



ESSENTIAL QUESTION

# What Are Food Chains?



## Engage Your Brain

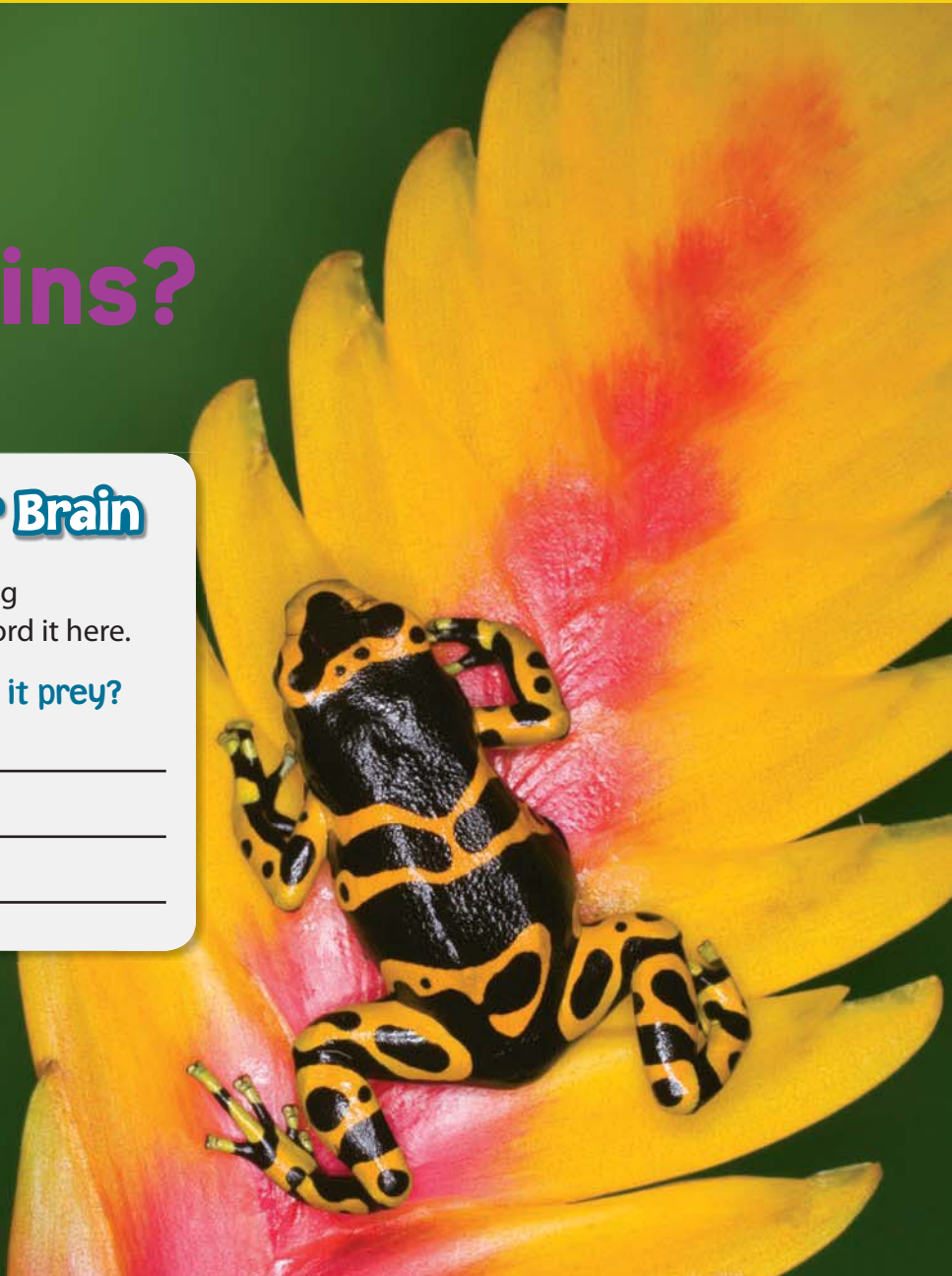
Find the answer to the following question in this lesson and record it here.

Is this frog a predator, or is it prey?

