

# Teaching Searchlight Books™

## What Is a Food Web?



Interest Level: Grades 3–5

Reading Level: Grade 3–4

**LEARNER**  **SOURCE™**

### Titles in this series:

*Desert Food Webs in Action*

*Forest Food Webs in Action*

*Grassland Food Webs in Action*

*Lake and Pond Food Webs in Action*

*Ocean Food Webs in Action*

*Tundra Food Webs in Action*

### Standards

#### Next Generation Science Standards

- Developing and using models (Scientific and Engineering Practices)
- Energy and matter (Crosscutting Concepts)
- LS2A Interdependent Relationships in Ecosystems
- LS2B Cycles of Matter and Energy Transfer in Ecosystems
- LS4B Natural Selection

#### Common Core Reading (Informational Text)

- Key Ideas and Details
- Integration of Knowledge and Ideas
- Range of Reading and Level of Text Complexity

#### Common Core Speaking and Listening

- Comprehension and Collaboration

### Multiple Intelligences Utilized

- Verbal-linguistic, bodily-kinesthetic, visual-spatial, logical-mathematical, interpersonal, intrapersonal, naturalist



# Lesson 1

## Understand Diagrams

### Purpose

Students will use diagrams to gather information.

### Materials

- What Is a Food Web? series
- Look at Diagrams p. 6
- pencils

### Prepare

- Prepare to electronically show the diagram in Look at Diagrams p. 6.
- Copy Look at Diagrams p. 6 for each student. Alternatively, you might ask students to copy the questions into their notebooks when you show the diagram electronically.

### Pretest

- What kinds of pictures and art can you find in science books?

- Why do you think science books include pictures and art?

### Model

- Show Look at Diagrams p. 6 electronically.
- Explain the purpose of a diagram and point out major features, such as the title, labels, caption, and colors.

### Practice

- Invite students to search for diagrams in the What Is a Food Web? books.
- Students will record where they found each diagram and then answer the questions in Look at Diagrams p. 6.

### Read

- Read a chapter of a What Is a Food Web? book that contains a diagram.

### Discuss

- Did studying the diagram before you read the chapter make it easier to understand the information in that chapter? Why or why not?
- Would you change anything on the diagram? What would it be and why?
- Which feature do you think is most important on any diagram?

### Evaluate

- Evaluate Look at Diagrams p. 6 for completeness and accuracy.

## Lesson 2

# Energy in a Food Web

### Purpose

Students will learn about how energy is transferred in an ecosystem.

### Materials

- What Is a Food Web? series
- Grasslands Energy Pyramid p. 7
- pencils

### Prepare

- Copy Grasslands Energy Pyramid p. 7 for each student. Alternatively, divide students into groups and make one copy of Grasslands Energy Pyramid p. 7 for each group.

### Pretest

- What is energy? Where does energy come from? How do you use energy?

### Read

- Read books from the What Is a Food Web? series.

### Model

- Draw a pyramid on the board. Divide the pyramid into four horizontal parts. From bottom to top, label the rows producers, first-level consumers, second-level consumers, and third-level consumers. Label the area below the pyramid decomposers.
- Explain that scientists draw pyramids like this to explain how energy moves through a food web.
- Explain that energy gets lost at each level of this pyramid. Producers use energy to create food. Consumers use it to move around, keep warm, and have babies.
- Ask students where they would put a tree, a squirrel, a snake, and a fox on the pyramid. Label these parts of the food web on the pyramid.

### Practice

- Students will cut out the boxes from the bottom of Grasslands Energy Pyramid p. 7.
- Students will glue the producers, consumers, and decomposers on the correct levels of the pyramid.

### Discuss

- Why are there more living things at the bottom of the pyramid?
- Why are there so few third-level consumers?
- What has the most energy in the food chain? Why do you think that is?

### Evaluate

- Collect Grasslands Energy Pyramid p. 7 and assess for comprehension.

## Lesson 3

### Build a Food Web

#### Purpose

Students will make a food web that shows producers, consumers, and decomposers.

