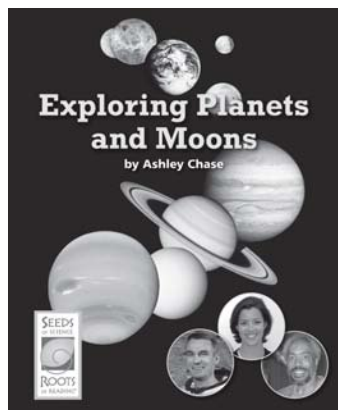


Connecting Science Words and Everyday Words

with *Exploring Planets and Moons*
from *Seeds of Science/Roots of Reading*®



Introduction

This strategy guide introduces an approach for helping students learn to use the language of science—the specialized language that scientists use to communicate about ideas and processes. Teaching students to connect scientific words with everyday words is one way to help them acquire this important academic discourse. This guide includes an introductory section about the differences between scientific words and everyday words, a description of how to use the science/everyday words strategy with many science texts, and a plan for using this strategy with the *Seeds of Science/Roots of Reading*® book *Exploring Planets and Moons*.

Book Summary

Exploring Planets and Moons introduces the work of three people and the ways that they study other planets and moons. First, readers learn about astronaut Eugene Cernan, who collected samples from the Moon's surface on the *Apollo 17* mission. Next, readers are introduced to engineer Jessica Collisson Samuels and her work as part of the team that designed the successful Mars rovers *Spirit* and *Opportunity*. Then, readers meet space scientist Gibor Basri, who uses powerful telescopes to gather information about distant planets orbiting other stars. Through learning about a variety of ways to explore the Solar System and beyond, readers learn that there are many ways to investigate space without ever leaving Earth.

Science Background

People have been exploring space for thousands of years. Within the last century, scientists, engineers, and astronauts have explored parts of space that have never been seen before. One way to explore space is to send astronauts to gather firsthand data. So far, six manned missions have explored Earth's Moon, and twelve people have walked on its surface. However, it is more practical to explore distant planets and moons by sending spacecraft to collect data. Engineers use their scientific knowledge to design and build robots to explore space. Some missions are designed to land on (or even crash into) other planets and moons; others fly by them to collect data and send it back to Earth. Still another way to explore space is by making observations from Earth; some of the earliest known scientists explored space in this way. Technology has advanced a great deal in recent years, enabling space scientists to gather more data from places that are even farther away. However, in order to collect data about stars and planets outside our own Solar System, scientists send telescopes into space to make observations that we cannot make from Earth. All missions require teams of engineers and scientists who use scientific knowledge to design technology to learn more about distant worlds.

About This Book

Reading Level

Guided Reading Level*: Q

Key Vocabulary

design, engineer, gravity, planet, rover

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 Connecting Science Words and Everyday Words

Different disciplines involve different ways of communicating, which include specialized vocabulary and ways of organizing explanations and arguments. In particular, scientists have ways of speaking and writing that characterize the work of the scientific community. Learning the academic discourse of science is key to success in school. While one way of communicating is not *better* than another, different contexts do call for particular types and uses of language. It is important to teach these distinctions to students and help them recognize when and how to use academic discourse effectively.

The discourse of science includes words that are similar to commonly used words, but have a more specific and nuanced meaning in science (e.g., *observe* as opposed to *look*). The science/everyday words strategy involves students in building a chart that associates scientific words with their everyday counterparts. This activity allows students to recognize differences between speaking and writing in science and in other situations, which focuses their attention on the use of specialized language. The science/everyday words strategy draws upon and validates what students already know; it also helps students use this knowledge as a bridge to learning new ideas. This strategy is effective for all students and may be especially helpful for English Language Learners.

Teaching How to Connect Science Words and Everyday Words

Many content-rich texts provide opportunities for students to associate academic vocabulary with everyday words. The following guidelines can be used to teach students the science/everyday words strategy with any science text.