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## ACTIVE READING

### Lesson Vocabulary

List the terms. As you learn about each one, make notes in the Interactive Glossary.

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### Main Ideas

The main idea is the most important idea of a paragraph or section.

The main idea may be stated at the beginning, or it may be stated elsewhere. Active readers look for main ideas by asking themselves, What is this paragraph or section mostly about?

# Food Chains

Did you know that you are fed by the sun? Find out how!

**ACTIVE READING** As you read these two pages, circle common, everyday words that have a different meaning in science.

**L**ettuce is a plant that uses energy from the sun to make its own food. When you eat lettuce, some energy passes from the lettuce to you. You can show this relationship in a food chain. A **food chain** is the transfer of food energy in a sequence of living things. In a diagram of a food chain, arrows show how energy moves. Here is a food chain that shows how energy moves from lettuce to you.

lettuce → you

The food chain above has only two steps, or links. Food chains can have more than two links. Look at the pictures to see a food chain with five links.

Producers make up the first link. In this pond, tiny algae [AL•jee] are the producers. Mosquito larvae eat the algae. They make up the second link in this food chain.

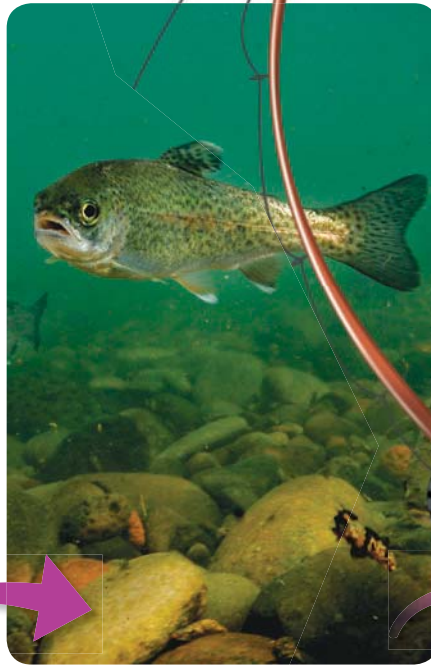


## Make a Food Chain

Choose a food that you ate for breakfast or lunch today. Make a food chain showing how energy from the sun flowed from the food to you.



Minnows are small fish. They eat the mosquito larvae. They make up the third link in this food chain.



Bass are bigger fish. They eat the minnows. They make up the fourth link in this food chain.



People eat the bass. People make up the last link in this food chain.



# You Are What You Eat

A zebra and a lion are both consumers. But they eat very different foods. How can you group consumers by what they eat?

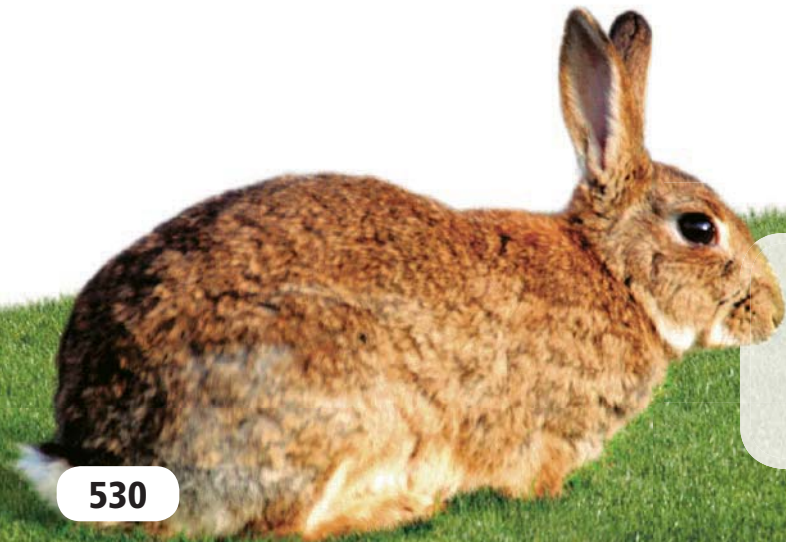
**ACTIVE READING** As you read this page, underline the sentence that identifies one characteristic that is used to classify consumers.

Consumers eat other living things. They can be placed into groups according to the kind of food they eat.

