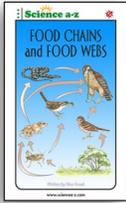


Food Chains and Food Webs

INTRODUCTION



This book is available at three reading levels, as indicated by the one, two, or three dots beside the Science A–Z logo on the front cover.

This guide offers general instructions that can be used with any or all of the leveled books. When appropriate, tips are provided for modifying the instruction for a specific level. The dots in this guide indicate elements of the instruction that are only applicable to certain book levels

- can only be used with low level
- can only be used with middle level
- can only be used with high level
- |• can be used with low and middle levels
- |•• can be used with middle and high levels
- |••• can be used with all three levels

BOOK SUMMARY

The book *Food Chains and Food Webs* helps readers explore how living things are interconnected. It classifies organisms in several ways based on what they eat or how they receive the energy they need to live and perform activities. Organisms can be described as producers, consumers, or decomposers. The consumers can be classified as carnivores, herbivores, and omnivores. Consumers can also be described as being predators or prey, and sometimes both. Special species such as scavengers and parasites also play important roles in ecosystems.

The book introduces food chains, food webs, and energy pyramids as graphical devices that can be used to demonstrate connections within an ecosystem. By visualizing the interconnectedness of species within an ecosystem, one can observe and understand population patterns, competition, and why each species has the adaptations it does. Finally, the book explains natural and human-caused ways that ecosystems can change.

Labeled photographs and diagrams support the text.



Preview the book title, cover, and table of contents with students. Ask them to predict what the book will be about. Invite students to preview the remainder of the book, looking at pictures and captions, as well as special features, section heads, and the glossary. Encourage them to use this information to continually make and revise their predictions while reading.

Vocabulary



Instruction for the unit’s vocabulary terms can be found in the *Unit Guide*. It defines core and other key science terms, and suggests resources you can use to teach vocabulary before, during, or after the reading.

These terms are found in the glossary. Certain terms are only found in certain book levels, as noted.

- | | | | |
|-------------------|---------------------|-----------------------|--------------------|
| carnivores | competition | consumers | decomposers |
| ecosystem | food chains | food web | herbivores |
| omnivores | organism : : | photosynthesis | predators |
| prey | producers | scavengers : : | |

Reading Strategy

Summarize

Explain that one way readers understand and remember information in a book is to review and condense in their minds what they have just read, or to summarize. By summarizing, readers include only the parts of the story or section that are the most important. Read the section of the book

- |:|: (p. 5) called Producers and Consumers with students. Then model how to summarize this section in your own words

Think-aloud: *I am going to read this section again. This time, I will underline what I think are the most important things to know. Then I am going to use just those important things to write a summary of what I read.*

Model underlining the most important ideas and details from this section. Use these to write your summary on the board. You may want to use the sample summary that follows.

Think-aloud: *Listen to my summary of the Producers and Consumers section of the book: “Some living things produce energy and some consume energy. Producers are usually plants, which get energy from the Sun through a process called photosynthesis. Consumers are mostly animals and they get energy by eating plants or other consumers.” Notice that I used some of my own words and some words from the book to create my summary.*

Invite students to create and then share their own summaries of the same section. As students read the book, encourage them to summarize other sections. Have them begin by underlining the most important ideas and details in each section or paragraph. Then have them share their summaries orally or in writing. Encourage students to continue summarizing as they read.



Download and print the *Summarize Graphic Organizer*. Have each student choose one section of the book to summarize. They can use the main idea and details they underlined in that section of the book to fill in the top portion of the worksheet. Then have students write their summary in the space provided.

TIP The *Graphic Organizer* can also be used with each of the *Quick Reads*.

As students read, they should use other reading strategies in addition to summarizing.



The book begins with an example of how a child gets energy by eating and how she uses that energy in her daily activities. After students read this section, check for understanding by having them discuss what they have eaten today and how they plan to use the energy they will get from those foods. Also have students discuss where each of the foods and drinks they consumed came from.

You may want to review the key science terms in each section before students read. Encourage students to read one section at a time, and then discuss in pairs, in groups, or as a class what was read. (See Discussion Questions.)

Students can read the special features of the book to build on the concepts within each section. Some vocabulary terms can be reinforced in these features.

Comprehension Skill Focus

Interpreting Charts, Graphs, and Diagrams

Explain to students that there are many different ways for an author to provide the reader with information. While many books use illustrations or photographs, some books (such as *Food Chains and Food Webs*) also use charts, graphs, and/or diagrams. Good readers study these graphic aids to understand more about the book's content.

- |:|: Have students turn to page 9. Discuss what this diagram shows (a sample food chain involving a plant, mouse, snake, and hawk).

Think-aloud: *When I read about something that may be new to me or may be confusing, I look at the charts, graphs, or diagrams to help me understand it better. The writing in this section explained the roles of producers and consumers, but it also described herbivores, carnivores, and omnivores. At the same time, this section explained that all these living things could be combined into a food chain. That's a lot of ideas in one section of text! This diagram helps me see how all these types of living things are related in a food chain. And now I also realize that more than one term can be used to describe a single species.*

Encourage students to examine other visual aids in the book. Have students explain what each one means. Ask questions based upon the content of each visual aid, or have students make up their own questions and call upon classmates to answer them.