#### Materials

- What Is a Food Web? series
- old magazines or access to online images and a printer
- poster paper
- paper
- crayons or colored pencils
- scissors
- glue
- pencils

#### Prepare

- Gather old nature magazines or other magazines that include pictures of plants and animals. Alternatively, collect a list of websites that have downloadable pictures. A few examples include [www.exploringnature.org](http://www.exploringnature.org), [nationalgeographic.com](http://nationalgeographic.com), and <http://www.naturephotographers.net/>.
- Cut out or print pictures of a producer, a consumer, and a decomposer to model the activity.
- Divide students into six groups, one for each book in the series.

#### Pretest

- What is an environment?
- What are producers, consumers, and decomposers?
- What is a food chain?

#### Read

- Read books from the What Is a Food Web? series.

#### Model

- Explain that students will be working in groups to make food chains for different environments. Assign a different environment to each group.
- Invite students to look at p. 4 of the What Is a Food Web? books to see an example of a food web diagram.
- Demonstrate how to glue the pictures of a producer, a consumer, and a decomposer to a larger sheet of paper. Demonstrate how to draw colored arrows between them to represent energy movement.

#### Practice

- Groups will look through

- magazines or websites to find pictures of producers, consumers, and decomposers in their assigned environments. Students may also draw their own pictures.
- Groups will cut out or print pictures and glue them to poster paper.
- Students will add colored arrows and a key to their food web posters to show how energy is transferred between the plants and animals.

#### Discuss

- Display the completed food webs in the classroom.
- Do some plants or animals have more connections than others? Why do you think that is?
- Where would a human fit into this food web?

#### Evaluate

- Evaluate completed food webs for completeness and accuracy. Evaluate how well groups worked together to complete the assignment.

## Lesson 5 Tundra Tag

### Purpose

Students will learn that food webs are constantly fluctuating.

### Materials

- What Is a Food Web? series
- Tundra Tag Directions p. 8
- green strips of paper
- brown, red, and yellow construction paper
- string
- hole punch
- paper lunch bags

### Prepare

- Cut seventy strips of green paper to represent lichens.
- Cut the other colors of construction paper into name-tag-sized pieces. You will need about sixteen yellow pieces for lemmings, six red pieces for foxes, and three brown pieces for bears. Each student will get one of these three colors, so adjust the numbers accordingly.
- Punch holes in the top two corners of the colored pieces of paper and tie strings through the holes, so students can wear them as

necklace-style identification tags.

- Arrange to use the gym or an open playing field for the game.
- Plan to show Tundra Tag Directions p. 8 electronically.

### Pretest

- What happens to the plants and animals in an environment if there is a fire?
- What happens if one population gets too large? What happens if it gets too small?

### Read

- Read books from the What Is a Food Web? series, focusing on Tundra Food Webs in Action.

### Model

- Using the diagram on p. 4 of Tundra Food Webs in Action, describe a food web that contains lichens, lemmings, foxes, and bears.
- Explain that students will play a game to show what happens in this ecosystem.

- The green paper strips represent lichens. The yellow name tags represent lemmings. The red tags represent foxes, and the brown tags represent bears. Each student will play one of these roles in the game.
- Review Tundra Tag Directions p. 8 with students.

### Practice

- Play Tundra Tag.

### Discuss

- Talk through the scenarios listed at the bottom of Tundra Tag Directions p. 8.
- Discuss how people fit into the food web and the impact they can have on the food web.
- Discuss the complexity of food webs and ecosystems.

### Evaluate

- Evaluate participation in the game and students' comprehension of the topic.