- A consumer that eats only plants is a **herbivore**. A zebra is a herbivore. It eats grasses and other plants.
- A consumer that eats other animals is a **carnivore**. A lion is a carnivore. It eats zebras and other animals.
- A consumer that eats both plants and animals is an **omnivore**. People are omnivores. They eat plants such as tomatoes and animals such as fish.
- A consumer that eats dead plants and animals is a scavenger.



A crocodile is a carnivore. It eats mainly fish. But it will eat big animals, such as hippos, when it can catch them.



A rabbit is a herbivore. It eats leafy plants during spring and summer, and woody plants during fall and winter.



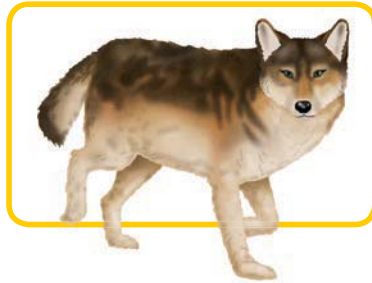
Raccoons are omnivores. They eat fruit, acorns, fish, and mice. They'll eat sweet corn right from your garden!



Vultures are scavengers. They eat dead animals.

## What Does It Eat?

Look at the pictures below. The top row shows different kinds of consumers. The bottom row shows the kinds of food they eat. Draw lines to match the consumers to the foods they eat. Some consumers might eat more than one kind of food.



# Hunt or Be Hunted

A lion crouches in the tall grass. Nearby, a zebra nibbles on the grass. Who is the hunter? Who will be hunted?

**ACTIVE READING** As you read these two pages, draw boxes around two words that are key to understanding the main idea.



A hawk can see the movement of small animals, like this mouse, from high in the sky.

Consumers are grouped by what they eat. But you can also group consumers by whether they hunt or are hunted.

A *predator* is an animal that hunts other animals. Lions are predators. They often hunt in packs. This helps them catch big animals, like hippos and rhinos. They hunt smaller animals, too.

An animal that is eaten is called *prey*. Deer, elk, and moose are all prey for wolves in the Rocky Mountains.

Some animals can be both predator and prey. A frog might eat insects in a forest. But the frog might be eaten by a snake.





Lions can run fast for short bursts. Zebras may not run as fast, but they can run for a much longer time.

Sharks feed on many kinds of prey. Fish stay in large groups to make it difficult for predators to hunt individuals.



## Who's the Hunter? Who's Hunted?

Fill in the table below. Classify the animals shown on these pages as predators or prey.

Animals	
Predators	Prey

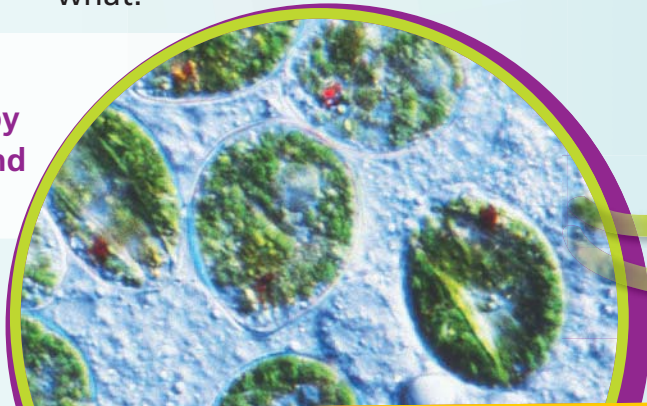
# Food Webs

A food chain shows how energy moves from one living thing to another. But living things often eat more than one kind of food. How can you show these different feeding relationships?

**ACTIVE READING** As you read these two pages, draw a line under the main idea.

**L**obsters eat clams. But they also eat crabs, sea stars, and mussels. Other animals, like the shark and the octopus, eat the lobster. You can use a model to show all these feeding relationships. A **food web** shows the relationships among different food chains. Food web models use arrows to show who eats what.

These green plankton are producers. They are eaten by clams, small fish, whales, and other organisms.

