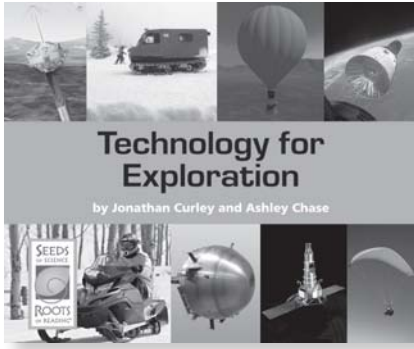


Promoting Word Consciousness

with *Technology for Exploration*
from *Seeds of Science/Roots of Reading*®



Introduction

This strategy guide introduces an approach for promoting word awareness as students read science texts. Students who are word conscious are aware of the words around them and appreciate the power of words as a means of communicating ideas in a precise manner. This guide includes an introductory section about word consciousness, a general overview of how to teach this strategy with many science texts, and a plan for promoting word consciousness with the *Seeds of Science/Roots of Reading*® book *Technology for Exploration*.

Book Summary

Technology for Exploration explores the creative and varied solutions that engineers design to help humans explore Earth and beyond. Readers learn that technology is not just computers and digital technology, but that it can be any tool or machine designed for a specific purpose. The varied photographs and detailed captions illustrate how there are many technological solutions to the same design problem. For example, both rockets and parachutes can be used to slow down a spacecraft. Engineers design technology based on the conditions in the place that people want to explore. That is why a device for collecting samples from a volcano may look different from a device for collecting samples from deep in the ocean.

Science Background

Engineers use their scientific knowledge and creativity to design solutions that work for a given design problem. Some of the simplest forms of technology include basic human-designed objects, such as the wheel. Technology has become increasingly advanced and pervasive over time. Today, people rely on countless forms of technology for much of their everyday activities—from bicycles and cars to computers and cell phones. Technology is always designed to fulfill a given need or solve a given problem. When it comes to designing technology for exploring space, engineers work to solve many different problems, such as launching, landing, collecting samples, and communicating with Earth. The design of a particular piece of technology depends on its purpose; a device for collecting soil and rocks will look very different from a device used to power a spaceship. Throughout human history, technology has become more and more advanced, and it has allowed us to explore farther into space and learn more about our Solar System. As we learn more and technology continues to advance, engineers and scientists are able to probe deeper into space and make new and exciting discoveries.

About This Book

Reading Level

Guided Reading Level*: R

Key Vocabulary

communicate, conditions, creativity, engineer, technology

Text Features

bold print, captions, glossary, headings, illustrations, labels, photographs, table of contents

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

About Word Consciousness

A comprehensive approach to teaching vocabulary includes varied language experiences: teaching individual words, teaching word-learning strategies, and fostering word consciousness. Word consciousness refers to strategies for promoting interest in words and their meanings, metacognition about words, and motivation to learn words. Creating opportunities to develop word consciousness will help students gain a greater understanding about the importance of vocabulary and language. Science texts often contain specialized terms that may be unfamiliar to students and, thus, are excellent vehicles for promoting curiosity about words. Word consciousness activities build on students' existing vocabularies and help draw students' attention to new vocabulary when it is encountered in text. They also encourage precise word usage in speaking and writing.

Promoting Word Consciousness

The following guidelines can be used to promote word consciousness with many science texts.

- Choose a text that relates to a topic or unit of study. Make sure the text includes conceptually important words that you think will be relatively new to your students.
- Familiarize yourself with the text and select about five words on which to focus. Ideally, the text should convey the meaning of these words in context.
- Create a student sheet that encourages students to assess their familiarity with new words that they will encounter in the text. You can use the copymaster included in this guide or create your own. List the words you selected and make a copy for each student.
- Explain to the class that they will read the text and think carefully about some of the interesting words they will encounter. Distribute the student sheets and read each word aloud. Prompt students to think about how familiar they are with each of these words in the context of the science topic you are studying. Have students indicate their levels of familiarity with each word as follows:

