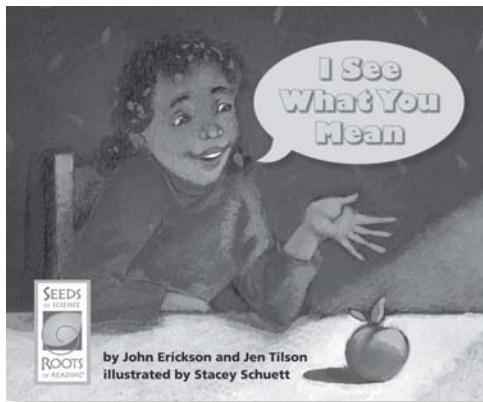


## Using Discourse Routines with Science Texts

with *I See What You Mean*  
from *Seeds of Science/Roots of Reading*®



### Introduction

This strategy guide introduces an approach for teaching students to discuss ideas presented in science texts using discourse routines. Discourse routines help students learn to use the language of science to discuss important content and are powerful ways for students to share knowledge and communicate ideas. This guide includes an introductory section about discourse in science, a description of how to use three different discourse routines with many science texts, and a plan for using one of these discourse routines with the *Seeds of Science/Roots of Reading*® book *I See What You Mean*.

### Book Summary

*I See What You Mean* explains the relationship between reflection and vision. The book follows an extended dialogue between two girls who are trying to figure out how light enables them to see a peach. As they question each other and add to their description of how people see, they explain more of the process involved in vision. Over the course of the book, readers learn that light comes from a source, bounces off objects, and travels to our eyes. Detailed illustrations and ray diagrams support the text and show the path of light in each scenario. This book helps readers understand that all objects reflect light and that this is how we see.

### Science Background

We see objects because they either reflect or emit light. When light is emitted by a source (such as a lamp or the Sun), it reflects off an object, and the reflected light enters our eyes, stimulating our retinal cells and sending a signal to the brain. All visible materials reflect some light. There are two types of reflection. Reflection off a mirror or any shiny surface is called *specular* reflection. Reflection off a non-shiny surface is called *diffuse* reflection. Students are often aware that shiny objects reflect light, but it is important for them to understand that *all* objects reflect light, which is how we are able to see them. Young students may have a number of misconceptions about light and vision. For example, students may think that we see an object because light travels out of our eyes *to* the object. They may understand that light travels from a source to an object, but they may not recognize that the light must then travel to our eyes in order for us to see the object. A ray diagram is a simple model that shows how light travels. It does not show every ray of light in a given situation; specific rays are chosen to make a particular path of light more clear. The ray diagrams in *I See What You Mean* illustrate how light travels from a source to an object and then reflects and travels to our eyes.

### About This Book

#### Reading Level

Guided Reading Level\*: O

#### Key Vocabulary

emit, light, reflect, source, travel

#### Text Features

bold print, diagrams, glossary, illustrations

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

## About Discourse in Science

Academic discourse is a specialized way people talk and write in different disciplines of study. Knowing how to communicate in this way is critical to students' success in school. Structured opportunities that engage students in content-based conversations help them participate in academic discourse. Providing contexts in which students can use new vocabulary, talk about complex concepts, and practice communicating their thoughts effectively is especially important in science, a domain that has a particularly specialized way of talking and writing. The discourse routines described in this guide offer ways to help students discuss scientific ideas in a variety of ways.

## Using Discourse Routines with Science Texts

Introduce a discourse routine before, during, or after reading a text using the following guidelines.

- Choose a text that presents a concept you feel will be especially engaging for your class to read and discuss. Good texts for this purpose include ones that pique student interest or present divergent ways of thinking.
- As you familiarize yourself with the text, decide whether you want to use a discourse routine before, during, or after reading. Choose one of the three discourse routines described in this section to use in your lesson.
- Develop two to four questions to pose that are broad enough to prompt an elaborated response and that encourage students to reflect on central ideas in the text.
- Make a class chart that lists the expectations for respectful listening and clear speaking. See the box on this page for ideas, or use guidelines you have already established with your class.
- Tell students they will learn a new procedure for sharing their ideas about a text. Discuss the Listening and Speaking Guidelines chart before you begin the routine.
- Model the routine you selected. Read, explain, and role-play each step of the directions with

## Listening and Speaking Guidelines

### Listening Guidelines

- Look at the speaker.
- Do not interrupt the speaker.
- Think carefully about everything the speaker says.
- When the speaker has finished, make a polite comment or ask a question.