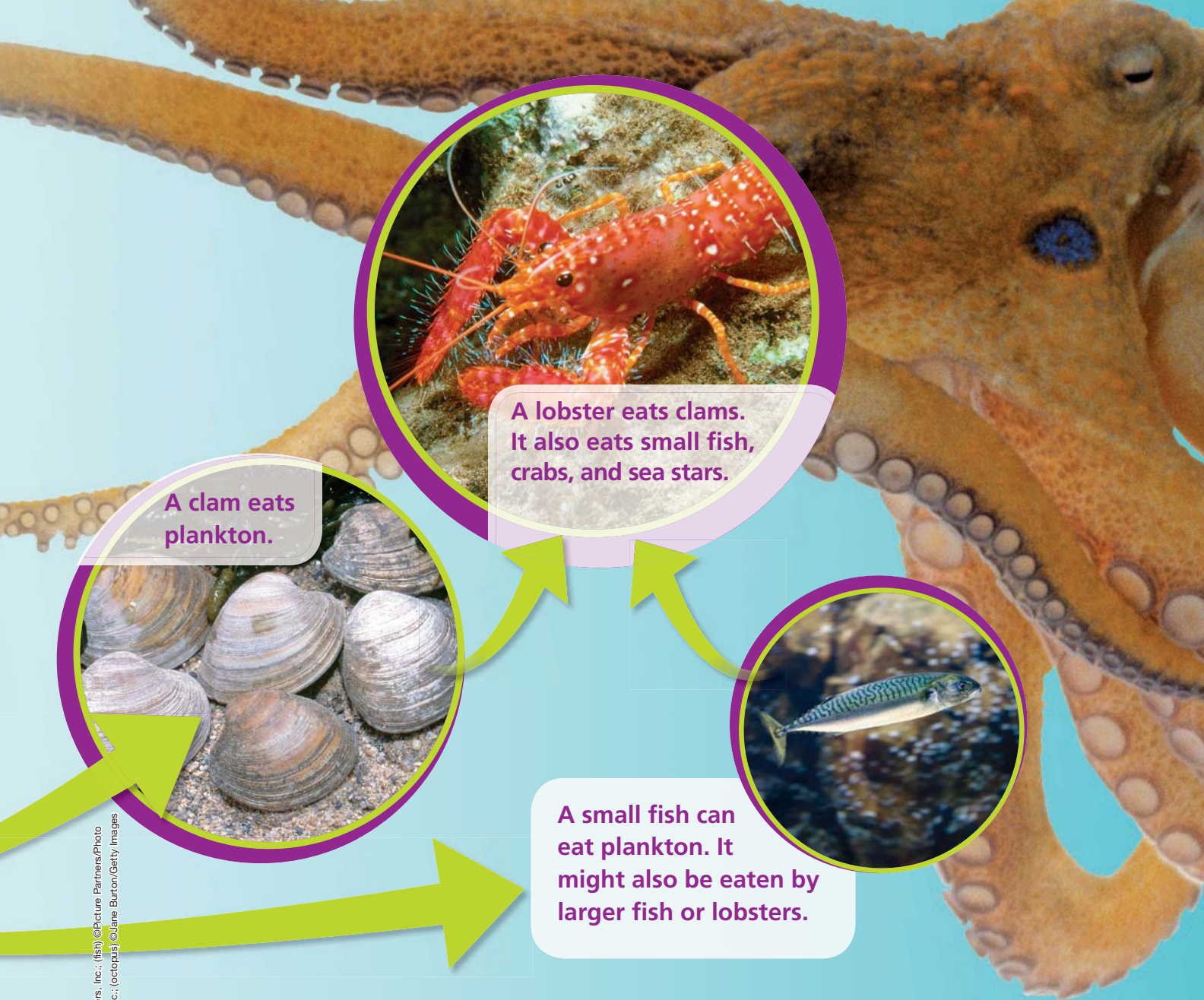


## Desert Food Chain

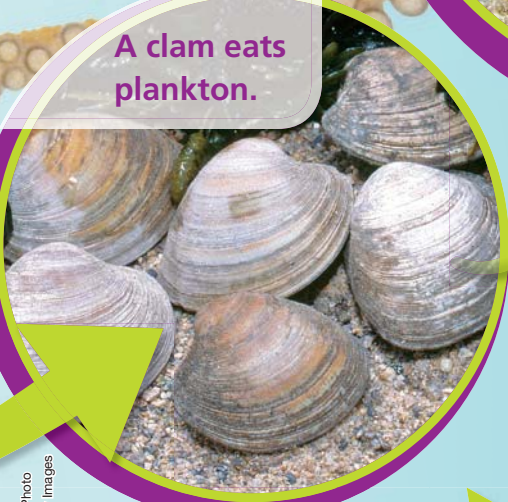
Use arrows to show how energy moves from one living thing to another in this desert food chain.







