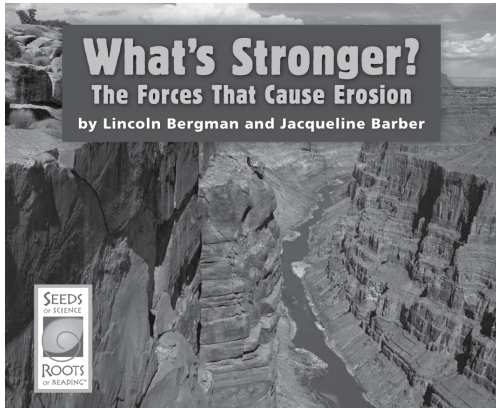


Interpreting Visual Representations

with *What's Stronger? The Forces That Cause Erosion*
from *Seeds of Science/Roots of Reading*[™]



Introduction

This strategy guide introduces an approach for teaching students how to use visual representations to enrich understanding of text. The ability to make use of illustrations to help comprehend text is particularly important in science, where information is often too complex to explain using words alone. This guide includes an introductory section about using visual representations to enhance comprehension, a description of how to teach this strategy with many science texts, and a plan for teaching students how to interpret visual representations with the *Seeds of Science / Roots of Reading*[™] book, *What's Stronger? The Forces That Cause Erosion*.

Book Summary

What's Stronger? The Forces That Cause Erosion illustrates the power of wind, water, waves, and glaciers to wear away things as hard as rocks and as big as mountains through a process called erosion. Readers learn how erosion washes soil down hillsides, how wind moves earth materials, and how rivers carry sand to beaches. With sections that pose questions about which forces of nature are stronger—raindrops or a hill, a river or a mountain, wind or land, waves or a cliff—readers are prompted to access and build on their existing knowledge of these forces. This book enables readers to see the effects of natural phenomena, not directly observable in the classroom, through powerful photographs that vividly illustrate the processes described in the text.

About This Book

Reading Level

Guided Reading Level*: 0

Text Features

book description, table of contents, glossary, headings, bulleted lists, about the author, bold print, illustrations, captions

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

Science Background

For the purposes of this book, erosion is defined as the wearing away of landforms by natural forces, such as water, waves, wind, or glaciers. The process can be gradual or more rapid. Erosion loosens and breaks up the surface of rocks and other objects, setting free rocks, sand, and other earth materials. These earth materials are further eroded as they move from one place to another. Streams, rivers, and ocean currents transport these small pieces long distances. Wind, ice, and rain are powerful natural forces that break up rock formations high in the mountains. Wind can push boulders and stones loose; it also gradually wears down rock surfaces by blowing particles such as sand, silt, and gravel into cliff sides. In essence, these particles sandblast the rock into fine sediment. Rain often combines with wind to wash out wind-loosened sediment. In formal earth science terms, erosion is only one part of this overall process, which also includes weathering and transport. Weathering is the physical, chemical, or biological breakdown of rocks and minerals into smaller-sized particles. Weathering and erosion are constantly at work wearing away the rocks that make up the Earth's crust. Transport is the movement of eroded material by air, water, and ice.

About Interpreting Visual Representations

Information in science texts is often represented with illustrations as well as with words. Visual representations—photographs, drawings, and diagrams—are important sources of information for readers. In contrast to fictional texts where visual representations are most often used to enhance the written text, visual representations in science texts often contain essential information that is necessary to understand the ideas being presented. They are used strategically by authors to communicate ideas or show relationships that cannot be captured by words alone. Visual representations can offer models of events that occur in the natural world and can illustrate processes and sequences. Visual representations in science texts aid understanding by affording students another modality from which to derive meaning and solidify understanding of science concepts. Visual representations serve several functions, as listed in the Roles of Visual Representations box on this page. (Not all books, however, use visual representations in all of these ways.) Asking students to think carefully about the role visual representations play in relation to the written text can help them think critically about what they are reading.

Teaching How to Interpret Visual Representations

The following guidelines can be used to teach the strategy of interpreting visual representations with any content-rich text.

- Select a text. Choose a text that uses photographs, diagrams, and/or drawings as an important source of information. (You may wish to choose just one section of a longer text to focus on during class.) Carefully consider the visual representations that accompany the words, and think about which role(s) the illustrations play (see the box on this page).
- Explain to the class that authors use illustrations, or pictures, to assist readers in understanding ideas presented in a text. Tell students they should pay particular attention to photographs, drawings, and diagrams, and that it is important to carefully read the words,

Roles of Visual Representations

1. **Exemplify:** Gives an example of something from the text
2. **Contextualize:** Shows where something happens
3. **Clarify:** Shows something that is hard to explain with words
4. **Extend:** Adds new information

look at the illustrations, and consider the ways these elements work together.

- Preview the text with students. Identify the roles visual representations play in the book to help readers better understand the text. You can use the Making Observations from Illustrations copymaster included with this guide to name and define these roles.
- Model how to make observations from illustrations. Focus students on the section of text you selected before class. Model how to connect the illustration with the written text. Ask “Why did the author put this illustration here?” Discuss how illustrations provide information that enhances understanding of the ideas conveyed by the words.
- Reflect on each illustration during reading. As students read, ask them to pause and consider the illustrations on each page. They should think about how the illustrations help them understand the text. Students can use their Making Observations from Illustrations student sheets to record which role(s) the illustrations play in the book, or they can simply discuss the illustrations with a partner during reading.
- Reflect on the strategy. After reading, lead a class discussion about what students noticed about the illustrations in relation to the words. Ask students to choose three illustrations from the text and tell what role they think each played and why. Ask students to reflect on how thinking about the illustrations in addition to the words helped them understand the ideas.
- Continue practicing the strategy. As students read other content-rich texts, remind them to look carefully at illustrations and think about how they are related to the words on the page.

