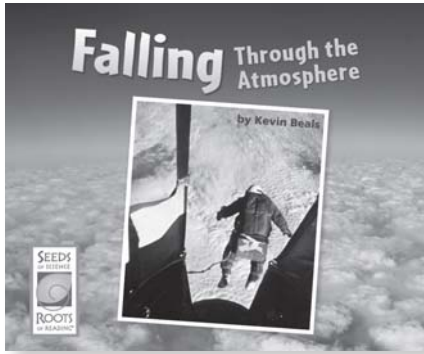


Teaching About Multiple Meaning Words

with *Falling Through the Atmosphere*
from *Seeds of Science/Roots of Reading*®



Introduction

This strategy guide introduces an approach for teaching about multiple meaning words. The ability to understand multiple meaning words—words that have different meanings depending on how, where, and in what way they are used—helps students access important information in science texts. This guide includes an introductory section about words with multiple meanings, a general overview of how to teach about multiple meaning words found in many science texts, and a plan for teaching about multiple meaning words with the *Seeds of Science/Roots of Reading*® book *Falling Through the Atmosphere*.

Book Summary

Falling Through the Atmosphere introduces students to Joseph Kittinger, the only person to have “fallen” almost 20 miles through the atmosphere to land on Earth. This book tells the true story of Kittinger’s jump. It also explains what conditions are like at different heights in Earth’s atmosphere. The beginning of the book focuses on Kittinger’s ascent in a balloon, including details about the special suit he wore, the temperature changes at different elevations, and the things he saw. Readers then follow Kittinger’s descent down through the atmosphere. This book helps readers visualize what Earth’s atmosphere is like and provides a window into Kittinger’s unique experience.

About This Book

Reading Level

Guided Reading Level*: O

Key Vocabulary

atmosphere, parachute, temperature, weather

Text Features

bold print, captions, glossary, graphs, labels, photographs, text boxes

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

Science Background

The atmosphere is the layer of air that surrounds Earth. Air is a mixture of gases, mostly nitrogen (78%) and oxygen (21%), but also other gases including water vapor. Earth’s atmosphere reaches up to about 350 miles high, but there is no precise boundary where the atmosphere ends and space begins. There is just gradually less and less air until eventually there is no air. *Weather* is a term that describes anything that happens in the atmosphere related to temperature, air, and water. All weather takes place in the lowest part of the atmosphere, known as the troposphere. As you travel higher in the troposphere, there is less air, and the temperature gets colder. This is why mountain climbers sometimes use bottled oxygen—because there is not enough air to breathe at high altitudes. Clouds are mostly found in the lowest four miles of the atmosphere. At lower altitudes, clouds are made of tiny droplets of liquid water. At higher altitudes, where it is colder, clouds are made of ice crystals. Above approximately eight miles high, there is not enough air and water for weather to exist. At very high altitudes, the sky appears black. This is because the blue appearance of the sky is caused by air molecules scattering sunlight; at high altitudes, the air is too thin for this effect to be visible.

About Multiple Meaning Words

Students build conceptual understandings of new words as they are exposed to the words multiple times. Students gain new information about words as they hear the words used in conversation and see them used in text. In English, words often have very different meanings depending on the context in which they are used. Readers may experience comprehension difficulties when encountering words that have more than one meaning. Learning to infer the intended meaning of a word based on context can help students better comprehend content-rich texts. Becoming aware of multiple meaning words and using context to determine the intended meanings is particularly valuable in science, where secondary meanings are often key to understanding important concepts. While all students can benefit from a focus on multiple meaning words, this instruction may prove especially helpful for English Language Learners.

Teaching About Multiple Meaning Words

The following guidelines can be used with any science text to teach students to consider multiple meaning words encountered during reading.