A lobster eats clams. It also eats small fish, crabs, and sea stars.



A clam eats plankton.



A small fish can eat plankton. It might also be eaten by larger fish or lobsters.

How are food chains like food webs?

Two horizontal lines for writing an answer.



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© Marek Ziv/Alamy, (clam) © Andrew J. Martinez/Photo Researchers, Inc.; (fish) © Picture Partners/Photo Researchers, Inc.; (lobster) © Andrew G. Wood/Photo Researchers, Inc.; (octopus) © Jane Burton/Getty Images

# Changes in Food Webs

Imagine that one animal disappeared. What would happen to the other living things in the food web?

**ACTIVE READING** As you read these two pages, circle clue words that signal a detail such as an example or an added fact.

Changes in food webs can affect all parts of a food web. For example, suppose the weather was very cold in the spring. Only a few plants in a meadow might live through the cold spring. This means that the mice in the meadow would not have enough to eat. Their numbers would go down. The snakes in the meadow eat mice. Their numbers would also go down. The hawks in the meadow hunt snakes and mice. The hawks would be hungry, too.

Now suppose that the spring was warm and wet. Many plants would grow in the meadow. The mice would have plenty to eat. Their numbers would go up. The snakes and hawks would also have plenty to eat, so their numbers would go up, too.

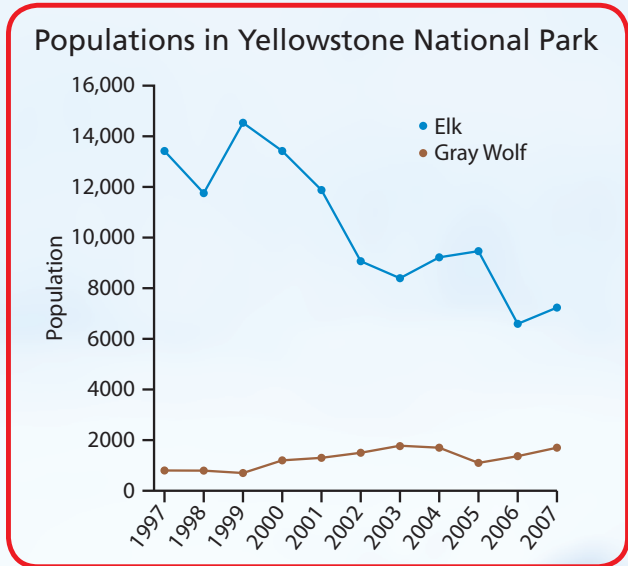


Food webs can be disrupted when one member of a food web goes away. This happened in Yellowstone National Park. During the early 1900s, the gray wolf was hunted in the park. Eventually, no gray wolves were left.

The gray wolf preyed mostly on elk. The number of elk in the park increased after the wolves disappeared. In 1995, scientists returned 14 gray wolves to the park. The number of wolves has since increased. As a result, the number of elk in the park has decreased.

Other changes happened, too. Elk eat trees. Before the wolves were reintroduced, the elk overgrazed the trees in the park. This harmed the trees. Since beavers had fewer trees to build

dams with, the beaver population decreased. After the wolves were reintroduced to the park, both the trees and beavers began to thrive.



## DO THE MATH

### Interpret Tables

The table shows the height of trees in Yellowstone National Park before and after the gray wolves returned. Study the table, and then answer the questions.

Kind of tree	Average height before 1995	Average height after 2002
Cottonwood	less than 1m	2 to 3 m
Willow	less than 1m	3 to 4 m

1. Describe the heights of the trees before the gray wolves were brought back to Yellowstone National Park.

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2. Describe the heights of the trees after the gray wolves were brought back to Yellowstone National Park.