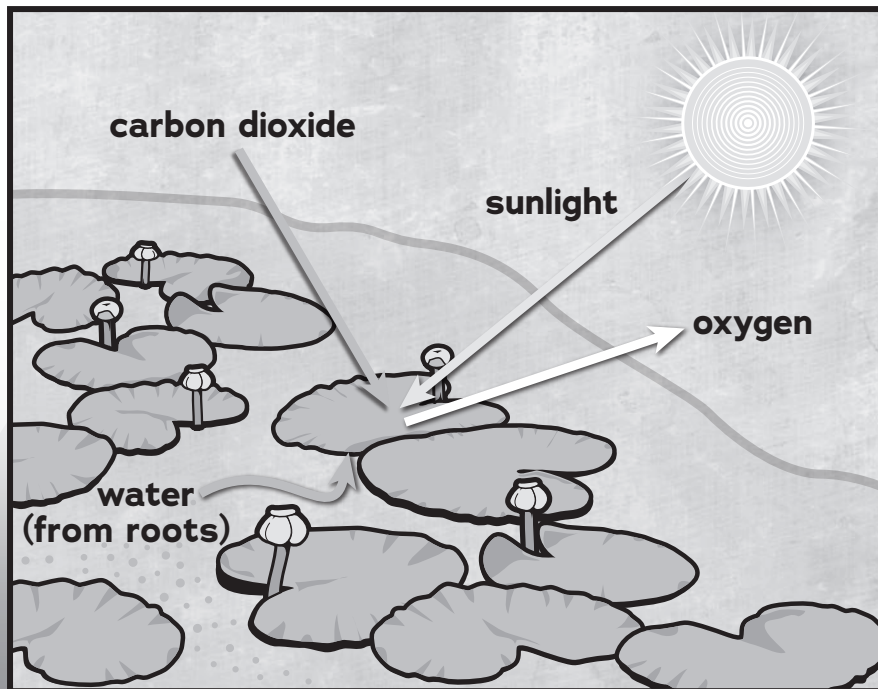
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## Look at Diagrams

**Directions:** Use the diagram to answer the questions below.

### HOW PHOTOSYNTHESIS WORKS



A water lily's leaves turn sunlight, carbon dioxide, and water into food for the plant.

1. What is the **title** of this diagram? \_\_\_\_\_

2. Write two of the **labels** used on this diagram.

\_\_\_\_\_

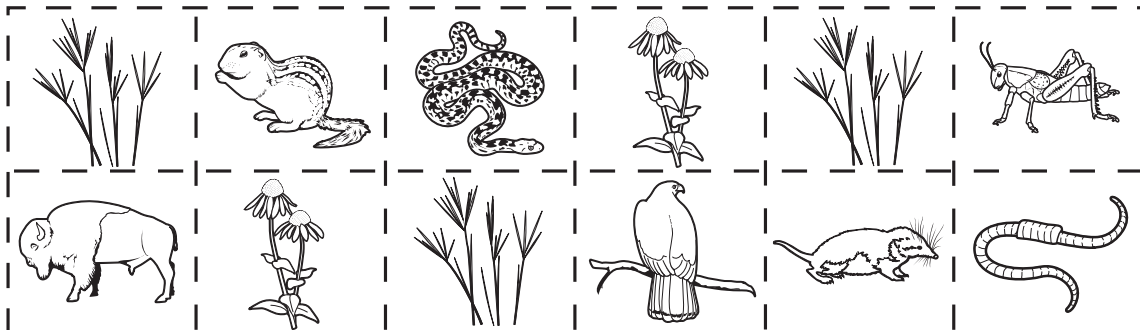
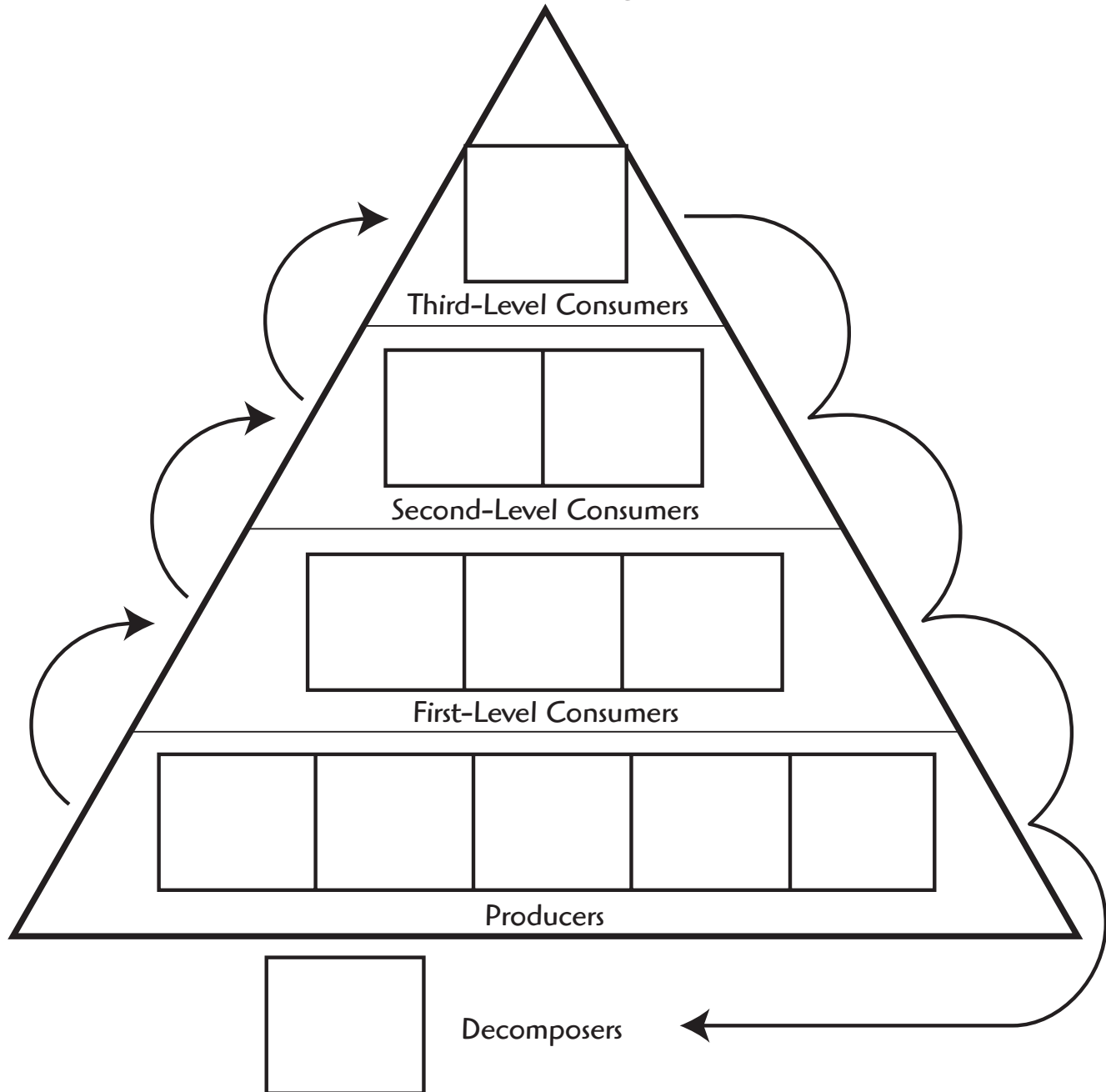
3. What is happening in this diagram?