### Speaking Guidelines

- Look at the listener.
- Speak clearly and loudly enough for the listener to hear you.
- Explain as much as you can about what you are thinking.

the class. Point out how you are following each of the listening and speaking guidelines.

- Have students conduct the discourse routine using one of the following sets of directions.

## Shared Listening

Shared Listening is a routine for promoting active listening and sharing of ideas between two students.

- a. Pair students with a partner. Designate one student in each pair as partner #1 and the other as partner #2.
- b. Pose a question for partner #1s and allow time for them to think about their responses.
- c. Partner #1s tell partner #2s the answer to the question.
- d. Partner #2s repeat back what they heard partner #1s say. Partner #1s confirm that partner #2s remembered all the relevant points. Partner #1s can correct information as necessary but not add anything new.
- e. Ask a few Partner #2s to share with the class what they heard their partners say.
- f. Repeat steps b–e with a new question and reverse roles (partner #2s speak and partner #1s repeat).

## Roundtable Discussion

A Roundtable Discussion is a routine for facilitating small-group, student-led conversations.

- a. Prepare four questions about the content of the text and write them on index cards.

- b. Organize students into groups of four and have each student choose one of the questions.
- c. Explain the role of a discussion leader, which is to pose the question, elicit responses from the group, and share the group's ideas with the class after the group discussion.
- d. Ask one student to begin by reading his question and facilitating conversation among the group. (You may want to encourage leaders to take notes on the back of the index card, if necessary.)
- e. Have students rotate to the next discussion leader and the next question. Continue until all four questions have been discussed.
- f. After the group discussions, debrief each question with the whole class. Have the discussion leader from each group briefly share the group's ideas.

### Thought Swap

A Thought Swap is a routine that maximizes participation of all students by having them simultaneously share ideas with a partner.

- a. Have the class form two lines so that each person is standing face to face with a partner.
  - b. Pose a question and allow time for students to think about their responses.
  - c. Partners discuss the question. Both partners should have a chance to speak.
  - d. One line of students moves one step to the right, so that everyone has a new partner.
  - e. Repeat steps b–d for two or three more questions.
- Discuss what the class learned from participating in the routine. In addition to reflecting on the content of the discussion, ask students to evaluate how well they listened and spoke during the routine. You might use the Discussion Reflections copymaster provided with this guide to have students reflect in writing.
  - Use the routine again to discuss other science texts. When students are comfortable with one routine, introduce a new routine and practice it in the same manner. The routines should become a resource that you can use to encourage discussion in your classroom.

## Using a Discourse Routine with *I See What You Mean*

*I See What You Mean* provides a realistic example of two people having a conversation about academic content.

### Getting Ready

Prepare a class chart that lists the guidelines for listening and speaking. (See the box on the previous page for ideas.)

### During Class

1. Read *I See What You Mean* in a way that is consistent with your classroom routines, giving students as much independence as possible.
2. After reading, conduct the Shared Listening routine. Discuss the Listening and Speaking Guidelines before posing the first question.
  - Pair students with a partner. Designate one student in each pair as partner #1 and the other as partner #2.
  - Pose a question for partner #1s, such as “How do people see?”
  - Instruct partner #1s to answer the question while partner #2s listen.
  - Instruct partner #2s to repeat what they heard partner #1s say.
  - Pose a question for partner #2s to respond to, such as “What is reflection?”
  - Repeat the steps above for partner #2s.
3. Debrief the discussion with the whole class. Invite students to share what they learned from reading and discussing.
4. Ask the class to orally reflect on their participation in the discourse routine.

### Independent Extension

Have students reflect on their Shared Listening discussion in writing, using the Discussion Reflections copymaster included with this guide. Encourage students to refer to the Listening and Speaking Guidelines chart to answer questions #3 and #4.

## 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](http://www.seedsofscience.org/strategyguides.html)).

## Available Student Books for Grades 3–4

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 *Weather and Water* student books and strategy guides will be available in late 2009.

<i>Digestion and Body Systems</i>	
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>
<i>Variation and Adaptation</i>	
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>
<i>Light Energy</i>	
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>

Name \_\_\_\_\_ Date \_\_\_\_\_

## **Discussion Reflections**

**Title of book:** \_\_\_\_\_

1. Write one idea that you shared with someone else during the discussion.

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2. Write one idea that you heard from someone else during the discussion.

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3. Write one thing that you thought you did well during the discussion.

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4. Write one thing you would like to improve the next time you participate in a discussion.

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## 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.deltaeducation.com](http://www.deltaeducation.com)



### Light Energy 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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