Examples:

- *Why is this food chain shown as a complete circle?* •|:|: p. 12
- *Which species in the diagram are predators and which are prey?* •|:|: p. 14
- *How is a food web different from a food chain?* •|:|: p. 15
- *What do the arrows and percentages in this energy pyramid represent?*
: p. 16, •|: p. 17

As students read, they should use other comprehension skills in addition to interpreting charts, graphs, and diagrams.

Discussion Questions

Use the *Discussion Cards* during or after reading. The cards are structured so they can be used for whole-group discussion, or assigned to individuals, pairs, or groups. Choose the activity that best serves your purposes. It may be helpful to allow students to use their books and completed *Graphic Organizers* as they try to answer the questions. Here are some suggested activities:



- Divide the class into groups and have each group discuss the questions from a section of the book. Then have groups report their responses to the class.
- Have all groups discuss all the questions, and then discuss the similarities and differences among the groups' answers.
- Place discussion cards at centers and have groups talk about or write their responses as they rotate through them.
- Have each student choose a card and write an answer on the back. Collect and review these with the whole class.
- Assign certain questions to groups or individuals for homework.

Each question can be answered with certain book levels, as noted with dots in the upper-left corner. You may want all students to think about all the questions, even if their book level is not noted on certain cards. The book section or topic most closely related to the question appears on each card. Question types are noted in parentheses.

All questions can be answered with all three book levels, except where noted.

Introduction

- Why do people and other animals need to eat? (comprehension)
- Where do your favorite foods come from? (application)
- Does everything that you eat and drink come from a living thing? Explain. (synthesis)

Producers and Consumers

- How do producers get energy? (knowledge)
- How do consumers get energy? (knowledge)
- How are producers and consumers similar and different? (analysis)
- What are some producers and consumers you can find outside your school? (application)

Food Chains

- What purpose does a food chain serve? (comprehension)
- What do herbivores, carnivores, and omnivores each eat? (knowledge)
- If you were a wild animal in Africa, would you prefer to be an herbivore, carnivore, or omnivore? Why? (evaluation)
- What are some examples of primary, secondary, and tertiary consumers? (application)

Predators and Prey

- What kinds of predators are there in a desert? (application)
- What kinds of prey animals are there in a forest? (application)
- What else makes up an ecosystem besides plants and animals? (comprehension)
- How are the roles of scavengers and decomposers in a food chain similar and how are they different? (analysis)
- What would be some pros and cons of being a top predator? (evaluation)

Food Webs

- What can you show on a food web that you cannot show on a food chain? (comprehension)
- Why are some animal species both predators and prey? (analysis)

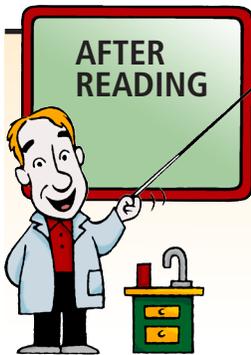
Energy Pyramid

- Is a large or small portion of the total energy in one level of an energy pyramid passed on to the next? (knowledge)
- In a typical ecosystem, why are there more producers or consumers? (analysis)
- How do parasites get energy? (knowledge)

Survival

- Why is there competition within an ecosystem? (comprehension)

- How might changes in ocean temperature affect the things that live there? (analysis)
 - If you were a creature that could fly, what adaptations would you want to have? Why? (evaluation)
 - What are some helpful and harmful ways people cause changes to ecosystems? (synthesis)
 - Why are many invasive species harmful to ecosystems? (comprehension)
 - What should be done about invasive species? (evaluation)
- Conclusion**
- Can a species live in more than one ecosystem? Explain and give examples. (synthesis)
 - How would you show the foods Ana eats in a food chain or food web? (application)
 - Does understanding that you are part of a food web change the way you think about what you eat? Why or why not? (evaluation)



Encourage students to reread the book.

Reflect on the Reading Strategy: *Summarize*

Review the strategy of summarizing. Invite students to share how this strategy helped them understand what they read.

Enduring Understanding

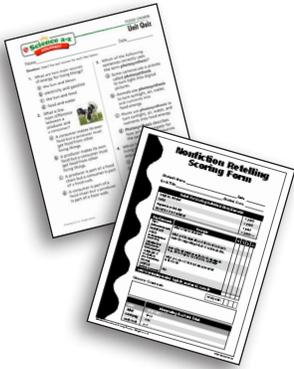
In this book, students have read about food chains and food webs, and the many types of organisms that can share a single ecosystem. They have also read about ways ecosystems can change, but not always for the better. Discuss the following with students:

- *Now that you have read this book, will you do anything differently to help prevent harm to ecosystems? Explain your answer.*

Home Project

Have students choose three foods from their kitchen at home and create a separate food chain diagram for each one. Require them to use at least three links in each food chain. Back in class, ask students to share their food chains and then discuss whether any of these could be connected to other students' food chains as part of a larger food web. See the *Process Activity Paper Food Chains and Food Web* for a similar project to use with the whole class.





Assess

Download and print the *Unit Quiz*.

Use the *Nonfiction Retelling Rubric* to assess understanding.

Quick Check: For individual or group assessment, have students respond orally or in writing to the following question:

- *What are some ways to put living things into categories, and what is one example of a species that belongs in each category?*