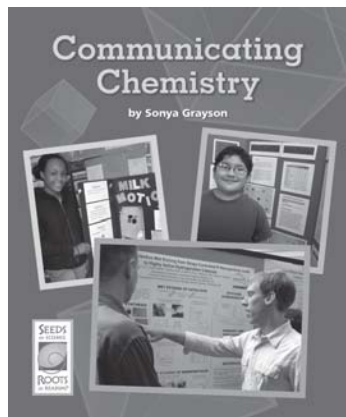


Promoting Word Consciousness

with *Communicating Chemistry*
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 *Communicating Chemistry*.

Book Summary

Communicating Chemistry follows chemist Michael Grass as he prepares to present an investigation to the scientific community. Grass studies ways of creating nanoparticles—tiny groups of atoms—that can be used to make chemical reactions happen more quickly. The book models the process of communicating the results of an investigation, focusing on how Grass thinks carefully about how to convey his results, creates a poster, and prepares for a scientific conference. The book also includes tips for presenting posters, which may be helpful to students as they prepare and present investigations in science class or at a science fair.

About This Book

Reading Level

Guided Reading Level*: S

Key Vocabulary

communicate, investigate, procedure, scientific community

Text Features

bold print, bulleted lists, captions, glossary, headings, illustrations, photographs, table of contents

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

Science Background

Chemistry

Chemistry is the study of what substances are made of and how they react with one another. Chemists investigate chemical reactions to learn how substances change to form new substances. Some chemical reactions can be sped up by adding tiny groups of atoms called nanoparticles. Some nanoparticles are so small that they are only 30 atoms wide! Nanoparticles affect the speed of the chemical reaction but are not used up in the reaction itself.

Communicating Ideas in Science

The scientific community is made up of scientists around the world who share ways of thinking. Scientists regularly share their ideas within the scientific community. They communicate by writing papers, speaking at conferences, and presenting scientific posters. These activities allow them to make their ideas public, get feedback on their investigations, and revise their explanations. Scientists can evaluate one another's ideas and generate new questions for further investigation. They also may criticize one another's work by pointing out flaws in the investigations, evidence, or explanations. Ongoing critical analysis of investigations and evidence is one of the hallmarks of the discipline of science.

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. It may also increase their motivation, interest, and enjoyment in reading. Science texts often contain specialized terms that may be unfamiliar to students and are, thus, excellent vehicles for promoting curiosity about words. Word consciousness activities build on students' existing vocabularies and help students with limited vocabularies, as well as students with larger vocabularies. Promoting word consciousness helps draw students' attention to new vocabulary when it is encountered in text and encourages 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

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.

in the context of the science topic you are studying. Have students indicate their levels of familiarity with each word.

- 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 with the class as needed.
 - 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 talking and writing. For example, you could provide a small-group discussion topic that would necessitate using the words, or have students write about the text and incorporate the words into their writing.
 - Encourage students to preview other texts before reading 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 the previous page lists several ideas.

Promoting Word Consciousness with *Communicating Chemistry*

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: *nanoparticle*, *conference*, *data*, *procedure*, *investigate*, and *scientific community*. Make a copy for each student.
2. Using the copymaster as a guide, reproduce the familiarity scale (the four headings) on the board. Use *communicate* as an example word.

During Class

1. Introduce *Communicating Chemistry* by explaining that it is a book about a chemist named Michael Grass and the ways he shares his scientific findings. Ask students to preview the table of contents on page 3 to get an overview of the book’s content.
2. Explain that being curious about and interested in words can help students better understand what they read. Explain that students will think about and discuss some of the words in this book as they read.
3. Prompt students to think about how familiar they are with the word *communicate*. Have them raise their hands to indicate if they (a) know the word well and can explain it and use it, (b) know something about the word and can relate it to a situation, (c) have seen or heard the word before, or (d) do not know the word. Have a few students explain why they chose a category. Tally students’ responses on the board.
4. Have students turn to page 7 and read it together, focusing on the word *communicate*. Discuss what the text says about this idea. Highlight the ways that context helped students figure out more about the word’s meaning.
5. Have students reassess their familiarity with the word. Tally the results again and point out how students’ understanding has shifted.
6. Distribute the student sheets and have volunteers read each word from *Communicating Chemistry* in the “Before reading” column. Prompt students to think about how familiar they are with each of these words, and then have them indicate 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. Invite discussion about the text.
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 is a *nanoparticle*?
 - What do scientists do at a *conference*?
 - What are some examples of *data*?
 - Why might a scientist use a *procedure*?
 - What did Grass *investigate*, and what did he find out?
 - Why do scientists share their investigations with the *scientific community*?
9. Have students reflect on the words after reading and discussing. Ask students to compare what they knew about the words before reading to what they know now. Have them indicate their new levels of knowledge in the “After reading” section.
10. Discuss how reflecting on new words supports an awareness of words and the context in which they are used. Encourage students to pay attention to interesting words as they read other texts. Note that paying greater attention to words (as opposed to just skipping over them) will help students discover more about the words’ meanings.

Independent Extension

Have students work together to generate sentences using the words from the “Before reading” and “After reading” sections of the copymaster. 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

Nine engaging student books are now available from *Models of Matter* and *Chemical Changes*, each with a corresponding strategy guide. The books are part of the *Seeds of Science / Roots of Reading*[®] curriculum program described on page 6. Eighteen student books from the remaining grade 4–5 units (*Planets and Moons* and *Aquatic Ecosystems*) are currently in development and will be available in spring and summer 2010.

<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



Chemical Changes 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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