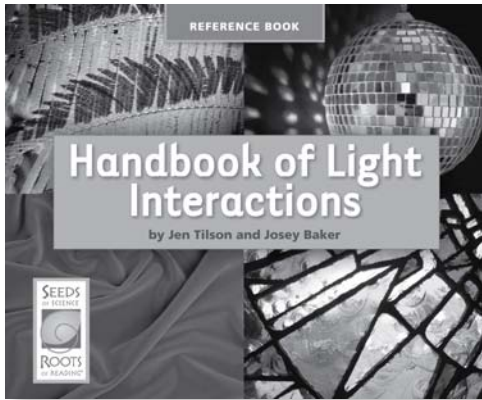


## Searching for Information in Science Texts

with *Handbook of Light Interactions*  
from *Seeds of Science/Roots of Reading*®



### Introduction

This strategy guide introduces an approach for teaching students how to search for information in text. The ability to search for information is particularly important in science, where students are often asked to locate specific information about particular topics. This guide includes an introductory section about the strategy of searching for information, a description of how to teach this strategy with many science texts, and a plan for teaching students how to search for information in science texts with the *Seeds of Science/Roots of Reading*® book *Handbook of Light Interactions*.

### Book Summary

*Handbook of Light Interactions* is a unique book that presents data about how light interacts with many different materials. The authors collected the data in an investigation that measured how much light each material transmitted, reflected, and absorbed. An introduction describes the three ways that light interacts with materials, details how the investigation was done, and provides a helpful explanation of how to use the book. The data are organized into tables and grouped by type of material. Analyzing the data in the tables enables readers to draw conclusions about how light interacts with different types of materials.

### About This Book

#### Reading Level

Guided Reading Level\*: Q

#### Key Vocabulary

absorb, data, interaction, reflect, transmit

#### Text Features

bold print, captions, diagrams, glossary, headings/subheadings, index, photographs, tables, table of contents

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

### Science Background

When light strikes a material, it can interact in three ways: light can pass through, or be *transmitted*; it can bounce back, or be *reflected*; or it can be *absorbed* by the material. All visible materials reflect and absorb light, but only some materials transmit light. Each different material transmits, reflects, and absorbs different amounts of light because of the characteristics of the material, such as its color and composition. Clear materials, such as air or glass, transmit most light, while other materials, such as paper or fabric, transmit only a little. Both shiny and non-shiny materials reflect light, but each reflects light differently. Light that is not transmitted or reflected is absorbed. When light is absorbed, it stops traveling in its path and is converted into thermal energy. Clear materials absorb very little light, but dark materials absorb most of the light that shines on them. To measure how light interacts with materials, scientists can use sensitive electronic light detectors that accurately measure the brightness of a light source and the amount of light transmitted and reflected by a material. It is difficult to directly measure the amount of light absorbed by a material, but it can be calculated from the other measurements.

## About Searching for Information in Science Texts

Searching for information is a useful reading-to-learn strategy. The strategy involves using text features to locate specific information in a text. Readers often use this strategy when they are researching or learning about a particular topic. Although this strategy can be used with any content-rich text, it is particularly useful when reading reference books. Readers do not usually read reference books from start to finish; instead, they skim appropriate sections of the text to find information related to a certain topic. As students use the strategy of searching for information, they gain practice in setting a purpose for reading. They also learn skills that are helpful when researching a topic for writing.

## Teaching How to Search for Information in Science Texts

The following guidelines can be used to teach students how to search for specific information in any content-rich text.

- Identify a general topic of interest for your class (e.g., animals) and an appropriate text with which to demonstrate the use of the strategy of searching for information in science texts.
- Point out that there are times when readers do not read books from beginning to end. Instead, readers strategically search for information. For example, when reading to answer a question or to gather information for a report, readers look for information that is most relevant to their topic.
- Brainstorm a few instances in which this strategy might be used. For example, a person might read about dog breeds before adopting a pet, or they might read about Jupiter before writing a school report. Guide students to understand that the strategies readers use are connected to their purposes for reading.
- Demonstrate the use of the strategy with the chosen text. For example, when reading a book about animals, choose a specific animal to research, such as birds. Think aloud about key words related to this animal to use when searching for information about birds (e.g., *wings* or *pelicans*).