Interpreting Visual Representations with *What's Stronger? The Forces That Cause Erosion*

Getting Ready

Make a copy of the Making Observations from Illustrations copymaster for each student.

During Class

1. Explain that *What's Stronger? The Forces That Cause Erosion* shows how a process called erosion shapes Earth. Read the book in a way that is consistent with your classroom routines, giving students as much independence as possible.
2. Explain that the photographs, drawings, and diagrams an author includes in a book are also called illustrations or visual representations. Illustrations are carefully chosen and placed on particular pages to help readers understand more about the ideas in the text. Explain that the authors of *What's Stronger?* used photographs to further explain the concept of erosion.
3. Distribute a Making Observations from Illustrations student sheet to each student. Explain that illustrations work with the words in a text in a variety of ways. Provide a general explanation of what each role means (using the list in the column labeled "Role" on the student sheet as a guide).
4. Ask students to turn to pages 18–19 in the book. Reread the text and explain how the photograph on page 19 helps to clarify the ideas conveyed in the words. Point out that the photograph helps the reader see how sand might move and change the shape of the land when the wind moves across it, which is something that the text alone does not completely show.
5. Direct students to fill in the "Shows" row on their student sheets. Tell them to write the page number on which the photograph is found. [Page 19.] Then, ask students to help you construct a sentence or two that explains how the photograph clarifies the text. [It shows what the sand looks like when the wind moves across it.] Write this information on the board and ask students to write the information on their student sheets.
6. Ask students to turn to pages 8–9. Read the text aloud and explain that the photograph on page 9 plays the role of adding information. The words state that rainwater can carry soil and rocks down a hill quickly. The photograph shows the results of this process—rainwater and soil have run down the hill and might cause a threat to the house and the car below. The words do not indicate that moving water and soil can cause problems for people, but we know this from the photograph. Ask students to record the page number of this photograph in the "Adds" row on their student sheets. [Page 9.] Then ask students to write a note, in their own words, about how the photograph adds information.
7. Ask students to reread the book, look closely at the photographs, and think about the roles that the photographs play. Tell students that they should choose one photograph for each of the remaining two roles and record the page number on which it appears. They should also write a short description of how the photographs and the words work together. ["Example," pages 10, 11, or 15; "where," pages 13, 17, or 21.]
8. Share ideas about the photographs in the book. Have each student show the class a photograph that they chose and explain what role it played. Ask students to explain what they learned about erosion from looking at the photograph and the words together.
9. Ask students to reflect on why it is important to pay attention to illustrations when reading. Ask questions such as, "What did you learn when you looked more carefully at the photographs that you didn't notice during your first read? How do you think paying attention to illustrations helps you understand what you are reading?"

Independent Extension

Ask students to imagine that they are asked to redesign the cover of *What's Stronger? The Forces That Cause Erosion*. Students should respond to the question, "What new photograph would you choose for the cover that would show an important idea from the book?" Ask students to write a description of their new photograph. Students can then explain (in writing or orally with a partner) how their new photograph shows an important idea.

Name _____ Date _____

Making Observations from Illustrations

Title of Book _____

Role	Page Number	How the illustration and words work together
Gives an example of something from the text		
Helps you understand where something happens		
Shows something that is hard to explain with words		
Adds new information		

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* website (<http://www.seedsofscience.org/strategyguides.html>).

Available Student Books for Grades 2–3

Twenty-three engaging student books are now 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. Four *Gravity and Magnetism* student books and strategy guides will be available in 2009.

Soil Habitats	
Strategy	Student Book
Using Discourse Routines with Science Texts	<i>Into the Soil</i>
Using the Cognates Strategy	<i>Walk in the Woods</i>
Connecting Science Words and Everyday Words	<i>What Are Roots?</i>
Teaching About the Nature of Science	<i>Talking with a Habitat Scientist</i>
Teaching Text Structure	<i>Handbook of Forest Floor Animals</i>
Using Text Features	<i>Earthworms Underground</i>
Taking Notes Based on Observations	<i>My Nature Notebook</i>
Making Sense of Data in Science Texts	<i>Snail Investigations</i>
Using Discourse Circles	<i>Without Soil</i>
Shoreline Science	
Strategy	Student Book
Teaching Vocabulary with Science Texts	<i>Beach Postcards</i>
Teaching Concept Mapping	<i>What Belongs on a Beach?</i>
Teaching Scientific Explanations	<i>Gary's Sand Journal</i>
Interpreting Visual Representations	<i>What's Stronger? The Forces That Cause Erosion</i>
Using Text Features	<i>What Lives on a Sandy Beach?</i>
Teaching About Multiple Meaning Words	<i>My Sea Otter Report</i>
Searching for Information in Science Texts	<i>Handbook of Sandy Beach Organisms</i>
Teaching Text Structure	<i>The Black Tide</i>
Teaching About the Nature of Science	<i>Shoreline Scientist</i>
Designing Mixtures	
Strategy	Student Book
Using Discourse Circles	<i>What If Rain Boots Were Made of Paper?</i>
Using Anticipation Guides	<i>Solving Dissolving</i>
Teaching Scientific Explanations	<i>Handbook of Interesting Ingredients</i>
Teaching Text Structure	<i>Jelly Bean Scientist</i>
Teaching About the Nature of Science	<i>Jess Makes Hair Gel</i>

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



Soil Habitats Science and Literacy Kit



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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