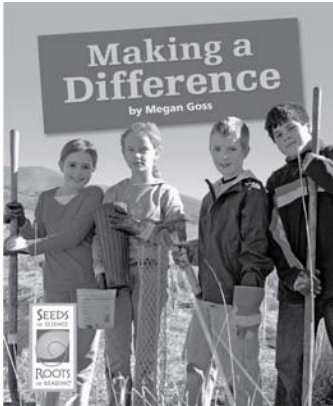


Teaching Vocabulary with Science Texts

with *Making a Difference*
from *Seeds of Science/Roots of Reading*[®]



Introduction

This strategy guide introduces an approach for teaching vocabulary with science texts. Knowing specialized vocabulary is necessary for understanding important concepts in content-rich texts. This guide includes an introductory section about teaching conceptually important vocabulary, a general overview of how to teach this strategy with many science texts, and a plan for teaching vocabulary with the *Seeds of Science/Roots of Reading*[®] book *Making a Difference*.

Book Summary

Making a Difference introduces readers to a class that participates in the restoration of a local creek in partnership with a community organization. With the help of scientists and their teacher, the students travel to the creek, learn about how human activity can impact a watershed, and plant trees. The students learn that making a difference in the world can be hard work but that it is something that anyone can do if they make a commitment. By reading about this effort, readers learn how small changes can affect an entire ecosystem because everything in an ecosystem is connected.

Science Background

A community of organisms living together within its environment, or physical surroundings, is called an ecosystem. Humans are part of ecosystems and depend upon and interact with organisms and the environment in different ways. Humans, like all organisms, cause changes in ecosystems. When changes occur in an ecosystem, some plants and animals may survive and reproduce, and others may die or move to new locations. Humans can cause changes to ecosystems that are both helpful and harmful. Some of the ways that humans can harm ecosystems are by overharvesting organisms, polluting, destroying habitats, and introducing nonnative species. Humans can reduce harm to ecosystems and help restore damaged ecosystems by learning more about them, making rules and regulations that protect or sustain them, and working to restore specific natural areas. By understanding the ways in which the different parts of an ecosystem interact, scientists can sometimes make changes in order to help the ecosystem as a whole. One way of doing this is by introducing native plants or animals in a strategic way. Over time, this type of human intervention can help the ecosystem become healthier and more diverse.

About This Book

Reading Level

Guided Reading Level*: S

Key Vocabulary

ecosystem, human impact, restoration, survive, watershed

Text Features

bold print, captions, diagrams, glossary, illustrations, labels, maps, photographs

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

About Vocabulary in Science Texts

Science texts often contain many specialized terms that may be unfamiliar to students. These terms represent important concepts that are central to understanding science; not knowing such words can impede students' abilities to understand and learn from text. Vocabulary instruction that targets conceptually important words can increase students' understanding of complex ideas presented in text while also broadening their overall word knowledge. Students best learn vocabulary when they have multiple opportunities for meaningful exposure to a few select words. Thus, the most effective vocabulary strategies are those that provide opportunities for students to read, write, and discuss words in a variety of contexts. The ultimate goal of vocabulary instruction is to help students develop a deep understanding of vocabulary so they can use words to explain ideas when speaking and writing.

Teaching Vocabulary with Science Texts

The following guidelines can be used to teach vocabulary with any science text.


- Choose a text related to your science curriculum. Familiarize yourself with the text, noting the main ideas and difficult or specialized terms. Look for words that convey the most important ideas in the text. Then, select a few words on which to focus instruction.
- Think about how the words you chose relate to the concepts you are teaching. You may want to make a concept map that shows the relationships among words to help you conduct a vocabulary discussion with your class.
- Introduce the words to students and gauge their familiarity with each word. Prompt students to think about whether or not they know the word, have heard the word but do not know what it means, or have never heard the word before.
- Orally, provide short, accessible definitions of the words before, during, or after reading. Initial definitions need not be complex or

Guidelines for Selecting Vocabulary to Teach with Science Texts

- Select words that convey the most important ideas from a text.
- Choose words that can generate many examples (e.g., *planet*, *invertebrate*) rather than specific examples (e.g., *Jupiter*, *centipede*).
- Choose words that relate to other words you are teaching (e.g., *erosion*, *rock*).
- Focus on two to three words from each text. It is better to help students gain a deep understanding of a few words than to try to teach long lists of words.

include many examples. Introduce each word to students so they understand its basic meaning.