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3. Why do you think the heights of the trees changed?

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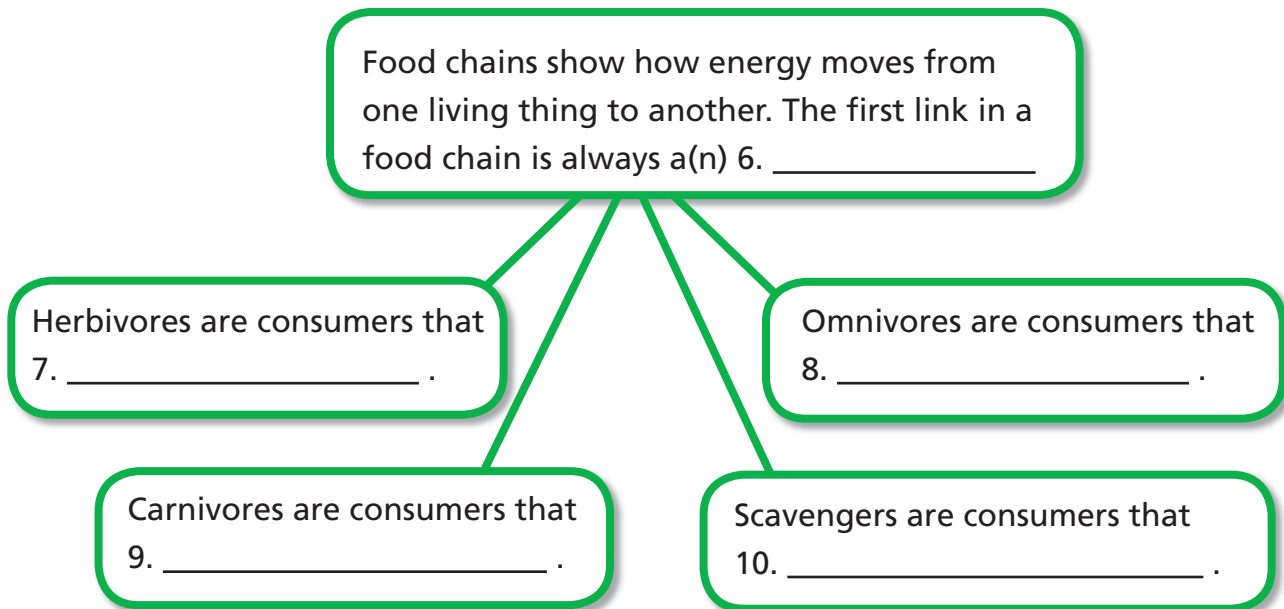
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# Sum It Up »

Match the words in Column A to their definitions in Column B.

	Column A	Column B
1	_____ scavenger	a. model that shows all the feeding relationships in an ecosystem
2	_____ herbivore	b. eats other animals
3	_____ carnivore	c. eats only plants
4	_____ omnivore	d. eats dead animals and plants
5	_____ food web	e. eats both plants and animals

The idea web below summarizes the lesson. Complete the web.





Name \_\_\_\_\_

## Vocabulary Review

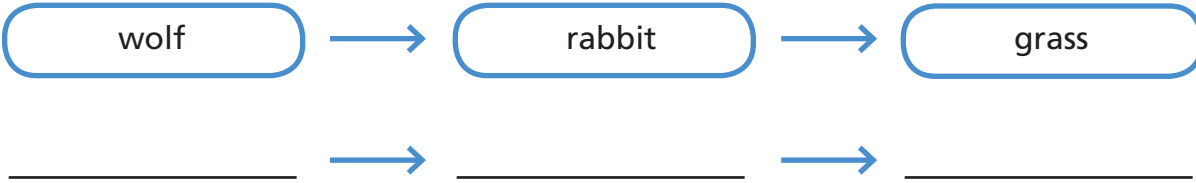
**1** Use the clues to fill in the missing letters of the words.