Ways to Promote Word Consciousness

- Create a classroom environment that encourages curiosity about words and their meanings.
 - Provide repeated opportunities to identify, explore, and use new words found in text.
 - Encourage precision with language in discussions and writing.
 - Foster an awareness about words through the study of prefixes, suffixes, and roots.
 - Help students see relationships between words.
 - Involve students in conducting investigations as a context for learning and using new words.
-
- a. They know the word well and can explain it and use it.
 - b. They know something about the word and can relate it to a situation.
 - c. They have seen or heard the word before.
 - d. They do not know the word.
- Have students read the text you selected. After reading, discuss the content of the text.
 - Ask students to locate one of the words in the text and read aloud the sentence that contains the word.
 - Discuss ways that the context of the sentence can help students figure out the word's meaning.
 - Have students locate, read about, and discuss the remaining words.
 - Provide opportunities for students to use the words in discussions and in writing. For example, you could provide a small-group discussion topic that would necessitate using the words, or have students write in response to the text and incorporate the words into their writing.
 - Encourage students to preview other texts and select their own words on which to focus. Explain that paying greater attention to these words as they read (as opposed to skipping over them) will help them discover the words' meanings.
 - Incorporate similar activities to support word awareness across the curriculum. The box on this page lists several ideas.

Promoting Word Consciousness with *Technology for Exploration*

Getting Ready

1. Write the following words in the “Before reading” and “After reading” sections of the How Well Do I Know These Words? copymaster: *communicate*, *conditions*, *creativity*, and *engineer*. Make a copy for each student.
2. Using the copymaster as a guide, reproduce the familiarity scale on the board. Use *technology* as an example word.

During Class

1. Introduce *Technology for Exploration* by explaining that it is a book that shows many vehicles for exploration, both on Earth and in space. Ask students to preview the table of contents on page 3 to get an overview of the book’s content.
2. Tell students that science texts often contain specialized words with which they may be unfamiliar. Explain that students will think about and discuss some of the many interesting words in this book as they read. Point out your example on the board.
3. Prompt students to think about how familiar they are with the word *technology*. Have them raise their hands to indicate whether they know the word well and can explain it and use it, whether they know something about the word and can relate it to a situation, whether they have seen or heard the word before, or whether they do not know the word. Have one student representing each category explain why they chose that category. Tally students’ responses.
4. Have students turn to page 5 and read the sentences that discuss technology. Discuss the ways that the context of the sentences helped students figure out the word’s meaning. Then, have students reassess their familiarity with the word. Tally the results again and point out how students’ understanding has shifted.
5. Distribute the student sheets and read each target word from *Technology for Exploration* that is listed in the “Before reading” section. Prompt students to think about how familiar

they are with each of these words, then have them complete the “Before reading” section.

6. Have students find an additional word or two in the text that they are interested in and record this on their student sheets.
7. Read the book in a way that is consistent with your classroom routines, giving students as much independence as possible.
8. Provide opportunities for students to use each of the target words in a discussion about the text. Pose the following questions and have students discuss each with a partner:
 - What do engineers do in their work?
 - What conditions do engineers consider in their design of space vehicles?
 - What are some ways that spacecraft and other vehicles communicate?
 - Why is it important for engineers to use creativity?
9. After reading and discussing, have students reflect on the selected words, including the additional words they chose. Ask students to compare what they knew about the words before reading to what they know now. Have them indicate this on their student sheets in the “After reading” section.
10. Discuss how reflecting on new words before reading supported an awareness of these words and the context in which they are used. Encourage students to pay attention to interesting words as they read other books.

Independent Extension

Have students work together to generate sentences using the words *communicate*, *conditions*, *creativity*, and *engineer*. Challenge students to use two or three of the words in the same sentence and to come up with as many sentences as they can.

Name _____

Date _____

How Well Do I Know These Words?

Title of Book: _____

Put an “X” in one column to show how much you know about each word.

Before reading

Word	I do not know anything about this word.	I have seen or heard this word before.	I know something about this word and can relate it to a situation.	I know this word well and can explain it and use it.

After reading

Word	I do not know anything about this word.	I have seen or heard this word before.	I know something about this word and can relate it to a situation.	I know this word well and can explain it and use it.

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).

Available Student Books for Grades 4–5

Eighteen 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. Nine *Aquatic Ecosystems* student books and strategy guides will be available in summer 2010.

<i>Planets and Moons</i>	
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>
<i>Chemical Changes</i>	
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>
<i>Models of Matter</i>	
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



Planets and Moons 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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