- Connect the word's usage to students' prior knowledge. Discuss how the word relates to a familiar topic. Describe a common situation in which the word is used, and clarify the meaning of the word as necessary.
- Ask students to locate one of the words in the text and read aloud the sentence that contains the word. When applicable, discuss the ways in which the context of the sentence helps the student better understand the word.
- Have students generate examples that relate to the target words. Students can also create sentences or drawings that incorporate the words. You may want to have students record their thinking on the Word Map copymaster included in this guide.
- Provide opportunities for students to use new words in speech and writing. For example, structure a small-group discussion in which students incorporate a set of words that you provide on index cards. Or, create a class glossary to use as a reference when writing.
- Continue to deepen students' understanding of previously learned words by revisiting those words over time. Incorporate vocabulary instruction to support learning in other content areas.

Definition bringing something back to the way it used to be	Example planting small trees and putting nets around them to stop deer and other animals from eating them
Picture 	Sentence To continue their restoration of the creek, the class could return once a month to pick up trash.

Teaching Vocabulary with Making a Difference

The following steps can be used to help students understand important concepts using a word map.

Getting Ready

1. Make a copy of the Word Map copymaster for each student.
2. On the board or on chart paper, draw a word map as shown above. Write the word “restoration” in the center box. You will fill in the boxes (including the drawing) with students during class; sample student responses are in green.

During Class

1. Introduce *Making a Difference*. Explain that the book follows students on a class trip to a creek. Once there, the class learns how humans can affect an ecosystem and how to bring it back to the way it used to be.
2. Read *Making a Difference* in a way that is consistent with your classroom routines, giving students as much independence as possible. Before reading, encourage students to focus on how the word *restore/restoration* is used in the book.
3. Direct students’ attention to the word map you prepared. Explain that a word map can help readers understand an important concept. Tell them that they will use a word map to organize information about the word *restoration*.
4. Invite students to reread pages 5, 8, and 9 in order to generate a definition for the word *restoration*. Discuss the meaning of the word

based on the text. If students provide an incomplete definition, prompt them to add more information. When the class has agreed on a definition, write it on your word map in the box labeled “Definition.”

5. Next, ask students to identify an example of restoration from the book. [When students planted small trees and then put nets around them to stop deer and other animals from eating them, page 19.] In the box labeled “Example” on the word map, write one student’s example.
6. Then, have students describe a simple picture that would depict restoration. Draw it in the box labeled “Picture.” (One possibility is shown on the sample word map on this page.)
7. Lastly, ask students to use the word *restoration* in a sentence. Record this sentence in the box labeled “Sentence” on the word map.
8. Distribute the Word Map student sheets and ask students to write the term *human impact* in the box in the center of the map. Explain that students will now complete a word map for the term *human impact*.
9. Discuss how to locate the most important information about human impact in the text. Encourage students to use the glossary, bold print, photographs, and illustrations to help support their completion of the word map.
10. Provide time for students to reread the text, find information related to human impact, and use this information to complete their word maps. You may choose to have students do this individually or with a partner.
11. Have a few volunteers share their word maps with the class. Discuss how thinking carefully about the key terms *restoration* and *human impact* helped students understand the text.

Independent Extension

Give pairs of students the following terms written on index cards: *ecosystem*, *human impact*, *restore*, *watershed*, and *survive*. Ask pairs to work together to generate sentences that incorporate two or three of the terms in the same sentence. Challenge students to come up with as many sentences as they can.

Name _____

Date _____

Word Map

Title of book: _____

Definition	Example
Picture	Sentence

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



Aquatic Ecosystems 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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