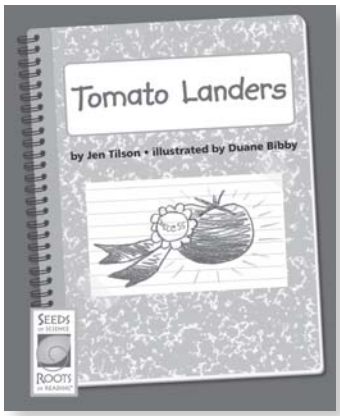
Strategy Guide

Using Anticipation Guides

with *Tomato Landers* from *Seeds of Science/Roots of Reading*®



Introduction

This strategy guide describes an approach for using an anticipation guide (statements with which students agree or disagree before reading) to support discussions of ideas in science books. This strategy helps students activate background knowledge, read with a purpose, think about important concepts before reading, and discuss science texts. This guide includes an introductory section about anticipation guides, a general overview of how to teach this strategy with many science texts, and a plan for using an anticipation guide with the *Seeds of Science/Roots of Reading*® book *Tomato Landers*.

Book Summary

Tomato Landers tells about a student who is presented with a design challenge at a summer science camp. Through realistic journal entries, the student narrator describes the steps she takes to design a device that will protect a tomato from breaking when dropped from a tall building. The entries tell how the narrator conceptualizes the design, tests the lander, evaluates the results, and redesigns her lander based on these results. For each of three attempts to design a successful lander, she records information in a data table and provides diagrams of her designs. The narrator learns that trial and error are part of the design process that engineers use to solve problems.

About This Book

Reading Level
Guided Reading Level*: R

Key Vocabulary
design, engineer, evaluate, table

Text Features
bold print, captions, diagrams, glossary, illustrations, labels, tables

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

Science Background

Designing a successful solution to a problem takes a great deal of work. When engineers design something, such as a rover, a parachute, or a lander, there is a great deal of trial and error involved. Initial ideas almost never work perfectly. For this reason, engineers build models of their designs and then conduct tests to see how well the models perform. By testing their designs, evaluating the results, and making revisions, engineers are able to design successful solutions to problems. This process of testing and retesting is referred to as the design process. The first thing engineers do when designing something new is figure out exactly what the design problem is. Once they know the details of the design problem, they begin thinking of different ways to solve the problem. Engineers often work in teams, using their scientific knowledge to help them figure out the best solutions. Once they have designed a solution, they test it, paying very close attention to the results of the test. They then use that information to help them revise and improve their design. They repeat this process over and over, until their design works the way they want it to. For complex problems, such as designing a rover that can travel around the surface of Mars, this process can take years.

About Anticipation Guides

An anticipation guide is a list of statements with which students agree or disagree before reading. Anticipation guides help readers anticipate the big ideas in a text, set a purpose for reading, activate background knowledge, and promote discussions about important concepts. Anticipation guides can also create interest by providing an initial hook to draw readers in. Discussing anticipation guides encourages students to focus on important information found in the text. This strategy is most effective when used with content-rich texts such as science books, especially those that present new or surprising ideas.

Teaching with Anticipation Guides

The following guidelines can be used to introduce anticipation guides with any content-rich text.

- Select a book that is connected to your curriculum. Ideal texts for use with this strategy provide further information about a topic with which students are somewhat familiar.
- Read the text to identify important concepts you would like students to discuss and learn about from reading.
- Prepare an anticipation guide by writing some statements about important ideas in the text that are true and some that are false. (See the box on this page for guidelines for writing anticipation guide statements.) The number of statements will vary according to the content and length of the text, but five to eight statements is ideal. The Anticipation Guide copymaster included in this guide can be used to list your statements.
- Briefly introduce the book you have selected to the class. Tell students that before reading, the class will do an activity to help them consider what they already know about some of the information found in the book.
- Tell students that they will be asked to agree or disagree with each of the statements listed on the anticipation guide and that they should discuss their responses in groups. During reading, students will look for information to support or refute the statements. After reading, students will revisit the statements in light of new information found in the text.
- Form groups of about four students. Have students read each statement, write down whether they agree or disagree, and discuss their reasons in their groups.
- Lead a class discussion in which students briefly discuss each of the statements. Encourage students who have differing viewpoints to discuss their positions. Be sure students understand that discussing their reactions to the statements is more important than getting the correct answers right now.
- Have students read the text and locate specific places where the ideas in the anticipation guide are discussed. You may wish to have students use sticky notes to flag ideas from the text that either support their initial responses or cause them to rethink those responses.
- After reading, lead another class discussion about the statements on the anticipation guide. Encourage students to cite evidence from the text to support their positions. Ask students to explain how their ideas changed as a result of reading.
- Utilize anticipation guides throughout your curriculum. Students will become more familiar with the process of using anticipation guides over time and will benefit from the focused discussion of important concepts.