- Choose a text that is related to your curriculum. Locate a few science words in the text that have everyday counterparts (note that not every scientific word has an everyday counterpart). Choose words associated with concepts that may be familiar to students. For example, students know the word *look* but may not know the word *observe*.
- Make a class chart with two columns—one labeled “Science words” and the other labeled “Everyday words.” On the chart, record the science words that you have selected from the text. Leave the “Everyday words” column blank; you will fill this in with students during class. You may also want to make a copy of the Science/Everyday Words copymaster (included in this guide) for students so they can keep a list of words for themselves.
- Before reading the text, talk with your students about different ways of speaking in different situations. For example, students will likely recognize that they speak differently to their teachers than to their friends. Give examples of these differences and ask students to provide examples from their own lives. Make it clear that one way of communicating is not better than another—they are just *different* ways of communicating. Knowing about these differences will help students learn to speak and write in the way that is most appropriate to each situation.
- Explain that scientists have a distinct way of speaking and writing and that they use particular words. These words are often similar in meaning to words we use every day, but the words have a more specialized meaning in the context of science.
- Using one word as an example, explain or demonstrate how a science word can have a comparable everyday word (e.g., *represent* and *show*). Be sure to highlight the differences in meanings between the two words.
- During or after reading, ask students if they can identify words they already know that are similar in meaning to the scientific words listed on the class chart. Write these everyday approximations for the science words in the “Everyday words” column. Lead discussions about how each science word and everyday word is similar and different in meaning. Students may also suggest additional science words to add to the class chart.
- Use the completed class chart as a resource. After reading additional science texts or throughout a unit of study, add science words and their everyday approximations to the class chart. Encourage students to use the scientific words when talking or writing about science.

Science words	Everyday words
mission	trip, project
evidence	clues
rover	robot
design	make, invent
creativity	imagination
investigate	study
observe	look

Teaching How to Connect Science Words and Everyday Words with *Exploring Planets and Moons*

Getting Ready

1. Using the model above as a guide, write the science words on the Science/Everyday Words copymaster. Leave the “Everyday words” and “Page number” columns blank. Make a copy for each student.
2. Create the Science/Everyday Words chart on the board or on a piece of chart paper using the model above. Fill in only the “Science words” column; you will fill in the “Everyday words” column with students during class. (Suggested student responses are in green.)

Before Reading

1. Explain to students that people have different ways of speaking depending on what they are discussing and to whom they are speaking. Ask students for examples of ways they talk differently with people in different situations.
2. Tell students that scientists have a particular way of talking that helps them explain science ideas. Explain that scientists often use words that can be similar, but not identical, to words one might use in other situations.
3. Provide an example of a science/everyday word pair in the text. Read pages 4–5 of *Exploring Planets and Moons* aloud. Point out the word *mission* on page 5 and show students how to use context to suggest a word they already know that has the same meaning. [Trip or project.] On the board, record the everyday word across from the word *mission*. Tell students that scientists use the word *mission*

because it means more than just a trip—it is a trip to gather new information about a place.

During Reading

1. Distribute a Science/Everyday Words student sheet to each student and have them read the list of science words. Say that as they read, they should notice how these words are used.
2. Read the book in a way that is consistent with your classroom routines, giving students as much independence as possible. As they read, ask students to record everyday words across from the corresponding science words on their student sheets. Tell students that they should use the context of the book to help them figure out what the science words mean. Students should also record the page number on which each science word appears.

After Reading

1. Have students share their everyday approximations of the science words with the class. Record the everyday words across from the science words on the board. You may also have students suggest additional science words for you to record on the chart, along with the everyday approximations of those words.
2. Lead a class discussion about the differences in meaning of several of the science/everyday word pairs, emphasizing that each science word is more precise or has a slightly different meaning than its everyday counterpart.
3. Explain that students can use these science words when they write and discuss ideas as scientists do. To encourage students to use science words in a discussion, have the class help you write a shared summary of the book. Encourage students to use science words from their Science/Everyday Words student sheets as they discuss ideas from the text.

Independent Extension

Have students choose a science word from the “Science words” column of their Science/Everyday Words student sheets and write a few sentences explaining what the word means. Encourage students to use examples from *Exploring Planets and Moons* to help clarify the word’s meaning. They can also add a realistic illustration to their writing.

Name _____ Date _____

Science/Everyday Words

Title of book: _____

Page number	Science words	Everyday words

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.

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



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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