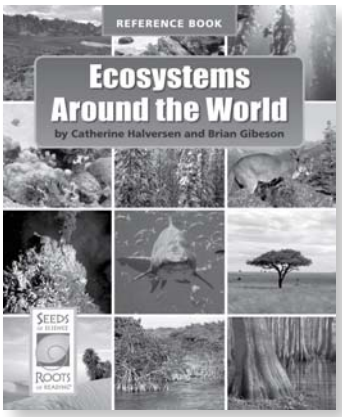
Strategy Guide

Teaching Scientific Comparison Writing

with *Ecosystems Around the World* from *Seeds of Science/Roots of Reading*®



Introduction

This strategy guide introduces an approach for teaching students to write a scientific comparison. This type of writing encourages careful observation and close reading and helps students explain how two things are similar and how they are different. This guide includes an introductory section about scientific comparison writing, an overview of one approach for teaching students to write a scientific comparison using information found in many science texts, and a plan for teaching scientific comparison writing with the *Seeds of Science/Roots of Reading*® book *Ecosystems Around the World*.

Book Summary

In *Ecosystems Around the World*, nine very different ecosystems are presented, from an Alaskan river to the Antarctic waters. Each ecosystem is described in detail, with information about the community of organisms that lives in the ecosystem, the nonliving environment of the ecosystem, and the ways in which humans impact the ecosystem. Photographs of organisms and the environment help readers consider the great variety of ecosystems that exist on Earth. This book helps expand readers' ideas about what an ecosystem is and exposes them to many of the varied ecosystems around the world. A focus on the human impact on ecosystems, both harmful and helpful, makes this a unique and comprehensive reference book.

About This Book

Reading Level
Guided Reading Level*: S

Key Vocabulary
ecosystem, environment, human impact, organism

Text Features
bold print, bulleted lists, captions, glossary, headings, illustrations, index, labels, photographs, subheadings, table of contents

*Guided Reading Levels based on the text characteristics from Fountas and Pinnell, *Matching Books to Readers.*

Science Background

A community of organisms living together within its environment, or physical surroundings, is called an ecosystem. There are many, many different kinds of ecosystems on Earth—deserts, coral reefs, rivers, savannahs, swamps, deep-sea vents, and rainforests, just to name a few! Some ecosystems are in the water, some are on land, and some are at the shoreline where land and water meet. Most of our planet is covered with water, and, thus, most of the ecosystems on Earth are in or near water. The environment of an ecosystem consists of the nonliving factors, such as water, rocks, air, light, and minerals. The amounts of these nonliving things in an ecosystem affect what types of organisms can survive there. The organisms that interact and live in any given ecosystem are called a community. Within every community, there are many types of organisms that interact with one another in various ways. One of the main ways organisms in a community interact is by eating, or being eaten by, other organisms. All organisms, including humans, cause changes in their ecosystems. The ways that humans interact with an ecosystem is called human impact. Human impact can harm ecosystems, but humans can also help to protect and reduce harm to ecosystems.

About Scientific Comparison Writing

Scientists make comparisons after carefully observing and reading other scientists' work. These comparisons help scientists understand the relationships among things in the natural world and are the basis of classification. A scientific comparison explains how two or more things are both similar and different. Typically, a scientific comparison draws specific parallels between two or more things by beginning with a description of similarities, followed by a discussion of differences. The language of comparison (e.g., *alike*, *similar*, *different*, *in contrast*) is used to signal when similarities and differences are being discussed. Writing a scientific comparison encourages attention to detail and can help students better understand science ideas.

Teaching Scientific Comparison Writing

The following guidelines can be used to teach scientific comparison writing using information found in many science texts.