- Select a text that includes concepts related to your curriculum. Look through the text and locate about five words that have different meanings depending on how, where, and in what way the words are used.
- Prepare a class chart or transparency that lists the multiple meaning words you selected from the text. You might also choose to make a student sheet that lists these words. The Multiple Meaning Words copymaster included in this guide can be used for this purpose.
- For each word you selected, write a simple definition that aligns with the way the word is used in the text. Then, write an additional definition that is based on a second meaning of the word. Students will select the meaning of each word that makes the most sense based on the text's content and context clues.
- Explain to students that many words have more than one meaning. Provide an example: The word *property* can mean a piece of land or the things you own. In science, the word *property* also means a characteristic of something, such as its shape or color. In many cases, a word has a unique and specialized meaning in science that differs from the way it is used in everyday language.
- Ask students to brainstorm other words with multiple meanings. Introduce examples, such as the following, and discuss how each word is used in both an everyday context and in a scientific context. *Fault*: everyday context—responsibility for a mistake; scientific context—a crack in Earth's crust, such as a fault line for earthquakes. *Force*: everyday context—physical power or effort; scientific context—something that causes an object to move or change speed or direction, such as the force of gravity.
- Introduce a process that can be used to infer the meaning of a word. Model how to look for clues before, within, and after the sentence in which the target word is used. Give the following example: *The scientist wrote down information in each row of a table.* Ask students to identify the intended meaning of the word *table* in the sentence (a way of recording information inside lines and boxes). Point out that the words *information* and *row* clarify that the scientific meaning applies.
- Explain that the placement of the word in a sentence also helps you know if it is a noun (a naming word), an adjective (a describing word), or a verb (an action word). Use the example: *Sam had change in his pocket.* Ask students to identify which meaning of *change* is meant. Point out that in this sentence, change is an object Sam can put in his pocket. Therefore, it must be a noun, not a verb.
- Point out the list of multiple meaning words that you prepared before class. Have students read the text you selected and look for these words. Direct students to pay careful attention to the sentences in which these words are used and to select the intended meaning that applies to each word.
- Have students discuss the strategies they used to figure out which meaning of each word fit the context of what they were reading.

Word	Meaning 1	Meaning 2
space	any location outside Earth's atmosphere	distance between one thing and another
land	to come to rest	the solid part of Earth's surface
tanks	military vehicles	large vessels for holding gas or liquid
rose	moved upward	a flower
negative	bad	less than zero

Teaching About Multiple Meaning Words with *Falling Through the Atmosphere*

Falling Through the Atmosphere provides opportunities for students to use context to determine the intended meaning of words that have multiple meanings in this text.

Getting Ready

Prepare the Multiple Meaning Words copymaster using the example above as a guide. (The correct responses are shown in green for your reference.) Make a copy for each student.

During Class

1. Explain that many words in English have more than one meaning. Provide an example of a familiar word that has two different meanings. (For example, *trip*—to fall down; *trip*—a voyage or journey.)
2. Ask students to brainstorm other words with multiple meanings. Discuss the different meanings along with examples of the situations in which they might be used.
3. Explain that there are several multiple meaning words in *Falling Through the Atmosphere* and that paying attention to which meaning is intended in the book can help students better understand the text.
4. Distribute the Multiple Meaning Words student sheets. Have students skim *Falling Through the Atmosphere* and record the number of the first page on which each word listed on their student

sheets appears. [Space, page 4; land, page 5; tanks, page 6; rose, page 8; negative, page 12.]

5. Lead a class discussion about one of the multiple meaning words on the student sheet. Model one process that can be used to determine which meaning makes the most sense using the following steps:
 - Ask a student to share the page number on which he found the word. Direct all students to turn to that page.
 - Ask a student to find the sentence that contains the multiple meaning word. Have students look for clues that signal the word's meaning before, within, and after the sentence in which the word is found.
 - Point out the context clues that can be used to figure out which meaning applies in this situation. For example, the sentence containing the word *tanks* on page 6 also uses the phrases *filled with air* and *to breathe*. Tell students that clues like these help clarify which meaning is most applicable in this context.
6. Direct students' attention to their student sheets. Have students locate the sentence in which each word appears and decide whether Meaning 1 or Meaning 2 is a better match with the information introduced in the text. Direct students to circle the meaning that makes the most sense. Discuss the words as needed.
7. Next, have students read *Falling Through the Atmosphere* in a way that is consistent with your classroom routines, giving students as much independence as possible.
8. After reading, discuss how the multiple meaning words were used in the book. Tell students that multiple meaning words are often found in science books. Explain that the strategy of paying attention to the intended meaning of multiple meaning words can be helpful as they read other books.