## Steps for Searching for Information

1. Identify key words that relate to your topic.
  2. Use text features to find sections about the topic.
  3. Skim (read quickly) to look for key words related to your topic. If the information is useful, go on to Step #4. If it is not, try Step #2 again with another part of the text.
  4. Read the text carefully and make notes about what you want to remember.
- Model how to use text features to find specific information in the text. You could demonstrate how to use the table of contents to locate different sections of a book that might provide information about your topic, or you could demonstrate how to use the index to look for an exact word or phrase. Depending on your students' familiarity with text features, you might choose to introduce and practice one or two text features at a time. Additional text features useful for this purpose include headings, bold print, and illustrations.
  - Introduce and model how to skim for information. Explain that skimming is moving your eyes quickly over the text without reading every word. Tell students that once they find a section of text that contains the information they want, they should slow down and read carefully. Model this by thinking aloud as you locate information about your topic. Provide opportunities for students to practice skimming.
  - Review the strategy of searching for information in texts by creating a class chart that lists steps you introduced to the class. You may want to have students use the Searching for Information copymaster included with this guide (which also lists the steps) to record the information for which they are searching, the page number(s) on which that information is located, and any notes about the topic that will help them remember the information.
  - Periodically revisit the strategy of searching for information in texts. Students will become more efficient at finding information if they have ample opportunities to practice using this strategy with many content-rich texts.

## Teaching How to Search for Information in *Handbook of Light Interactions*

### Getting Ready

Make a copy of the Searching for Information copymaster for each student.

### During Class

1. Introduce *Handbook of Light Interactions*. Explain that students will use the book to learn whether light is transmitted, reflected, or absorbed by different materials.
2. Read the introduction on pages 4–5 with the class. Discuss each of the three light interactions. Write each term, along with a brief definition, on the board for reference: “reflect: to bounce off”; “absorb: to take in and hold”; “transmit: to go through.”
3. Ask students to read pages 6–11 next. After students have finished reading these pages, briefly discuss how to read the data tables using the information on page 11.
4. Distribute the Searching for Information student sheets and discuss the steps listed at the top. Discuss different features that can help students find information in the remainder of the book (table of contents, index, and headings). Have the class locate information about one type of material as an example.
  - Have students write the question “How does light interact with fabric?” in the first box in the “Information I am searching for” column on their student sheets.
  - Direct students to use the table of contents to find the page on which they can find this information. Have students record the page numbers in the “Page numbers” column of their student sheets. [Pages 12–13.]
  - Model how to skim the data table to find out if all types of fabric transmit, reflect, and absorb light. Have students record the information in note form in the “Notes” column on their student sheets. [All transmit, reflect, and absorb.]
  - Ask questions as needed to be sure students understand how to read the tables and have drawn accurate conclusions from the data.
5. Have students select another material using the table of contents, then search for information about this material on their own. Remind students to record on their student sheets what they are searching for, the page number(s), and notes about what they find out.
6. After students find and record information for one material, encourage them to search for information about other materials and record this information on their student sheets.
7. After students have had time to search for information about a few different materials, discuss what they discovered. Ask for volunteers to share information about each type of material. Have other students who looked up the same material confirm that the information shared is accurate.
8. Guide students to draw conclusions about different types of materials based on the data. Have the class help you write a statement about each kind of material that tells how the material interacts with light. For instance, you could write, “Fabric transmits, reflects, and absorbs light” and, “Metal reflects and absorbs light but does not transmit light.”
9. After the discussion, have students reflect on the strategies they used to search for information. Ask a few volunteers to explain how they found the information they were looking for. Point out that these strategies can be used to find specific information in a text any time students are reading.

### Independent Extension

Ask students to use *Handbook of Light Interactions* to formulate three to five questions about how light interacts with materials (such as “Which transmits more light, red felt or white felt?”). Students should write down their questions on a separate piece of paper and trade questions with a partner. Partners can challenge each other to find the answers in the book and explain how they located the information.

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

## Searching for Information

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

1. Identify key words that relate to your topic.
2. Use text features to find sections about your topic.
3. Skim (read quickly) to look for key words related to your topic. If the information is useful, go on to Step #4. If it is not, try Step #2 again with another part of the text.
4. Read the text carefully and make notes about what you want to remember.

Information I am searching for	Page numbers	Notes

## 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>

## 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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