Guidelines for Writing Effective Anticipation Guide Statements

- Focus on the information in the text that you want students to better understand.
- Write statements that students can discuss without having read the text.
- Include some statements that are true and some that are false. Students should be able to find evidence within the text they read that supports or refutes each statement.
- Include statements that may be surprising to students.

Using an Anticipation Guide with *Tomato Landers*

Getting Ready

1. Write a list of statements about *Tomato Landers* on the Anticipation Guide copymaster, referring to the guidelines in the box on page 2. Then, make a copy for each student. Statements might include:
   - Only engineers can design something to solve a problem. [False.]
   - There is usually only one good way to design something. [False.]
   - You can learn about designs from tests that fail. [True.]
   - In design, first ideas are always best. [False.]
   - Most good designs require only one test. [False.]
2. Prepare a stack of three to five sticky notes for each student so they can flag information in the book as they read.

During Class

1. Discuss what an engineer does. Invite students to share what they know and then explain that an engineer is a type of scientist who designs things to solve problems.
2. Introduce *Tomato Landers*, a book about a student who designs a landing device to protect a tomato that will be dropped off a tall building. Explain that the student designs her lander using a design process similar to one that real engineers use.
3. Explain the anticipation guide activity by telling students that they will react to statements listed on an anticipation guide before and after reading. Explain that the goal of this activity is to promote discussion of science ideas.
4. Distribute the Anticipation Guide student sheets. Ask students to indicate whether they agree or disagree with each statement. Be sure students understand that their reactions to the statements are more important than getting the correct answers right now.
5. Form groups of about four students and have them discuss their responses to the statements. Encourage students who have differing viewpoints to explain their positions.
6. Distribute *Tomato Landers* and sticky notes. Have students read the book in a way that is consistent with your classroom routines, giving them as much independence as possible. Ask students to use sticky notes to flag sections of the book that provide more information about the statements they discussed earlier.
7. After reading, revisit the anticipation guide statements. Invite students to change their responses (if applicable) based on the evidence they found in the text. Have students compare and contrast their initial responses with their current reactions and discuss how their ideas changed, or did not change, after reading.
8. Lead a class discussion in which students share ideas about the anticipation guide statements. Encourage students to refer to the text for supporting evidence.
9. Ask students to restate the false statements from the anticipation guide as true statements. [False statement: There is usually only one good way to design something. Restated: Engineers consider many factors and test many designs before choosing the best one.] Summarize the main idea from the text using the anticipation guide. [Engineers use the design process to solve problems.]
10. Invite students to reflect on the use of an anticipation guide and explain how reacting to the statements and discussing ideas in their groups helped them better understand the important concepts found in the book.

Independent Extension

Have students choose a statement from the anticipation guide. Invite them to write about the statement, drawing on what they learned in *Tomato Landers.* Encourage students to provide evidence about the statement they chose based on concepts introduced in the book. Have students share their writing in pairs or small groups.

Name _____ **Date** _____

Anticipation Guide

Title of book: _____

Read each statement. If you agree with the sentence, write **"A"** in front of it. If you disagree with the sentence, write **"D"** in front of it. Then read the book. After you read, come back to this page and see if your ideas have changed. Be ready to explain your thinking.

_____ 1. _____

_____

_____ 2. _____

_____

_____ 3. _____

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_____ 4. _____

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_____ 5. _____

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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	*Exploring Planets and Moons*
Using Science Text to Visualize	*Spinning Through Space*
Taking Notes Based on Observations	*Observing the Moon*
Using the Cognates Strategy	*How Big Is Big? How Far Is Far?*
Teaching Scientific Comparison Writing	*Handbook of Planets and Moons*
Using Discourse Circles	*What About Pluto?*
Teaching About How Scientists Use Models	*Planetary Scientist*
Using Anticipation Guides	*Tomato Landers*
Promoting Word Consciousness	*Technology for Exploration*
Chemical Changes	
Strategy	**Student Book**
Teaching Scientific Explanation Writing	*Chemical Reactions Everywhere*
Posing Investigation Questions	*Handbook of Chemical Investigations*
Teaching Text Structure	*What Happens to the Atoms?*
Teaching Procedural Writing	*Bursting Bubbles: The Story of an Improved Investigation*
Promoting Word Consciousness	*Communicating Chemistry*
Models of Matter	
Strategy	**Student Book**
Teaching Summary Writing	*Made of Matter*
Using Roundtable Discussions	*Break It Down: How Scientists Separate Mixtures*
Interpreting Visual Representations	*Phase Change at Extremes*
Teaching About How Scientists Make Inferences	*Science You Can't See*

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**

SEEDS OF SCIENCE / ROOTS OF READING®

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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