Name _____ Date _____ Class _____

Study Guide

CHAPTER 2

Section 2: Flow of Energy in an Ecosystem

In your textbook, read about autotrophs and heterotrophs.

Match the definition in Column A with the term in Column B.

Column A		Column B
_____	**1.** get energy by eating other organisms	**A.** autotrophs
_____	**2.** eat both plants and animals	**B.** carnivores
_____	**3.** eat only animals	**C.** detritivores
_____	**4.** collect energy to produce their own food	**D.** herbivores
_____	**5.** eat only plants	**E.** heterotrophs
_____	**6.** eat or break down dead things	**F.** omnivores

In your textbook, read about models of energy flow.

Label the food chain below to identify each trophic level. Use these choices:

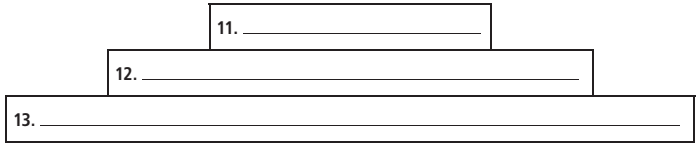
carnivore **herbivore** **omnivore** **producer**

GRASS → **GRASSHOPPER** → **RACCOON** → **COYOTE**

7. _____ **8.** _____ **9.** _____ **10.** _____

Label the ecological pyramid. Use these choices:

primary consumers **producers** **secondary consumers**



Respond to each statement.

14. Recall the name for the total amount of living matter in each trophic level of an ecological pyramid.

_____

15. Explain why an ecological pyramid is smaller at the top than at the bottom.

_____

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Enrichment

CHAPTER 2

Diagramming: A Food Web

Studying the flow of energy in an ecosystem is one way that ecologists learn about the relationships between the different organisms in the ecosystem. Ecologists try to determine how the organisms obtain the energy they need and thereby identify the trophic level of each organism. Most ecosystems are complex, and it is often difficult or impossible to trace all the energy pathways between organisms. Ecologists use models, called food chains and food webs, to help them study the flow of energy in an ecosystem.

Food Chains A simple model of the energy flow in an ecosystem is a food chain. A food chain represents the one-way flow of energy, which starts with an autotroph and moves to heterotrophs. An example of a simple food chain is:

grass → rabbit → hawk

Arrows represent the direction of the energy flow.

Food Webs More complex and realistic energy flows within ecosystems are modeled by food webs. Because most organisms use more than a single source of food, food webs more closely model the relationships in ecosystems. In the preceding example, rabbits are not the only herbivores that consume grass, and hawks eat other organisms besides rabbits.

Directions

In the space below, draw a diagram that shows an example of a food web in a terrestrial ecosystem. The organisms in the ecosystem include the following: fungi, snakes, rabbits, grass, mountain lions, mice, shrubs, seed-eating birds, trees, hawks, bacteria, and deer. Use arrows to represent the flow of energy in this ecosystem. Also indicate the trophic level of each organism: decomposer, autotroph, or heterotroph. Use your text and other resources as references. Be sure to label all the organisms in the food web, as well as their trophic levels.

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Section Quick Check

CHAPTER 2

Section 2: Flow of Energy in an Ecosystem

After reading the section in your textbook, respond to each statement.

1. **State** why detritivores are an important part of the ecosystem.

2. **Describe** how food chains are related to food webs.

3. **Differentiate** among herbivores, carnivores, and omnivores.

4. **Distinguish** ecological pyramids from food webs and food chains.

5. **Predict** how the removal of an herbivore from a food web could affect the entire community.

2. **Illustrate** In the space below, make a labeled diagram that shows how carbon and oxygen are recycled in your mini-environment.

3. **Hypothesize** Ecosystems will remain in equilibrium unless disturbed by external factors. Write a hypothesis about the ecological consequences for each of the following variables.

   a. A rare disease kills all the *Daphnia* in the mini-environment.

   b. The mini-environment is placed in a dark part of the room.

   c. The *Elodea* plant is thoroughly cleansed of all bacteria before being planted.

4. **Design** an experiment to test how the amount of light affects a mini-environment. List the materials you would use and describe your procedure.

CAREERS IN BIOLOGY

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