows that food webs and food chains do not show.

An ecological pyramid shows that energy decreases as you go up the trophic levels. There are more organisms in the lower trophic levels. An ecological pyramid also shows biomass consumption.

Create a food web and name the organisms you include. Indicate each organism's trophic level.

Accept all reasonable drawings. See SE page 43 for an example.

SUMMARIZE

Analyze the place in the food chain in which you participate. Use the vocabulary terms from this section that apply to you.

Most students will indicate that they are the top level in their food webs. Strict vegetarians might indicate that they are heterotrophs and herbivores. Others will report that they are heterotrophs and omnivores.