Independent Extension

Ask students to craft two sentences for each multiple meaning word on their student sheets. Each sentence should illustrate one of the word's meanings. Encourage students to incorporate context clues that provide information about the intended meaning of each word.

Name _____ Date _____

Multiple Meaning Words

Title of book: _____

Find each word in the book and write down the page number where the word first appears. Circle the meaning that is used in the book.

Page number	Word	Meaning 1	Meaning 2

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 3–4

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.

Digestion and Body Systems	
Strategy	Student Book
Analyzing Part-to-Whole Relationships	<i>Systems</i>
Teaching About the Nature and Practices of Science	<i>Secrets of the Stomach</i>
Teaching Process Description Writing	<i>Voyage of a Cracker</i>
Searching for Information in Science Texts	<i>Handbook of Body Systems</i>
Making Sense of Data in Science Texts	<i>What's the Diagnosis?</i>
Variation and Adaptation	
Strategy	Student Book
Teaching Scientific Comparison Writing	<i>Blue Whales and Buttercups</i>
Using Discourse Circles	<i>The Code</i>
Using Visual Evidence to Make Inferences	<i>Mystery Mouths</i>
Teaching About the Nature and Practices of Science	<i>Evidence from the Past</i>
Weather and Water	
Strategy	Student Book
Teaching About the Nature and Practices of Science	<i>Tornado! A Meteorologist and Her Prediction</i>
Teaching About Multiple Meaning Words	<i>Falling Through the Atmosphere</i>
Gathering Information from Science Texts	<i>Weather Encyclopedia</i>
Teaching Text Structure	<i>Water in the Desert</i>
Using the Cognates Strategy	<i>Drinking Cleopatra's Tears</i>
Connecting Science Words and Everyday Words	<i>Go with the Flow: Making Models of Streams</i>
Taking Notes Based on Observations	<i>Sky Notebook</i>
Teaching Text Features	<i>Wet Weather Handbook</i>
Making Sense of Data in Science Texts	<i>What's Going on with the Weather?</i>
Light Energy	
Strategy	Student Book
Teaching About Idioms	<i>Can You See in the Dark?</i>
Teaching Summary Writing	<i>The Speed of Light</i>
Teaching About the Nature and Practices of Science	<i>Why Do Scientists Disagree?</i>
Using Discourse Routines with Science Texts	<i>I See What You Mean</i>
Searching for Information in Science Texts	<i>Handbook of Light Interactions</i>
Teaching Scientific Explanation Writing	<i>Light Strikes!</i>
Teaching Vocabulary with Science Texts	<i>Cameras, Eyes, and Glasses</i>
Teaching Concept Mapping	<i>It's All Energy</i>
Interpreting Visual Representations	<i>Sunlight and Showers</i>

Extend Learning with *Seeds of Science/Roots of Reading*®

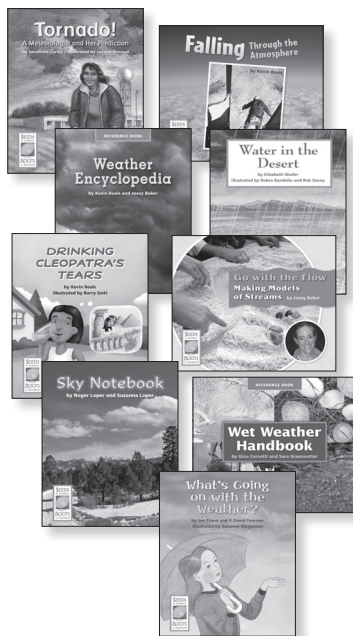
The strategy featured in this guide is drawn from the *Seeds of Science / Roots of Reading*® curriculum program. *Seeds / Roots* is an innovative, fully integrated science and literacy program.

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



Weather and Water 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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