\_\_\_\_\_

4. What is the **purpose** of this diagram? \_\_\_\_\_

\_\_\_\_\_

Name \_\_\_\_\_

**Grasslands Energy Pyramid**

## Tundra Tag Directions

**Players:** 20–30 students

**Materials:** identification necklaces (lemming, fox, and bear), brown bags (stomachs), green paper strips (lichens)

**Goal:** To discover what happens to a food web under various circumstances.

1. Spread fifty green strips (lichens) around the playing area.
2. Hand out identification tags and brown bags to all the students.
3. (30 sec.) All lemmings enter the game. They try to get as many lichens in their stomachs as possible.
4. (1 min.) All foxes enter the game. They try to tag the lemmings. If they tag a lemming, the lemming has to give the fox all of their lichens. The fox puts the lichens in its own stomach. The tagged lemming has to stand near the teacher.
5. (2–3 min.) All bears enter the game. They try to tag the foxes. If they tag a fox, the fox has to give the bear all of its lichens. The bear puts the lichens in its own stomach. The tagged fox has to stand near the teacher.
6. The teacher calls out “Freeze!” and has the players check their stomachs. Those without food in their stomach have to stand near the teacher. As a class, discuss which animals survived and which animals died.

Play the game again, using one of the following scenarios:

- There has been a fire on the tundra. Lichens burn quickly and grow back slowly. Play the game with half the number of lichens. Discuss the result of the fire after the game.
- A disease has spread through the lemming population. Many of them died. Play the game with half the number of lemmings. Discuss the effect of disease on a food web.
- A wildlife restoration project was started in the tundra. People were not allowed to walk or drive over the tundra surface. Lichens and other plants slowly grow back. Add twenty lichens to the game and play. Discuss how this impacts the food web.