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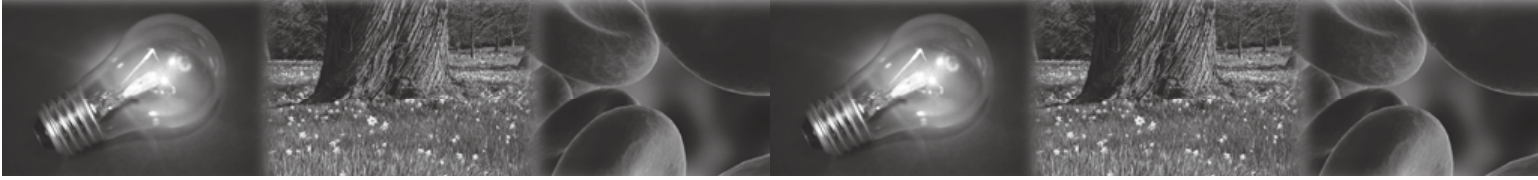
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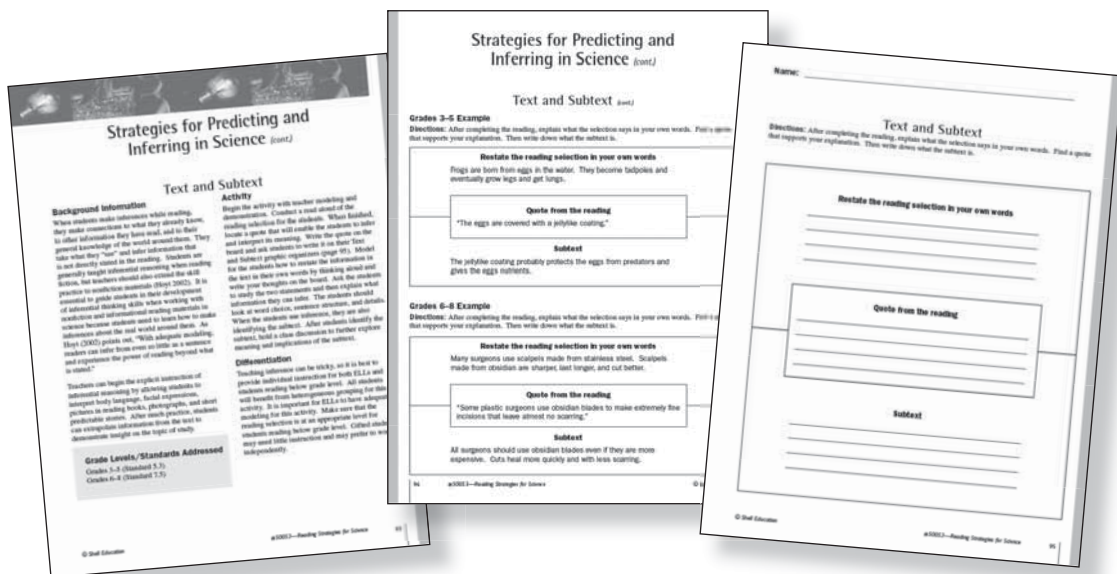


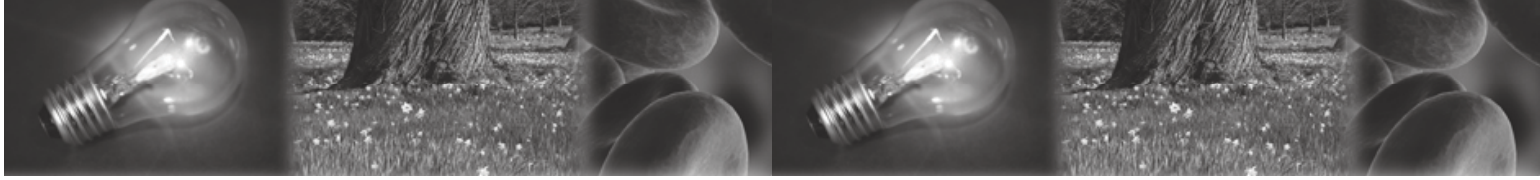
Introduction: How to Use This Book

This book includes a variety of strategies that can be used within science lessons to improve students' reading comprehension skills: promoting word consciousness, analysis of word parts, activating knowledge through vocabulary development, using and building prior knowledge, predicting and inferring, think-alouds and comprehension monitoring, questioning, summarizing, using visual representations and mental imagery, using text structure and text features, and multiple reading comprehension strategy instruction.

Each section opens with an overview of current research in that area to emphasize the importance of that particular reading comprehension skill. It also includes a clear and detailed definition of the skill, suggestions for instruction, and best practices. This information provides teachers with the solid foundation of knowledge to provide deeper, more meaningful instruction to their students.