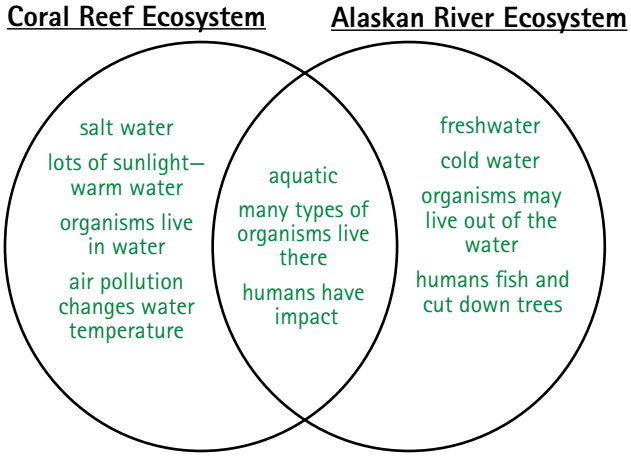
- Select a text with photographs that provides information about two things that can be compared. Good choices include texts about things in the natural world, such as animals, rocks and minerals, or weather.
- Explain that scientists compare things to help them understand and classify those things. Introduce the word *observe* by explaining that scientists observe, as well as read about, what they want to compare.
- Read the text in a way that is consistent with your classroom routines, giving students as much independence as possible. To support making comparisons, have students observe information shown in photographs as well as descriptions in the text. It is often helpful to have students discuss these observations with a partner.
- Choose two topics from the text that can be compared. Draw a Venn diagram on the board and label the two circles (for instance, "Hail" and "Snow").
- Have students share what is common and what is distinct between the two topics.

Comparison Words

Similarities	Differences
alike	even though
similar	different
both	but
too	while
in the same way	although
similarly	in contrast
the same as	on the other hand

Record their ideas in brief phrases in the Venn diagram.

- Through shared writing, use the ideas in the Venn diagram to construct a scientific comparison. First, explain that scientific comparisons begin with a topic sentence that tells what is being compared. With help from the class, write a topic sentence on the board, such as "Hail and snow are the same in some ways and different in others."
- Have students talk you through turning the notes from the Venn diagram into two or three sentences that describe the similarities. Use the words from the "Similarities" column in the box at the top of this page as needed.
- As you model scientific comparison writing, point out that a transition sentence is needed to signal a shift from similarities to differences. Provide an example, such as "While hail and snow are alike, there are also ways that they are different."
- Using ideas from the Venn diagram, create two or three sentences that describe the differences. Use the words from the "Differences" column in the box on this page as needed.
- Explain that scientific comparisons end with a conclusion that explains what was learned by making the comparison. Provide an example, such as "Hail and snow are similar in many ways, but they also have differences that allow us to classify them."
- Find opportunities to make comparisons throughout a unit of study. You may want to use the Scientific Comparison Writing copymaster included in this guide to support students' writing as you give them more independence.



Teaching Scientific Comparison Writing with *Ecosystems Around the World*

Getting Ready

1. Make a copy of the Scientific Comparison Writing copymaster for each student.
2. Make a class chart that lists comparison words, using the box on page 2 as a guide.
3. Draw a Venn diagram on the board. Label one circle "Coral Reef Ecosystem" and the other "Alaskan River Ecosystem." You will fill in the circles with students during class; sample student responses are in green.

During Class

1. To introduce *Ecosystems Around the World*, have students turn to pages 4–7 and briefly discuss what an ecosystem is. Also, discuss the types of information contained in this reference book.
2. Direct students' attention to the Venn diagram on the board and explain its purpose—to show how two things are alike and different. Tell students that they will read in order to compare and contrast two of the ecosystems in the book.
3. Ask students to use the table of contents on page 3 to find the sections that contain information about the coral reef ecosystem and the Alaskan river ecosystem. Then, have students read these sections in a way that is consistent with your classroom routines, giving them as much independence as possible.
4. After reading, ask students to identify ways in which the two ecosystems are alike and different. Have students refer to the text as they discuss.
5. Use the Venn diagram to record students' ideas. List similarities where the circles overlap. List differences where the circles do not overlap.
6. Distribute the Scientific Comparison Writing student sheets. Point out the organizational supports for paragraph structure that are included on the student sheets. Provide needed support for sudents to craft a well-developed scientific comparison paragraph using the information in the Venn diagram.
7. First, have students write a topic sentence that introduces what is being compared. [The coral reef and Alaskan river ecosystems are similar in some ways and different in others.]
8. Next, ask students to write about ways that the two ecosystems are similar. Have them use the middle section of the Venn diagram and the Comparison Words chart for reference. [Both of these ecosystems are aquatic and have been impacted by humans.]
9. Have students write a transition sentence that signals a shift from similarities to differences. [While the coral reef and the Alaskan river ecosystems are alike, they are also different in many ways.]
10. Encourage students to write two or three sentences about how the ecosystems are different. Have them refer to the outer sections of the Venn diagram and the Comparison Words chart for reference. [In contrast to the cold water in the Alaskan river ecosystem, water in the coral reef ecosystem is warm.]
11. Model writing a concluding sentence that explains what was learned by making the comparison. [Even though the coral reef and Alaskan river ecosystems are different, they both have plants and animals living together and depending on one another.]