1. \_\_\_\_ d \_\_\_\_ h a \_\_\_\_      the transfer of energy from one living thing to another
2. \_\_ m \_\_\_\_\_ e      a consumer that eats both plants and animals
3. c \_\_\_\_\_ v \_\_\_\_\_      a consumer that eats other animals
4. \_\_\_\_ y      an animal that is hunted
5. h \_\_\_\_\_ o \_\_\_\_      a consumer that eats only plants
6. \_\_ o \_\_\_\_ w \_\_\_\_      shows the relationship among all of the food chains in an ecosystem
7. \_\_\_\_ d \_\_\_\_\_      an animal that hunts
8. \_\_\_\_\_ s e r      a consumer that breaks down the remains of plants and animals

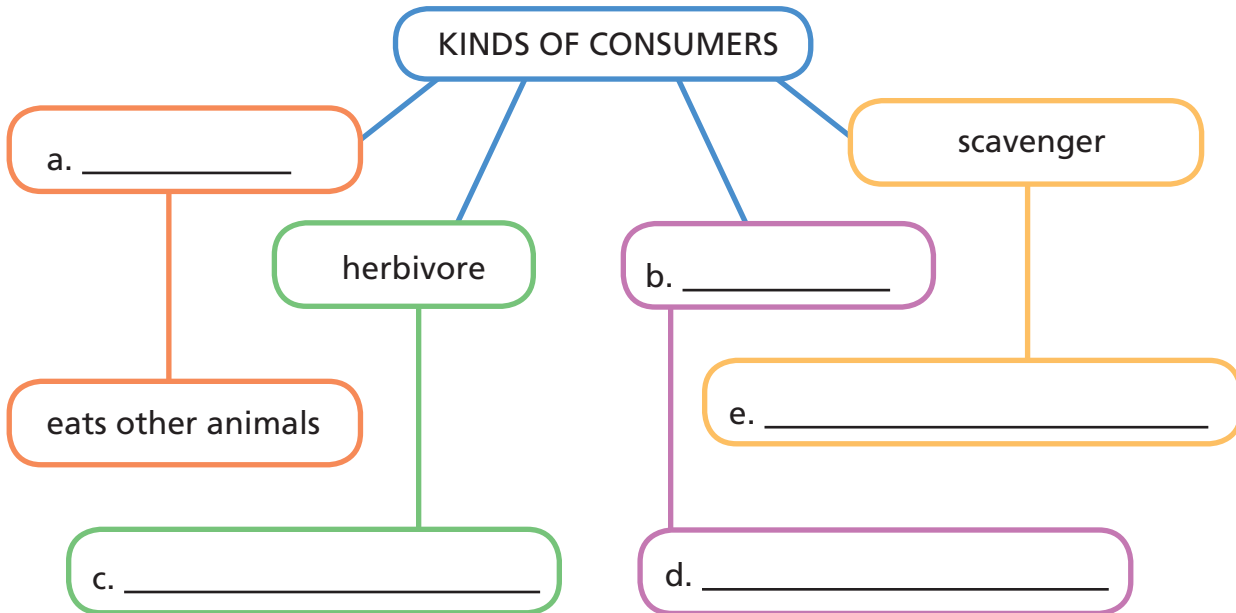


# Apply Concepts

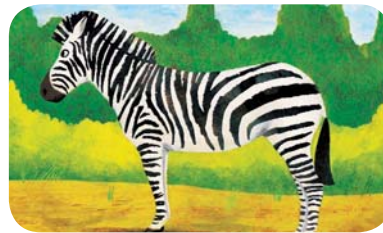
2 The food chain below is in scrambled order. Put the links of the food chain in the correct order.



3 Fill in this graphic organizer about different kinds of consumers.



4 The pictures below show a lion and a zebra. Label the animals as *predator* or *prey*.



\_\_\_\_\_

\_\_\_\_\_

- 5** The picture shows different animals in a pond food web. Use arrows to show who eats what. Remember that arrows should point from the living thing that is being eaten to the living thing that is eating.



- 6** In the space below, draw an ocean food chain and a forest food chain.

**7** The pictures show different kinds of consumers. Label each consumer as a herbivore, carnivore, omnivore, or scavenger.



**8** The population of a predator in an area has gone up. What do you think will happen to the population of prey in the area? Explain your answer.

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**Take It Home!**

Share what you have learned about food chains with your family. With a family member, tell which of the foods you ate for dinner came from plants and which came from animals.