Following each skill overview are a variety of instructional strategies to improve students' comprehension in that area. Each strategy in the book includes the definition and purpose of the strategy, the research basis for the strategy, and the reasons why the strategy is effective in improving comprehension. The grade level spans for which the strategy is most appropriate (1–2, 3–5, or 6–8) and the language arts standards that are addressed are listed. A detailed description of the strategy includes any special preparation that might be needed and extension ideas where appropriate. Finally, suggestions for differentiating instruction are provided for English language learners, students reading below grade level, and gifted students. Following the strategy descriptions are grade-level examples of how the strategy is applied to science. A blank template of the graphic organizer or activity page is included as a reproducible where applicable as well as on the accompanying CD-ROM.





Strategies to Assess and Build on Prior Knowledge in Science *(cont.)*

Think Sheet

Background Information

The Think Sheet strategy enables students to compare and contrast their pre-reading ideas with their post-reading understandings. Teachers encourage students to examine their own background knowledge and questions on science issues to be studied so that they will be better prepared to read. After reading, when students compare and contrast their ideas and questions with the new information in the reading materials, they are better able to make connections between their prior knowledge and their new conceptual knowledge. This technique helps new science information remain in the long-term memory because the students have made the connections among their schemata.

This strategy works best when there is an issue that involves some debate or controversy. The teacher models the process on an overhead transparency so that students better understand the procedure. The teacher should take some time to explain that science reading generally centers on an issue or topic about which the reader may have many questions.

Grade Levels/Standards Addressed

Grades 1–2 (Standards 7.3, 7.4)

Grades 3–5 (Standards 7.1, 7.6)

Grades 6–8 (Standards 7.1, 7.4)

Activity

Determine the main topic of the selected passage. Distribute copies of the Think Sheet (page 87) to the students or recreate one on an overhead transparency or on the board. Present the main issue to the class, and ask students to generate questions that they have about the topic. Ask them to explain what they hope to learn from reading. Write their questions down in the first column, “My Questions.” Next, ask students to explain what they already know about the main issue, and encourage them to share even if they are not sure if their information is correct. Write their information in the second column, “My Thoughts.” Explain to the students that they should read the text to locate the answers to their questions and also to determine if their thoughts were supported or countered by the information in the text. As the students read, they record the important ideas from the text in the last column on the Think Sheet (“Text Ideas”). After they have completed the reading, students share what they have learned from the reading and make connections between their questions, their thoughts, and the information presented in the text. Have students complete the reading task, and write down the answers to their questions in the third column as they read.



Strategies to Assess and Build on Prior Knowledge in Science *(cont.)*

Think Sheet *(cont.)*

Activity *(cont.)*

The reading can be completed as a read aloud for the younger students (1–2), paired reading for middle grades (3–5), or as a homework assignment for the older students (6–8). Discuss what students learned from the reading, and show them how their questions, their thoughts, and the information in the text are all related and connected. Ask questions such as: *What did the book say about your question? Did you have any questions that were not answered by the book? Were any of your thoughts inaccurate? Which ones?*

Differentiation

Model how to formulate questions for ELLs. Gifted students should be encouraged to conduct further reading to find the answers to any questions left unanswered by the reading selection and share their findings with the class. Scaffold the Think Sheet with some responses for students reading below grade level, and allow them to do a paired reading or hear the reading selection aloud.

Strategies to Assess and Build on Prior Knowledge in Science *(cont.)*

Think Sheet *(cont.)*

Grades 1–2 Example

Main Issue: the life cycle of chicks

My Questions	My Thoughts	Text Ideas
How long do the eggs take to open?	Chicks are born from eggs.	Chick eggs incubate for 21 days.
How long does it take a chick to peck out of the egg?	Chicks are fluffy and yellow.	Chicks take ten hours after the first hole in their eggs to get out.
How fast do the chicks grow?	Chicks eat seeds.	Not in reading.

Grades 3–5 Example

Main Issue: plants and carbon dioxide

My Questions	My Thoughts	Text Ideas
How do plants use carbon dioxide?	Cars produce carbon dioxide.	Plants use it to make food, and they release oxygen.
Do other creatures produce carbon dioxide?	Carbon dioxide is pollution.	All land organisms use oxygen and release carbon dioxide as a byproduct.
What makes coal?	Coal burning makes carbon dioxide.	Carbon in the plants of dead or fossilized forests forms coal.

Grades 6–8 Example

Main Issue: circuitry

My Questions	My Thoughts	Text Ideas
How does a circuit work?	I turn on a light switch to get light.	Circuits are loops that have switches to turn on and off the energy source conducted by wires from a load.
What do circuits turn off when overloaded?	When all the electrical appliances are running, sometimes the circuit breaker shuts off.	Circuit breakers have fuses that heat up and melt when too hot, and this turns the circuit off.
What is a closed circuit?	I've heard of closed circuit T.V.	Not in reading.

Name: _____

Think Sheet

Directions: Write down the main topic of the reading. Next, write questions about the topic in the My Questions column. Write what you already know about the question in the My Thoughts column. After reading, record important ideas in the Text Ideas column.

Main Issue: _____

My Questions	My Thoughts	Text Ideas