Independent Extension

Have students work with a partner to use their written comparisons and *Ecosystems Around the World* to discuss which two ecosystems they think are the most similar and which two they think are the most different. Encourage students to use evidence to support their ideas.

Name _____ **Date** _____

Scientific Comparison Writing

Title of book: _____

_____

(Topic sentence)

_____

_____

(Similarities)

_____

_____

_____

_____

(Transition sentence)

_____

_____

(Differences)

_____

_____

_____

_____

(Conclusion)

_____

About Strategy Guides

A six-page strategy guide is available for each *Seeds of Science/Roots of Reading*® student book. These strategies support students in becoming better readers and writers. They help students read science texts with greater understanding, learn and use new vocabulary, and discuss important ideas about the natural world and the nature of science. Many of these strategies can be used with multiple titles in the *Seeds/Roots* series. For more information, as well as for additional instructional resources, visit the *Seeds/Roots* Web site (**www.seedsofscience.org/strategyguides.html**).

Student Books for Grades 4–5

Twenty-seven engaging student books are available, each with a corresponding strategy guide. The books are part of the *Seeds of Science/Roots of Reading*® curriculum program described on page 6.

Aquatic Ecosystems	
Strategy	**Student Book**
Teaching Scientific Description Writing	*Visit to a Pond*
Gathering Information from Science Texts	*Tabletop Pond Guide*
Interpreting Visual Representations	*Investigating Crayfish*
Using Roundtable Discussions	*Dragonfly Explanations*
Making Sense of Data in Science Texts	*Eat and Be Eaten: How an Ecologist Uses Food Webs*
Teaching Concept Mapping	*What Makes Living Things Go?*
Teaching Scientific Comparison Writing	*Ecosystems Around the World*
Teaching Text Structure	*Ecosystem News*
Teaching Vocabulary with Science Texts	*Making a Difference*
Planets and Moons	
Strategy	**Student Book**
Connecting Science Words and Everyday Words	*Exploring Planets and Moons*
Using Science Text to Visualize	*Spinning Through Space*
Taking Notes Based on Observations	*Observing the Moon*
Using the Cognates Strategy	*How Big Is Big? How Far Is Far?*
Teaching Scientific Comparison Writing	*Handbook of Planets and Moons*
Using Discourse Circles	*What About Pluto?*
Teaching About How Scientists Use Models	*Planetary Scientist*
Using Anticipation Guides	*Tomato Landers*
Promoting Word Consciousness	*Technology for Exploration*
Chemical Changes	
Strategy	**Student Book**
Teaching Scientific Explanation Writing	*Chemical Reactions Everywhere*
Posing Investigation Questions	*Handbook of Chemical Investigations*
Teaching Text Structure	*What Happens to the Atoms?*
Teaching Procedural Writing	*Bursting Bubbles: The Story of an Improved Investigation*
Promoting Word Consciousness	*Communicating Chemistry*
Models of Matter	
Strategy	**Student Book**
Teaching Summary Writing	*Made of Matter*
Using Roundtable Discussions	*Break It Down: How Scientists Separate Mixtures*
Interpreting Visual Representations	*Phase Change at Extremes*
Teaching About How Scientists Make Inferences	*Science You Can't See*

Extend Learning with *Seeds of Science/Roots of Reading*®

The strategy featured in this guide is drawn from the *Seeds of Science / Roots of Reading*® curriculum program. *Seeds / Roots* is an innovative, fully integrated science and literacy program.

The program employs a multimodal instructional model called "Do-it, Talk-it, Read-it, Write-it." This approach provides rich and varied opportunities for students to learn science as they ***investigate*** through firsthand inquiry, ***talk*** with others about their investigations, ***read*** content-rich books, and ***write*** to record and reflect on their learning.

Take advantage of the natural synergies between science and literacy instruction.

- Improve students' abilities to read and write in the context of science.
- Excite students with active hands-on investigation.
- Optimize instructional time by addressing goals in two subject areas at the same time.

To learn more about *Seeds of Science / Roots of Reading*® products, pricing, and purchasing information, visit **www.seedsofscience.org**

***Aquatic Ecosystems* Science and Literacy Kit**

SEEDS OF SCIENCE / ROOTS OF READING®

Developed at Lawrence Hall of Science and the Graduate School of Education at the University of California at Berkeley.

Seeds of Science/Roots of Reading® is a collaboration of a science team led by Jacqueline Barber and a literacy team led by P. David Pearson and Gina Cervetti.

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